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UNIVERSITY OF CALIFORNIA, SAN DIEGO

Mindset Matters: Gender Differences in the Psychological Mechanisms Shaping
Social Comparison with Peers

A dissertation submitted in partial satisfaction of the requirements for the degree
Doctor of Philosophy

in

Psychology

by

Shiloh Elizabeth Beckerley

Committee in charge:

Professor James Kulik, Chair
Professor Nicholas Christenfeld
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Professor Christine Harris
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2012

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Chair

University of California, San Diego

2012

DEDICATION

This manuscript is dedicated to my daughter Sierra Nicole,
the most welcome distraction I could ask for,

and to my husband Joseph, who I fall in love with again
every time I watch him with our daughter.

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- McWhorter, S., Beckerley, S., McAnany, J., Darby, R. & Thompson, C. (2010). Behavioral Health Quarterly: Women's work, 1 (2/3), (Report No. 10-30) San Diego, CA: Naval Health Research Center.
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- McWhorter, S., Beckerley, S., McAnany, J., Darby, R. & Thompson, C. (2010). Behavioral Health Quarterly: National Guard/Reserves, 1 (1), (Report No. 10-09) San Diego, CA: Naval Health Research Center.
- Mahler, H., Beckerley, S., & Vogel, M. (2010). Effects of Media Images on Attitudes Toward Tanning. *Basic and Applied Social Psychology*, 32(2), 118-127.
- Barron, D., Krieger, S., Butler, H., Mahler, H., Kulik, J. (2007) Motivating safer sun protection behaviors through an appearance-based intervention in two distinct regions. *Annals of Behavioral Medicine*, 33 (Supplement 1), S205.

ABSTRACT OF THE DISSERTATION

Mindset Matters: Gender Differences in the Psychological Mechanisms Shaping
Social Comparison with Peers

by

Shiloh Elizabeth Beckerley

Doctor of Philosophy in Psychology

University of California, San Diego, 2012

Professor James Kulik, Chair

Although the presence of thin-ideal females in the media has been shown to decrease women's body satisfaction, preliminary research suggests that men may not be as negatively impacted. Recent research highlights the role of an individual's mindset in moderating comparison outcomes, which raises the possibility that mindset differences between men and women moderate the effects of comparisons with fit others. Mussweiler's (2003) selective accessibility model (SAM) predicts that initial perceptions of either similarity or dissimilarity with the comparison target will lead to differential reactions. A similarity mindset is predicted to promote assimilation (i.e., move self-evaluations in the direction of the comparison target), whereas a

dissimilarity mindset is predicted to promote contrast (i.e., move self-evaluations away from the comparison target). Additionally, researchers have considered the role of a temporal mindset, proposing that a comparison other which elicits inspiration and thoughts of a future, better version of the self, promotes assimilation, whereas a mindset that is evaluative and focused on who one is at present fosters contrast. Most women demonstrate contrast (decrements in appearance satisfaction) following exposure to idealized media targets. However, both SAM and the temporal-mindset models predict that if women were to adopt either a similarity or possible-self mindset when comparing to idealized media targets, increased self-satisfaction should occur. Research suggests men generally may not be as negatively impacted by comparisons with media images, but SAM and the temporal-mindset models predict that if either a dissimilarity or current-self mindset are induced, men may demonstrate contrast (decreased self-satisfaction). Results of the first two studies demonstrate that men experience increases in appearance satisfaction, and women decreases in appearance satisfaction, following exposure to fit peers, a pattern that likely contributes to the more pervasive negative feelings women have about their bodies. Manipulations of similarity and temporal mindsets were found to moderate social comparison outcomes in ways that may help to explain this gender difference. Consistent with temporal mindset models, possible-self mindsets were associated with increased appearance satisfaction in women. However, when temporal mindsets were tailored specifically to appearance, men responded with decreased appearance satisfaction. The implications of these findings for body-image research are discussed.

Introduction

Body dissatisfaction has reached almost normative levels among American girls and young women (Rodin, Silberstein, Streigel-Moore, 1984). A national survey revealed that many women report high levels of dissatisfaction with their weight (60%), hips (60%), and stomach (71%) (Garner, 1997); in addition, researchers have consistently found that approximately 50% of girls and undergraduate women report overall dissatisfaction with their bodies (e.g. Bearman, Presenell, & Martinez, 2006; Monteath & McCabe, 1997). In women, these perceptions emerge among children as young as age 7 years, and appear to exist across diverse levels of body size and race (Dohnt & Tiggemann, 2006; Grabe & Hyde, 2006). In contrast, research has found that men do not experience the high levels of body dissatisfaction or eating disorders that are so widespread among women (Gabriel, Critelli & Ee, 1994; Miller, Gleaves, Hirsch, Green, Snow & Corbett, 2000; Powell, Matacin & Stuart, 2001; Strahan, Wilson, Cressman & Buote, 2006; Fallon & Rozin, 1985; Zellner, Harner & Adler, 1989). Researchers suggest that women have been exposed to more extreme idealized images from the media than men (Kilbourne, 1994; Reichert, Lambiase, Morgan, Carstarphen & Zavoina, 1999; Richins, 1991; Sohn, 2010), and have suffered the consequences more (Botta, 1999; Brodie & Slade, 1988).

Numerous studies (see Botta, 1999; Brodie, Slade & Riley, 1991; Lin & Kulik, 2002; Richins, 1991; Myers & Crowther, 2009) have identified social comparison (Festinger, 1954) as one of the most influential elements in the development of appearance dissatisfaction. Social comparisons – comparisons between the self and

others – are a fundamental psychological mechanism that have been shown to influence people’s experiences, behavior, and self-evaluations (e.g., Morse & Gergen, 1970). When given information about what others have achieved or have failed to achieve, or what others can and cannot do, we automatically relate this information to ourselves (Brickman & Bulman, 1977; Dunning & Hayes, 1996; Botta, 1999; Blanton & Stapel, 2008).

Effects of Gender and Social Comparisons with Media Images on

Appearance Satisfaction. The shift in society over the past 40 years to a preference for thin-figured women has been well-documented (e.g., Davis & Oswalt, 1992; Garner, Garfinkel, Schwartz, & Thompson, 1980; Morris, Cooper & Cooper, 1989; Silverstein, Peterson, & Perdue, 1986; Wiseman, Gray, Moismann, & Ahrens, 1992). Most believe that the media, because it tends to feature thin-figured women, has been the primary causal agent for this shift (e.g., Anderson & DiDomenico, 1992; Greenberg et al., 2003; Silverstein, Perdue, Peterson, & Kelley, 1986; Striegel-Moore, Silberstein, & Rodin, 1986). There is an extensive body of supporting correlational evidence linking naturally occurring media exposure to increased eating disorder symptomology (Stice, Schupak-Neuberg, Shaw & Stein, 1994), greater body dissatisfaction, and a stronger desire for thinness (Tiggemann & Pickering, 1996). However, such correlational evidence does not address the question of causal direction, nor can it rule out selection biases. Consequently, in an effort to test the speculated causal role played by media images, a number of studies have experimentally manipulated exposure to thin idealized images by randomly assigning women to different conditions of exposure and assessing their immediate impact. The

meta-analysis of such studies by Groesz, Levine, and Murnen (2002) concluded that there were small, but consistent, negative effects on mood, body dissatisfaction, and self-perception of physical attractiveness. Since the publication of Groesz and colleagues' meta-analysis in 2002, there has been a dramatic increase in such studies that overwhelmingly demonstrate the negative effects of acute exposure to thin media ideals, (see the more recently published meta-analysis of Grabe, Ward, and Hyde, 2008).

Such findings suggest that exposure to same-gender, thin-ideal figures has set a standard most women internalize but few can meet (Nemeroff, Stein, Diehl, & Smilack, 1994); this may account for the increasingly high levels of body dissatisfaction and eating disorders among women in Western societies (e.g., Garner & Garfinkel, 1980; Gordon, 2000; Halmi, Falk, & Schwartz, 1981; Mazur, 1986; Pike & Rodin, 1991; Thompson & Heinberg, 1993; Wilson & Eldredge, 1992). Furthermore, in experiments wherein participants are provided with specific instructions directing them to engage in social comparisons with the ideal images, negative self-evaluative reactions to thin-ideal figures are exacerbated (Halliwell & Dittmar, 2005; Cattarin, Thompson, Thomas, & Williams, 2000).

Men's appearance satisfaction may also be impacted by an environment that is increasingly appearance-focused (Blond, 2008; Leit, Pope and Gray, 2001; Frederick, Fessler & Haselton, 2005) but the nature of the impact on men of body comparisons is not yet clear. What is clear is that men do not experience the high levels of body dissatisfaction that are so widespread among women (Gabriel, Critelli & Ee, 1994; Powell, Matacin & Stuart, 2001; Strahan, Wilson, Cressman & Buote, 2006). While a

few experimental studies have linked exposure to the muscular, male ideal with body dissatisfaction (Hobza, Walker, Yakushoko & Peugh, 2007; Lavine, Sweeney & Wagner, 1999; Agliata & Tantleff-Dunn, 2004; Blond, 2008), others have shown that males sometimes experience less negative affect and more positive self-regard after exposure to idealized male images (e.g. Humphreys & Paxton, 2004; Halliwell, Dittmar & Orsborn, 2007; McCabe & Ricciardelli, 2003; Ricciardelli, McCabe & Banfield, 2000; Kalodner, 1997; Venkat & Ogden, 2002).

Although considerable research indicates that exposure to attractive, idealized women in the media leads to negative self-evaluations that manifest as reduced self-esteem and appearance satisfaction (e.g., Irving, 1990; Stice & Shaw, 1994; Thompson & Heinberg, 1993; Tiggemann & Pickering, 1996; Wilson & Eldredge, 1992; see Groez, Levine, & Murnen, 2002, and Grabe, Ward, and Hyde, 2008, for meta-analytic reviews), and an emerging literature is beginning to explore how exposure to the muscular, male ideal may impact men's self-regard (Hobza, Walker, Yakushoko & Peugh, 2007; Lavine, Sweeney & Wagner, 1999; Agliata & Tantleff-Dunn, 2004; Humphreys & Paxton, 2004; Halliwell, Dittmar & Orsborn, 2007; McCabe & Ricciardelli, 2003; Ricciardelli, McCabe & Banfield, 2000; Kalodner, 1997), to date, the majority of claims surrounding gender differences in response to idealized media figures have been based on comparisons between separate studies. In order to more clearly determine whether men and women's appearance satisfaction is differentially impacted by social comparisons with others, men and women need to be directly compared in a single study. To date, this has only been attempted by a handful of researchers, where exposure to idealized images has reduced body

satisfaction in women, but had mixed results among men (Grogan, Williams & Conner, 1996; Hargreaves & Tiggemann, 2004; Venkat & Ogden, 2002).

Effects of Gender and Social Comparisons with Peers on Appearance

Satisfaction. A relatively limited but growing body of research has examined how social comparisons with peers impact appearance satisfaction. This is a vital area for examination, given that comparisons with peers are more frequent than comparisons with media figures (Wheeler & Miyake, 1992), and that comparisons with peers are likely to be more relevant for self-concepts. This follows from Festinger's (1954) original social comparison theory, which argues that people generally prefer to compare themselves to similar others to obtain the most accurate self-appraisals possible. Consistent with these ideas, there is evidence that college-age women engage in frequent comparisons with peers in order to establish an idea of their weight status (Striegel-Moore et al., 1986) and experience decreased appearance satisfaction when exposed to slim peers (Krones, Stice, Batres, & Orjada, 2005; Lin & Kulik, 2002; Wanic, 2011; Wasilenko, Kulik, & Wanic, 2007). Furthermore, the impact of peer comparisons for men has been only minimally investigated (Strahan et al., 2006). Given that everyday social comparisons most typically involve peers, not media figures (Wheeler & Miyake, 1992), and that men are less likely than women to use media images as a source of comparison (Strahan et al., 2006), this is a potentially important question that we address in this collection of studies.

Less studied are the effects of comparisons with others who appear overweight or physically unfit. This omission from the media-effects literature is understandable given the dearth of overweight individuals featured in the media, but in everyday life,

men and women potentially have many opportunities to compare themselves with peers who appear unfit and overweight. Basic social comparison research suggests comparisons with “worse-off” others (downward comparisons) can serve to elevate self-regard (e.g., Taylor & Lobel, 1989; Wills, 1981). This suggests that comparisons with a peer who appears overweight may enhance appearance satisfaction, which could serve to offset the possible deleterious effects of comparisons with thin or very fit peers. However, two studies have now found that women's social comparisons with peers produce asymmetrical effects; in both studies, one in a lab setting (Lin & Kulik, 2002) and the other in a naturalistic setting (Wasilenko et al., 2007), exposing women to thin peers caused decreased appearance satisfaction, whereas exposing them to overweight peers produced no significant enhancement of appearance satisfaction. Wanic (Study 2; 2011) more recently found that overweight peers could increase women’s appearance satisfaction, but only among women who perceived themselves as dissimilar to the overweight peer.

The first major purpose of the present series of experiments was to extend the line of work on peer comparisons and body image by directly examining how men's reactions to exposure to fit and unfit peers are similar or dissimilar to women's reactions. Only one study has directly (in the same study) tried to compare how men and women’s body satisfaction is impacted by social comparisons with fit peers, but the operationalization of fit peers (photos in a magazine) arguably did not truly involve peers (Strahan et al., 2006). To our knowledge, no studies have yet considered the impact of unfit peers on male versus female appearance satisfaction or affect.

Moderating Influences of Mindset. Despite the growing evidence that media images of idealized female figures can lead to decreased appearance satisfaction and self-esteem (Hargreaves & Tiggemann, 2003; Rodin, Silberstein, & Steigle-Moore, 1985), in some experimental studies, negative effects have been limited to subgroups of women with high trait body dissatisfaction (e.g. Posavac, Posavac & Posavac, 1998). Furthermore, a handful of studies have actually reported unexpected positive effects of exposure to thin ideals among some subgroups of women. Specifically, positive effects of exposure to idealized images has been found among women who were currently dieting (Joshi, Herman & Polivy, 2004; Mills, Polivy, Herman & Tiggemann, 2002), were high self-monitors (Henderson-King & Henderson-King, 1997) and had “low interpersonal sensitivity” (Wilcox & Laird, 2000). Additionally, as noted, preliminary research suggests that men may not be negatively impacted by idealized images (Gabriel, Critelli & Ee, 1994; Powell, Matacin, & Stuart, 2001; Strahan et al., 2006). Basic social comparison theory suggests that comparisons with those who are better off on a given dimension (upward comparisons) will likely result in decrements in self-evaluations (Festinger, 1954). However, the mixed results found among both men and women suggest that in the realm of body image, the effects of upward comparisons are not uniform, and may depend on situational and/or individual differences that moderate reactions to body comparisons. If there is in fact a reliable overall difference in how men and women’s appearance satisfaction tends to be impacted by peer comparisons, the question of how these gender differences occur becomes an additional important, understudied question. This is a particularly important question if men, after exposure to more attractive peers, do not show the

decrease in appearance satisfaction that social comparison theory would predict (Marsh & Parker, 1984; Morse & Gergen, 1970; Salovey & Rodin, 1984; Tesser, Millar & Moore, 1988). A second major goal of the present set of studies therefore will be to explore whether the differential effects of peer comparisons can be explained by a factor that has been found to determine the direction of social comparison effects in other domains, namely mindset.

Selective Accessibility Model. Imagine two young, aspiring musicians attending a concert by their favorite band. During the concert, one of the aspiring musicians selectively focuses on the differences between himself and his favorite musician, e.g., how his favorite musician is an unbelievable guitar player while he, in comparison, struggles at the guitar. For this young musician, comparing to his favorite musician may lower his self-evaluations as a musician. Suppose the second aspiring musician focuses instead on the similarities between the professional and herself, specifically, on how they both are vocally talented. For her, comparing to her favorite musician may improve her self-evaluations. Research supports this pattern, showing that induction of a general similarity or dissimilarity focus prior to a comparison task via priming procedures can result in assimilation or contrast in self-evaluations, respectively. Assimilation refers to the process whereby an individual's self-evaluation is displaced in the direction of the comparison target, that is, more favorable self-evaluations following comparisons with one that is better off on the relevant dimension. Contrast on the other hand is said to occur when an individual's self-evaluation is displaced away from the comparison target, leading to less positive ratings following an upward comparison.

Drawing on theories that attempt to integrate self-concept and mindset (e.g. Higgins, 1987), it is possible to theorize that upward comparisons may be processed very differently, depending on which self-related mindset individuals adopt during exposure. Mussweiler's (2003) selective accessibility model (SAM), for example, proposes that in the beginning of the social comparison process, the perceiver first makes a quick assessment of the basic similarity between the self and the standard, briefly considering a small number of salient features to determine whether the self is generally similar, or dissimilar, from the standard. The results of this initial assessment determine whether the subsequent social comparison process is driven by similarity testing or dissimilarity testing. When perceived similarity is high, the individual theoretically will engage in a process of similarity testing (i.e., look selectively for similarity), which should as a result increase cognitive access to target-consistent information. Conversely, low perceived similarity theoretically triggers a process of dissimilarity testing, which results in greater cognitive access to target-inconsistent information. As a result of these accessibility differences, similarity testing is more likely to lead to assimilation effects and dissimilarity testing to contrast effects. In sum, whether a perceiver will assimilate to or contrast away from the standard depends heavily, according to the SAM model, on the information activated during that quick initial assessment (Hafner, 2004; Mussweiler, 2003; Smeesters & Mandel, 2006).

In an illustrative study, Mussweiler (2001) primed participants to focus on similarities or dissimilarities by examining two pictures and listing either similarities or differences between them. They were then asked to compare themselves with a

student who was adjusting well or adjusting poorly to life at a new university, and thereafter to evaluate their own adjustment to university life. Participants who initially searched for similarities assimilated their self-evaluations to the standard, judging themselves to be better adjusted to university life when the standard was well adjusted. In contrast, participants who had initially searched for dissimilarities in the pictures contrasted their self-evaluations away from the standard. These participants judged themselves to be better adjusted to university life when the standard was poorly adjusted.

Manipulations of similarity focus have generally supported this model (Hafner, 2004; Brown, Novick, Lord & Richards, 1992; Papies & Nicolaije, 2012; Mussweiler, Ruter & Epstude, 2004; Hanko, Crusius & Mussweiler, 2010; see Mussweiler, 2003, 2007, for overviews), as have analyses based on naturally occurring differences in perceptions of similarity (Wanic, 2011; Papier & Nicolaije, 2012). In the present context, this suggests that if we focus particularly on how our physiques are similar to that of a fit peer, our appearance satisfaction should benefit, whereas focusing instead on how we differ from a fit peer should undermine appearance satisfaction.

An interesting question that follows from the selective accessibility model is *why* certain individuals focus on similarities as opposed to dissimilarities between themselves and a comparison other. One possibility is that similarity and attainability are fundamentally interrelated. When one perceives another's success as attainable, it often leads to assimilation (e.g. Buunk et al., 1990; Lockwood & Kunda, 1997; Taylor, Wayment & Carrillo, 1996), because judges are more likely to assume similarity if the standard's level of performance is attainable. If the standard is not

attainable, however, assuming similarity is unrealistic, so judges then may be more likely to test for dissimilarity (Corcoran, Crusius & Mussweiler, 2011). While the selective accessibility model alone does not offer a concrete explanation for why individuals may focus on similarities as opposed to dissimilarities between themselves and a comparison other, the model does begin to suggest cognitive processes that may moderate the social comparison process.

Current and Possible Selves Mindsets. While not directly addressed by Mussweiler's (2003) SAM model, one can imagine situations when upward comparisons do not result in a deflation of the self.¹ Because social comparisons are at the heart of many human activities, it is unlikely that humans would be hardwired to uniformly respond to all comparisons with a single default response. Again, imagine a young, aspiring musician attending a concert of his favorite artist. If the aspiring musician is focused on his current musical ability, comparing to his favorite musician may lower his self-evaluations. However, if the aspiring musician is focused on what he may one day become, comparing to his favorite musician may inspire him, bolstering his feelings of satisfaction. When a person is motivated to improve, social comparisons can provide a sense of what is possible. In the domain of body image, researchers have variously termed this "thinness fantasy" (Myers & Biocca, 1992), "inspiration" (Mills et al., 2002; Evans, 2003; Engeln-Maddox, 2006), or a "possible self mindset" (Blanton, 2001; Stapel & Van der Zee, 2006; Brewer & Gardner, 1996). While there are different nuances to each theory, they all appear to be addressing a single construct that may account for whether assimilation or contrast effects occur in response to social comparisons. Importantly, they all suggest that social comparisons

are unlikely to occur while in a single mindset. Rather, social comparisons are fundamentally shaped by the particular self-concept that is active in the working memory during the time of social comparison. If one's self-concept is focused on his or her current individual traits and characteristics – a category with clear self-other-borders – contrast effects theoretically should occur. According to Blanton (2001), focusing on who one currently is emphasizes the static, defined self-other-borders of the self. As such, social comparison information that is received when the current self-concept is activated theoretically should function as an external standard against which the (static) individual compares and result in contrastive comparison outcomes. On the other hand, if one's self-concept actively involves thoughts that he or she may become like the comparison other at some point in the future (Markus & Nurius, 1986), we might expect a different outcome. Since the possible-self mindset by definition is a representation of who one might eventually become, and is therefore mutable, the self-other borders should be relatively blurred (Blanton, 2001). This would theoretically create room for attributes of others to be included in representations of the self. As a result, when a possible-self mindset is activated, such inclusions theoretically should lead to assimilative comparison outcomes (Blanton & Stapel, 2008). Throughout this paper, I will refer to these mindsets as “current self” versus “possible self,” respectively.

One can see how the situational contexts of many research experiments may encourage a “current self” as opposed to a “possible self” mindset, accounting for the predominant finding of a contrast effect with upward comparisons. Many are familiar with the classic study by Morse and Gergen (1970), for example, which initially

demonstrated that comparisons with others can shape self-evaluations. In this study, researchers exposed participants to a fellow job applicant who was competing against them for an attractive job. Participants exposed to another job applicant who appeared highly qualified and competent (“Mr. Clean”) reported lower self-evaluations than those exposed to a job applicant who appeared unqualified for the position (“Mr. Dirty”). More recently, some researchers have noted that this contrast effect may have occurred because the researchers created an evaluative context where the “current-self” mindset was salient, rather than a “possible-self” mindset (Lockwood & Kunda, 1997; Blanton & Stapel, 2008).

To date, three studies have attempted to manipulate mindset for social comparison in the realm of body image. Martin and Gentry (1997) found instructing girls to view advertisements under a “possible-self” motive (explicit comparison of physical attractiveness with the models to seek ways of improving one’s own attractiveness) produced higher self-perceptions of physical attractiveness than self-evaluation instructions. Similarly, Halliwell and Dittmar (2005) showed that among women scoring high on internalization of sociocultural attitudes toward appearance, body-related anxiety was significantly higher after viewing advertisements with models (versus no models) under “current self” instructions, but that there was no difference under “possible-self” instructions. Finally, Wanic (2011) recently found that engaging college women in a writing task that primed a “possible-self” mindset resulted in significantly higher self-satisfaction than when women completed a different writing task that primed a “current-self” mindset. While additional research is clearly needed, these studies provide an excellent starting point for exploring the

role that mindset may play in the effects of social comparisons in general and, more specifically, in possible gender differences in self-evaluative reactions to body comparisons.

Attainability Perceptions. Fundamentally integrated with the concept of the temporal self is the perceived attainability of the status or attributes of the comparison other. The meaning derived from a comparison is greatly increased if there is a high likelihood of finding oneself at the target's level (Brickman & Bulman, 1977). In order for comparisons with those who are better off to leave us feeling motivated and inspired, it may not be sufficient for one to simply assume a "possible self" mindset during comparisons. It may only be when the self is perceived as mutable (Stapel & Koomen, 2000), *and* the standard as attainable (Lockwood & Kunda, 1997) that people are motivated by such comparisons. When both conditions are met, upward comparisons may be uplifting, because they provide the comparer with evidence that such achievements are within reach (Lockwood & Kunda, 1997). Role models can enhance and inspire by making successful future selves appear more tangible and by illustrating how future achievements may be accomplished (Meichenbaum, 1971; Lirgg & Feltz, 1991; Maddux, 1995).

