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Testing the Affect Model of Social Comparison (AMSC): Emotional and Behavioral
Implications of Viewers' Shifting Comparisons to Transforming Media Targets

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by

Lauren Keblusek

Committee in charge:

Professor Robin Nabi, Chair

Professor Dana Mastro

Professor Daniel Linz

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The thesis of Lauren Keblusek is approved.

Dana Mastro

Daniel Linz

Robin Nabi, Committee Chair

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ABSTRACT

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by

Lauren Keblusek

Past research on social comparison and media has not explored how comparisons shift over the course of a program, or more specifically, how different comparison directions alter audiences' affective states and behavior. Using an experimental design that manipulated comparison direction by exposing participants to the beginning and/or the ending of a weight loss reality program, the present study found mixed support for a newly proposed Affect Model of Social Comparison (AMSC). As predicted, different comparison directions contributed to specific emotions and health behaviors. Those who made more upward health comparisons felt more envy, which in turn contributed to increased health behavioral intent. Hope was also identified as an indirect mediator in the upward health comparison-health behavioral intent relationship. Further, upward comparisons led individuals to consume more healthy snacks, and downward comparisons led individuals to consume more unhealthy snacks. This experiment indexes the importance of discrete emotions in social comparison processes, and highlights the need for research on nuanced comparison behavior that evolves as characters evolve.

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Testing the Affect Model of Social Comparison (AMSC): Emotional and behavioral Implications of Viewers' Shifting Comparisons to Transforming Media Targets

Social comparisons help us make sense of a complex social world and our place within it. Given that our personal identity and sense of self are at stake, it is understandable that we regularly compare ourselves with those around us, including media figures. We sometimes make downward comparisons to worse-off media figures, thinking about how our lives are better than those depicted onscreen. We can also make upward comparisons to better-off media figures we admire or envy. These comparisons help us assess our relative standing and strive for improvement when possible.

We know from extant literature that comparisons lead to a range of psychological and behavioral outcomes. Studies involving media and body image generally indicate that upward comparisons to thin media targets contribute to body dissatisfaction (Jones, 2001; Morrison, Kalin, & Morrison, 2004; Agliata & Tantleff-Dunn, 2004; Botta, 1999; Cattarin, Thompson, Thomas, & Williams, 2000; Hawkins, Richards, Granley, & Stein, 2004; Tiggemann & McGill, 2004) and disordered eating (Botta, 1999; Harrison & Cantor, 1997). However, while we know that upward comparisons to media figures can shape our feelings and actions, the important connection between comparison-induced emotions and subsequent health behavior remains understudied, particularly in the context of downward comparisons.

We also very little about *message-specific* features in media-based social comparison processes. Past studies have typically considered social comparison to a media message or character in general, and some assume that comparisons are occurring without explicitly measuring them. When researchers ask viewers if they made comparisons during a program, or simply show them a picture of a model, we may not know the specific comparison target,

the domain and direction of comparison, or when comparisons took place. Refinement here would be highly instructive to gain a fuller understanding of the comparisons occurring, and to account for the dynamic nature of media messages—the fact that these messages often feature transitional characters that change over time.

To address these gaps in media and social comparison research, the present study had two major goals: 1) to examine the connection between emotional arousal and subsequent health behaviors in the context of both upward *and* downward comparisons, and 2) to examine comparisons to transitional characters that change over the course of a program. To meet these goals, an experiment was conducted to test a newly proposed model of social comparison, emotion, and health behavior—the Affect Model of Social Comparison (AMSC). The AMSC model is the first to address the emotional and behavioral implications of viewers' shifting comparisons to evolving media targets. The model was tested in the context of a weight loss reality television program, where social comparisons to a specific transitional character were measured at different points in the program. This context was chosen because a transformational reality program has the potential to prompt viewers to make both upward and downward comparisons. Ultimately, this paper argues that the comparison target, direction, domain, and time of comparison matter, as they differentially impact the audience's psychological and behavioral responses to a media stimulus.