Consider again an aspiring young musician attending his favorite musician's concert. If the student is focused on his current musical ability, comparing to his favorite musician may lower self-evaluations. However, if he is focused on what he may one day become, attainability may come into question. If the young musician perceives musical ability as a gift that cannot be changed over time, he may perceive the talent (and therefore performance) of his favorite musician as unattainable and

therefore lower his self-evaluations. However, if the young musician believes music is a skill, and that musical ability and performance can be improved through dedication and practice, he may perceive the performance levels of his favorite musician as attainable. Because the young musician may view the other's achievements as attainable and within reach, such a comparison may be uplifting rather than deflating (Brickman & Bulman, 1977).

In the area of intelligence, researchers have found that those who believe intelligence is malleable and attainable display greater motivation and enhanced performance in response to upward as compared to downward comparisons, whereas those who believe that intelligence-related abilities are fixed display greater motivation and enhanced performance in response to downward as compared to upward counterfactuals (Dyczewski & Markman, 2012). Major et al.'s review (1991) also concluded that the impact of a superior other was positive in studies in which participants most likely viewed their own performance as controllable (and so viewed future success as attainable; e.g. Lockwood & Kunda, 1997; Meichenbaum, 1971; Seta, 1982), but the impact of superior others was negative in studies in which participants most likely viewed future success as unattainable (e.g. Salovey & Rodin, 1984; Tesser & Paulhus, 1983).

The directionality of the relationship between a "possible-self" mindset and attainability of a target's success remains unclear - it is possible that introducing a possible-self mindset may enhance perceptions of attainability of a target's success, but is possible also that when a target's success is perceived as attainable, individuals may more readily find themselves in a possible-self mindset. Regardless of

directionality, the temporal mindset models, along with the attainability literature, suggest that these two constructs may be important cognitive processes moderating the social comparison process. In the present context, this temporal mindset model suggests that being in a “current-self” mindset during comparisons with a fit peer may undermine appearance satisfaction. However, a “possible-self” mindset should improve appearance satisfaction, particularly in cases where a similarly fit physique is viewed as attainable.

Current Research. Although social comparison processes are believed to play a major role in determining feelings of appearance satisfaction, there have been very few distinctions made between men's and women's social comparison tendencies in this context. Furthermore, as discussed above, there appears to be strong evidence that an individual's mindset can moderate social comparison outcomes (e.g. Stapel & Koomen, 2001; Lockwood & Kunda, 1997; Gardner, Gabriel & Hochschild, 2002; Kimmelmeier & Oyserman, 2001; Mussweiler, 2003). It is possible that mindset may be just as crucial as the characteristics of the comparison person in determining resulting appearance satisfaction. Therefore, determining if the social comparison process and the functions of comparison motives are generally different between men and women is an essential question that could shape our understanding of gender differences in appearance satisfaction.

Main Goals. In summary, one major goal of this collection of studies will be to compare directly women's and men's responses to same-sex peers, something that has rarely been attempted in the literature; the primary hypothesis here is that female appearance satisfaction will be more negatively impacted than male appearance

satisfaction by exposure to fit peers. Accordingly, Study 1 will directly compare women's and men's responses to same-sex peers of varying body types. Studies 2 - 4 will then focus on evaluating how women's and men's appearance satisfaction is impacted specifically by fit peers.

A second goal of this collection of studies will be to explore the possibility that when confronted with a fit peer, women selectively focus on both the dissimilarities between themselves and a fit peer, and on the static nature of their body and the lack of their potential for change ("current self"). This would foster contrast and ultimately diminished appearance satisfaction. It is also possible that men are more likely to consider the similarities between themselves and a fit peer, and the possibility of improving their body in the future ("possible self") when viewing a fit peer. This theoretically would foster assimilation and enhanced appearance satisfaction. If such differences in typical mindset occur and play a significant role in producing the observed gender differences in response to a fit peer, it should be theoretically possible, by experimentally controlling the current-self versus possible-self mindset of individuals, to eliminate the observed gender difference in responses to a fit peer. Studies 2 - 4 will explore systematically the effects of the mindset variables of perceived similarity and current self-representation, as they pertain to body-image related comparisons. We would predict for both men and women that activation of either a dissimilarity-focus mindset or a current-self mindset, when exposed to the fit peer, should produce lower self-satisfaction ratings and decreased perceptions of the attainability of a fit body; in contrast, activation of a similarity-focus mindset or a

possible-self mindset should produce higher self-satisfaction ratings and increased perceptions of attainability of a fit body.

Study 1: Gender Differences in Appearance Satisfaction and Mood following Social Comparison with Peers

The main goal of the first study was to compare appearance satisfaction and affective responses of females and males to fit and unfit peers. To do so, male and female participants were exposed to a same-sex peer in a short video, who based on pilot testing and depending upon randomized condition, appeared fit, unfit, or of average fitness. Each participant then completed a brief questionnaire. In line with Lin and Kulik (2002), Wasilenko et al. (2007), and Wanic (2011), we predicted an asymmetric response pattern from female participants, such that appearance satisfaction would be lower after viewing a fit peer but no higher in response to an unfit peer compared to an average-fitness peer. We anticipated that male participants would react differently to exposure to a fit peer. Specifically, we anticipated that men would be less likely than women to feel negative affect (depression) and dissatisfaction with themselves when exposed to a fit peer, and that men might even experience self-enhancement relative to those who viewed an average or unfit peer. We thought tentatively that men might also be more apt than women to experience self-enhancement in response to exposure to an unfit compared to average-fitness peer.

Method

Participants. Undergraduates (73 male, 69 female; $M = 20.39$, $SD = 2.41$, years old) at the University of California, San Diego (UCSD), participated in the study to fulfill a lower division psychology course requirement. Two participants (1 male

and 1 female) were dropped from the study because they were suspicious about the experimental manipulation. The final sample was 54.9% Asian, 23.2% White, 9.9% Hispanic, and 12.0% other. Each participant was randomly assigned to one of three experimental conditions.

Procedure. Participants were run individually. The gender of the experimenter was matched with the gender of the participant. The experimenter always wore a long lab coat in order to conceal his or her own body shape and thus decrease the likelihood that participants would compare their bodies to that of the experimenter. All individuals who were asked to participate agreed, read and signed a consent form, and completed a baseline questionnaire (described below).

The experimenter explained that the study concerned “how information about individuals is conveyed through online dating profiles.” It was further explained that each participant would be asked to view another UCSD student who, purportedly in the context of being in an earlier experiment, had made a short, extemporaneous “dating” video of the sort seen on the Internet. Participants then viewed a short video (8-9 minutes long) in which a same-sex peer described him/herself and the qualities that they were looking for in a dating partner. Throughout the video, the body of the peer was in full view of the camera. The script of the video, which was developed from a collection of the common ways individuals on Match.com describe themselves and their ideal dating partner, was intentionally generic and held constant between all actor confederates. The setting of the video was also held constant between all actor confederates, with all actors dressed similarly (blue jeans, white t-shirt) filmed in front of a solid blue background. The body type of the actor varied between conditions,

being fit, average, or unfit (see manipulation checks below). After the video was over, participants completed the dependent measures (described below).

Background Measures. Prior to viewing the video, participants completed the Rosenberg Self-Esteem Scale (Rosenberg, 1965), a widely used 10-item self-report measure of global self-esteem. Each of 10 items (e.g., “I feel that I’m a person of worth”) was rated on separate 4-point scales (1 = *strongly agree*, 4 = *strongly disagree*) and then averaged to form an overall index ($\alpha = .91$). To promote the cover story, participants then completed a page of filler questions about their use of the Internet for dating purposes. After completing the dependent measures, participants also provided their height and weight so that we could calculate their body mass index (BMI) using the formula, $BMI = \text{Height} * 703 / (\text{Height in inches}^2)$. BMI is an indirect but reliable indicator of body fat (Garrow & Webster, 1985; Mei, Grummer-Strawn, Pietrobelli, Goulding, Goram, & Dietz, 2002).

Appearance-Satisfaction. Participants rated themselves on 13 items taken from the Body Parts Satisfaction Scale (Berscheid, Walster & Bohrnsteldt, 1973), a frequently used measure of appearance satisfaction that has been shown to have good internal consistency and predictive validity (Krones et al., 2005; Lin & Kulik, 2002; Stice, 2001). Specifically, participants rated on separate 5-point scales (1 = *extremely dissatisfied*, 5 = *extremely satisfied*) how they felt about their facial attractiveness, shoulders, arms, hands, feet, size of abdomen, bust, buttocks, hips, upper thighs, legs and ankles, height, weight, general muscle tone, and overall shape. Ratings were subsequently averaged for analyses ($\alpha = .84$).

We also measured appearance self-esteem using the six appearance-related items from Heatherton and Polivy's (1991) state self-esteem scale. Participants assessed how they felt about their appearance and body on 5-point scales (1 = *not at all*, 5 = *extremely*) by responding to statements such as, "I feel satisfied with the way my body looks right now", "I am pleased with my appearance right now", and "I feel unattractive". Ratings were averaged for analyses ($\alpha = .82$).

We also measured level of acute depression using the 8-item short form of the POMS-Depression Scale (Sacham, 1983). Participants indicated on separate 5-point scales (0 = *Not at all*, 4 = *Extremely*) the extent that at that moment they felt unhappy, sad, blue, hopeless, discouraged, miserable, helpless and worthless, respectively. Ratings were later averaged for analyses ($\alpha = .91$).

Manipulation Checks. To check on the effectiveness of the manipulation, participants rated the confederate on separate 5-point scales (1 = *not at all*, 5 = *extremely*) on the following items: "S/he is physically attractive"; "S/he has a good figure or physique"; "S/he has a better-looking body than average"; and "S/he looks physically fit." Participants additionally rated the confederate on a 10-point scale (1 = *extremely unattractive*, 10 = *extremely attractive*) in response to the statement, "How would you rate the attractiveness of the body of the person on the videotape?" Because these 5 items were very highly interrelated ($\alpha = .96$), we created a physique attractiveness index comprised of their averaged z-scores for analyses.

Results

Preliminary Analyses. A preliminary 2 (Gender: male vs. female) x 3 (Peer Condition: fit vs. average vs. unfit) analysis of variance (ANOVA) indicated that there

were no differences in participants' baseline global self-esteem as a function of peer conditions, $F < 1$, *ns*, participant gender, $F < 1$, *ns*, or in interaction, $F(2, 136) = 2.09$, $p = .13$. An additional ANOVA likewise indicated no significant differences in participants' BMI values across peer conditions, $F(2, 136) = 1.81$, $p > .11$, that males had marginally higher average BMI values than females, $M_s = 23.14$ versus 22.09 , $F(1, 136) = 3.40$, $p = .07$, and that there was no interaction between peer condition and gender, $F < 1$, *ns*.

Manipulation Checks. A Gender x Peer Condition ANOVA performed on the manipulation check physique attractiveness index indicated first that there was a main effect for gender, $F(1,136) = 34.08$, $p < .001$, with the physiques of the male confederates rated overall as more attractive than those of the female confederates (male $M = .23$, $SD = .89$ versus female $M = -.24$, $SD = .91$). Separately, and of more central interest, the physiques of the peers were perceived as being the most fit and attractive in the fit-peer condition (male $M = 1.02$, $SD = .34$; female $M = .66$, $SD = .61$), least in the unfit-peer condition (male $M = -.80$, $SD = .55$; female $M = -1.14$, $SD = .34$), and intermediate in the average-peer condition (male $M = .46$, $SD = .48$; female $M = -.25$, $SD = .51$), $F(2,136) = 177.13$, $p < .001$. There was no interaction, indicating that these effects did not vary significantly for male and female participants, $F(2,136) = 2.09$, $p = .13$. Post hoc comparisons indicated that each of the experimental groups differed significantly from the others, $p_s < .001$. The body manipulations therefore appear to have been successful.

A separate validation study was run to assess differences in facial attractiveness, allowing for faces of the actors to be rated separately from their bodies.

Undergraduates (26 male, 42 female; $M = 21.26$, $SD = 2.32$, years old) at the University of California, San Diego (UCSD), participated in the study to fulfill a lower division psychology course requirement. The final sample was 63.2% Asian, 14.7% White, 13.2% Hispanic, and 8.8% other. Participants were instructed to view a binder containing 6 photographs in which only the face of the individual was visible. Female participants viewed female faces, while male participants viewed male faces. Participants rated the face of the attractive, average, and unattractive peer from the experiment, as well as three foil photographs. For each face, participants answered the question, “How would you rate the attractiveness of this face? (1 = *extremely unattractive*, 7 = *extremely attractive*)”.

A Gender x Peer Condition mixed design ANOVA indicated first that there was a no main effect for gender, $F < 1$. However, analysis of the within-subjects effects revealed a significant main effect of the peer condition on ratings of facial attractiveness, $F(2,66) = 3.48$, $p = .034$. Faces were rated as most attractive in the fit-peer condition (male $M = 4.19$, $SD = .20$; female $M = 4.36$, $SD = .15$), and less attractive in both the average-peer (male $M = 3.92$, $SD = .20$; female $M = 4.24$, $SD = .16$), and unfit-peer conditions (male $M = 4.00$, $SD = .15$; female $M = 3.86$, $SD = .12$). There was no interaction, indicating that these effects did not vary significantly for male and female participants, $F(2,66) = 1.58$, $p = .21$. Post hoc comparisons indicated that while the fit-peer face was rated more attractive than the unfit-peer face, $F(2,66) = 6.82$, $p = .011$, there were no differences in facial attractiveness between the fit-peer and the average-peer, $p = .13$, or between the average-peer face and the unfit-peer face, $p = .26$.

Primary Analyses. As expected, preliminary analyses indicated significant relationships between global self-esteem and the dependent measures (see also Lin & Kulik, 2002), so baseline global self-esteem was entered as a control variable (covariate) in all primary analyses.¹ Because the dependent measures (body part satisfaction, appearance self-esteem, depression) were significantly inter-correlated, we first performed a 2 (Gender) x 3 (Peer Condition) analysis of covariance (ANCOVA) on a composite self-evaluation index ($\alpha = .77$). We formed the composite index by creating separate z scores for each dependent measure and then using participants' averaged z scores, scaled so that higher values indicate more positive self-evaluations (in standard deviation units).

As expected, the results indicated first that baseline global self-esteem was strongly and positively related to overall self-evaluations, $F(1, 135) = 143.18, p < .001$. Of more interest, and independent of global self-esteem, a significant Gender x Peer Condition effect indicated that males and females reacted somewhat differently to peers, $F(2, 134) = 4.12, p < .02$. As can be seen in Figure 1.1, males and females reacted fairly similarly to average-fitness and unfit peers but differed markedly in their responses to a fit peer; after viewing a fit, same-sex peer, females had significantly more negative overall self-evaluations than males ($M_s = -.37$ versus $.20, p < .002$). Viewed another way, females had significantly more negative overall self-evaluations after viewing a fit compared to an average or unfit peer ($p < .003$), with no difference between the latter groups. In contrast, males actually experienced a boost in overall self-evaluations in response to the fit peer, although the increase relative to the average and unfit conditions did not reach significance, $p = .26$.

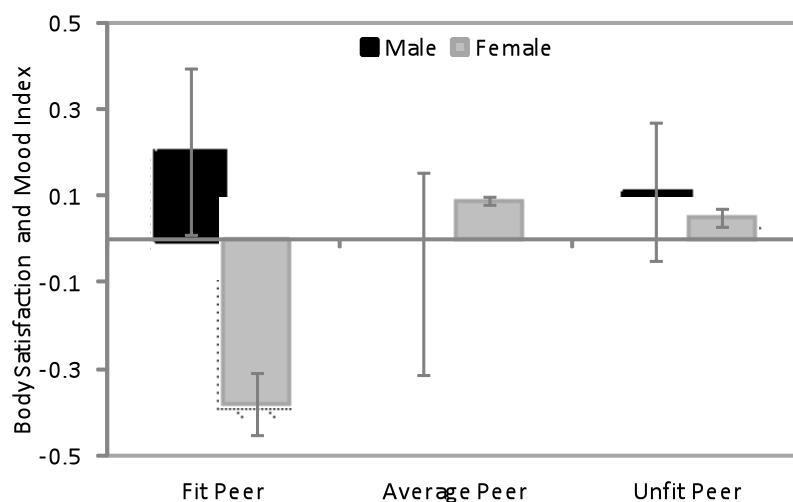


Figure 1.1. Overall self-evaluation and mood index as a function of gender and social comparison conditions, controlling for baseline global self-esteem.

Given the results of this composite self-evaluation analysis, and because we also were interested in how social comparisons affected the specific aspects of self-evaluation that were measured, we then performed separate 2 (Gender) x 3 (Peer Condition) ANCOVAs (controlling for global self-esteem) on the individual dependent measures. With respect to body part satisfaction, controlling again for a positive relationship with baseline global self-esteem, $F(1, 135) = 61.98, p < .001$, there was a main effect of peer condition, $F(2, 134) = 3.71, p < .03$. Paired comparisons indicated that participants were significantly less satisfied with their bodies after viewing the fit peer ($M = 3.16$) compared to the average or unfit peer ($M_s = 3.34$ and 3.40), which did not differ from each other ($p > .52$). No separate effects involving gender reached significance (p 's $> .19$). See Figure 1.2.

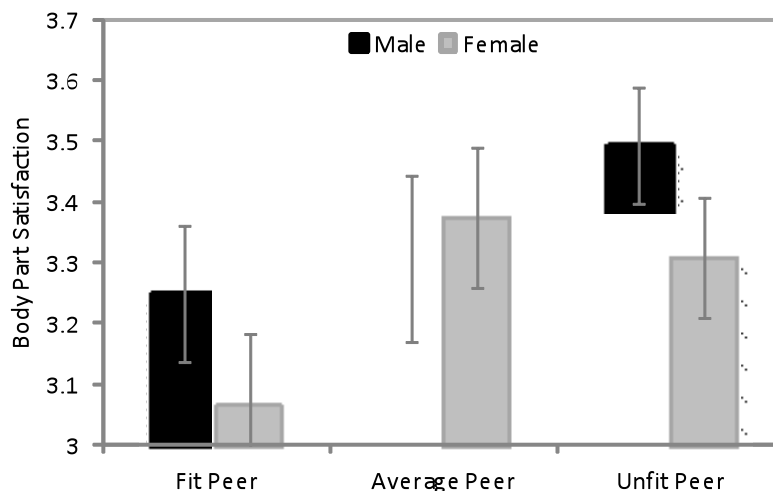


Figure 1.2. Averaged Body Part Satisfaction as a function of gender and social comparison conditions, controlling for baseline global self-esteem.

A similar analysis of appearance self-esteem indicated a significant effect of gender, $F(1, 134) = 4.46, p < .04$, that was independent of a positive relationship with baseline global self-esteem, $F(1, 134) = 109.84, p < .001$. Women on average reported lower appearance self-esteem than men, $M_s = 3.40$ vs. 3.59 . This effect was qualified, however, by a significant Gender x Peer Condition effect, $F(2, 134) = 4.85, p < .01$. As can be seen in Figure 1.3, women and men responded similarly to an average or unfit peer, but women expressed significantly lower appearance self-esteem than men after viewing a fit peer ($M_s = 3.15$ versus $3.71, p < .002$). Women experienced significantly ($p < .005$) lower appearance self-esteem in response to exposure to a fit peer ($M_s = 3.15$) compared to an average or unfit peer, which did not differ from each other ($M_s = 3.58$ vs. 3.47). In contrast, men exposed to a fit peer

reported nonsignificantly ($p = .18$) higher appearance self-esteem ($M_s = 3.71$) compared to those exposed to either an average or unfit peer ($M_s = 3.38$ and 3.56).

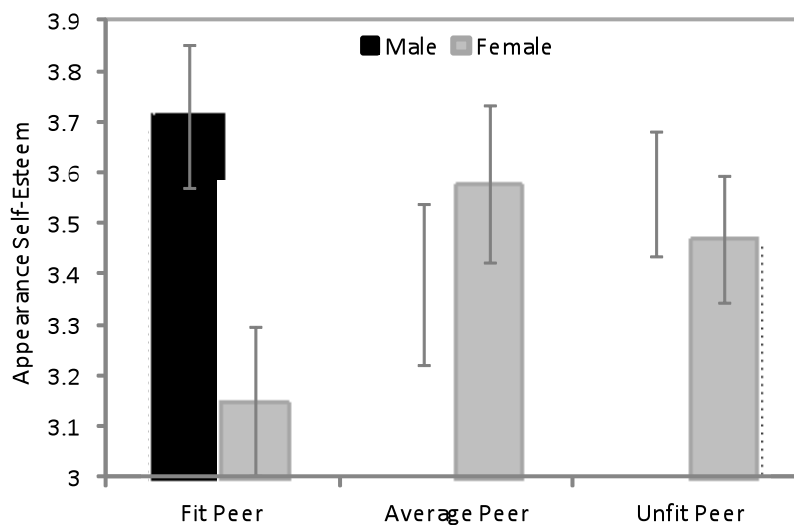


Figure 1.3. Averaged appearance self-esteem as a function of gender and social comparison conditions, controlling for baseline global self-esteem.

Finally, the analysis of acute depression indicated a significant negative relationship with baseline global self-esteem, $F(1, 135) = 67.36, p < .001$, and independently, a significant Gender x Peer Condition effect, $F(2, 135) = 3.12, p < .05$. Due to the very low levels of depression, in absolute terms, here we were only interested in relative differences. As seen in Figure 1.4, women in the unfit-peer condition reported slightly less depressive affect than those in either the fit or average-peer conditions, but this difference did not approach significance ($p = .24$). In contrast, men in the fit-peer condition reported significantly ($p = .008$) less depressive affect than those in the average or unfit-peer conditions, which did not differ from each

other. Viewed another way, women and men responded very similarly to an average peer, and there were nonsignificant trends for women to report more depression in response to a fit peer ($p = .09$) and less depression in response to an unfit peer ($p = .08$) compared to men.

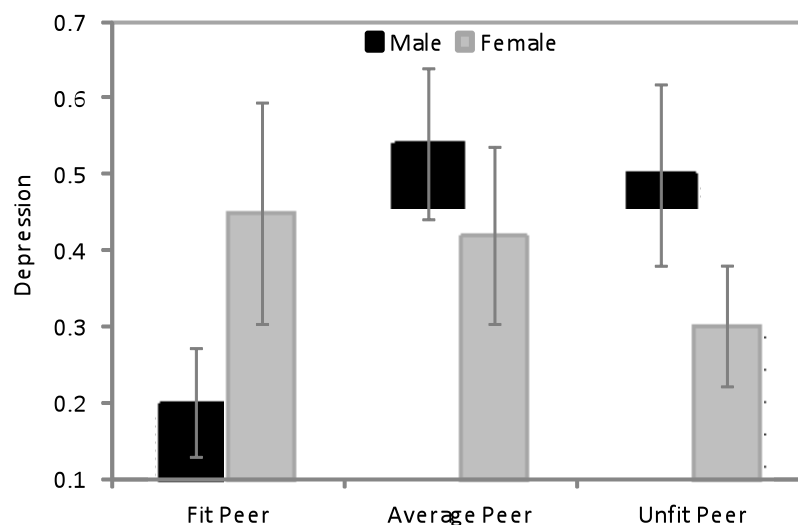


Figure 1.4. Averaged POMS depression scores as a function of gender and social comparison conditions, controlling for baseline global self-esteem.

Brief Discussion

The main results for women indicated that compared to those exposed to a video featuring a peer of average fitness, women exposed to a fit peer subsequently expressed significantly lower appearance satisfaction and appearance self-esteem, whereas those exposed to an unfit (overweight) peer experienced no significant compensatory, elevating effect. The depressive mood of women was not reliably influenced. The asymmetric effects on appearance satisfaction and appearance self-esteem conceptually replicate results obtained in previous settings that had much more

explicit competitive cues, e.g., a dating game in which the participant versus a competitor would be "chosen" (Lin & Kulik, 2002); exercising in a recreation center (Wasilenko, et al., 2007). Thus the asymmetric response pattern of women to comparisons with peers does not appear to be limited to overtly competitive settings. To the extent that comparisons with unfit-appearing peers fail generally to elevate women's feelings of appearance satisfaction as readily as comparisons with fit-appearing peers undermine such feelings, a negative spiral may occur that contributes to the high prevalence of body dissatisfaction among women (Rodin, Silberstein & Striegel-Moore, 1985).