Social Comparison Theory

Social comparison theory explains how, in the absence of objective information about our performance (such as IQ), we compare ourselves to somewhat similar others to gain a more accurate conception of our relative standing in a *self-relevant* domain—a domain relevant to our personal identity (Festinger, 1954). Indeed, research suggests that

comparison targets tend to be similar to ourselves in certain demographic attributes, including ethnicity and gender, as these comparisons are likely most informative for individuals making comparisons (see Meisel & Blumberg, 1990; Zanna, Goethals, & Hill, 1975). We make comparisons to those we perceive as better off than ourselves in certain areas (upward social comparisons) and those we perceive as worse-off in other areas (downward social comparisons) to determine the upper and lower skill boundaries and assess our relative standing in a domain of interest (Gruder, 1971; Wheeler, 1969). According to Festinger (1954), the primary motivation for social comparison behavior is the drive for an accurate self-assessment of abilities. However, later theorists and researchers recognized that a variety of other motives could drive comparison behavior, including the need for self-enhancement and self-improvement (Taylor, Neter, & Wayment, 1995). The self-improvement motive suggests that we make upward comparisons to see how we can improve in a self-relevant domain, and the self-enhancement motive suggests that we compare downward to maintain positive self-esteem in the face of threat. As we will see in the coming section, both upward and downward comparisons lead to a variety of discrete emotions.

Social Comparison and Emotion

Depending upon the subject's cognitive appraisals of a comparison—such as his perceived attainability of success in the upward comparison domain or perceived susceptibility of future failure in the downward comparison domain—both upward and downward comparisons can be seen as either empowering or discouraging, leading to either positive or negative affective states (Buunk, Collins, Taylor, Van Yperen, & Dakof, 1990). Upward comparisons in self-relevant domains have been shown to lead to self-reported envy

(De Steno & Salovey, 1996; Salovey & Rodin, 1984; Tesser & Collins, 1988) and unhappiness (Tesser & Collins, 1988). In line with this, Tesser's self-evaluation maintenance (SEM) model of social behavior suggests that unfavorable upward comparisons result in negative affect that we seek to reduce or avoid, as the discrepancy between self and target exposes our deficiencies and shortcomings (Tesser 1988, 1991). In general, negative feelings of self-deflation and demoralization are likely when the comparison domain is perceived to be *unattainable*, because this means that the individual's worse-off position is unlikely to change (Lockwood & Kunda, 2000; Lockwood & Kunda, 1997). Note that while it is often true that negative emotions result when we feel that we cannot attain our goals, we will see in the coming text that envy is an exception, for this negative emotion can occur under conditions of high perceived attainability.

In contrast, when our goal of success in an upward comparison domain seems *attainable*, we are more likely to experience positive emotions. For instance, research suggests that when individuals perceive physical attractiveness to be attainable, they experience more positive affective responses to ideal media targets (Knobloch-Westerwick & Romero, 2011). Similarly, when becoming thin seems attainable rather than unobtainable, individuals feel less anxious and experience less negative affect following media-based comparisons (Mills, Polivy, Herman, & Tiggeman, 2002). When a self-relevant comparison domain is deemed attainable, upward comparisons can also lead to positive emotions such as hope, by demonstrating that success is possible and by inspiring individuals to strive for improvement (Buunk, Kuyper, & Van der Zee, 2005; Helgeson & Taylor, 1993; Collins, 1996; Lockwood & Kunda, 1997, 2000; Taylor & Lobel, 1989). Hope is presumably most

likely to result when individuals are driven by a self-improvement motive, making comparisons to learn from superior others.