Men exhibited an overall pattern that was fairly similar to that of women in response to average and unfit peers. Where men differed from women most clearly was in their reactions to fit peers. Women had significantly more negative reactions overall than men to fit-peer comparisons. In fact, men exhibited a tendency, if anything, to react more favorably, particularly in terms of their appearance self-esteem and depression levels, to a fit compared to an average or unfit peer. In effect, whereas women demonstrated a self-deprecating asymmetry, men showed a slight self-enhancing asymmetry of response to peer comparisons. It is worth noting, however, that the pattern exhibited by men was not maximally self-enhancing inasmuch as men (like women) showed no significant self-enhancement in response to an unfit peer relative to an average peer. We also must caution that men's more positive response to the fit peer compared to average and unfit peers was individually significant only for depression, so additional work will be necessary to determine whether men just

respond relatively less negatively than women or actually experience a reliable boost in self-evaluation in response to fit peers.

There are also inherent, underlying parametric issues that are worth noting. One could argue that more extreme examples of fit or unfit peers might have stronger effects. Perhaps if our unfit woman were even more overweight, our female participants would have experienced greater appearance satisfaction comparable in magnitude to the lower appearance satisfaction (relative to the average condition) they experienced in response to the fit peer. Several factors, however, argue against the obtained asymmetric pattern being due to more extreme operationalizations of fit than unfit peers. First, examination of the manipulation check items indicates not only that perceived fitness differed strongly between the fit, average, and unfit peer conditions, but also that we appeared to be fairly successful in getting equal perceived intervals of fitness between the conditions. In addition, the fact that the same asymmetric pattern exhibited here by women has been found in two other studies in very different settings, with completely different sets of fit and unfit peers (Lin & Kulik, 2002; Wasilenko et al., 2007) gives us more confidence that acute feelings of appearance satisfaction in young women are generally more easily undermined by exposure to a fit peer than boosted by exposure to an unfit peer. In that this was the first comparable study of male reactions to peers, however, future work will need to use more (and less) extreme manipulations of peer fitness ideally to establish the generality of those results.

Study 2: Gender Differences in Appearance Satisfaction Following Social Comparison with Peers as a Function of Similarity Mindset

In Study 1, we found that whereas men and women appeared to respond fairly similarly to average and unfit-appearing peers, after exposure to a fit peer, women were more likely to engage in contrast, experiencing decreases in appearance satisfaction, whereas men did not experience such negative effects. The primary aims of Study 2, therefore, were to determine if this gender difference in reactions to fit peers was replicable, and, if so, to begin to explore the possibility that differences in male and female mindsets in response to a fit peer may help explain the more negative reactions of women.

According to Mussweiler's (2003) selective accessibility model (SAM), the perception of similarity between observer and target should moderate the effects of comparisons. Individuals who perceive themselves to be similar to a comparison target are likely to show a pattern of assimilation in their subsequent self-evaluations, whereas individuals who perceive themselves to be dissimilar to a comparison target are likely to show a pattern of contrast. Based on this model, upward social comparisons (i.e., comparisons with someone better off on a dimension) therefore should result in *more positive* self-evaluations under conditions of perceived similarity and *less positive* self-evaluations under conditions of perceived difference.

Manipulations of similarity focus have supported this model (Mussweiler, Ruter, & Epstude, 2004; Wanic 2011).

In the present context, this suggests that if individuals focus on how their physique is similar to that of a fit peer, subsequent appearance satisfaction should benefit, whereas focusing primarily on one's differences from a fit peer should diminish appearance satisfaction. One possibility then which the present study will explore is that when confronted with a fit peer, women selectively perceive ways their bodies differ, and therefore feel worse about themselves, whereas men focus relatively more on how their bodies are similar to the fit peer and therefore experience self-enhancement (or, at least, are protected from loss of self-regard). If this is the case, inducing a similarity or dissimilarity mindset theoretically should be able to attenuate if not completely eliminate gender differences in reaction to fit peers. Specifically, when men and women are induced to selectively focus on how their bodies are similar to fit peers, they should both experience self-enhancement (Mussweiler, 2003). If men have a natural tendency to perceive how their bodies are similar to fit peers, we would expect that men would respond similarly under an induced similarity mindset condition, and a condition where no mindset is induced. Women however, should demonstrate a significantly more self-enhancing response when in an induced similarity mindset condition, as opposed to a condition where no mindset is induced. Additionally, when men and women are induced to selectively focus on how their bodies differ from fit peers, they should both experience decreases in appearance satisfaction (Mussweiler, 2003). If women have a natural tendency to selectively focus on ways that their bodies differ from fit peers, however, we would expect that women would respond similarly under an induced dissimilarity mindset condition, and a condition where no mindset is induced. Men however, should demonstrate a

significantly more self-deprecating response when in an induced dissimilarity mindset condition, as opposed to a condition where no mindset is induced.

A second potential moderator of the consequences of social comparison may be attainability of the standard's status (Buunk et al., 1990; Lockwood & Kunda, 1997; Taylor et al., 1996). Perceptions that the success or status of another is personally attainable may often lead to assimilation (Buunk et al., 1990; Lockwood & Kunda, 1997; Taylor et al., 1996). This may be the case because when another person's status is viewed as attainable, individuals are more likely to test the hypothesis that they are similar to the comparison other (Mussweiler, 2001). However when another person's success or status is viewed as personally unattainable, assuming similarity with the comparison other becomes unrealistic, and individuals may therefore be more likely to test for dissimilarity (Mussweiler, 2001). This perspective suggests that while perceptions of similarity are ultimately responsible for the effects of a given social comparison, attainability may shape perceptions of similarity (Mussweiler, 2001). Therefore, another possible explanation for gender differences in responses to fit peers that will be explored in the next study is that when confronted with a fit peer, women assume that her fit physique is not attainable, and are subsequently more likely to test for dissimilarity. Men, however, may be more apt to believe that a fit peer's physique is attainable and therefore may be more likely to test the hypothesis that they are similar to the comparison peer.

In summary, in order to explore the hypothesis that gender differences in response to a fit-peer comparison may be due to differences in mindset, the second study had three specific aims. First, we sought to replicate the gender differences in

response to the fit peer, found in Study 1, solidifying the findings that men respond to exposure to fit peers less negatively (if not positively in absolute terms) than women. Second, we sought to determine if there are natural differences in mindset tendencies in terms of perceived similarity to a fit peer or perceptions of attainability of a fit body between men and women when viewing a fit peer. Third, we intended to more systematically explore the impact of perceived similarity by attempting to experimentally induce a similarity or dissimilarity mindset during exposure to the fit comparison target. Specifically, we aimed to determine whether an induction of a similarity mindset would “protect” women from the typical loss of appearance satisfaction typically experienced when exposed to a fit peer, and, conversely, whether an induction of a dissimilarity mindset would result in men demonstrating the more self-deprecating pattern typically seen among women.

Method

Participants. A total of 224 undergraduates (107 male, 117 female) from UCSD participated in this study. Students were recruited via an online experiment posting and completed the experiment for course or extra credit. The mean age was 20.15 ($SD = 1.92$). The racial distribution was 57% Asian, 20% Caucasian, 10% Hispanic, and 12% other.

Procedure. Participants arrived for the experimental session, were greeted by the experimenter, and were seated alone in a private room. The experimenter introduced the study in the same manner that it was described in the recruitment materials online, as a study involving "perception and evaluation." Participants then

completed all baseline questionnaires (described below). After completing all baseline measures, participants were told they would be participating in two separate, short studies. Participants were instructed that the first study involved a short perception task in which they would be looking at a few drawings. They were instructed that the second study would involve watching a short video in which a person describes him or herself, and then answering a few questions about the person in the video and themselves.

Background Measures. Upon arrival, prior to completing the mindset manipulation or viewing the video, participants completed a single item measure of appearance satisfaction, “I am satisfied with my overall body shape” (1 = *not at all*, 5 = *extremely*). This item was identical to that used in the Trampe, Stapel and Siero (2007) study and was interspersed with 24 foil baseline questions, in order to conceal the aims of the study. We also measured appearance self-esteem using the six appearance-related items from Heatherton and Polivy’s (1991) state self-esteem scale. Participants indicated how they felt about their appearance and body on 5-point scales (1 = *not at all*, 5 = *extremely*) responding to statements such as, “I feel satisfied with the way my body looks right now”, “I am pleased with my appearance right now”, and “I feel unattractive”. Ratings of baseline appearance self-esteem were reverse-scored as needed and subsequently averaged for analyses, with higher values indicating more positive baseline appearance self-esteem ($\alpha = .80$).

Similarity/Dissimilarity Mindset Manipulation. The manipulation of the similarity/dissimilarity mindset was adapted from Markman and Gentner (1996) and was accomplished by asking participants first to view a pair of drawings and then to

list as many similarities or differences between the two scenes as possible in two minutes. At the end of the drawing comparison task, participants were asked to rate the similarity or dissimilarity of the two images. The drawing comparison task was then repeated a second time with new drawings. Participants who had identified similarities between the two drawings in the first task were again asked to identify similarities, while participants who had identified dissimilarities between the two drawings in the first task were again asked to identify differences. The same images used by Markman and Gentner (1996, 2000) were used. This manipulation has also been successfully shown to induce similarity and dissimilarity mindsets by Mussweiler (2001). In the control condition, participants were asked to sit quietly for two minutes, without any mention of comparing images. Control participants were then shown the first set of images and asked to rate how similar or dissimilar the two images were. Controls were then asked to sit quietly for another two minutes, and then again were asked to rate the similarity or dissimilarity of the second set of images to each other. Order of image pairs was randomized.

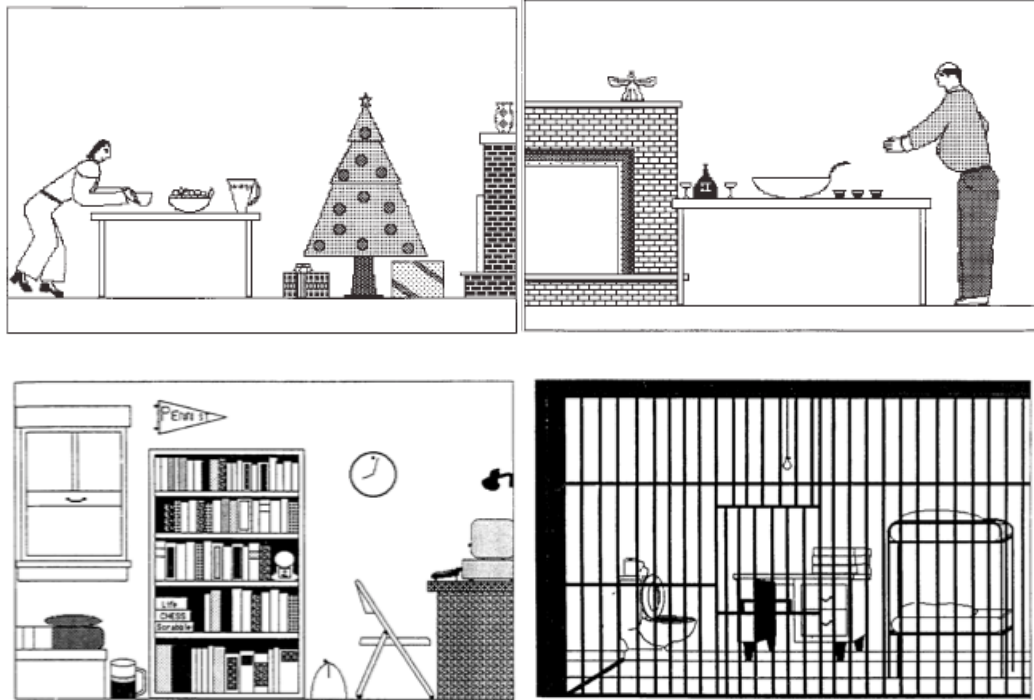


Figure 2.1. Image pairs used in general similarity and general dissimilarity task (Markman & Gentner, 1996; 2000).

Following the similarity mindset manipulation, participants viewed the identical short video of a same-sex, fit peer used in Study 1 in which the person describes him/herself and the qualities being sought in a dating partner. Prior to viewing the video, the experimenter explained that the study concerned “how information about individuals is conveyed through online dating profiles.” As in Study 1, the experimenter further explained that each participant would be asked to view another UCSD student who, purportedly in the context of having been in another experiment, had made a short, extemporaneous “dating” video of the sort seen on the Internet.

Change in Appearance Satisfaction. Immediately following exposure to the video, participants completed the main dependent measures to assess body and appearance satisfaction. Body-shape satisfaction was again measured through the single item used by Trampe et al. (2007), “I am satisfied with my overall body shape” (1 = *not at all*, 5 = *extremely*). Appearance self-esteem was also reassessed after exposure to the video using the six appearance-related items from Heatherton and Polivy’s (1991) state self-esteem scale. Ratings of post-manipulation appearance self-esteem were subsequently averaged for analyses ($\alpha = .80$). A factor analysis performed on appearance self-esteem and the body shape satisfaction item indicated that they were significantly correlated ($r = .89, p < .001$). Change scores therefore were calculated for both the body shape satisfaction item and the appearance self-esteem scale. These were then z-scored and averaged to create an overall index of appearance satisfaction change ($\alpha = .81$). , where higher, positive numbers indicate changes toward more positive feelings and more negative values more negative feelings about one’s body and appearance. This index was used as the primary dependent variable in all further analyses.

Similarity and Attainability Perceptions. Participants also were asked how similar to the target they believed themselves to be by responding to the item (1 = *strongly disagree*, 5 = *strongly agree*), “S/he seems very similar to me in general.” Perceived attainability of a similarly fit body was assessed with an index of three attainability items, “How possible is it that your body could look like the body of the person on the video tape (within the next couple years)?” 1 = *not at all possible*, 7 = *very possible*; “How likely is it that your body will look like the body of the person on

the video tape (within the next couple years)?” 1 = *very unlikely*, 7 = *very likely*; “How attainable is having a body like the body of the person on the videotape, for you?” 1 = *completely unattainable*, 7 = *very attainable*. These three items were highly intercorrelated and therefore were combined to create an attainability index ($\alpha = 0.93$), where higher numbers indicate greater perceived attainability of the perceived body.

Manipulation Checks. After completing the dependent measures and prior to being debriefed, participants provided their height and weight so that BMI could later be calculated. They also were asked to indicate whether the target was “physically attractive” (1 = *strongly disagree*, 5 = *strongly agree*) and to estimate the target’s height and weight to check on the effectiveness of the peer-fitness manipulations.

Results

This study used a 3 (Comparison Mindset: similarity-focus, dissimilarity-focus, no-mindset control) x 2 (Participant Gender: male, female) between subjects design, with an additional appended no-mindset control in which male and female participants with no induced mindset viewed a same-gender, average-fitness peer.^{2,3}

Gender Differences in Appearance Satisfaction after Viewing a Fit or Average Peer. One of the primary goals of this study was first to replicate the result from Study 1 that indicated that males respond more positively than females to exposure to a fit peer and then to further explore whether male responses to a fit peer are actually positive in absolute terms. To address these questions, we initially limited analyses to the conditions in the present study that are directly comparable to those in Study 1, namely, those involving no-mindset controls. A 2 (Peer Fitness: fit peer,

average peer) by 2 (Gender: male, female) ANOVA performed on change in appearance satisfaction revealed that there was no main effect of peer fitness condition, $F < 1$, but that there was a highly significant effect of gender, with men in the no-mindset control conditions reporting increases in appearance satisfaction (as indicated by positive change scores) and women reporting decreases in appearance satisfaction (as indicated by negative change scores), $F(1, 102) = 10.45, p = .002, Ms$ Male = .30 ($SD = .64$); Female = -.12 ($SD = .69$). There was no significant interaction ($p = .23$).

In order to directly address the question of whether males respond more positively than females after exposure to a fit peer, we also conducted a planned comparison between men and women in the fit peer, no-mindset control condition. The results (see Figure 2.2) showed that men clearly responded more positively than women to a fit peer, $p = .002, (Ms$ Male = .39, $SD = .64$; Female = -.19, $SD = .74$). Additional analyses indicated that while men also responded more positively than women to an average peer, this difference was not significant ($p = .16$). Further inspection of the means indicates that men actually showed a more positive change to a fit than average peer (Ms Male/Fit = .39, $SD = .64$; Male/Average = .30, $SD = .63$), whereas women responded with more negative change to the fit than average peer (Ms Female/Fit = -.19, $SD = .74$; Female/Average = -.06, $SD = .63$). However, paired comparisons indicated that these opposite reactions to peers within gender were not individually significant.

Additional analyses were conducted in order to assess whether the positive appearance satisfaction change score reported by men in the fit peer condition

indicated a significant increase in appearance satisfaction over time (pre-test versus post-test). A repeated measures ANOVA was conducted comparing the appearance satisfaction index measured at baseline to the appearance satisfaction index measured after viewing a fit peer. Results indicated that, for men, there was a significant effect of time on the appearance satisfaction index, $F(1,26) = 6.21, p = .019$, with men reporting increased appearance satisfaction after viewing a fit peer. When the same analysis was conducted on women who viewed a fit peer, results indicated that women reported a significant decrease in appearance satisfaction after viewing a fit peer, $F(1,27) = 4.23, p = .049$. For both men and women, when viewing an average-bodied peer, there was no effect of time on the appearance satisfaction index, F 's < 1 .

In sum, consistent with the results of Study 1, men clearly responded more positively than women to comparisons with a same-sex, fit peer. Unlike Study 1, however, in this study actual change in appearance satisfaction was measured, and it is noteworthy, therefore, that males in Study 2 were shown to have actually become significantly *more* satisfied and females less satisfied with their appearances after exposure to a fit peer. The same pattern was observed in male versus female responses to an average peer, but consistent with the results of Study 1, the gender difference to the average peer among these no-mindset controls was not significant. In addition, neither male nor female satisfaction levels changed significantly in absolute terms in response to an average peer. Thus overall men differed from women primarily in how they responded to a fit peer, with men in absolute terms experiencing an increase and women a decrease in their appearance satisfaction.

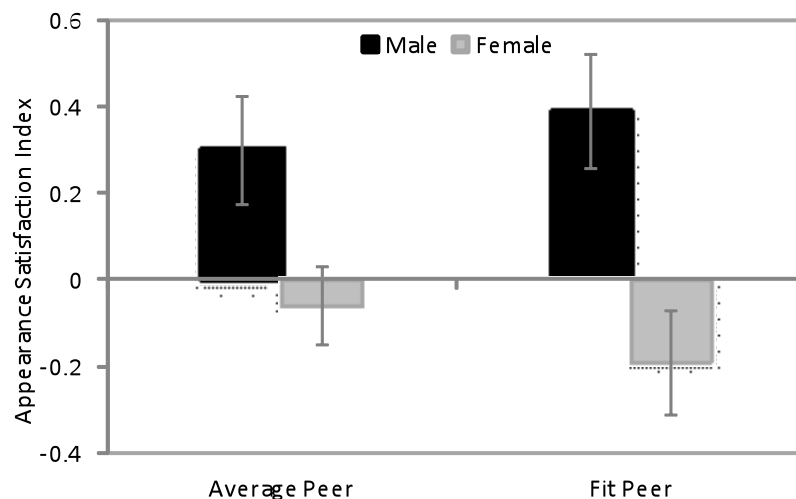


Figure 2.2. Appearance satisfaction change in the no-mindset conditions after viewing fit and average peers as a function of gender.

Gender differences in “natural” mindset when viewing a fit peer. A

second goal of Study 2 was to determine if males and females may naturally lean towards different mindsets when exposed to fit peers. In order to answer this question, we can again focus on participants in the no-mindset control conditions. Among those who viewed a fit peer in the no-mindset control condition, we do see a marked contrast between male and female participants, both in terms of perceived similarity and attainability. A one way analysis of variance revealed that male, no-mindset control participants perceived greater similarity between themselves and the fit peer when compared to female no-mindset control participants, $M_s=3.15$ ($SD=1.10$) and 2.48 ($SD=1.02$), $F(1, 54) = 5.51, p < .05$, see Figure 2.3. It is worth noting that we have no reason to believe that the male, no-mindset control participants actually were more similar to the fit comparison peer. Within these no-mindset control groups, there

were no gender differences in measured BMI of male and female participants, $M_s=23.10$ ($SD=2.60$) and 22.29 ($SD=2.90$), respectively, $F(1, 53) = 1.18, p = .28$. Additionally, when we calculated the difference between the measured BMI of the participant, and the measured BMI of the same-sex actor/actress in the video (BMI for female actress = 20.4 ; BMI for male actor = 22.3), there were no effects of gender on this difference score ($M = .80, SD=2.60$; and $M = 1.89, SD=2.90$), $F(1, 53) = 2.16, p = .15$. Thus even though measurements of BMI reveal that male participants were not significantly more similar to the same-sex fit peer than female participants, men *perceived* themselves as more similar.

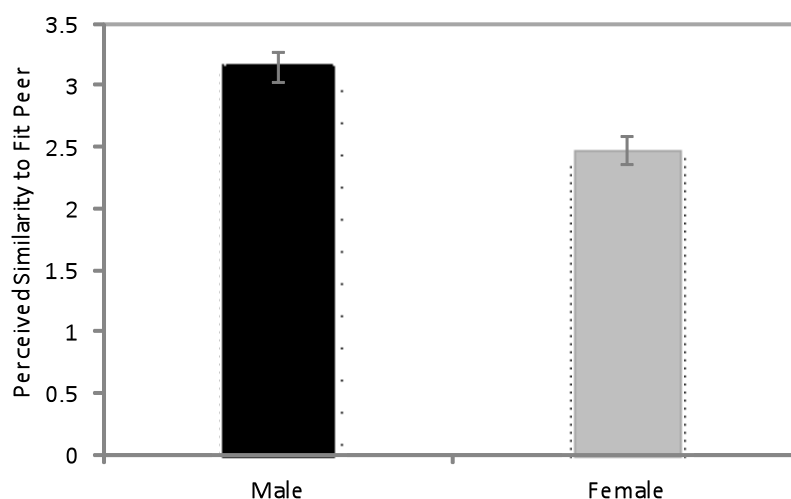


Figure 2.3. Perceived similarity to the fit peer as a function of gender, with no mindset manipulation.

Attainability was evaluated using the perceived attainability index described previously. A one way analysis of variance revealed that male, no-mindset control participants reported higher perceived attainability of the peer's fit body than did

female, no-mindset control participants, $M_s=5.41$ ($SD = 1.50$) versus 3.61 ($SD=1.87$), $F(1, 54) = 15.60, p < .001$ (see Figure 2.4). Thus here too male participants perceived the body of the fit, same-sex peer as more attainable than female participants did, even though as noted, their current fitness relative to the fit peer (as indexed by BMI) was comparable.

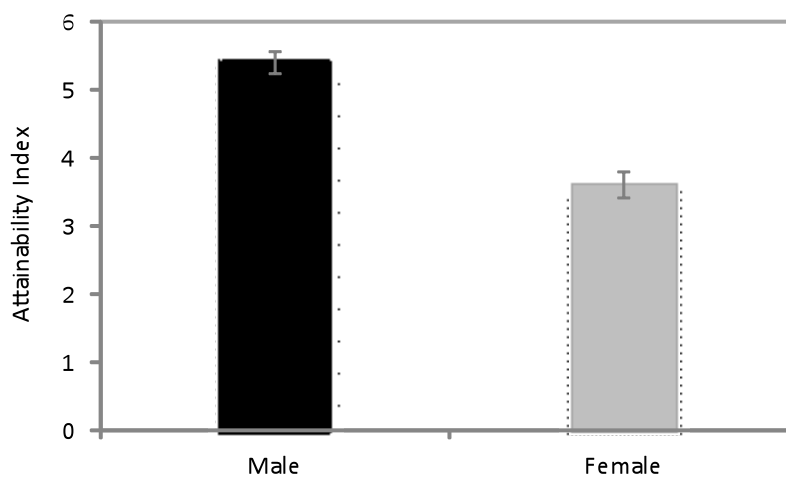


Figure 2.4. Perceived attainability of a fit body as a function of gender, with no mindset manipulation.

Mediation Analyses within No-mindset Control Group, Viewing Fit Others.

The foregoing gender differences in perceptions of similarity and body attainability suggest that men may react less negatively to exposure to fit peers than women at least in part due to a gender difference in mindset, with men being more apt to view the physique of a fit peer as similar to their own and as more attainable. To test these possibilities more directly, we therefore next conducted several meditational analyses. A mediating variable is one that explains or accounts for the relationship

between two other variables (Baron & Kenny, 1986; Holmbeck, 1997). The following conditions are necessary to support a mediational hypothesis: (1) the independent variable(s) (e.g. gender) is (are) related to the mediator (e.g., similarity); (2) the independent variable is related to the dependent variable (e.g., appearance satisfaction index); (3) the mediator is significantly related to the dependent variable when the independent variable is included in the equation; and (4) the relation between the independent variable and the dependent variable decreases to non-significance when the mediator is simultaneously included in the equation (Baron & Kenny, 1986; Holmbeck, 1997). Perfect mediation is indicated if the independent variable becomes completely unrelated to the dependent variable once the mediator is controlled (Baron & Kenny, 1986; Holmbeck, 1997).

In order to test whether perceived similarity mediated the impact of gender on the appearance satisfaction index, a mediation analysis was conducted, following the foregoing steps (Baron & Kenny, 1986). The results of this series of separate regression analyses indicated, as previously noted, that (male) gender was significantly and positively associated with perceived similarity, $b = .67$, $SE = .28$, $t = 2.35$, $p = .02$, and, separately, with the appearance satisfaction index, $b = .57$, $SE = .19$, $t = 3.07$, $p = .003$. Third, when appearance satisfaction was regressed simultaneously on gender and perceived similarity, gender continued to predict appearance satisfaction, $b = .51$, $SE = .20$, $t = 2.61$, $p = .01$, but similarity did not separately predict appearance satisfaction, $b = .10$, $SE = .09$, $t = 1.12$, $p = .27$. The results of these analyses therefore provide no direct evidence that differences in perceptions of perceived similarity mediated the gender differences found in appearance satisfaction.

A parallel set of mediation analyses to test whether perceived attainability may have mediated the gender differences in appearance satisfaction produced more promising results. First, (male) gender was significantly and positively associated with perceptions of attainability, $b = 1.80$, $SE = .46$, $t = 3.95$, $p < .001$, and, separately, with the appearance satisfaction index, $b = .57$, $SE = .19$, $t = 3.07$, $p = .003$. Third, perceived attainability was significantly and positively associated with the appearance satisfaction index when gender was included in the model, $b = .11$, $SE = .05$, $t = 2.03$, $p = .05$. Notably, the relationship between gender and satisfaction also fell to nonsignificance when perceived attainability was included in the equation, $b = .38$, $SE = .21$, $t = 1.86$, $p = .07$. Although the magnitude of the decrease was not quite significant by a subsequent Sobel test (Sobel, 1982), $z = -1.76$; $p = .078$, the results nonetheless are consistent with the notion that differences in perceptions of attainability may at least partially mediate gender differences in appearance satisfaction (see Baron & Kenny, 1986, for discussion of partial mediation).

Effects of Similarity Mindset Manipulations on Reactions to Fit Peers.

A final aim of Study 2 was to experimentally manipulate perceptions of similarity in order to assess the impact of comparisons on the appearance satisfaction index, and, more specifically, to determine whether the negative impact of fit others on women can be attenuated, if not eliminated, by inducing them to focus on their similarities rather than dissimilarities to fit others. While our mediation analysis of similarity on the relationship between gender and the appearance satisfaction change index did not find evidence that similarity was a significant mediator of the

relationship between gender and appearance satisfaction, other researchers have found that manipulations of similarity focus have supported the selective accessibility model (Mussweiler, Ruter, & Epstude, 2004; Wanic 2011).

Similarity Manipulation Check. A 3 (Mindset Condition: similar, dissimilar, no-mindset control) x 2 (Gender: male, female) ANOVA performed on perceptions of similarity to the fit peer revealed participants differed only marginally by mindset, $F(2, 164) = 2.26, p = .11, Ms$ Similar = 2.46 ($SD = 0.98$); Control = 2.80 ($SD = 1.10$); Dissimilar = 2.48 ($SD = 0.95$); of particular interest, there were no differences in perceptions of similarity to the fit peer in the similarity versus dissimilarity conditions, $F < 1$. Separately, male participants perceived greater similarity between themselves and the fit peer than did female participants, $F(1, 164) = 4.47, p = .04, Ms$ Male = 2.74 ($SD = 1.09$); Female = 2.42 ($SD = 0.93$). Although the Gender x Mindset interaction was not significant ($p = .29$), closer inspection revealed that the greater similarity perceptions of males compared to females was primarily in the no-mindset control conditions ($p = .014$), a finding reported previously, rather than within either the similarity or dissimilarity mindset conditions, $F's < 1$. Therefore, while results from the manipulation check do not indicate that the manipulation was successful in inducing a similarity and dissimilarity mindset, it did appear to eliminate the gender differences in perceived similarity found among the no-mindset control group.

Change in Appearance Satisfaction. As can be seen in Figure 2.5, and consistent with the previous analyses of no-mindset control participants, a 3 (Mindset: similarity, dissimilarity, no-mindset control) x 2 (Gender: male, female) ANOVA performed on change in appearance satisfaction revealed a highly significant gender

effect, $F(1,164) = 13.21, p < .001, M_{male} = .28 (SD = .67), M_{female} = -.11 (SD = .74)$, with men reporting an increase and women a slight decrease in appearance satisfaction after viewing the fit peer. Separately, participants primed to perceive similarity increased slightly in appearance satisfaction ($M = .20$) in response to exposure to a fit peer, whereas those primed to perceive dissimilarity decreased slightly ($M = -.04$), with no-mindset controls intermediate ($M = .10$), but this overall effect of mindset condition was not significant ($p = .22$). There was no interaction effect, $F < 1$.

A follow-up one-way (time) repeated measures ANOVA, comparing the appearance satisfaction index measured at baseline to the appearance satisfaction index measured after viewing a fit peer, performed on male responses indicated that their increase in satisfaction in response to the fit peer was significant, $F(1,81) = 12.06, p < .001$, whereas a parallel analysis of females indicated that their decrease in appearance satisfaction in response to the fit peer was not significant, $p = .32$. Given that the analysis of the no-mindset control groups found that men were more likely to perceive similarities between themselves and a fit peer and that women were more likely to perceive differences, we anticipated more specifically that for men, inducing a similarity mindset might produce a response to the fit peer that was fairly similar to responses produced when in their natural mindset; in contrast, we thought a successful induction of a dissimilarity mindset, by getting men to focus more than usual on differences between themselves and a fit peer, might decrease their appearance satisfaction when compared to men in the no-mindset control condition. As can be seen in Figure 2.4, men in the dissimilarity-mindset condition did report some decrease in appearance satisfaction, as anticipated, but a planned comparison

contrasting their response to the combination of the no-mindset control and the similarity-mindset condition fell just short of significance, $F(1,164) = 3.33, p = .07$.

However, a repeated measures ANOVA comparing the appearance satisfaction index measured at baseline to the appearance satisfaction index measured after viewing a fit peer conducted on the combination of men in the no-mindset control and the similarity-mindset condition was highly significant, $F(1,55) = 13.55, p = .001$, with men in these conditions experiencing an absolute increase in appearance satisfaction over the course of the study. In contrast a parallel repeated measures analysis of men in the dissimilarity condition indicated a no change in appearance satisfaction, $F < 1$.

Given that the analysis of the no-mindset control groups found that women were more likely to perceive differences between themselves and a fit peer, we predicted that for women, inducing a dissimilarity mindset would produce a similar response to their natural mindset response (viz., a comparable decrease in appearance satisfaction), whereas a similarity mindset, if induced, might lead to smaller negative change and perhaps even a positive change in appearance satisfaction. As can be seen in Figure 2.5, the pattern of means is consistent with predictions but a planned comparison that contrasts the similarity-mindset condition against the combination of the control and the dissimilarity-mindset condition was not significant, $p = .29$. A one-way repeated measures ANOVA of change over time in appearance satisfaction conducted on the combination of women in the no-mindset control and the dissimilarity mindset condition indicated that their absolute decrease in appearance satisfaction did not reach significance, $p = .13$.

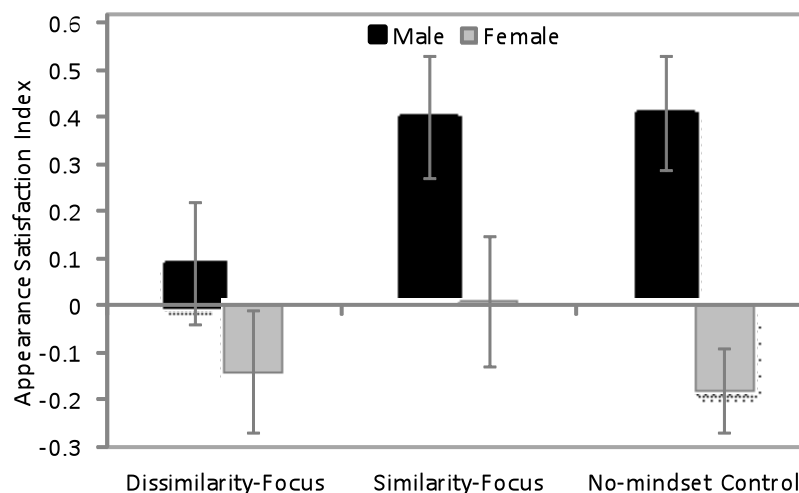


Figure 2.5. Appearance satisfaction index after viewing a fit peer as a function of gender and mindset conditions.

Brief Discussion

Study 2 had multiple aims. First, we sought to replicate the gender differences in response to the fit peer, found in Study 1, solidifying the findings that men respond less negatively, if not actually positively, to exposure to fit peers. Our analyses of the no-mindset control groups are most relevant here. As in Study 1, we found that males responded significantly more positively than females to a fit peer. Males also responded more positively than females to an average fitness peer, but this difference, as in Study 1, was not reliable. Thus the clearest gender difference in appearance satisfaction reactions appears to be in response to fit peers.

A related but separate question addressed in Study 2 that could not be answered in Study 1 is whether the foregoing gender difference in reactions to a fit peer is due to men simply not reacting as negatively as women or whether men might actually experience a reliable boost in appearance satisfaction in response to fit peers.

The use of change scores in Study 2 allowed us to see more clearly that men seem to experience an actual boost in appearance satisfaction after exposure to fit peers, whereas women experience a loss in self-regard. Such a differential response pattern to fit others could help account for the finding that women on average experience more body dissatisfaction than men (Gabriel et al., 1994; Powell et al., 2001; Strahan et al., 2006). As no prior research to date had directly compared how male and female appearance satisfaction is impacted by exposure to fit peers, the combination of Study 1 and Study 2 greatly contribute to our understanding of how fit peers may differentially impact men and women.

Study 2 also aimed to determine if there are natural differences in mindset between men and women when viewing a fit peer. We found that male compared to female participants perceived the body of the fit, same-sex peer as more similar and as more attainable. A mediation analysis revealed that while rated perceptions of similarity did not seem to mediate directly the observed gender difference in appearance satisfaction change, there was significant support for the idea that perceived future attainability of a similar fit body was a mediator. These results suggest then that men may react less negatively to exposure to fit peers than women due at least in part to a gender difference in mindset, with men believing a similarly fit body is more readily attainable. It is possible that for women, the cultural ideal of attractiveness is a narrowly defined category (i.e. young, tall, very thin) (Hargreaves & Tiggemann, 2002; Levine & Smolak, 1996; Groesz et al., 2002; Strahan et al., 2006), whereas appearance-based cultural norms for men are more flexible (Strahan et al., 2006) and the ideal male figure more moderate (Rand & Wright, 2001). There are

many different types of men (with different physical characteristics) that are viewed as attractive by women (Humphreys & Paxton, 2004). Therefore, while the “ideal male” may be viewed as muscular and athletic, men may fit a variety of categories and still be accepted and viewed as attractive. Gender differences in perceptions of attainability of an ideal physique could also stem from the fact that women are more likely to have dieted and exercised for weight control than men (Horm & Anderson, 1993; Serdula, Collins, Williamson, Anda, Pamuk, & Byers, 1993), and, as a result, have a better sense of the difficulty of looking so fit.

Finally, Study 2 tried to explore whether experimentally inducing a similarity or dissimilarity mindset could mitigate if not eliminate the gender difference in satisfaction in response to exposure to a fit peer, particularly the negative response of women. Unfortunately, while our similarity mindset manipulation was successful in reducing gender differences in perceived similarity of the fit peer, it did not appear to be as impactful as intended. In that this precise manipulation was used successfully by others (Mussweiler; 2001; Haddock, Macrae, & Fleck, 2002) to influence similarities or dissimilarities to a social comparison standard, it is unclear why the manipulation check was only marginally effective. One possibility has to do with the nature of the stimulus materials in this study. While social comparison standards are typically presented to participants through short vignettes or still photographs (Mussweiler; 2001; Haddock, Macrae, & Fleck, 2002; Wanic, 2011), our study made use of comparatively rich stimulus materials – 8-minute videos. While this is desirable in the sense that it better mirrors real life exposure to peers, it may have made it more

difficult to sustain the intended mindset through the entire length of the exposure to the fit peer.

Despite the suboptimal impact of the similarity mindset manipulation, men actually did experience a small (though not significant) decrease in appearance satisfaction when primed with the dissimilarity-mindset compared to the no-mindset control group. It is possible that men typically have a mindset when exposed to fit peers that is closer to the similarity-mindset condition, and notably different from the dissimilarity-mindset condition. Women appeared to show the makings of the opposite pattern in that when primed with a similarity-mindset, they did not show the usual loss in appearance satisfaction, whereas responses to the no-mindset control and dissimilarity-mindset conditions were negative and virtually identical. However, this did not reach statistical significance.

If differences in similarity mindset were the sole cognitive strategy moderating processing of comparisons to fit others, successful priming of the similar and dissimilar mindsets should have completely eliminated gender differences in appearance satisfaction. While gender differences were not eliminated, they were somewhat reduced when compared to the no-mindset control condition in which participants also viewed a fit comparison other. Additional research with more effective manipulations of similarity will be needed in order to better understand how similarity and dissimilarity mindsets impact the differential responses of men and women to comparisons with fit peers.

Study 3: Gender Differences in Appearance Satisfaction following Social Comparison with Fit Peers as a Function of Temporal Mindset

In Studies 1 and 2, we found that after exposure to a fit peer, women were more likely to experience decreases in appearance satisfaction (engaging in contrast), while men did not experience such negative effects. Study 2 also found evidence suggesting women have a tendency to focus on dissimilarities between themselves and a fit peer, whereas men are more apt to focus on their perceived similarities to the peer. However, statistical mediation analyses revealed that these gender differences in perceptions of similarity alone did not explain the observed gender differences in appearance satisfaction after exposure to a fit peer, and efforts to manipulate similarity mindset directly likewise provided limited support at best for similarity perceptions as a mediator of gender differences in reaction to fit peers.

In Study 3 we therefore sought to explore a different mindset manipulation. As discussed above, although the specific label given to the mindset may vary among researchers, it has been proposed that thinking about the type of person one is presently leads to different comparison outcomes than thinking about the person one could be in the future (Blanton, 2001; Brewer & Gardner, 1996; Engeln-Maddox, 2006; Evans, 2003; Myers & Biocca, 1992; Mills et al., 2002; Stapel & Van der Zee, 2006). As current abilities are by definition inferior to those of a superior other, if an individual focuses only or primarily on that inferiority, we would expect decreases in self-satisfaction. A present-focused, or "current-self" mindset (who I am), theoretically should focus individuals on these inferiorities and their static nature,

thereby fostering contrast (Blanton, 2001). However, a different picture theoretically emerges if we are able to incorporate more than our current abilities into our self-perceptions. Possible (future) selves can also play a central role in guiding aspirations and satisfaction (Markus & Nurius, 1986). A future-focused, or "possible-self" mindset (who I could be), should focus individuals on what they may become, thus leaving the self-concept more mutable and open to assimilation (Blanton & Stapel, 2008).

Extending this model to the domain of body image, it is possible that when confronted with a fit peer, women selectively focus on the static nature of their body and the lack of their potential for change ("current self"), which fosters contrast and ultimately diminishes appearance satisfaction. It is also possible that men are more likely to consider the possibility of improving their body in the future ("possible self") when viewing a fit peer, which theoretically would foster assimilation and enhanced appearance satisfaction. If such differences in typical mindset occur and play a significant role in producing the observed gender differences in response to a fit peer, it should be theoretically possible, by experimentally controlling the current-self versus possible-self mindset of individuals, to attenuate if not eliminate the observed gender difference in responses to a fit peer. That is, we would predict that for both men and women, activation of a current-self mindset when exposed to the fit peer should produce lower self-satisfaction ratings and decreased perceptions of the attainability of a similarly fit body; in contrast, activation of a possible-self mindset should produce higher self-satisfaction ratings and increased perceptions of attainability of a similarly fit body.

Method

Participants. A total of 318 (126 male and 191 female) undergraduates from UCSD participated in this study. Students were recruited via an online experiment posting and completed the experiment for course or extra credit. The mean age was 20.00 ($SD = 1.83$). The racial distribution was 63% Asian, 17% Caucasian, 10% Hispanic and 10% other.

Procedure. Participants arrived at the lab individually, were greeted by the experimenter, and were seated at a desk. The experimenter introduced the study as one on "perception and evaluation" and told participants they would be asked to view and evaluate an image in addition to completing a questionnaire. Following the procedure used by Blanton and Stapel (Study 2, 2008), the experimenter then presented each participant with an essay sheet and instructed them (depending on condition) to write a brief essay about "who you are" (current-self condition) or "who you might be someday" (possible-self condition). In the current-self condition, participants described their current qualities and personality as if they were introducing themselves to a stranger. In the possible-self condition, participants described the qualities and personality they believe they might possess at some time in the future and were instructed not to feel constrained by their current qualities or traits. Researchers have found that such primes are effective in producing the current-self mindset versus the possible-self mindset, respectively (Blanton & Stapel, 2008). Participants were given 5 minutes to complete this essay task, during which time the experimenter left the participant to complete the tasks in private.

After completing the mindset manipulation, participants were asked to view the same video used in the previous studies of a fit same-sex peer discussing his/her qualities and dating interests.

Appearance Satisfaction Change. As in the previous studies, immediately after watching the peer on the video, participants responded to the same dependent measures used in Study 2, assessing body shape satisfaction and appearance self esteems. Again, as in Study 2, these items were also measured at baseline, prior to the mindset manipulation and viewing the video of the fit same-sex peer. The baseline measures allowed for assessment of change. As in Study 2, an overall appearance satisfaction index subsequently was created by z-scoring and averaging the various dependent measures ($\alpha = 0.86$). Again, positive numbers indicated increases and negative numbers decreases (from baseline) in appearance and body shape satisfaction.

Manipulation Check. After completing the main dependent measures, as a check of our temporal-mindset manipulation, we also asked participants to complete an ad hoc, one-item measure to assess beliefs in personal mutability. Specifically, we asked participants how strongly they agreed or disagreed (1 = *strongly disagree*; 7 = *strongly agree*) with the statement, “People can do things differently but the important parts of who they are can’t really be changed.” Thus higher scores indicate less belief in mutability. This is an item from Dweck’s mindset scale (Levy, Stroessner, & Dweck, 1988), a scale developed to assess an individual’s belief about the stability of traits across time.

We also included three items intended to measure perceived attainability of a similarly fit body as that of the peer in the video. Specifically, we asked participants, “How possible is it that your body could look like the body of the person on the video tape (within the next couple years)?” 1 = *not at all possible*, 7 = *very possible*; “How likely is it that your body will look like the body of the person on the video tape (within the next couple years)?” 1 = *very unlikely*, 7 = *very likely*; and “How attainable is having a body like the body of the person on the videotape, for you?” 1 = *completely unattainable*, 7 = *very attainable*. These three items were highly intercorrelated and therefore were combined to create a perceived attainability index ($\alpha = 0.92$), where higher numbers indicate greater perceived attainability of a similarly fit body as that of the peer.

Results

Manipulation Check. To determine whether the mindset manipulation was effective, we performed a 2 (Temporal Mindset: current, possible) x 2 (Gender: male, female) ANOVA on the personal mutability measure. As intended, the results revealed a significant main effect of mindset condition, with those in the current-self conditions reporting the self to be less changeable than those in the possible-self conditions, $F(1, 312) = 3.98, p = .047$; $M_{current} = 4.21 (SD = 1.34)$; $M_{possible} = 3.88 (SD = 1.51)$. There was no main effect of gender and no interaction effect.

We also performed a 2 (Temporal Mindset: current-self, possible-self) x 2 (Gender: male, female) ANOVA on participants' perceptions of the future attainability of a similarly fit body. Results revealed a significant main effect of temporal-mindset such that participants in the possible-self condition perceived a fit body as more

attainable than those in the current-self condition, $F(1,312) = 4.10, p = .044$; $M_{possible} = 4.59$ ($SD = 1.85$), $M_{current} = 4.15$ ($SD = 1.82$). Results also revealed a main effect of gender such that males perceived a fit body as more attainable than did female participants, $F(1,312) = 23.93, p < .001$; $M_{male} = 4.95$ ($SD = 1.66$), $M_{female} = 3.96$ ($SD = 1.86$).

Change in Appearance Satisfaction. Consistent with the previous two studies, a 2 (Temporal Mindset: current-self, possible-self, no-mindset control) x 2 (Gender: male, female) ANOVA performed on the change in appearance satisfaction index resulted in a significant main effect of gender, $F(1, 313) = 3.96, p = .047$, with men again reporting an increase in self-ratings after viewing the fit target ($M = .12$; $SD = .61$) and women a slight decrease in self-ratings after viewing the fit target ($M = -.03$; $SD = .71$). Separate one-way repeated measures of satisfaction over time indicated that males experienced a nonsignificant increase in response to fit peer exposure, $p = .29$, whereas females experienced a nonsignificant decrease overall, $F < 1$.

Results also revealed a separate, significant main effect of temporal-mindset, $F(1,313) = 3.87, p = .05$, $M_{possible} = .12$ ($SD = .67$), $M_{current} = -.03$ ($SD = .67$). As anticipated, participants who, prior to viewing the video, had written about who they were currently, activating a current-self mindset and decreasing perceived attainability of a similarly fit body, demonstrated contrast with the fit target by reporting a decrease in their self-satisfaction (though this decrease was not significant, in absolute terms, $F < 1$). However participants who had written about who they could be, activating a possible-self mindset and increasing perceived attainability of a similarly fit body,

demonstrated assimilation with the fit target by exhibiting increases in their self-satisfaction; this increase was significant in absolute terms, $p = .042$; see Figure 3.1). There was no interaction between temporal-mindset and gender, $F < 1$, indicating that the effect of mindset was consistent across gender. While the mindset manipulation thus was not powerful enough to eradicate the overall gender effect, it is noteworthy that males put in a current-self mindset and females put in a possible-self mindset exhibited virtually identical self-satisfaction reactions (see Figure 3.1).



Figure 3.1. Appearance satisfaction index after viewing a fit peer as a function of gender and temporal-mindset conditions.

Brief Discussion

Study 3 had multiple aims. First, we sought to replicate the findings from Studies 1 and 2 that men experience an increase in appearance satisfaction after exposure to fit peers, while women show the opposite pattern. Study 3 replicated these findings, even after men and women had first been primed with various mindset

tasks. Study 3 also provides support for the hypothesis that an individual's mindset can alter the effects on self-regard of social comparison processes. As discussed above, Blanton's (2001) three-selves model, along with a variety of "inspiration" models (Myers & Biocca, 1992; Mills et al., 2002; Evans, 2003; Engeln-Maddox, 2006; Stapel & Van der Zee, 2006; Brewer & Gardner, 1996) suggest that the particular temporal self-mindset activate at the time of the comparison should determine whether a social comparison results in assimilation or contrast and thereby produces a self-enhancing or self-deprecating effect. Theoretically, since the current-self mindset evokes a relatively stable view of who one is (Blanton, 2001), there is little room for incorporating others' attributes into evaluation of the self and little room for perceiving a better version of the self as attainable, making contrastive comparison outcomes more likely (Blanton, 2001; Blanton & Stapel, 2008). Consistent with this prediction, Study 3 male and female participants who were asked to write about their current selves demonstrated contrast following a social comparison; that is, they decreased self-satisfaction when exposed to a fit peer.