Whereas upward comparisons contribute to positive or negative affect based upon perceived attainability of success in the comparison domain, downward comparisons can lead to positive or negative affect depending upon one's perceived *susceptibility*, or fear of becoming similar to the worse-off comparison target in the future. Research suggests that downward comparisons can improve mood (Gibbons & Gerrard, 1989) and self-esteem (Reis, Gerrard, & Gibbons, 1993), particularly among low self-esteem subjects. Indeed, self-relevant downward comparisons can lead to feelings of pride and happiness by highlighting one's superior abilities (Tesser & Collins, 1988; Willis, 1981), particularly when accompanied by perceptions of low susceptibility of becoming worse off in the future. However, downward comparisons can also lead to negative affect by demonstrating how one's plight may become similar to the worse-off target in the future—how one's goals of success in the target domain may be threatened or thwarted in the future. Indeed, downward comparisons coupled with these perceptions of high susceptibility have been shown to lead to feelings of fear and worry (Buunk et al., 2005). Overall, it is clear that emotions matter in social comparison processes, but they have not been integrated systematically into the social comparison literature. We turn to Richard Lazarus' (1991a) cognitive-motivational-relational theory of emotion next, which explains that social comparisons contribute to specific emotions, which in turn lead to specific behaviors.

Lazarus' Cognitive-Motivational-Relational Theory of Emotion

Lazarus' cognitive-motivational-relational theory of emotion maintains that each emotion is associated with a specific, characteristic pattern of cognitive appraisals of the

person-environment relationship. Appraisals are shaped by environmental constraints and personal beliefs and motives (1991a, 1991b). According to the theory, there are three primary appraisals relating to one's goals. The first, *goal relevance*, involves whether a goal is currently at stake. If more important goals are implicated, we feel emotions more intensely (Lazarus, 1991b). The second, *ego-involvement*, revolves around whether or not one's self-esteem, status, or wellbeing is implicated in the situation (Lazarus, 1991a, 1991b). The third goal-based appraisal, *goal congruency/incongruency*, involves whether the goal is being achieved or is being thwarted—in other words, whether a situation is seen as threatening or beneficial. Threatening situations tend to lead to negative emotions, whereas beneficial situations tend to lead to positive emotions (Lazarus, 1991a, 1991b).

Lazarus' cognitive-motivational-relational theory of emotion includes three other secondary appraisals, which involve coping processes. *Coping potential* consists of one's perceived ability to cope with threats in the environment to improve this environment, and *future expectations* involve one's perception of whether things will change for better or worse in the future (Lazarus, 1991a, 1991b). Finally, individuals make *credit/blame* appraisals, in which perceived credit or blame for beneficial or threatening situations are assigned, individuals consider whether this credit or blame was directed toward themselves or others, and they assess their perceived control over the situation (Lazarus, 1991a, 1991b).

Beyond appraisals, the second major component of Lazarus' theory is the link between specific discrete emotions and specific actions. Lazarus (1991a) asserts that each emotion leads to specific action tendencies or "biological urges" (p.229). (See Figure 1 for action tendencies associated with each emotion). This emotion-action link has been widely recognized. Indeed, evolutionary-based scholars concur that emotions motivate action—

different arousal states lead to “approach” or “avoidance” action tendencies meant to aid us in survival and reproduction by altering the source of our arousal physically or mentally (Frijda, 1986; Lazarus, 1991a; Plutchik, 1982).

Integrating Emotion into Social Comparison Theory

We know from the social comparison literature that attainability and susceptibility are important variables to consider in social comparison research. Further, we understand from Lazarus’ cognitive-motivational-relational theory that emotions result from patterns of cognitive appraisals, and that each emotion leads to a different action tendency. Combining these two theories will allow us to better understand which emotions are likely to be evoked, and what actions are likely to be taken following upward and downward comparisons, respectively.

As a first step, let us consider how social comparison theory might relate to Lazarus’ emotion appraisals, generally speaking. Goal relevance is always cued when we engage in social comparisons because we make comparisons in self-relevant domains. Appraisals of ego involvement generally accompany social comparisons, because we tend to make comparisons in self-relevant domains and often engage in comparisons to improve our self-esteem and enhance our relative status in the comparison domain. Appraisals of goal congruence or incongruence vary based on the specific comparison situation and determine whether the comparison-induced emotion is positive or negative. Negative emotions generally result from goal-incongruent comparison situations (in which our goals are seen as threatened), whereas positive emotions generally result from goal-congruent comparison situations (in which our goals are seen as being attained). Finally, appraisals of coping

potential, future expectations, and credit/blame vary based upon the comparison situation, and ultimately shape the specific comparison-induced emotions that we feel.

In the present discussion, two of the aforementioned coping appraisals are likely most important: *coping potential* (i.e., perceived ability to cope with threats in the environment), and *future expectations* (i.e., whether things will change for better or worse in the future). These appraisals are most important for us because they can be linked with perceived attainability of success and perceived susceptibility of failure in the comparison domain. If we can map perceived susceptibility and attainability onto some of Lazarus' emotion appraisals, we will be in a position to predict the specific comparison-induced emotions that individuals might feel.

Attainability is linked to coping potential as both involve an assessment of our ability to take action to reverse a threatening person-environment relationship and improve our relative standing in the domain of interest. Attainability is also linked to future expectations, for our expectations of the future are shaped by whether or not we feel that our goals can indeed be reached in the future. When perceived attainability is high, coping potential is favorable and future expectations are favorable—we do not believe that our current unfavorable situation will persist in the future. When perceived attainability is low, coping potential is likely unfavorable or uncertain—we believe that the unfavorable situation may persist because we cannot attain success in the upward comparison domain. Future expectations are likely more negative or uncertain under conditions of low attainability, because individuals do not believe that the goal-incongruent situation will be ameliorated in the future.

Perceived susceptibility can also be mapped onto appraisals of coping potential, for when we feel susceptible to becoming worse-off, we are experiencing a threatening person-environment situation with which we may or may not be able to cope. Susceptibility is related to future expectations as both consist of perceiving future threat. When perceived susceptibility is low—when we believe that we are and will remain better off—coping potential is irrelevant because the situation is already favorable. Future expectations are favorable because we believe that the situation will remain positive in the future. When perceived susceptibility is high, coping potential could be favorable, unfavorable, or uncertain. Expectations for the future are generally negative or uncertain under conditions of high susceptibility, as we fear that things might become worse in the future.

Given all of this, we see that perceptions of attainability and susceptibility—important variables in social comparison research—map onto Lazarus’ (1991a) appraisals of coping potential and future expectations. These appraisals can be used to predict specific emotions resulting from upward and downward comparisons. Indeed, using appraisals to predict emotions resulting from comparisons is one major goal of the proposed Affect Model of Social Comparison (AMSC).

The other major goal of the model is to predict the actions individuals will take based upon the discrete emotions that they feel, using Lazarus’ theory and the action tendencies he proposes for each emotion. Applying Lazarus’ (1991a, 1991b) perspective, we can reason that appraisals of coping potential are linked to action following social comparisons. Behavior change is most likely when coping potential is favorable—when we feel that we can take action to reverse a threatening comparison and restore positive affect. Thus, we will term emotions with high coping potential *corrective emotions*, because these emotions

generally drive us to act to correct our unfavorable relative status. Conversely, behavior change is least likely when reversing the negative situation seems impossible (when coping potential is unfavorable or uncertain) or when the situation is already favorable and coping potential is unnecessary. We will call emotions with unfavorable, uncertain, or unnecessary coping potential *non-corrective emotions*, as these emotions generally do not prompt us to take action to improve our comparative status.

Consistent with the discussion above, Tesser's (1988) Self-Evaluation Maintenance (SEM) model of social behavior helps further explain the emotion-action link by positing that unfavorable comparisons often lead to negative affect that we seek to reduce in a number of ways, including by engaging in status-improving behaviors (Tesser, 1988, 1991). Thus, according to the SEM model, when making unfavorable comparisons we will be motivated to engage in behaviors to reduce the discrepancy between self and target, which will improve self-esteem and restore positive affect. Stated differently, corrective emotions (which tend to be negative emotions) lead to action that will replace the negative affect with more positive affect. The emotion-action link has also been acknowledged in the media literature—for example, envy and hope have been found to mediate the relationship between social comparisons and intentions to undergo cosmetic procedures in the context of reality makeover programs (Nabi & Keblusek, 2014).

Overall, we propose that while appraisals of coping potential and future expectations help determine the emotions we feel, coping potential (along with the action tendency associated with the emotion aroused) determines whether or not we will take action to improve our comparative status. These appraisals form the backbone of the Affect Model of Social Comparison (AMSC), which will be further elucidated below.