In contrast, a possible-self mindset theoretically evokes a relatively mutable self-view, since it focuses on who one might be in the future, allowing for incorporation of others' attributes into evaluations of the self and priming the possibility of self-improvement (Blanton, 2001). Activation of the possible-self should therefore make assimilation following social comparison more likely (Blanton, 2001; Blanton & Stapel, 2008), which in the context of exposure to a fit peer, should produce positive changes in self-satisfaction. Consistent with these ideas, male and female participants in Study 3 primed to think in terms of possible selves (by writing

about who they could be) experienced increased appearance satisfaction when subsequently exposed to the peer.

Of additional interest, we found that when participants were in a “current-self” mindset, they not only reported believing that individuals are less mutable, but also perceived the body of the fit peer as less attainable than when participants were in a “possible-self” mindset. This builds on the finding from Study 2 that showed when there was no mindset manipulation, men perceived the body of the fit, same-sex peer as more attainable than female participants. This also builds on the finding from Study 2 suggesting that perceived future attainability of a similarly fit body may mediate the relationship between gender and appearance satisfaction.

In sum, the results of Study 3 suggest that gender differences in temporal mindset can play a significant role in shaping how fit peers influence men’s and women’s feelings of appearance satisfaction. We were able to essentially eliminate the usual loss of self-satisfaction women experience in response to a fit peer by putting them into a possible-self mindset; and we were also able to eliminate the usual boost in appearance self-satisfaction that men experience after exposure to a fit peer by first priming a current-self mindset. However, we still were not able to completely eliminate the overall tendency for females to respond more negatively than males in terms of appearance satisfaction after exposure to a fit peer.

Study 4: Gender Differences in Appearance Satisfaction following Social Comparison with Fit Peers as a Function of Temporal Body Mindset

The results of the previous studies indicate that the primary differences in appearance satisfaction between men and women emerge after exposure to fit others (Study 1). Although manipulated perceptions of similarity were shown to marginally influence how men feel about their bodies in response to social comparisons (Study 2), mediation analyses suggested that while men show a natural tendency to view themselves as more similar to fit peers than women, greater perceptions of attainability of a similar fitness level, rather than current perceptions of similarity, are more likely to mediate the more positive responses of men (Study 2). Study 3 demonstrated that by manipulating a focus on the current-self versus a possible-self, we were able to influence perceptions of both mutability and attainability of a fit physique, and subsequently to impact how men and women feel about their bodies in response to social comparisons. Activation of the possible-self produced an increase in appearance satisfaction when compared to activation of the current-self. By putting women into a possible-self mindset, and men into a current-self mindset, prior to exposure to a fit peer, we were able to eliminate the previously observed gender difference in self-satisfaction reactions.

In Study 3, the temporal mindset manipulation was accomplished by having participants write essays on the topics, “Who I Am” or “Who I Can Become.” These essay prompts have been successfully used to manipulate temporal mindset both outside of the domain of body image (Blanton, 2001) and, more recently, in the realm

of appearance satisfaction (Wanic, 2011; Study 3 above). However, the open-endedness of the essay prompts allows participants to focus on any dimension of their choosing. Some dimensions selected by participants may have been irrelevant to appearance satisfaction (e.g. career direction, academic accomplishment, financial successes). We therefore in the final study were interested in whether focusing participants temporally and specifically on the relevant dimension of appearance would strengthen the mindset effect found in Study 3. Accordingly, in Study 4, we sought to examine how focusing participants on their current body versus on the best body that they could imagine might impact the outcomes of social comparisons with fit peers.

Method

Participants. A total of 190 (75 male and 115 female) undergraduates from UCSD participated in this study. All students were recruited via an online experiment posting and completed the experiment for course or extra credit. The mean age was 20.41 ($SD = 1.81$). The racial distribution was 58% Asian, 16% Caucasian, 13% Hispanic and 13% other.

Procedure. Participants arrived at the lab individually, were greeted by the experimenter, and were seated at a desk. The experimenter introduced the study as one on "perception and evaluation" and told participants they would be asked to view and evaluate an image in addition to completing a questionnaire. Modifying the procedure used by Blanton and Stapel (Study 2, 2008), the experimenter then presented each participant with an essay sheet and instructed them (depending on condition) to write a brief essay about their "current body" (current-body condition) or

their “best possible body” (possible-body condition). In the current-body condition, participants described their current body and physical abilities. They were encouraged to consider the aspects of their body that they liked and the aspects of their body that they did not like. They were also encouraged to discuss both the appearance of their body, along with their strength and athletic ability. In the possible-body condition, participants described the best body that they could imagine having. They were encouraged to discuss what they would look like, along with their strength and athletic abilities. They were instructed not to feel constrained by their current body’s qualities or traits, and they were instructed not to critique their current body. Participants were given 5 minutes to complete the essay task, during which time the experimenter left the participant to complete the tasks in private.

After completing the body mindset manipulation, participants were asked to view the same 8-minute video used in the previous studies of a fit same-sex peer discussing his/her qualities and dating interests.

Appearance Satisfaction Change. As in the previous studies, immediately after watching the peer on the video, participants responded to the same dependent measures assessing body shape satisfaction and appearance self esteem, which had also been measured at baseline, prior to the body-mindset manipulation and prior to the peer video, to allow for assessment of change in appearance satisfaction. An overall appearance satisfaction index again was subsequently created by z-scoring and averaging the various dependent measures ($\alpha = 0.86$). Again, positive numbers indicated positive change and negative numbers negative change in appearance and body shape satisfaction.

Manipulation Check. As a check of our body-mindset manipulation, we included an ad hoc, one-item measure to assess participants' personal mutability beliefs. Specifically, we asked them how strongly they agreed or disagreed (1 = *strongly disagree*; 7 = *strongly agree*) with the statement, "People can do things differently but the important parts of who they are can't really be changed." This is an item from Dweck's mindset scale (Levy, Stroessner, & Dweck, 1988), a scale developed to assess an individual's belief about the stability of traits across time. It was administered after the dependent measures had been completed.

We also then asked participants to complete three items intended to measure perceived attainability of a similarly fit body as that of the peer in the video. Specifically, we asked participants, "How possible is it that your body could look like the body of the person on the video tape (within the next couple years)?" 1 = *not at all possible*, 7 = *very possible*; "How likely is it that your body will look like the body of the person on the video tape (within the next couple years)?" 1 = *very unlikely*, 7 = *very likely*; and "How attainable is having a body like the body of the person on the videotape, for you?" 1 = *completely unattainable*, 7 = *very attainable*. These three items were highly intercorrelated and therefore were combined to create a perceived attainability index ($\alpha = 0.92$), where higher numbers indicate greater perceived attainability of a similarly fit body.

Results

Manipulation Check. To determine whether the body mindset manipulation was effective, we performed a 2 (Body Mindset: current-body, possible-body) x 2 (Gender: male, female) ANOVA on the personal mutability item. The results revealed only a weak trend for those in the current body condition to report the self to be less changeable than those in the best-possible body, $F(1, 186) = 2.08, p = .15$; $M_{\text{current body}} = 4.32 (SD = 1.14)$; $M_{\text{best-body}} = 4.00 (SD = 1.41)$. There was no main effect of gender, and no interaction between condition and gender, $F's < 1$.

We also performed a 2 (Body Mindset: current-body, possible-body) x 2 (Gender: male, female) ANOVA on participants' perceptions of future attainability of a similarly fit-appearing body. There was no main effect of condition, $F < 1$, but males, considerably more than females, perceived a similarly fit body as attainable in the future, $F(1,186) = 39.99, p < .001$; $M_{\text{male}} = 5.25 (SD = 1.54)$, $M_{\text{female}} = 3.54 (SD = 1.82)$. There was no interaction effect, $F < 1$.

Thus the body mindset manipulations showed evidence of weakly impacting general perceptions of mutability but no evidence of influencing specific perceptions of attainability of a similarly fit body.

Change in Appearance Satisfaction. A 2 (Body Mindset: current-body, possible-body) x 2 (Gender: male, female) ANOVA performed on change in appearance satisfaction revealed no main effect of gender, $F < 1$. Separately, there was only a very slight trend towards body mindset effect, $F(1,184) = 1.72, p = .19$; $M_{\text{current-body}} = -.18 (SD = .72)$, $M_{\text{best-body}} = -.02 (SD = .77)$; participants in the current-body mindset condition reported a slightly greater decrease in their appearance satisfaction

(contrast) than did participants in the possible-body mindset condition. There was no interaction between body mindset and gender, $p > .25$. As can be seen in Figure 4.1, men experienced an almost identical decrease in appearance satisfaction in the current-body mindset condition and the possible-body mindset condition, $F < 1$. However, a planned comparison contrasting women's responses in the current-body mindset condition to those in the possible-body mindset condition showed a marginally significant effect of body mindset, ($p = .056$), such that women in the current-body mindset reported a greater decrease in their appearance satisfaction (contrast) than did women in the possible-body mindset condition; in fact, whereas follow-up repeated measures analyses indicated that women in the current-body mindset experienced a significant decrease in appearance satisfaction in absolute terms ($p = .028$), women in the possible-body mindset did not exhibit any loss in appearance satisfaction at all.

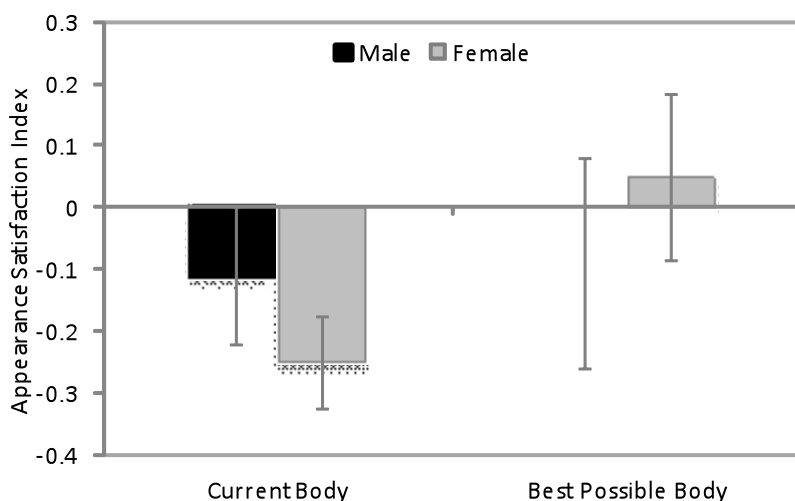


Figure 4.1. Appearance satisfaction change after viewing a fit peer as a function of gender and current-body versus possible-body mindset conditions.

Brief Discussion

Study 4 found that when men and women were primed with a current-body or a possible-body mindset prior to viewing a fit peer, gender differences in subsequent appearance satisfaction were reduced to a non-significant level. However, as the manipulation in the present study did not have the intended effects, as indicated by manipulation checks, the results are difficult to interpret. Most noteworthy, perhaps, is that the positive impact of the fit peer on men's appearance satisfaction found in Studies 2 and 3 was completely eliminated, and in fact became somewhat negative, in both the current-body and best-possible body mindset conditions of Study 4.⁴ While we must be very cautious about making comparisons between studies, we speculate that it is possible that both experimental conditions in Study 4 prompted male participants simply to be in a general "appearance-focused" state unqualified by temporal (current versus possible self) considerations. Appearance focus has been implicated indirectly in research linking neuroticism and body dissatisfaction among exercising men (Davis, Elliot, Dionne, & Mitchell, 1991).

Perhaps when men are in an appearance-focused state, they are unable to effectively self-enhance in the typical manner. In the more general possible-self mindset condition of Study 3, men presumably were able to focus on dimensions other than the body. Research has found that emphasizing non-appearance dimensions during body comparisons can be an effective strategy (Lew et al., 2007; Tiggemann & Polivy, 2010) for protecting self-regard. In a study by Lew and colleagues (2007), for example, women were asked to look through an advertisement folder with pictures of models and were asked to write about aspects of themselves that they valued, but which they did not see in the models, such as special talents and important friendships.

When women compared with media images of fashion models on non-appearance dimensions, they were protected from the negative effects of exposure to the idealized images (Lew et al., 2007). Similarly, Tiggemann and Polivy (2010) found that when women engaged in intelligence comparison processing while viewing fashion magazine advertisements featuring thin and attractive models, women experienced increased body satisfaction. It is possible that for men, a key strategy in coping with appearance-based body comparisons with fit others is focusing on dimensions completely unrelated to the physical self (Lew et al., 2007). Forcing men to think only in terms of the body may have forced them to consider shortcomings in a way that they normally might avoid by considering other self-enhancing dimensions.

Of course it is likely that women, like men, were put into an appearance-focused state, yet in the possible-body condition, women did not react negatively in absolute terms, whereas those in the current-body condition did, with the relative difference being marginally significant. Thus the question becomes, why are women protected in the possible-self mindset, whether a general or body mindset? Perhaps women, who tend to go automatically to body comparisons when viewing a fit other (Allgood-Merten, Lewinsohn & Hops, 1990; Polce-Lynch, Myers, Kilmartin, Forssmann-Falck & Kliewer, 1998), find comfort in focusing on possibilities rather than current realities. However, as this is the first study to explore how body mindset may impact gender differences in outcomes of appearance-based comparisons with peers, and as the effectiveness of the manipulation was suboptimal, additional research is needed in order to better understand the role that this cognitive strategy may play.

Main Discussion

Social comparison theory argues that people have a basic need for self-evaluation, and when an objective standard is not available for reference, prefer to compare themselves to similar others to obtain the most accurate self-appraisals possible (Festinger, 1954). Research confirming these predictions shows that social comparisons are an important source of information when evaluating oneself (Klein, 1997; Wilson & Ross, 2000; Wood, 1989). While Festinger (1954) proposed that individuals prefer to compare themselves to similar others, there is evidence that we frequently encounter, and sometimes even seek, comparison targets who may be better or worse off than we are on a given evaluative dimension (Klein, 1997; Wood, 1989). The effects of such comparisons on our self-evaluations are quite varied (e.g., Blanton & Stapel, 2008). For example, it has been hypothesized that comparing with a target who is worse off than us (making a downward comparison) might serve as a frightening example of the depths to which we might fall or, alternatively, make us feel better about our status given that we are better than someone else (e.g., Buunk, Oldersma & de Dreu, 2001; Lockwood, 2002; Wills, 1981). Similarly, there are opposing predictions regarding the outcome of a comparison with someone who is better off (an upward comparison) than we are. Such a target could offer inspiration by showing the heights we may achieve while on the other hand serve to highlight our shortcomings or failure to excel (e.g., Gilbert, Giesler & Morris, 1995; Kimmelmeier & Oyserman, 2001; Pinkus et al., 2008).

Consequently, social comparisons can result in either heightened or lowered feelings about the self. Assimilation describes the process by which an individual's self-evaluation is shifted in the direction of a comparison target, seen as self-enhanced ratings following an upward comparison and more negative self-ratings following a downward comparison. Alternatively, one's self-evaluation may be displaced away from the comparison target, yielding contrast. Contrast following comparison with an upward target would result in more negative self-ratings, whereas contrast following comparison with a downward comparison target would result in more positive self-ratings.

In the realm of physical appearance, the media provides ample opportunity for upward comparisons. Considerable research indicates that exposure to attractive, idealized, slender women in the media leads to negative self-evaluations by women that manifest as reduced self-esteem and appearance satisfaction (e.g., Irving, 1990, Stice & Shaw, 1994; Thompson & Heinberg, 1993; Tiggemann & Pickering, 1996; Wilson & Eldredge, 1992; see Groez, Levine, & Murnen, 2002, for a meta-analytic review), suggesting that women tend to contrast their appearance with that of idealized media images. Similarly, an emerging literature is beginning to explore how exposure to the muscular, male ideal may impact appearance satisfaction and self-regard, but with mixed results, (Hobza, Walker, Yakushoko & Peugh, 2007; Lavine, Sweeney & Wagner, 1999; Agliata & Tantleff-Dunn, 2004; Humphreys & Paxton, 2004; Halliwell, Dittmar & Orsborn, 2007; McCabe & Ricciardelli, 2003; Ricciardelli, McCabe & Banfield, 2000; Kalodner, 1997), suggesting that men do not consistently contrast their appearance with the muscular, male ideal.

When considering the ample research documenting how women's appearance satisfaction is negatively impacted by media ideals, and the emerging literature suggesting that men may not respond so negatively, researchers have been quick to assert that there are pronounced gender differences in how men and women's appearance satisfaction is impacted by idealized images. However, the majority of claims surrounding gender differences in response to idealized figures have been based on comparisons between separate studies, with only a handful of researchers directly comparing male and female responses to idealized media images in a single study (e.g. Grogan, Williams & Conner, 1996; Hargreaves & Tiggemann, 2004; Venkat & Ogden, 2002).

Prior to the present series of experiments, only one study had directly (in the same study) tried to compare how men and women's body satisfaction is impacted by social comparisons with fit peers, but the operationalization of fit peers (photos in a magazine) arguably did not truly involve peers (Strahan et al., 2006). To our knowledge, no prior studies had previously considered the impact of unfit peers on male versus female appearance satisfaction or affect. In that comparisons with peers are more frequent than comparisons with media images (Wheeler & Miyake, 1992) and more likely to impact everyday self-concepts (Festinger, 1954), this is an important and understudied area of research. A small but growing experimental literature has considered the effects of peer comparisons on women's body images (Krones, et al., 2005; Lin & Kulik, 2002; Wasilenko, et al., 2007; Wanic, 2011), but to date the impact of peer comparisons on male body image had not been investigated. This series of experiments extended this line of work on peer comparisons and body image by

examining directly how men's reactions to peer body comparisons are similar or dissimilar to women's reactions.

Effects of Gender on Appearance Satisfaction Following Exposure to Peers

Study 1 was designed to compare relatively directly how men and women's appearance satisfaction is impacted by comparisons with fit, average, and overweight peers. In conceptual replication of several experimental studies, some of which have involved exposure to photographs (Lin & Kulik, 2002; Wanic, 2011) and others to live peers (Wasilensko et al., 2007), the main results indicated that women exposed to a video featuring a very fit peer expressed significantly lower body satisfaction and appearance self-esteem than women exposed to a peer of average fitness. However, women exposed to an unfit (overweight) peer experienced no significant compensatory, elevating effect. Given that different stimulus persons presented through different media have produced similar results, this pattern of response thus appears fairly robust. This is important because to the extent that downward body comparisons with peers fail generally to elevate women's feelings of body satisfaction as readily as upward comparisons undermine such feelings, a negative spiral may occur that contributes to the high prevalence of body dissatisfaction among women (Rodin, Silberstein & Striegel-Moore, 1985).

Men exhibited an overall pattern that was fairly similar to that of women in response to average and unfit peers. Where men differed from women most clearly was in their reactions to fit peers. Women had significantly more negative reactions overall than men to fit-peer comparisons. In fact, Study 1 men exhibited a tendency, if anything, to react more favorably to a fit compared to an average or unfit peer,

particularly in terms of their appearance self-esteem and depression levels. While in Study 1 men's more positive response to the fit peer compared to average and unfit peers was individually significant only for depression, the no-mindset control conditions of Study 2 successfully replicated the gender differences in response to the fit peer, solidifying the findings that men respond less negatively to exposure to fit peers.

A related but separate question addressed in Study 2 that could not be answered in Study 1 is whether the foregoing gender difference in reactions to a fit peer is due to men simply not reacting as negatively as women, or whether men might actually experience a reliable boost in appearance satisfaction in response to fit peers. In addition to assessing appearance satisfaction after viewing the comparison peer, Study 2 added an assessment of appearance satisfaction at baseline, thereby enabling change in appearance satisfaction to be measured directly. The results of the no-mindset controls indicated that males in Study 2 actually became significantly more satisfied, and females significantly less satisfied, with their appearances after exposure to a fit peer. While the same pattern was observed in male versus female responses to an average peer, the gender difference to the average peer among the no-mindset controls was not significant. In addition, neither male nor female satisfaction levels changed significantly in absolute terms in response to an average peer. Thus, overall, men differed from women primarily in how they responded to a fit peer, with men in absolute terms experiencing an increase and women a decrease in their appearance satisfaction.

Such a differential response pattern to fit others could help account for the finding that women on average experience more body dissatisfaction than men (Gabriel et al., 1994; Powell et al., 2001; Strahan et al., 2006). As minimal prior research to date had directly compared how male and female appearance satisfaction is impacted by exposure to fit peers, the combination of Study 1 and Study 2 greatly adds to our understanding of how exposure to fit peers may differentially impact men and women. This finding also raises the question of *why* men and women apparently differ so markedly in their appearance satisfaction after exposure to fit peers. The next section considers several possible, potentially interrelated explanations.

Coping / Defensiveness Explanation. Female body dissatisfaction is so widespread and widely acknowledged that women seem to feel very comfortable expressing their own body dissatisfaction. Rodin and colleagues (1984), for example, have gone so far as to suggest that appearance dissatisfaction has become part of the feminine gender role in this country, that to be a mentally healthy woman *means* complaining about or disliking one's body. This tendency, coupled with the tendencies for women to rate themselves as more emotionally expressive and to report more negative affect than men report (Brody, 2000), could result in women feeling more comfortable expressing negative thoughts about their own bodies when they occur.

One possibility then is that men actually feel just as negatively as women in response to a fit peer, but men are less comfortable, or are more defensive, about expressing such negative thoughts about their own bodies. Considerable effort was made in the present studies to ensure that participants knew all survey responses were

confidential and anonymous, but gender differences in willingness to report dissatisfaction with the self cannot be completely ruled out. Note, however, that a “defensiveness” mechanism would have to account not only for an unwillingness to report negative feelings about the self (which implies no change from baseline) but also the actual increase in appearance satisfaction reported by men, specifically in response to a fit peer. Such a strong defensive reaction, although not impossible theoretically, ultimately, however, would need also to explain why men would be so remarkably defensive in such a context.

Self-Serving Bias and Cultural Norms Explanation. Research on positive illusions has revealed a widespread, robust tendency for people to perceive their attributes in very positive, self-serving terms (Baumeister, 1998; Taylor & Brown, 1988); people tend to self-enhance in most domains of life, ranging from driving ability (Svenson, 1981) to personality (Alicke, 1985). Although there is evidence that men may extend such self-serving tendencies to evaluations of their bodies (Powell, Matacin & Stuart, 2001; Strahan et al., 2006), women appear generally to avoid making self-enhancing descriptions when describing their weight or appearance (Powell, Matacin & Stuart, 2001; Strahan et al., 2006).

Theorists have speculated that cultural norms for thinness and beauty play a large role in women’s chronic dissatisfaction with their bodies (Thompson & Stice, 2001) and their inability to engage in positive illusions in this domain (Powell et al., 2001). Many theorists have speculated further that the media is the primary agent perpetuating the cultural message that women, more so than men, need to be attractive (Wolf, 1991). This is very possibly correct, as images of thin women are ubiquitous in

the media, and women's magazines contain more messages about physical attractiveness than do men's magazines (e.g. Malkin, Wornian & Chrisler, 1999). Female attractiveness has also been shown to impact how women are perceived on dimensions unrelated to physique (Franzoi, Kessenich & Sugrue, 1989), while male attractiveness often does not impact unrelated dimensions as profoundly (Kaplan, 1978; Irving, DuPen & Berel, 1998; Townsend & Wasserman, 1997).

It is possible that due to the strong cultural message aimed at women, their physical appearance is of the utmost importance, but that the generally unobtainable appearance standards set by the media (Strahan et al., 2006) do not allow women the luxury of positive illusions in this particular realm (Baumeister, 1998, Powell et al., 2001). If cultural messages have left women unable to engage in the positive illusions during comparisons with fit peers, but have allowed men to indulge the general self-serving bias, this could offer one explanation for gender differences in appearance satisfaction after encountering a fit peer. However, by itself, such an explanation would not readily account for the relative lack of self-enhancement in men in response to average and unfit peers.