The Affect Model of Social Comparison (AMSC)

The Affect Model of Social Comparison integrates social comparison theory with Lazarus' emotion appraisal perspective to make predictions regarding the emotions individuals will feel, and the actions they will likely take following upward and downward comparisons, respectively. Four possible comparison scenarios define the four branches of the AMSC model (see Figure 2a). Each scenario, along with likely resulting emotions and actions, will be outlined in the coming text (see Figure 1 for a chart of Lazarus' discrete emotion typology, including appraisals and action tendencies associated with each emotion).

Upward Comparisons and High Attainability. The first possible scenario, upward comparisons paired with high attainability, is a scenario in which an individual is worse off than the comparison target but perceives he can become better off in the future, as when an individual compares upward to a thinner and healthier individual, but knows that he can exercise and eat healthy to become thinner and more physically fit in the future. Upward comparisons paired with perceptions of high attainability results in goal-incongruence (e.g. negative affect) because one's goal of success in the target domain is threatened by the existence of a more successful other. Coping potential is positive in this situation, because individuals feel that their goals can be obtained, thereby improving the presently threatening situation. Similarly, future expectations are somewhat positive because the threatening goal-incongruent situation will likely be reversed in the future.

Emotions that fit the aforementioned pattern of appraisals include envy and (to a lesser extent) hope (Lazarus, 1991a, see Figure 1). Because coping potential is generally favorable for envy and hope, these emotions are deemed corrective emotions that will motivate action meant to reduce the threat caused by the unfavorable upward comparison.

Presumably, that action would be targeted toward improving one's status in the comparison domain, such as exercising and dieting to become healthier.

Upward Comparisons and Low Attainability. The second scenario, upward comparisons paired with low attainability, arises for individuals who are worse off than the comparison target but do not believe that their inferior status can improve in the future. This might include an individual who compares upward to a thinner individual, but does not believe he can ever attain a similar weight due to a chronic medical condition resulting in weight gain. This individual does not feel as though action steps can be taken to lose weight due to his medical condition. This is a goal-incongruent, negative emotion-eliciting scenario because the individual's goal of success in the target domain is threatened by the existence of a better-off comparison target whose success he can never obtain. In this situation, coping potential is negative or uncertain because the individual does not believe that he can reverse the threatening situation and attain his goals, and future expectations are negative or uncertain because he believes things will not improve in the future.

Emotions that fit this appraisal pattern include sadness and anxiety (Lazarus, 1991a, see Figure 1). Sadness and anxiety are associated with unfavorable and uncertain coping potential, respectively. Because sad and anxious individuals generally do not feel as though they can take action to cope with the threat in their environment, we deem these *non-corrective* emotions. Individuals experiencing sadness and anxiety are unlikely to take action to improve their status in the upward comparison domain because restorative action seems impossible. They will not be inspired to diet and exercise to lose weight and become more fit, even after comparing themselves with healthier others.

Downward Comparisons and High Susceptibility. The third scenario, downward comparisons paired with high susceptibility, is one in which individuals are currently better off, comparatively speaking, but fear that they could become worse off in the future. An example might be a middle-aged woman who begins thinking about how her health might decline soon, as she ages. When she compares herself with elderly women, she is better off in terms of health and fitness now, but fears that she soon will not be. This is a goal-incongruent (and hence negative emotion-inducing) scenario because fear of becoming similar to the worse-off other in the future threatens to thwart one's goals of success. In this case, coping potential can be positive, negative, or uncertain depending upon whether or not one feels that the future threat can be prevented. Future expectations are negative or uncertain, because the individual perceives that she will become worse-off in the future.

Emotions that fit this pattern of appraisals include hope (when future threat *can* be prevented; i.e. when coping potential is somewhat favorable), sadness (when future threat *cannot* be prevented; i.e. when coping potential is unfavorable), and anxiety (when future threat *cannot* be prevented; i.e. when coping potential is uncertain). Hope is associated with somewhat favorable coping potential, so it is deemed a corrective emotion that will drive action meant to prevent future threat in the downward comparison domain (for example, exercising and eating healthier to protect oneself from becoming heavier and unhealthier in the future). Sadness and anxiety are deemed non-corrective emotions because coping potential is unfavorable (for sadness) or uncertain (for anxiety). Feeling as though they cannot take action to reverse the present unfavorable situation, individuals feeling sad or anxious are unlikely to act to help prevent the perceived future threat of deteriorating health.

Downward Comparisons and Low Susceptibility. The final scenario, downward comparisons paired with low susceptibility, is one in which the individual is and believes he will remain better off than a worse off comparison target. We can envision a situation in which a highly thin, fit person who exercises regularly compares himself to a heavier, less fit other. The fit individual does not think that becoming unhealthy is a possibility due to the fact that he is young and has been healthy all his life, and due to the action steps he currently takes to remain healthy—he exercises regularly and eats exclusively healthy foods. This is a goal-congruent (and hence positive affect-inducing) scenario because the goal of success in the target domain has already been achieved and the success will likely persist. Coping potential is unnecessary because one does not need to “cope” with the situation—it is already favorable and need not be altered. Future expectations are generally positive, because the individual believes the situation is and will likely remain favorable in the future.

Emotions that fit this appraisal pattern include pride, happiness, and compassion. Coping potential is unnecessary for all of the aforementioned emotions, rendering them *non-corrective*, meaning they are unlikely to inspire action meant to maintain superior standing in the downward comparison domain. In the absence of a perceived threat, no action is necessary—these individuals are unlikely to adopt a more rigorous exercise or diet plan to maintain their superior status in domains of fitness and health.

We tested the AMSC model in the context of a weight loss reality program. Ultimately, we considered two of the four possible scenarios—those deemed most likely in a health context. Because there is likely a bias toward high attainability and low susceptibility in domains involving fitness, especially among healthy young people, upward comparisons paired with high attainability and downward comparisons paired with low susceptibility will

be explored. Because the model will be applied in a media context, we now turn to research on social comparison and media, highlighting limitations that we seek to address.

Social Comparison and Media

In the media effects literature, research on social comparison largely appears within the context of body image and exposure to thin, ideal media models. Studies generally explore the relationship between media-based comparisons and subsequent behaviors, feelings, and attitudes. Perhaps unsurprisingly, upward comparisons to ideal media targets have been shown to adversely influence body-related attitudes. For instance, after making upward comparisons to ideal media targets, individuals are more likely to support attitudes and behaviors associated with eating disorders (Hawkins et al., 2004). Upward comparisons to media targets also contribute to negative affective states. While results are not entirely consistent (see Knobloch-Westerwick & Crane, 2012), a plethora of studies indicate that upward comparisons to ideal media targets are associated with both males' and females' general body dissatisfaction (Jones, 2001; Morrison, Kalin, & Morrison, 2004; Agliata & Tantleff-Dunn, 2004; Botta, 1999; Cattarin et al., 2000; Hawkins, Richards, Granley, & Stein, 2004; Tiggemann & McGill, 2004). Beyond body dissatisfaction, upward media-based comparisons can contribute to a variety of other negative affective states in women including anxiety, depression, anger, and lowered self-esteem (Hawkins et al., 2004; Cattarin et al., 2000), and depressive mood in men (Agliata & Tantleff-Dunn, 2004). While these studies are highly instructive, it is important to remember that these effects are predicated on the assumption that a thin body is an ideal body. However, research indicates that standards of beauty can vary among different racial/ethnic groups (see Overstreet, Quinn, & Agocha, 2010), so thin media models may have a less negative emotional and psychological impact

on racial/ethnic groups that idealize heavier and curvier body types (see Botta, 2000; Schooler & Daniels, 2014).