Socio-Evolutionary Explanation. While cultural messages may begin to scratch the surface of explanation, in order to better understand *why* cultural messages about attractiveness may be so different for men and women, we can consider an evolutionary psychology approach. While evolutionary accounts are clearly speculative, they offer an interesting perspective on how gender differences may have arisen, and can help frame our understanding of gender differences in processing of social comparisons with fit peers. From an evolutionary perspective, the process of

natural selection is inherently competitive. Men and women compete for access to ideal mates, and rather than simply striving to better themselves in general, individuals must strive to be better than their competition when competing for access to an ideal mate (Hill & Buss, 2008). When social comparisons reflect poorly on one's relative performance, it is typically met with subjective distress (Festinger, 1954) and can elicit envy (Hill & Buss, 2008).

An evolutionary framework predicts that the more closely a domain of comparison is linked to reproductive success, the more one's failures relative to competitors in that area would be expected to elicit distress. For men, the primary way they are able to succeed in passing on their genes is by gaining sexual access to young, healthy, fertile women. In contrast, women have historically ensured that they pass on their genes by securing a mate who is able and willing to invest in them and their offspring (Buss, 1994). Consequently, when women aspire to be perceived as a desirable mate, physical appearance is very relevant, and women may therefore place high value on having an attractive body. Researchers have also found that women's bodies play a larger role in how others judge their overall value, when compared with men (Irving, DuPen & Berel, 1998; Townsend & Wasserman, 1997). For women, having an attractive body is linked to reproductive success, so comparisons with more attractive female peers would be expected to elicit both distress and envy.

For men, having an attractive body is less closely linked with reproductive success, theoretically making this domain less relevant, and comparisons with fit men less threatening. Comparisons with others on a dimension that is not relevant to the self are relatively unlikely to elicit negative emotions such as envy (Smith, 2004). The

dimension of attractiveness may be even less relevant for men, as men's physical bodies play a fairly minor role in how others judge their overall value (Irving, DuPen & Berel, 1998; Townsend & Wasserman, 1997). It follows from the foregoing perspective therefore that women should experience greater distress than men in response to same-sex peers who are more attractive than them (Hill & Buss, 2006).

The foregoing suggests the possibility then that the gender difference in response to the fit peer found in this collection of studies was due to women experiencing higher levels of distress, because they were threatened in an arena that is relatively critical for their reproductive success. For men, the realm of physical appearance is not as strongly linked to their reproductive success, making comparisons with fit peers less threatening and distressing.

While such an evolutionary perspective offers a provocative explanation for why men did not experience as extreme a negative response as women to a fit peer, it does not explain why men experienced a *positive* response to fit peers. Another limitation of this evolutionary account, like most evolutionary accounts of social phenomena, is that it is extremely difficult to test experimentally the hypothesis that evolutionary pressures have shaped this gendered response.

Biopsychological Explanation. Another possible explanation for the observed gender difference, one that may help account for the boost in absolute terms for men and loss for women of appearance satisfaction in response to a fit peer, is grounded in hormonal differences between men and women. A large literature implicates testosterone as a key hormone involved in competitive social situations (see Archer, 2006, for review). Typically, winning a competition is thought to promote

increases in testosterone, thereby facilitating dominant behaviors and displays of high status; in contrast, losing a competition is thought to decrease testosterone, eliciting submissive behavior (Mazur, 1985).

Interestingly, however, there is evidence that men and women's endocrine responses to competition are more different than alike (Kivlighan, Granger & Booth, 2005). Specifically, in the context of competition, there is evidence that women are more likely to experience a decrease in testosterone and an increase in cortisol, while men are more likely to experience an increase in testosterone and a decrease in cortisol (Kivlighan, Granger & Booth, 2005). Increased testosterone levels have been linked not only to increased social dominance (Archer, 2006; Mehta & Josephs, 2006), but also to increases in positive emotion (Mazur & Lamb, 1980; Booth, Shelley, Mazur, Tharp & Kittok, 1989). Additionally, in an effort to test the speculated causal role played by testosterone, a number of studies have experimentally manipulated testosterone levels by randomly assigning individuals to receive varying levels of testosterone through intermuscular injection and transdermal gels (Rabijewski, Adamkiewicz, & Zgliczynski, 1998; Wang et al., 2000, O'Connor, Archer, Hair, Wu, 2001). When testosterone has been supplied exogenously, it has been shown to increase positive mood (Rabijewski, Adamkiewicz, & Zgliczynski, 1998; Wang et al., 2000) and to reduce tension, anger and fatigue (O'Connor, Archer, Hair, Wu, 2001).

While mood was not the focus of the present studies, in the one study in which mood was measured (Study 1), there was evidence that exposure to a fit peer reduced negative mood in men relative to women. It is possible that the implicitly competitive situation of viewing a fit same-sex peer produces an increase in testosterone in men

and a decrease in testosterone in women; this in turn could subsequently improve mood and self-evaluations in men, but dampen mood and self-evaluations in women (Brown & Mankowski, 1993).

If, as seems likely, viewing a fit peer elicits more implicit if not explicit feelings of competition than viewing either an average or unfit peer, this biopsychological hypothesis could potentially account for the specificity of gender differences to fit peers. An additional advantage is that it seems relatively testable. For example, the current relevant studies (Study 2, no-mindset controls) could be replicated with participants' testosterone levels measured before and after viewing the fit peer video. This would allow us to measure if exposure to a fit peer impacted testosterone levels in male and female participants. The prediction would be that exposure to a fit peer produces an increase in testosterone levels and appearance satisfaction in men, but a decrease in testosterone levels and appearance satisfaction in women. In an expansion of this approach that included exposure to average peers, we might further expect there to be relatively little effect on testosterone levels and appearance satisfaction of males and females.

To test the proposed causal role played by testosterone, the biopsychological hypothesis could be further tested by directly manipulating testosterone levels. As testosterone levels can readily be experimentally manipulated through administration of exogenous testosterone (e.g., (Rabijewski, Adamkiewicz, & Zgliczynski, 1998; Wang et al., 2000), it would be possible to manipulate participants' levels of testosterone prior to comparisons with fit peers. If, for example, both male and female participants who had received injections of testosterone reported increased appearance

satisfaction in response to a fit peer relative to participants who had received placebo injections, this would further support the proposed meditational role of testosterone in the observed gender differences in appearance satisfaction.

However, it should be noted that the primary biological structures responsible for the release of testosterone are different in men and women. In men, testosterone is produced primarily by the gonads, while in women, testosterone is produced primarily by the adrenal glands. As these distinct pathways have different implications for other endocrinological responses in the body, exogenous administration of testosterone may not accurately mirror the entire hormone profile that is produced when testosterone is created endogenously (Miller, Maner & McNulty, 2012). Nonetheless, although this biopsychological hypothesis clearly is very preliminary, and a substantial amount of additional research would be needed for an adequate test, it offers an interesting potential explanation for the different (and perhaps similar) appearance satisfaction responses of men and women in response to peers found in the current collection of studies.

Gender Differences in Mindset when Comparing with a Fit Peer

Given the findings from Studies 1 and 2 that men's appearance satisfaction improves after viewing a fit peer, while women's appearance satisfaction deteriorates in the same situation, the present collection of studies also sought to explore how men and women's mindsets might influence the effects of appearance-related social comparisons on their feelings of appearance satisfaction. As there are potentially negative psychological and behavioral consequences of exposure to idealized images, particularly for women (Stice, Schupak-Neuberg, Shaw & Stein, 1994), it is important

to understand how a woman's state of mind while making such comparisons may influence her self-evaluations. Additionally, if the state of mind that men assume when making appearance-focused social comparisons is protective against experiencing decreases in appearance satisfaction, this is also important to determine, as such information has the potential to help shape interventions designed to reduce the negative effects of exposure to idealized images for women. Furthermore, as mindsets can be manipulated or altered through interventions (e.g. Blanton, 2001), research in this area has the potential to assist with the development of effective body image interventions.

Study 2 attempted to address whether there were gender differences in men and women's natural mindsets when viewing a fit, same-sex peer. The results of Study 2 suggest that in their "natural" mindsets, male compared to female participants rated the body of the fit, same-sex peer both more similar to theirs currently and as more attainable in the future. While there was no evidence that rated perceptions of similarity mediated directly the observed gender difference in appearance satisfaction change, additional analyses did find support for the idea that perceptions of future attainability may play a mediational role in explaining the gender difference in appearance satisfaction, following exposure to a fit peer. These results suggest that men may react less negatively to exposure to fit peers than women due at least in part to a gender difference in mindset, with men more typically believing an equally fit body to that of a peer is readily attainable. We next consider possible reasons for this gender difference in perceptions of attainability.

Extremeness of Cultural Ideals Explanation. Gender differences in perceptions of the attainability of a fit physique may be due to gender differences in the extremeness of the cultural ideal. For women, the cultural ideal of attractiveness is a narrowly defined category (i.e. young, tall, very thin) (Hargreaves & Tiggemann, 2002; Levine & Smolak, 1996; Groesz et al., 2002; Strahan et al., 2006), representing a significant deviation from the appearance of the average woman (Groesz et al., 2002; Strahan et al., 2006). However, for men, appearance-based cultural norms are more flexible (Strahan et al., 2006), and the ideal male figure is more moderate (Rand & Wright, 2001). There are many different types of men (with different physical characteristics) that are viewed as attractive by women (Humphreys & Paxton, 2004). Therefore, while the “ideal male” may be viewed as muscular and athletic, men may fit a variety of categories and still be accepted and viewed as attractive.

Experiences with Dieting and Exercise Explanation. Gender differences in perceptions of attainability of an ideal physique could also stem from the fact that women are more likely to have dieted and exercised for weight control than men (Horm & Anderson, 1993; Serdula, Collins, Williamson, Anda, Pamuk, & Byers, 1993), and, as a result, may have a better sense of the difficulty of looking so fit. This, coupled with a strong cultural message telling women that their physical appearance will never measure up to the high standards set by the media (Strahan et al., 2006), may contribute to women’s belief that the desired physique is beyond their power to obtain (Smith, 2004). Men, however, may believe that a fit physique is readily attainable if sought, cultivating the belief that they will have such a physique in the future. One study found that male exercisers experienced less body dissatisfaction

than male non-exercisers after viewing idealized media images of other men (Halliwell, Dittmar & Orsborn, 2007). It is possible that men who are actively working on their muscularity perceive the media standard as particularly attainable. Therefore when considering the physique of a fit peer, the male response could be summed up as “it *will* be me,” whereas the female response to a fit peer may be more characterized by “it *could* have been me” (Smith, 2004).

Results from Study 2 suggest that there are natural differences in men and women’s mindsets while engaging in the comparison process, and that these mindset differences may be partially responsible for gender differences in appearance satisfaction following comparisons with fit peers. If this is the case, it should be possible to experimentally manipulate these mindsets, and subsequently impact both male and female appearance satisfaction. The following sections review the primary findings from our attempts at manipulating male and female participants’ mindsets prior to comparisons with fit, same-sex peers.

Gender Differences in Mindset when Comparing with a Fit Peer – Minimal Effects of Similarity Primes

In his selective accessibility model (SAM), Mussweiler (2003) proposes that an individual’s comparative mindset while engaging in a social comparison is an important determinant of comparison outcomes. Mussweiler (2003) proposes specifically that a similarity mindset will produce assimilative social comparison outcomes, and a dissimilarity mindset will produce contrastive social comparison outcomes. The SAM in this context predicts that perceived similarity with a fit peer

when making comparisons will result in increased (more favorable) self-ratings and perceived dissimilarity in more negative self-evaluations.

Study 2 tried to explore whether experimentally inducing a general similarity or dissimilarity mindset could mitigate if not eliminate the gender difference in satisfaction (particularly the negative response of women) in response to exposure to a fit peer. Unfortunately, while our similarity mindset manipulation was successful in reducing gender differences in the perceived similarity of the fit peer, it did not appear to be as impactful as intended. It is worth noting that we attempted in Study 2 to manipulate perceptions of similarity or dissimilarity at a comparatively general level by first having participants list similarities or dissimilarities between different drawings, with only moderate success. It is possible that more target-directed manipulations of similarity, such as having participants list similarities or dissimilarities with the comparison target, could prove more effective. However, such directed similarity manipulations have also been shown recently to be only moderately successful (Wanic, 2011).

Despite the suboptimal impact of the similarity mindset manipulation, men actually did experience a small decrease in appearance satisfaction when primed with the dissimilarity-mindset (compared to the no-mindset control group), and women did not show the usual loss in appearance satisfaction when primed with the similarity-mindset (compared to the no-mindset control group). However, neither of these effects reached statistical significance. This suggests that while perceived similarity with a target may have the potential to slightly reduce the negative effects of certain

social comparisons on body-image, the difficulty of inducing this mindset experimentally may make it less useful as an intervention strategy.

Gender Differences in Mindset when Comparing with a Fit Peer – “Possible Selves” Mindsets may Protect Women

Researchers have proposed that general beliefs about the self, irrespective of the comparison target, can moderate social comparison outcomes. Specifically, it has been proposed that if one’s self-concept is focused on his or her current individual traits and characteristics – a category with clear self-other-borders – contrast will occur (Blanton, 2001; Myers & Biocca, 1992; Mills et al., 2002; Evans, 2003; Engeln-Maddox, 2006; Stapel & Van der Zee, 2006; Brewer & Gardner, 1996), whereas if the active self-concept includes thoughts of who one may possibly become in the future (Markus & Nurius, 1986; Blanton, 2001; Myers & Biocca, 1992), assimilation will occur. Activation of the current-self therefore theoretically involves a relatively static representation of who one is at a given point in time, whereas one’s possible-self, because it incorporates potential changes that may take place in the future, theoretically is a more malleable self-representation.

Studies 3 and 4 were designed to explore the role of current versus possible-self mindsets in reactions to fit peer exposure. In Study 3 participants were primed to think generally in terms of current selves or possible selves, whereas in Study 4, participants were primed to think in terms of current selves or possible selves specifically within the area of physical appearance. Results indicated that when female participants were primed to think generally in terms of possible selves (Study 3) or by writing about the best body they could possibly imagine having (Study 4),

they were “protected” against the typical negative effects of exposure to a fit peer. In Study 3, women in the possible-self mindset experienced no absolute decrease in appearance satisfaction after viewing a fit peer (as determined by comparisons between baseline appearance satisfaction and post-manipulation appearance satisfaction), in sharp contrast to the absolute decrease in body satisfaction demonstrated in the no-mindset control group in Study 2. While we must be cautious when comparing results between studies, the finding that women respond negatively to idealized images is very well established (see Groesz et al., 2002 and Grabe et al., 2008 for meta-analyses), and any deviation from this trend is noteworthy.

A similar pattern was found for women in Study 4, in that women in the current-body mindset experienced a significant decrease in appearance satisfaction in absolute terms, whereas women in the possible-body mindset did not exhibit any loss in appearance satisfaction at all. The results of Study 3 and Study 4 thus suggest that for women, a possible-self mindset, be it general or body specific, may serve potentially to buffer against negative effects of comparisons with fit, same-sex others. As this is the second time that a buffering effect of a possible-self mindset has been found for women in response to fit peers (Wanic, 2011), this is an encouraging result. This finding also raises the question of *why* a possible-self mindset might protect women from the negative effects of comparisons with fit, same-sex others. The next section considers several possible, potentially interrelated explanations.

Possible Mindsets and Increased Perceptions of Attainability Explanation.

It may be that the shift in focus towards what is possible may have influenced women’s perceptions of the attainability of the thin-ideal. Recall that when there were

no mindset-manipulations, Study 2 found that women view the physique of a fit, same-sex peer as significantly less attainable than do men. Additionally, a mediation analysis revealed that perceptions of the future attainability of a similarly fit body was a statistical mediator of the relationship between gender and appearance satisfaction. If the experimentally induced possible-self and possible-body mindsets in Studies 3 and 4 were able acutely to increase perceptions of similar fitness attainability for women, this could explain why women were protected against the typical negative effects of exposure to fit peers in these conditions. In Study 3, this precise effect was found. That is, when participants were in a “possible-self” mindset, they not only reported believing that individuals are more mutable, but also perceived the body of the fit peer as more attainable. In contrast, the “possible-body” manipulation in Study 4 was not successful in producing an increase in perceived attainability relative to the current-body condition. We speculate that the explicit focus on appearance may have made participants highly conscious of their responses on the body-attainability items. If participants in both current and possible-body mindsets in Study 4 were acutely aware of the study’s focus on physical appearance, they may as result have reported a socially desirable response (e.g., increased attainability) on the body-attainability items, eliminating differences in reports of attainability between the mindset conditions.

If perceptions of attainability are central to gender differences in appearance satisfaction following social comparisons with fit others, it may be possible to test this experimentally in a more direct manner. For example, in a study unrelated to body image but nonetheless potentially relevant, Lockwood and Kunda (1997; Study 2)

attempted to experimentally manipulate perceptions of attainability by presenting participants with a vignette about a spectacular graduating student. Attainability was manipulated by virtue of the participant's own career stage. It was speculated that the graduating superstar student's success would seem attainable to first year students, but would not seem attainable to other graduating students (Lockwood & Kunda, 1997). While one could question the validity of Lockwood and Kunda's (1997) manipulation, it demonstrates an attempt at direct manipulation of attainability.

Attainability could perhaps be manipulated more effectively in the realm of body satisfaction by presenting participants with suggestions for how to achieve a fit figure or through success stories from those who have successfully transformed their bodies (increasing attainability) versus presenting statistics on the high percentage of people that fail at diets (decreasing attainability). If perceived attainability is ultimately the key component of the possible-selves models, we would expect that those primed with successful body transformations would report higher appearance satisfaction after exposure to a fit peer than those primed with statistics about the high prevalence of failed dieting.

Speculating about extending this finding beyond the lab, it is possible that encouraging women who are negatively affected by comparisons with highly fit peers (or media targets) to focus on the attainability of a fit physique might help reduce the generally negative effects of such exposures. Logically, though, the physical appearance of professional female models *should* be viewed as unattainable for most women. Models are selected from the thinnest 2% of the population, and it is their full-time career to maintain and present an ideal appearance. Furthermore, models

have a team of professionals who help them to achieve this goal at every stage of the process (Levine & Smolak, 1996; Wolf, 1991). Hence, striving for self-improvement by attempting to meet these standards is likely to cause women to pour their resources into a futile task and to experience a spiral of disappointment and self-blame.

Therefore, when considering potential interventions, the best approach to inducing possible-selves mindsets and thereby potentially to increasing perceptions of attainability of an idealized physique, awaits additional research. Ideally, the negative impact of idealized images on women would be addressed by changing society - that is, by replacing unrealistic standards and unattainable expectations with reasonable goals. Unfortunately, such a broad change is not likely to occur anytime soon.

Biopsychological Explanation. As discussed earlier, it is possible that gender differences in appearance satisfaction after exposure to a fit peer are due to a gender difference in production of testosterone during competition. A strength of this hypothesis is that it can be tested relatively directly. As previously noted, Study 3 and 4 could easily be replicated, with testosterone levels being measured during the study. Of interest would be the possibility that testosterone levels increase for women in possible-self mindsets and decrease in current-self mindsets. As increased perceptions of ability and possibilities are linked to social dominance (Brown & Zeigler-Hill, 2004), and social dominance is linked to testosterone (Archer, 2006; Mehta & Josephs, 2006), it is possible that the possible-self mindsets would also be associated with increased testosterone.

For the biopsychological explanation ultimately to be tenable, it must also explain why women's hormonal systems would be wired to increase testosterone

levels when women are in a possible-self mindset. Interestingly, researchers have found that when women are given a sublingual dose of testosterone, their motivation for action is increased (Aarts & Van Honk, 2009). This suggests the possibility that the body's hormonal system is wired to increase testosterone levels when women are in a possible-self mindset in order to prime them to take action, moving themselves closer to their best imagined self. Testosterone has never been studied in relation to the current selves or possible selves mindsets, however, making these hypotheses intriguing but extremely speculative.

Gender Differences in Mindset when Comparing with a Fit Peer – “Body Focus” may Harm Men

While the essay prompts in Study 3 (“Who I Am” vs. “Who I Can Become”) were successful in manipulating temporal mindset for men and women, the open-endedness of the essay prompt allowed participants to select any dimension upon which to focus. Since some dimensions selected by participants may have been irrelevant to appearance satisfaction, in Study 4 we directed participants to focus specifically on their current body or on the best body that they could imagine, respectively. In Study 4 the positive impact of the fit peer on men's appearance satisfaction found in Studies 2 and 3 was completely eliminated, and in fact, became somewhat negative, in both the current-body and best-possible body mindset conditions of Study 4.⁵ Although comparisons of results between studies are at best indirect, and must be made with caution, the sharply divergent (negative) responses of men in body-focused mindsets (Study 4) compared to the (positive) responses of men in natural (Studies 1 and 2), similarity (Study 2), and general temporal mindsets

(Study 3) suggests that men in these latter conditions likely were not reacting principally to spontaneous, body-specific comparisons. Men, unlike women, may tend not to automatically make body comparisons when viewing a fit other (Allgood-Merten, Lewinsohn & Hops, 1990; Polce-Lynch, Myers, Kilmartin, Forssmann-Falck & Kliewer, 1998). Note that the somewhat negative effects on appearance satisfaction of men to a fit peer observed in Study 4 were somewhat surprising only because of the robust boost to satisfaction observed in those other studies. Absent those results, the negative effect on feelings of self-satisfaction in response to a fit when in an explicit body focus would not seem particularly surprising. Thus it may be that when men dwell specifically on their physiques relative to a fit peer, their self-regard suffers, much as it does when women do. Perhaps the key difference is that when confronted with a fit peer, however, whereas women normally are more prone to focus comparisons on body dimensions, men typically focus elsewhere. We next consider what men may typically focus on during appearance-based comparisons with fit others, and why a shift into an appearance-focused state may produce decreases in appearance satisfaction.

Coping / Defensiveness Explanation. One possibility is that men in Study 4, because they were put in an appearance-focused state, were unable to effectively self-enhance in their typical manner. In the more general possible-self mindset condition of Study 3, men presumably were able to focus on dimensions other than the body. Research has found that emphasizing non-appearance dimensions during body comparisons can be an effective strategy for protecting self-regard (Lew et al., 2007; Tiggemann & Polivy, 2010). In a study on women by Lew and colleagues (1997), for

example, participants were asked to look through an advertisement folder with pictures of models and were asked to write about aspects of themselves that they valued, but which they did not see in the models (e.g., special talents, important friendships). When women compared themselves to media images of fashion models on non-appearance dimensions, they were protected from the negative effects of exposure to the idealized images (Lew et al., 2007). Similarly, Tiggemann and Polivy (2010) found that when women engaged in intelligence comparison processing while viewing fashion magazine advertisements featuring thin and attractive models, women experienced increased body satisfaction.

It is possible that for men, a key strategy normally used when exposed to highly fit peers involves focusing on dimensions completely unrelated to the physical self (Lew et al., 2007). Forcing men to think only in terms of the body may have forced them to consider shortcomings in a way that they normally might avoid by considering other self-enhancing dimensions. In order to test this hypothesis, measures of self-satisfaction on alternate dimensions (e.g. intelligence, personality) could be assessed in response to a fit peer after an appearance-focused prime, such as sitting or not in front of a mirror. If men rated themselves more highly on alternate dimensions in the non-body focus condition, particularly those that they also rated as highly important to themselves, but were unable to self-enhance in this way during the body-focus condition, this would support the hypothesis.

Biopsychological Explanation. As discussed earlier, gender differences in testosterone responses to competition may play a key role in determining responses to fit peers. In order to determine whether testosterone levels play a role in male

appearance dissatisfaction in both conditions of Study 4, the study could be replicated, with testosterone levels being measured during the study. As competition is typically shown to increase testosterone levels in men, something about being in the appearance-focused conditions of Study 4 would have to substantially alter this response. An interesting possibility is that when in this appearance-focused state, exposure to a fit peer signals a perception of reproductive defeat. Researchers have found that perceptions of defeat are linked to decreases in testosterone (Gladue, Boehler, & McCaul, 1989; Serrano, Salvador, Gonzalez-Bono, Sanchis & Suay, 2000), and that endocrinological responses may be sensitive to the presence of reproductive opportunities (or more applicably, the loss of reproductive opportunities) (Lopez, Hay & Conklin, 2009). Therefore, focusing on appearance, prior to viewing a fit male peer, may have caused a decrease in testosterone, and subsequent appearance dissatisfaction.

Note, however, the directionality of the link between appearance satisfaction and testosterone levels may be difficult to tease apart in this setting. It is possible, as proposed, that when men view fit peers while in an appearance-focused state, testosterone levels automatically drop, causing the perception of lost reproductive opportunities, and subsequently a loss in appearance satisfaction. Alternatively, it could be the case that when men view fit peers while in an appearance-focused state, they perceive lost reproductive opportunities, causing both a loss in appearance satisfaction and simultaneously a decrease in testosterone. By exogenously administering testosterone in various doses, and then measuring perceptions of self-ratings of the likelihood of reproductive success, and appearance satisfaction, future

research could begin to better understand this relationship. Testosterone has never been studied in relation to appearance-focused states, so additional research would be needed in order to determine what, if any, role hormonal responses play in appearance satisfaction following social comparisons.

Methodological Issues

The present studies have several notable methodological strengths (e.g., experimental design, tightly controlled, rich video stimuli), but like all studies, have limitations. First, as is the case with most work on body image phenomena, our sample was limited to young (college) adults. This is not altogether bad given that adolescents and young adults with body image problems are at particularly high risk for developing eating disorders (e.g., Beaumont & Touyz, 1985; Johnson & Schlundt, 1985; Pyle, Halvorson, Neuman, & Mitchell, 1986). Still, whether similar results would be found with other segments of the population remains to be determined.

Because our interest was in the effects of comparisons to same-gender peers, it was also impossible for male and female participants to react to the exact same stimulus persons. As such, our comparisons of female versus male reactions are technically at the conceptual rather than literal level. This would be more of an issue if not for two reasons. First, the available evidence from manipulation checks in the first study, where participants were exposed to either a fit, average, or unfit peer, suggests that if anything, our fit male was perceived as slightly more fit than our fit female. Thus the relatively strong negative reactions of women to a fit peer were unlikely due to their viewing a peer more fit than what men viewed. In the subsequent studies wherein participants only viewed average-sized or fit peers (Study 2) or only

fit peers (Studies 3 and 4), male and female peers were rated as similarly attractive, with fit peers being rated as having more attractive bodies than average-sized peers.

Second, in a separate pilot study in which participants rated the facial attractiveness of the fit, average, and unfit peers, participants rated the fit peer face as being equally attractive as the average face, and the average face as being equally attractive to the unfit face. Additionally, the male actors' faces were rated as equally attractive to the female actresses' faces. While considerable effort was made to select actors and actresses with comparable facial attractiveness, there was a significant difference in ratings of facial attractiveness between the fit and the unfit faces, which is somewhat to be expected given that increased body mass has been shown to be significantly correlated with decreases in ratings of facial attractiveness (Thornhill & Grammer, 1999). Information about an individual's weight is apparent even in photographs that only include faces and exclude the body (i.e. fuller cheeks, wider neck, fat accumulation under the chin), making it very difficult to completely tease apart facial and body attractiveness. In that only the fit and average peer stimuli videos were used in the second study, and only the fit male and female peer videos were used in the third and fourth studies, facial attractiveness was comparable across conditions in Studies 2 through 4.

Additionally reassuring is the fact that men and women reacted in such a qualitatively different manner to fit peers. Compared to the other peer conditions (Study 1), and compared to their own baseline (Studies 2-4), women responded negatively to a fit peer, whereas men reacted positively (significantly so in the case of depression in Study 1, and in terms of appearance satisfaction in Studies 2 - 4). Such

a fundamental divergence in valence seems unlikely to be due to any small parametric variances that may have been present between female and male peers.

Future Directions

While it would be ideal for women simply to avoid media that promote the thin ideal (Hamilton & Waller, 1993), or for the media industry to broaden the beauty ideal to include normal and overweight women (Irving, 1990; Pinhas et al., 1999; Thompson & Heinberg, 1999), these are both unrealistic goals. Idealized media imagery is pervasive, and the media industry places a priority on profit over women's health and well-being (Groesz et al., 2002). Consequently, it is essential to teach women strategies they can use to cope actively with idealized media imagery (Cattarin et al., 2000; Hargreaves & Tiggemann, 2002; Levine & Smolak, 1998; Posavac, Posavac & Weigel, 2001). The findings from the current studies suggest that the typical negative effects on appearance satisfaction of exposure to attractive, fit peers (Study 1 and 2) can be significantly reduced if not eliminated when women adopt possible-self mindsets, whether general (Study 3) or body specific (Study 4).

This finding could potentially be extended to develop successful interventions that decrease the negative effects of exposure to 'idealized' media targets and attractive, thin peers. One potential strategy, for example, could be to encourage women to adopt these mindsets via implementation intentions (Gollwitzer, 1996). Implementation intentions are specific plans using an "if-then" format to link an anticipated future situation to a goal-directed behavior. Perceivers could, for instance, form an implementation intention such as, "Whenever I see another woman who is fit, I will imagine my best possible body." Implementation intentions have been proven

useful for a variety of behavior change issues (see Gollwitzer & Sheeran, 2006, for an overview), and they have also been applied to overrule automatic patterns of thought, such as stereotyping (Stewart & Payne, 2008). Possibly, this kind of approach eventually could induce women to automatically imagine a best possible self, when viewing fit others, which could be beneficial for their well-being. Although the impact of these intention statements would need to be tested in order to determine if they are effective in consistently inducing a possible-self mindset, this seems like a promising method that could shift women into a more self-enhancing mindset during exposures to fit others.

Based on the results of our no-mindset intervention (control) group, it seems that for men, the most self-enhancing mindset to be in when viewing a fit peer is their typical or “natural” mindset. In contrast, results from Study 4 revealed that when men are placed specifically in an appearance-focused mindset, their appearance satisfaction is greatly reduced. This is important, as societal focus on male appearance appears to be on the rise, with more and more images of muscular male bodies appearing in movies, commercials and magazines (Leit, Pope & Gray, 2001; Pope, Olivardia, Gruber & Borowiecki, 1999). Already, incidences of muscle dysmorphia (Leone, Sedory & Gray, 2005), steroid use (Baker, Graham & Davies, 2006) and cosmetic surgery (American Society of Plastic Surgeons, 2007) are rising among men. While a cultural shift towards a more appearance-focused environment cannot be argued to be the sole cause of these trends, attention should be paid to the potentially harmful effects of appearance-focus on men’s body image. As men find themselves in an increasingly appearance-focused environment, it is possible that they will eventually

begin to adopt a more appearance-focused mindset during comparisons with fit peers, much as women typically do now (Allgood-Merten, Lewinsohn & Hops, 1990; Polce-Lynch, Myers, Kilmartin, Forssmann-Falck & Kliewer, 1998). If this occurs, men's naturally self-enhancing response to fit peers (Study 2), could be replaced by the deleterious response seen when in an appearance-focused mindset (Study 4).

Additional research is needed to determine whether men, in an appearance-focused *environment*, are more likely to find themselves in an appearance-focused *mindset*, and as a result experience the subsequent decreases in appearance satisfaction seen in Study 4. If so, additional research should investigate methods of reducing the link between an appearance-focused environment and an appearance-focused mindset. As is the case with women, it is likely impossible to alter the appearance-focus nature of the media and of our culture as a whole. However, interventions that induce self-enhancing mindsets during comparisons with fit others may effectively protect men from the negative effects of an increasingly appearance-focused environment.

Summary

In sum, the results of the present set of studies suggest that an important factor *contributing* to the widespread body dissatisfaction among women, but *protecting* men from such frequent dissatisfaction may be qualitative gender differences in appearance satisfaction following comparisons with peers. While neither male nor female appearance satisfaction seems to be impacted greatly by exposure to average or unfit peers (Study 1), men and women respond in a markedly different manner to same-sex, fit-appearing peers; women respond to fit peers with a decrease in appearance

satisfaction, while men respond with an increase in appearance satisfaction (Study 1 and Study 2). As minimal prior research to date had directly compared how male and female appearance satisfaction is impacted by exposure to fit peers, this is a significant addition to the body-image literature.

The present research also was able to shed additional light on the cognitive mechanisms that underlie the self-evaluative consequences of appearance-related social comparisons. We have demonstrated that the direction of social comparison consequences can be influenced by the acute mindsets of individuals during social comparisons. While in the present set of studies, attempts at manipulating perceived similarity between oneself and a fit target through the use of a general comparative mindset prime proved difficult to accomplish, induction of temporal-self mindsets was shown to impact the outcomes of social comparisons with fit peers. Consistent with findings from the temporal-self models (e.g. Blanton, 2001), it was encouraging to find that a possible-self mindset, whether general or body-specific, is effective in protecting women from the usual decrements in appearance satisfaction following comparisons with fit peers (Study 3 and Study 4). As considerable research has shown that exposure to attractive, idealized women leads to appearance dissatisfaction (see Groez, Levine & Murnen, 2002), as well as to eating disorders (Hargreaves & Tiggemann, 2003; Levine & Smolak, 1996; Rodin et al., 1985; Stice & Shaw, 1994) in women, this finding is particularly heartening.

Men in a general possible-self mindset experienced a boost in appearance satisfaction, much like men in no-mindset control condition (Study 2), relative to those in a general current-self mindset (Study 3). However, when both the current-self and

possible-self mindsets were tailored to the realm of physical appearance (Study 4), men no longer demonstrated their usual increase in appearance satisfaction following comparison with a fit peer. This finding is particularly concerning, as our culture appears to be shifting towards creating an appearance-focused environment for men, (Leit, Pope & Gray, 2001; Pope et al., 1999). Such a shift could increase the likelihood of men being in an appearance-focused mindset when exposed to fit peers, and subsequently suffering a loss of appearance satisfaction.

Taken together, these studies represent a snapshot of the differences in men and women's appearance satisfaction following comparisons with peers, as well as a systematic experimental investigation of the role of mindset in influencing satisfaction levels. Hopefully, these findings can be extended to develop successful interventions that may help alleviate current, widespread body dissatisfaction in women, and protect male appearance satisfaction in the face of an increasingly appearance-focused culture.

References

- Aarts, H. & Van Honk, J. (2009). Testosterone and unconscious positive priming increase human motivation separately. *NeuroReport*, *20*, 1300-1303.
- Agliata, D., & Tantleff-Dunn, S. (2004). The impact of media exposure on males' body image. *Journal of Social and Clinical Psychology. Special Issue: Body Image and Eating Disorders*, *23* (1), 7-22.
- Alicke, M. (1985). Global self-evaluation as determined by the desirability and controllability of trait adjectives. *Journal of Personality and Social Psychology*, *49*, 1621-1630.
- Allgood-Merten, B., Lewinsohn, P. & Hops, H. (1990). Sex differences and adolescent depression. *Journal of Abnormal Psychology*, *99*, 55-63.
- American Society of Plastic Surgeons (2007). 2007 cosmetic surgery gender distribution male, retrieved 10-29-08, from <http://www.plasticsurgery.org/media/statistics/>
- Anderson, A., & DiDomenico, L. (1992). Diet versus shape content of popular male and female magazines: A dose-response relationship to the incidence of eating disorders? *International Journal of Eating Disorders*, *11*, 283-287.
- Archer, J. (2006). Testosterone and human aggression: an evaluation of the challenge hypothesis. *Neuroscience and Biobehavioral Reviews*, *30*, 319-345.
- Baker, J., Graham, M., & Davies, B. (2006). Steroid and prescription medicine abuse in the health and fitness community: A regional study. *European Journal of Internal Medicine*, *17*, 479-484.
- Baron, R.M., & Kenny, D.A. (1986). The Moderator-Mediator variable distinction in Social Psychology research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, *51*, 1173-1182.
- Baumeister, R. (1998). The self. In D. Gilbert, S. Fiske, & G. Lindzey (Eds.), *The handbook of social psychology* (pp.680-740). New York: McGraw-Hill.
- Bearman, S., Presnell, K. & Martinez, E. (2006). The skinny on body dissatisfaction: A longitudinal study of adolescent girls and boys. *Journal of Adolescence*, *35*, 217-229.
- Beaumont, P., & Touyz, S. (1985). *Eating disorders: Prevalence and treatment*. Sydney, Australia: Williams & Wilkins.

- Berscheid, E., Walster, E., & Bohrnstedt, G. (1973). The happy American body: A survey report. *Psychology Today*, 7, 119-131.
- Blanton, H. (2001). Evaluating the self in the context of another: The three-selves model of social comparison assimilation and contrast. In G. B. Moskowitz (Ed.), *Cognitive social psychology: The Princeton Symposium on the Legacy and Future of Social Cognition* (pp. 75-87). Mahwah, NJ: Erlbaum.
- Blanton, H., & Stapel, D.A. (2008). Unconscious and spontaneous and . . . complex: The three selves model of social comparison assimilation and contrast. *Journal of Personality and Social Psychology*, 94, 1018-1032.
- Blond, A. (2008). Impacts of exposure to images of ideal bodies on male body dissatisfaction: A review. *Body Image*, 5, 244-250.
- Booth, A., Shelley, G., Mazur, A., Tharp, G. & Kittok, R. (1989). Testosterone and winning and losing in human competition. *Hormones and Behavior*, 23, 556-571.
- Botta, R. (1999). Television images and adolescent girls' body image disturbance. *Journal of Communication*, 49, 22-41.
- Brewer, M. & Gardner, W. (1996). Who is this "we"? Levels of collective identify and self representations. *Journal of Personality and Social Psychology*, 71, 83-93.
- Brewer, M.B. & Weber, J.G. (1994). Self-evaluation effects on interpersonal versus intergroup social comparison. *Journal of Personality and Social Psychology*, 66, 268-275.
- Brickman, P. & Bulman, R. (1977). Pleasure and pain in social comparison. In R. Miller & J. Suls (Eds.), *Social comparison processes: Theoretical and empirical perspectives* (pp.149-186). Washington, DC: Hemisphere.
- Brodie, D. & Slade, P. (1988). The relationship between body-image and body-fat in adult women. *Psychological Medicine*, 18, 623-631.
- Brodie, D., Slade, P., & Riley, V. (1991). Sex differences in body image perceptions. *Perceptual and Motor Skills*, 72, 73-74.
- Brody, L. (2000). The socialization of gender differences in emotional expression: Display rules, infant temperament, and differentiation. In A. Fischer (Ed.), *Gender and Emotion: Social Psychology Perspectives* (pp.24-47). Cambridge: Cambridge University Press.

- Brown, J. & Mankowski, T. (1993). Self-esteem, mood and self-evaluation: Changes in mood and the way you see you. *Journal of Personality and Social Psychology*, 64, 421-430.
- Brown, J.D., Novick, N.J., Lord, K.A., & Richards, J.M. (1992). When Gulliver travels: Social context, psychological closeness, and self-appraisals. *Journal of Personality and Social Psychology*, 62, 717-727.
- Brown, R. & Zeigler-Hill, V. (2004). Narcissism and the non-equivalence of self-esteem measures: A matter of dominance. *Journal of Research in Personality*, 38, 585-592.
- Buss, D.M. (1994/2003). *Evolution of desire: Strategies of human mating*. New York: Basic Books.
- Buunk, B., Collins, R., Taylor, S., VanYperen, N. & Dakof, G. (1990). The affective consequences of social comparison: Either direction has its ups and downs. *Journal of Personality and Social Psychology*, 59, 1238-1249.
- Buunk, B.P., Oldersma, F.L., & de Dreu, K.W. (2001). Enhancing satisfaction through downward social comparison: The role of relational discontent and individual differences in social comparison orientation. *Journal of Experimental Social Psychology*, 37, 1-16.
- Cattarin, J., Thompson, 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.
- Cialdini, R.B., Borden, R.J., Thorne, A., Walker, M.R., Freeman, S. & Sloan, L.R. (1976). Basking in reflect glory: Three (football) field studies. *Journal of Personality and Social Psychology*, 34, 366-375.
- Corcoran, K., Crusius, J., & Mussweiler, T. (2011). Social comparisons: Motives, standards, and mechanisms. In D. Chadee (Ed.), *Theories in social psychology* (pp. 119-139). Oxford, UK: Wiley-Blackwell.
- Davis, C., Elliot, S., Dionne, M. & Mitchell, I. (1991). The relationship of personality factors and physical activity to body satisfaction in men. *Personality and Individual Differences*, 12, 689-694.
- Davis, J. & Oswalt, R. (1992). Societal influences on a thinner body size in children, *Perceptual and Motor Skills*, 74, 697-698.

- Dohnt, H. & Tiggemann, M. (2006). Body image concerns in young girls: The role of peers and media prior to adolescence. *Journal of Youth and Adolescence*, *35*, 135-145.
- Dunning, D., & Hayes, A. (1996). Evidence for egocentric comparison in social judgment. *Journal of Personality and Social Psychology*, *71*, 213-229.
- Dyczewski, E., & Markman, K. (2012). General attainability beliefs moderate the motivational effects of counterfactual thinking. *Journal of Experimental Social Psychology*, Advance online publication. doi: 10.1016/j.jesp.2012.04.016
- Engeln-Maddox, R. (2006). Buying a beauty standard or dreaming of a new life? Expectations associated with media ideals. *Psychology of Women Quarterly*, *30*, 258-266.
- Evans, P. (2003). "If only I were think like her, maybe I could be happy like her": The self-implications of associating a thin female ideal with life success. *Psychology of Women Quarterly*, *27*, 209-214.
- Fallon, A. & Rozin, P. (1985). Sex differences in perceptions of desirable body shape. *Journal of Abnormal Psychology*, *94*, 102-105.
- Festinger, L. (1954). A theory of social comparison processes. *Human Relations*, *7*, 117-140.
- Franzoi, S., Kessenich, J. & Sugrue, P. (1989). Gender differences in the experience of body awareness: An experiential sampling study. *Sex Roles*, *21*, 499-515.
- Frederick, D., Fessler, D., & Haselton, M. (2005). Do representations of male muscularity differ in men's and women's magazines? *Body Image*, *2*, 81-86.
- Gabriel, M., Critelli, J., & Ee, J. (1994). Narcissistic illusions in self-evaluations of intelligence and attractiveness. *Journal of Personality*, *62*, 143-155.
- Gardner, W., Gabriel, S., & Hochschild, L. (2002). When you and I are "we," you are not threatening: The role of self-expansion in social comparison, *Journal of Personality and Social Psychology*, *82*, 239-251.
- Garner, D. (1997). The 1997 body image survey results. *Psychology Today*, *30*, 30-41.
- Garner, D., & Garfinkel, P. (1980). Socio-cultural factors in the development of anorexia nervosa. *Psychological Medicine*, *10*(4), 647-656.

- Garner, D., Garfinkel, P., Schwartz, D., & Thompson, M. (1980). Cultural expectations of thinness in women. *Psychological Reports, 47*, 483-491.
- Garrow, J., & Webster, J. (1985). Quetelet's index (W/H²) as a measure of fatness. *International Journal of Obesity, 9*, 147-153.
- Gilbert, D. T., Giesler, R. B., & Morris, K. A. (1995). When comparisons arise. *Journal of Personality and Social Psychology, 69*, 227-236.
- Gladue, B., Boechler, M., & McCaul, K. (1989). Hormonal response to competition in human males. *Aggressive Behavior, 15*, 409-422.
- Gollwitzer, P.M. (1996). The volitional benefits of planning. In P.M. Gollwitzer & J.A. Bargh (Eds.). *The psychology of action: Linking cognition and motivation to behavior* (pp. 287-312). New York: Guilford Press.
- Gollwitzer, P.M. & Sheeran, P. (2006). Implementation intentions and goal achievement: A meta-analysis of effects and processes. In M.P. Zanna (Ed.), *Advances in experimental social psychology* (pp. 69-119). San Diego, CA: Elsevier Academic Press.
- Gordon, R. (2000). *Eating disorders: Anatomy of a social epidemic* (2nd ed.). Oxford: Blackwell.
- Grabe, S. & Hyde, J. (2006). Ethnicity and body dissatisfaction among women in the United States: A meta-analysis. *Psychological Bulletin, 132*, 622-640.
- Grabe, S., Ward, L., & Hyde, J. (2008). The role of the media in body image concerns among women: A meta-analysis of experimental and correlational studies. *Psychological Bulletin, 134*(3), 460-476.
- Greenberg, B., Eastin, M., Hofschire, L., Lachlan, K., & Brownell, K. (2003). Portrayals of overweight and obese individuals on commercial television. *American Journal of Public Health, 93*, 1342-1348.
- Groesz, L.M., Levine, M.P., & Murnen, S.K. (2002). The effect of experimental presentation of thin media images on appearance satisfaction: A meta-analytic review. *International Journal of Eating Disorders, 31*, 1-16.
- Grogan, S., Williams, Z. & Conner, M. (1996). The effects of viewing same-gender photographic models on body-esteem. *Psychology of Women Quarterly, 20*, 569-575.

- Haddock, G., Macrae, C.N., & Fleck, S. (2002). Syrian science and smart supermodels: On the when and how of perception-behavior effects. *Social Cognition*, 20, 469-479.
- Hafner, M. (2004). How dissimilar others may still resemble the self: assimilation and contrast after social comparison. *Journal of Consumer Psychology*, 14, 187-196.
- Halliwell, E., & Dittmar, H. (2005). The role of self-improvement and self-evaluation motives in social comparisons with idealized female bodies in the media. *Body Image*, 2(3), 249-261.
- Halliwell, E., Dittmar, H., & Orsborn, A. (2007). The effects of exposure to muscular male models among men: Exploring the moderating role of gym use and exercise motivation. *Body Image*, 4, 278-287.
- Halmi, K., Falk, J., & Schwartz, E. (1981). Binge-eating and vomiting: A survey of a college population. *Psychological Medicine*, 11(4), 697-706.
- Hamilton, K., & Waller, G. (1993). Media influences on body size estimation in anorexia and bulimia. An experimental study. *The British Journal of Psychiatry*, 162, 837-840.
- Hanko, K., Crusius, J., & Mussweiler, T. (2010). When I and me are different: Assimilation and contrast in temporal self-comparisons. *European Journal of Social Psychology*, 40, 160-168.
- Hargreaves, D., & Tiggemann, M. (2002). The effect of television commercials on mood and body dissatisfaction: The role of appearance-schema activation. *Journal of Social and Clinical Psychology*, 21, 287-308.
- Hargreaves, D., & Tiggemann, M. (2003). The effect of “Thin Ideal” television commercials on body dissatisfaction and schema activation during early adolescence. *Journal of Youth and Adolescence*, 32,367–373.
- Hargreaves, D., & Tiggemann, M. (2004). Idealized media images and adolescent body image: “comparing” boys and girls. *Body Image*, 1, 351-361.
- Heatherton, T. & Polivy, J. (1991). Development and validation of a scale for measuring state self-esteem. *Journal of Personality and Social Psychology*, 60, 895-910.
- Henderson-King, E., & Henderson-King, D. (1997). Media effects on women’s body esteem: Social and individual difference factors. *Journal of Applied Social Psychology*, 27, 399-417.

- Higgins, E.T. (1987). Self-Discrepancy: A theory relating self and affect. *Psychological Review*, *94*(3), 319-340.
- Hill, S.E., & Buss, D.M. (2008). The evolutionary psychology of envy. In R. Smith (Ed.), *The Psychology of Envy* (p. 66-70). New York: Guilford.
- Hill, S.E., & Buss, D.M. (2006). Envy and positional bias in the evolutionary psychology of management. *Managerial and Decision Economics*, *27*, 131-143.
- Hobza, C., Walker, K., Yakushko, O., & Peugh, J. (2007). What about men? Social comparison and the effects of media images on body and self-esteem. *Psychology of Men & Masculinity*, *8*(3), 161-172.
- Holmbeck, G.N. (1997). Toward terminological, conceptual, and statistical clarity in the study of mediators and moderators: Examples from the child-clinical and pediatric psychology literatures. *Journal of Consulting and Clinical Psychology*, *65*(4), 599-610.
- Horm, J. & Anderson, K. (1993). Who in America is trying to lose weight? *Annals of Internal Medicine*, *119*, 672-676.
- Humphreys, P. & Paxton, S.J. (2004). Impact of exposure to idealized male images on adolescents boys' body image, *Body Image*, *1*, 253-266.
- Irving, L. M. (1990). Mirror Images: Effects of the standard of beauty on the self- and body-esteem of women exhibiting varying levels of bulimic symptoms. *Journal of Social and Clinical Psychology*, *9*, 230-242.
- Irving, L.M., DuPen, J., & Berel, S. (1998). A media literacy program for high school females. *Eating Disorders: The Journal of Treatment and Prevention*, *6*, 119-131.
- Johnson, W., & Schlundt, D. (1985). Eating disorders: assessment and treatment. *Clinical Obstetrics & Gynecology*, *28*, 598-614.
- Joshi R, C., Herman, P., & Polivy, J. (2004). Self-enhancing effects of exposure to thin-body images. *International Journal of Eating Disorders*, *35*, 333-341.
- Kalodner, C. (1997). Media influences on male and female non eating disordered college students: A significant issue. *Eating Disorder Treatment and Prevention*, *5*, 47-57.
- Kaplan, R. (1978). Is beauty talent? Sex interaction in the attractiveness halo effect. *Sex Roles*, *4*, 195-204.

- Kemmelmeier, M., Oyserman, D. (2001). The ups and downs of thinking about successful other: Self-construals and consequences of social comparisons. *European Journal of Social Psychology, 31*, 311-320.
- Kilbourne, J. (1994). Still killing us softly: Advertising and the obsession with thinness. In P. Fallon, M. Katzman, & S. Wooley (Eds.) *Feminist perspectives on eating disorders* (pp. 395-467). New York: Guilford Press.
- Kivlighan, K., Granger, D., & Booth, A. (2005). Gender differences in testosterone and cortisol response to competition. *Psychoneuroendocrinology, 30*, 58-71.
- Klein, W. M. (1997). Objective standards are not enough: Affective, self-evaluative, and behavioral responses to social cognition information. *Journal of Personality and Social Psychology, 72*, 763-774.
- Krones, P., Stice, E., Batres, C., & Orjada, K. (2005). In vivo social comparison to a thin-ideal peer promotes body dissatisfaction: A randomized experiment. *International Journal of Eating Disorders, 38*, 134-142.
- Lavine, H., Sweeney, D., & Wagner, S. (1999). Depicting women as sex objects in television advertising: Effects on body dissatisfaction. *Personality and Social Psychology Bulletin, 25*(8), 1049-1058.
- Leit, R., Pope, H., & Gray, J. (2001). Cultural expectations of muscularity in men: The evolution of playgirl centerfolds. *International Journal of Eating Disorders, 29*(1), 90-93.
- Leone, J., Sedory, E., & Gray, K. (2005). Recognition and treatment of muscle dysmorphia and related body image disorders. *Journal of Athletic Training, 40*, 352-359.
- Levine, M.P., & Smolak, L. (1996). Media as a context for the development of disordered eating. In L. Smolak, M.P. Levine, & R. Striegel-Moore (Eds.), *The developmental psychopathology of eating disorders* (pp.235-257). Hillsdale, NJ: Erlbaum.
- Levine, M.P., & Smolak, L. (1998). The mass media and disordered eating: Implications for prevention. In W. Vandereycken & G. Noordenbos (Eds.). *The prevention of eating disorders* (pp. 23-56). Washington Square, NY: New York University Press.
- Levy, S.R., Stroessner, S.J. & Dweck, C.S. (1998). Stereotype formation and endorsement: The role of implicit theories. *Journal of Personality and Social Psychology, 74*, 1421-1436.

- Lew, A.M., Mann, T., Myers, H., Taylor, S. & Bower, J. (2007). Thin-ideal media and women's body dissatisfaction: Prevention using downward social comparisons on non-appearance dimensions. *Sex Roles*, 57, 543-556.
- Lin, L. & Kulik, J. (2002). Social comparison and women's appearance satisfaction. *Basic and Applied Social Psychology*, 24(2), 115-123.
- Lirgg, C., & Feltz, D. (1991). Teacher versus peer models revisited: effects on motor performance and self-efficacy. *Research Quarterly for Exercise and Sport*, 62, 217-224.
- Lockwood, P. (2002). Could it happen to you? Predicting the impact of downward comparisons on the self. *Journal of Personality and Social Psychology*, 82, 343-358.
- 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.
- Lopez, H., Hay, C., & Conklin, P. (2009). Attractive men induce testosterone and cortisol release in women. *Hormones and Behavior*, 56, 84-92.
- Maddux, J. (1995). *Self-efficacy, adaptation, and adjustment: Theory, research, and application*. New York: Plenum Press.
- Major, B., Testa, M. & Bylsma, W. (1991). Response to upward and downward social comparisons: The impact of esteem-relevance and perceived control. In J. Suls & T.A. Wills (Eds.) *Social Comparison: Contemporary theory and research* (p. 237-260). Hillsdale, NJ: Erlbaum.
- Malkin, A., Wornian, K. & Chrisler, J. (1999). Women and weight: gendered messages on magazine covers. *Sex Roles*, 40, 647-655.
- Markman, A., & Gentner, D. (1996). Commonalities and differences in similarity comparisons. *Memory & Cognition*, 24, 235-249.
- Markman, A., & Gentner, D. (2000). Structure mapping in the comparison process. *The American Journal of Psychology*, 113, 501-538.
- Markus, H., & Nurius, P. (1986). Possible selves. *American Psychologist*, 41, 954-969.
- Marsh, H. & Parker, J. (1984). Determinant of student self-concept: Is it better to be a relatively large fish in a small pond even if you don't learn to swim as well. *Journal of Personality and Social Psychology*, 47, 213-231.

- Martin, M., & Gentry, J. (1997). Stuck in the model trap: The effects of beautiful models in ads on female pre-adolescents and adolescents. *The Journal of Advertising*, 36, 19-33.
- Mazur, A. (1985). A biosocial model of status in face-to-face primate groups. *Social Forces*, 64, 377-402.
- Mazur, A. (1986). U.S. trends in feminine beauty and overadaptation. *Journal of Sex Research*, 22(3), 281-303.
- Mazur, A., & Lamb, T. (1980). Testosterone, status, and mood in human males. *Hormones and Behavior*, 14, 236-246.
- McCabe, M. & Ricciardelli, L. (2003). Sociocultural influences on body image and strategies to both increase and decrease body size among adolescent boys and girls. *Adolescence*, 36, 225-240.
- Mehta, P. & Josephs, R. (2006). Testosterone change after losing predicts the decision to compete again. *Hormones and Behavior*, 50, 684-692.
- Mei, Z., Grummer-Strawn, L., Pietrobelli, A., Goulding, A., Goran, M., & Dietz, W. (2002). Validity of body mass index compared with other body-composition screening indexes for the assessment of body fatness in children and adolescents. *American Journal of Clinical Nutrition*, 75, 978-985.
- Meichenbaum, D. H. (1971). Examination of model characteristics in reducing avoidance behavior. *Journal of Personality and Social Psychology*, 17, 298-307.
- Miller, K.J., Gleaves, D.H., Hirsch, T.G., Green, B.A., Snow, A.C., & Corbett, C.C. (2000). Comparisons of body image dimensions by race/ethnicity and gender in a university population. *International Journal of Eating Disorders*, 27, 310-316.
- Miller, S., Maner, J., & McNulty, J. (2012). Adaptive attunement to the sex of individuals at a competition: the ratio of opposite- to same-sex individuals correlates with changes in competitors' testosterone levels. *Evolution and Human Behavior*, 33, 57-63.
- Mills, J., 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*, 28 (12), 1687-1699.
- Monteath, S. & McCabe, M. (1997). The influence of societal factors on the female body image. *Journal of Social Psychology*, 137, 708-727.

- Morris, A., Cooper, T., & Cooper, P. (1989). The changing shape of female fashion models. *International Journal of Eating Disorders*, 8, 593-596.
- Morse, S., & Gergen, K. J. (1970). Social comparison, self-consistency, and the concept of self. *Journal of Personality and Social Psychology*, 16, 148-156.
- Mussweiler, T. (2001). "Seek and ye shall find": Antecedents of assimilation and contrast in social comparison. *European Journal of Social Psychology*, 31, 499-509.
- Mussweiler, T. (2003). Comparison processes in social judgment: Mechanisms and consequences. *Psychological Review*, 110, 472-489.
- Mussweiler, T. (2007). Assimilation and contrast as comparison effects: a selective accessibility model. In D. Stapel & J. Suls (Eds.) *Assimilation and Contrast in Social Psychology* (pp. 165-185). New York: Psychology Press.
- Mussweiler, T., Ruter, K., & Epstude, K. (2004). The ups and downs of social comparison: Mechanisms of assimilation and contrast. *Journal of Personality and Social Psychology*, 87, 832-844.
- Myers, P., & Biocca, F. (1992). The elastic body image: The effect of television advertising and programming on body image distortions in young women. *Journal of Communication*, 42, 108-133.
- Myers, T. & Crowther, J. (2009). Social comparison as a predictor of body dissatisfaction: A meta-analytic review. *Journal of Abnormal Psychology*, 118, 683-698.
- Nemeroff, C., Stein, R., Diehl, N., & Smilack, K. (1994). From the Cleavers to the Clintons: Role choices and body orientation as reflected in magazine article content. *International Journal of Eating Disorders*, 16, 167-176.
- O'Connor, D., Archer, J., Hair, & Wu, F. (2001). Exogenous testosterone, aggression, and mood in eugonadal and hypogonadal men. *Physiology and Behavior*, 75, 557-566.
- Papies, E. & Nicolaije, K. (2012). Inspiration or deflation? Feeling similar or dissimilar to slim and plus-size models affects self-evaluation of restrained eaters. *Body Image*, 9, 76-85.
- Pike, K., & Rodin, J. (1991). Mothers, daughters, and disordered eating. *Journal of Abnormal Psychology*, 100, 198-204.

- Pinhas, L., Toner, B., Ali, A., Garfinkel, P. & Stuckless, N. (1999). The effects of the ideal of female beauty on mood and body satisfaction. *International Journal of Eating Disorders*, 25, 223-226.
- Pinkus, R.T., Lockwood, P., Schimmack, U., & Fournier, M.A. (2008). For better or for worse: Everyday social comparisons between romantic partners. *Journal of Personality and Social Psychology*, 95, 1180-1201.
- Pope, J. Harrison, G., Olivardia, R., Gruber, A. & Borowiecki, J. (1999). Evolving ideals of male body image as seen through action toys. *International Journal of Eating Disorders*, 26, 65-72.
- Posavac, H., Posavac, S., & Weigel, R. (2001). Reducing the impact of media images on women at risk for body image disturbance: three targeted interventions. *Journal of Social and Clinical Psychology*, 20, 324-340.
- Posavac, H.D., Posavac, S.S., & Posavac, E.J. (1998). Exposure to media images of female attractiveness and concern with body weight among young women. *Sex Roles*, 38, 187-201.
- Powell, J., Matacin, M., & Stuart, A. (2001). Body esteem: An exception to self-enhancing illusions? *Journal of Applied Social Psychology*, 31, 1951-1978.
- Pyle, R., Halvorson, P., Neuman, P., & Mitchell, J. (1986). The increasing prevalence of bulimia in freshman college students. *International Journal of Eating Disorders*, 5, 631-647.
- Rabijewski, M., Adamkiewicz, M., & Zgliczynski, S. (1998). The influence of testosterone replacement therapy on well-being, bone mineral density and lipids in elderly men. *Polish Archives of Internal Medicine*, 100, 212-221.
- Rand, C. & Wright, B. (2001). Thinner females and heavier males: Who says? A comparison of female and male ideal body sizes across a wide age span, *International Journal of Eating Disorders*, 29, 45-50.
- Reichert, T. Lambiase, J., Morgan, S., Carstarphen, M., & Zavoina, S. (1999). Cheesecake and beefcake: No matter how you slice it, sexual explicitness in advertising continues to increase. *Journalism & Mass Communication Quarterly*, 76, 7-20.
- Ricciardelli, L., McCabe, M., & Banfield, S. (2000). Body image and body change methods in adolescent boys: Role of parents, friends, and the media. *Journal of Psychosomatic Research*, 49, 189-197.

- Richins, M. (1991). Social comparison and the idealized images of advertising. *Journal of Consumer Research*, 18, 71-83.
- Rodin, J., Silberstein, L.R., & Striegel-Moore, R.H. (1985). Women and weight: A normative discontent. In: T.B. Sonderegger (Ed.) *Nebraska Symposium on Motivation: Vol. 32, Psychology and Gender*. Lincoln, Nebraska: University of Nebraska Press, pp. 267-307.
- Rosenberg, M. (1965). *Self-esteem scale*. Princeton, NJ: Princeton University Press.
- Sacham, S. (1983). A shortened version of the Profile of Mood States. *Journal of Personality Assessment*, 47(3), 305-306.
- Salovey, P., & Rodin, J. (1984). Some antecedents and consequences of social-comparison jealousy. *Journal of Personality and Social Psychology*, 47, 780-792.
- Serdula, M., Collins, M.E., Williamson, D., Anda, R., Pamuk, E., & Byers, T. (1993). Weight control practices of U.S. adolescents and adults. *Annals of Internal Medicine*, 119, 667-671.
- Serrano, M., Salvador, A., Gonzalez-Bono, E., Sanchis, C. & Suay, F. (2000). Hormonal responses to competition. *Psicothema*, 12, 440-444.
- Seta, F. (1982). The impact of comparison processes on coactors' task performance. *Journal of Personality and Social Psychology*, 42, 281-291.
- Silverstein, B., Perdue, L., Peterson, B., & Kelly, E. (1986). The role of the mass media in promoting a thin standard of bodily attractiveness for women, *Sex Roles*, 14, 519-532.
- Silverstein, B., Peterson, B., & Perdue, L. (1986). Some correlates of the thin standard of bodily attractiveness for women. *International Journal of Eating Disorders*, 5, 895-905.
- Smeesters, D., & Mandel, N. (2006). Positive and negative media image effects on the self. *Journal of Consumer Research*, 32, 576-582.
- Smith, R.H. (2004). Envy and its transmutations. In C. Leach & L. Tiedens (Eds.) *The social life of emotions* (pp.43-63). Cambridge: Cambridge University Press.
- Sobel, M.E. (1982). Asymptotic confidence intervals for indirect effects in structural equation models. In S. Leinhardt (Ed.), *Sociological Methodology 1982* (p. 290-312). Washington, DC: American Sociological Association.

- Sohn, S. (2010). Sex differences on social comparison and comparison motives in body image process. *North America Journal of Psychology, 12*, 481-500.
- Stapel, D. & Koomen, W. (2001). I, we, and the effects of others on me: How self-construal level moderates social comparison effects. *Journal of Personality and Social Psychology, 80*, 766-781.
- Stapel, D., & Van der Zee, K. (2006). The self salience model of other-to-self effects: Integrating principles of self-enhancement, complementarity, and imitation. *Journal of Personality and Social Psychology, 90*, 258-271.
- Stapel, D.A., & Koomen, W.A. (2000). Distinctiveness of others, mutability of selves: Their impact on self-evaluations. *Journal of Personality and Social Psychology, 79*, 1068-1087.
- Stewart, B., & Payne, B. (2008). Bringing automatic stereotyping under control: Implementation intentions as efficient means of thought control. *Social Psychology Bulletin, 34*, 1332-1345.
- Stewart, B.D. & Payne, B.K. (2008). Bringing automatic stereotyping under control: Implementation intentions as efficient means of thought control. *Personality and Social Psychology Bulletin, 34*, 1332-1345.
- Stice E., Schupak-Neuberg, E., Shaw, H.E., & Stein, R.I. (1994). Relation of media exposure to eating disorder symptomology: An examination of mediating mechanisms. *Journal of Abnormal Psychology, 4*, 836-840.
- Stice, E. (2001). A prospective test of the dual pathway model of bulimic pathology: Mediating effects of dieting and negative affect. *Journal of Abnormal Psychology, 110*, 124-135.
- Stice, E., & Shaw, H.E. (1994). Adverse effects of the media portrayed thin ideal on women and linkages to bulimic symptomology. *Journal of Social and Clinical Psychology, 13*, 288-308.
- Strahan, E., Wilson, A., Cressman, K. & Buote, V. (2006). Comparing to perfection: How cultural norms for appearance affect social comparisons and self-image. *Body Image, 3*, 211-227.
- Striegel-Moore, R., Silberstein, L., & Rodin, J. (1986). Toward an understanding of risk factors for bulimia. *American Psychologist, 41*, 246-263.
- Svenson, O. (1981). Are we all less risky and more skillful than our fellow drivers? *Acta Psychologica, 47*, 143-148.

- Taylor, S., & Brown, J. (1988). Illusion and well-being: A social psychological perspective on mental health. *Psychological Bulletin*, *103*, 193-210.
- Taylor, S., & Lobel, M. (1989). Social comparison activity under threat: Downward evaluation and upward contacts. *Psychological Review*, *96*, 569-575.
- Taylor, S., Wayment, H., & Carrillo, M. (1996). Social comparison, self-regulation, and motivation. In R. Sorrentino & E. Higgins (Eds.), *Handbook of motivation and cognition* (pp.3-27). New York: Guilford Press.
- Tesser, A. (1988). Toward a self-evaluation maintenance model of social behavior. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 20, pp. 181-227). New York: Academic Press.
- Tesser, A. & Paulhus, D. (1983). Self-definition of self: Private and public self-evaluation strategies. *Journal of Personality and Social Psychology*, *54*, 49-61.
- Tesser, A., Millar, M., & Moore, J. (1988). Some affective consequences of social comparison and reflection processes: The pain and pleasure of being close. *Journal of Personality and Social Psychology*, *54*, 49-61.
- Thompson, J. & Heinberg, L. (1999). The media's influence on body image disturbance and eating disorders: we've reviled them, now can we rehabilitate them? *Journal of Social Issues*, *55*, 339-353.
- Thompson, J. K., & Heinberg, L. J. (1993). Preliminary test of two hypotheses of body image disturbance. *International Journal of Eating Disorders*, *14*, 59-63.
- Thompson, J., & Stice, E. (2001). Thin-ideal internalization: Mounting evidence for a new risk factor for body image disturbance and eating pathology. *Current Directions in Psychological Science*, *10*, 181-183.
- Thornhill, R. & Grammer, K. (1999). The body and face of women: one ornament that signals quality? *Evolution and Human Behavior*, *20*, 105-120.
- Tiggemann, M., & Pickering, A.S. (1996). Role of television in adolescent women's body dissatisfaction and drive for thinness. *International Journal of Eating Disorders*, *20*, 199-203.
- Tiggemann, M., & Polivy, J. (2010). Upward and downward: Social comparison processing of thin idealized media images. *Psychology of Women Quarterly*, *34*, 356-364.

- Townsend, J., & Wasserman, T. (1997). The perception of sexual attractiveness: sex differences in variability. *Archives of Sexual Behavior, 26*, 243-268.
- Trampe, D., Stapel, D.A., & Siero, F.W. (2007). On models and vases: Body dissatisfaction and proneness to social comparison effects. *Journal of Personality and Social Psychology, 92*, 106-118.
- Venkat, R. & Ogden, H. (2002). Advertising-induced social comparison and body-image satisfaction: the moderating role of gender, self-esteem and locus of control. *Journal of Consumer Satisfaction, Dissatisfaction and Complaining Behavior, 15*, 51-67.
- Wang, C., Swerdloff, R., Iranmanesh, A., Dobs, A., Snyder, P., Cunningham, G., Matsumoto, A., Weber, T. & Berman, N. (2000). Transdermal testosterone gel improves sexual function, mood, muscle strength, and body composition parameters in hypogonadal men. *The Journal of Clinical Endocrinology and Metabolism, 85*, 2839-2853.
- Wanic, R.A. (2011). *The effect of mindset on assimilative and contrastive social comparison outcomes and body image*. (Unpublished doctoral dissertation). University of California, San Diego.
- Wasilenko, K.A., Kulik, J.A., & Wanic, R.A. (2007). Effects of social comparisons with peers on women's appearance satisfaction and exercise behavior. *International Journal of Eating Disorders, 40*, 740-745.
- Wheeler, L., & Miyake, K. (1992). Social comparison in everyday life. *Journal of Personality and Social Psychology, 62*, 760-774.
- Wilcox, K., & Laird, J. (2000). The impact of media images on women's self-esteem: identification, social comparison, and self-perception. *Journal of Research in Personality, 34*(2), 278-286.
- Wills, T.A. (1981). Downward comparison principles in social psychology. *Psychological Bulletin, 90*, 245-271.
- Wilson, A.E., & Ross, M. (2000). The frequency of temporal-self and social comparison in people's personal appraisals. *Journal of Personality and Social Psychology, 78*, 928-942.
- Wilson, G. & Eldredge, K. (1992). Pathology and development of eating disorders: Implications for athletes. In K.D., Brownell, J. Rodin, & J.H. Wilmore (Eds.), *Eating, body weight, and performance in athletes: Disorders of modern society* (pp.115-127). Philadelphia: Lea & Febiger.

- Wilson, G. T., & Eldredge, K. L. (1992). Pathology and development of eating disorders: Implications for athletes. In K. D. Brownell, J. Rodin, & J. H. Wilmore (Eds.), *Eating, body weight, and performance in athletes: Disorders of modern society* (pp. 115-127). Philadelphia: Lea & Febiger.
- Wiseman, M., Gray, J., Mosimann, J. & Ahrens, A. (1992). Cultural expectations of thinness in women: An update. *International Journal of Eating Disorders*, 11, 85-89.
- Wolf, N. (1991). *The Beauty Myth: How Images of Beauty are Used Against Women*. New York: Bantam Doubleday Dell Publishing.
- Wood, J. V. (1989). Theory and research concerning social comparison of personal attributes. *Journal of Personality and Social Psychology*, 106(3), 231-248.
- Zellner, D., Harner, D. & Adler, R. (1989). Effects of eating abnormalities and gender on perceptions of desirable body shape, *Journal of Abnormal Psychology*, 98, 93-96.

Footnotes

¹ Several theorists have suggested that exposure to superior others can have positive consequences for the self; however these benefits are often believed to stem from a different process. The processes of “reflection” (Tesser, 1988) or “basking in reflected glory” (Cialdini et al., 1976) both describe mechanisms through which an individual is positively affected by the successes of a close other. However, these processes do not produce positive self-evaluations from an opening up of possibilities for the self, but rather from the pride of association with the comparison other. Increased self-evaluations due to association with a successful other have been shown to occur only in domains that are irrelevant to the self (Tesser, 1988), and in situations where an individual can focus on their social self rather than their individual self (Brewer & Weber, 1994). In the competitive, individually-centered domain of physical attractiveness, it is more likely that positive responses would be due to a process of inspiration than from “basking in reflected glory.”

² Analyses of participants’ BMI scores in studies 2, 3 and 4 revealed no main effect of mindset condition, F 's < 1. In all studies there was a trend for men to have slightly higher BMIs than women (Study 2: $p = .10$; Study 3: $p = .06$; Study 4: $p = .003$). No other effects were significant. Because results of analyses that included versus omitted BMI as a control variable were highly similar, for simplicity BMI is not considered further in this collection of studies.

³ Preliminary 2 (Peer Fitness: fit, average) x 2 (Participant Gender: male, female) ANOVA performed on ratings of whether the target was “physically attractive” supported the intended peer fitness manipulation, such that peers in the fit videos ($M = 3.76$; $SD = .80$) were perceived as more physically attractive than were those in the average peer fitness videos ($M = 3.06$; $SD = .74$), respectively, $F(1, 219) = 31.50$, $p < .001$. There were no significant effects involving gender, either separately or in interaction with peer fitness condition. Facial attractiveness ratings from the validation study described in Study 1 for the fit and average peer, when subjected to a Gender by Peer-fitness mixed design ANOVA, revealed no main effect of peer-fitness condition, $p = .134$ or gender, $p = .274$, and no interaction $F < 1$. Thus the peer fitness manipulation appears to have been successful.

⁴ Baseline measures of appearance satisfaction were not measured in study 1, so it is not possible to know whether men in study 1 experienced an increase or decrease in appearance satisfaction after exposure to a fit peer when compared to baseline.

⁵ Baseline measures of appearance satisfaction were not measured in study 1, so it is not possible to know whether men in study 1 experienced an increase or decrease in appearance satisfaction after exposure to a fit peer when compared to baseline.