Media-based upward comparisons are also linked to intentions and overt health behaviors. For instance, after upward comparisons to ideal media targets, women express an increased desire for invasive cosmetic surgeries and other procedures (Nabi, 2009; Markey & Markey, 2010), and stronger intentions to diet and exercise (Smeesters et al., 2010). In terms of overt behavioral outcomes, upward comparisons to ideal media targets have been associated with women's eating disorders (Botta, 1999; Harrison & Cantor, 1997), women's restricted eating (Morrison et al., 2004; Smeesters, Mussweiler, & Mandel, 2010), men's steroid use and dieting to gain weight, and pathogenic weight control for both genders (Morrison et al., 2004). It is instructive to note that studies within the psychology literature reinforce the notion that social comparisons influence behavior in a variety of contexts beyond those that are purely health and body-oriented. Such studies have found that comparisons contribute to differential consumer behavior, performance judgments, and helping or harming behavior (Karlsson, Garling, Dellgran, Klingander, & Klein, 2005; Lam, Van der Vegt, Walter, & Huang, 2011).

Overall, there is ample evidence that media-stimulated comparisons contribute to behavioral and emotional responses. While instructive, the aforementioned studies face five key limitations. The first is that the wide array of potential emotional responses to media-stimulated comparisons is not completely understood, as most past research has only explored general negative affect and body dissatisfaction. Extant research generally assumes that negative affect or internalization of the thin ideal contribute to behavior change, but does not systematically explore the role of specific discrete emotions in differentially impacting

individuals' behavior. Thus, while past research has often considered emotional and behavioral outcomes to be separate effects, emotion and action are inextricably linked such that specific emotions lead to specific actions, as indicated by Nabi and Keblusek (2014), who found that envy and hope mediate the relationship between upward appearance-based comparisons and intent to undergo invasive cosmetic procedures. To address this limitation, we measured subjects' discrete emotional responses to a media program, and examined how different emotions contribute to different behaviors.

The second limitation is that past studies generally measured behavioral *intentions* rather than overt eating behavior. To address this gap, we included an overt eating measure. The third limitation of existing media and social comparison research is that studies tend to measure general comparison behavior without focusing on a particular target and domain of comparison. Subjects were often shown images to induce comparisons in a short-term experimental setting, but subjects sometimes completed surveys of general trait-level comparison tendencies (see Dittmar & Howard, 2004; Jones, 2001). This broad type of analysis ignores the fact that comparisons are highly character-specific—we consider ourselves better off than some characters, and worse off than others, and the comparison domains we choose depend on traits of the character in question at a particular moment in the program. We addressed this important issue by measuring specific domains of comparison to a single media target over the course of a program. The fourth limitation is that because past research tends to examine negative effects of ideal media models, it generally only explores emotional responses to *upward* comparisons, neglecting the prevalence of downward comparisons during media viewing and the resulting emotions and behaviors. To address this limitation, we experimentally manipulated comparison direction.

The fifth and final key limitation is that past media research has typically only considered comparisons at one point in time due to short-term experimental and survey designs. Those that have considered the role of time include content analyses revealing that television and magazine models of both genders have become increasingly thin in recent years, and males have become increasingly muscular (Garner, Garfinkel, Schwartz, & Thompson, 1980; Leit, Pope, & Gray, 2001; Schwartz & Andsager, 2011; Soulliere & Blaire, 2006; Spitzer, Henderson, & Zivian, 1999), perhaps prompting more frequent or more threatening upward comparisons. Acknowledging that psychological outcomes shift along with comparison direction over time, Zell and Alicke (2010) found that when individuals see that their performance is rising relative to others over time, they make more positive self-evaluations than when their performance is falling or remaining constant. Even when comparison direction remains constant, repeated exposure (and presumably comparisons) to ideal media models can have positive consequences such as increased body satisfaction by inducing viewers to engage in dieting behavior (Knobloch-Westerwick & Crane, 2012). We addressed this issue by measuring social comparison behavior at different points in a television program. The proliferation of popular transformational reality programs such as *Extreme Weight Loss*, *Extreme Makeover*, and *What Not to Wear* suggests that considering a temporal approach is particularly relevant for media scholars today. To account for the reality that media characters frequently transform psychologically and physically, research on comparisons at different points in a program is needed. A temporal approach is important because comparisons at different points in a program likely lead to different appraisals and hence different emotions and behavior. Our repeated exposure to the same characters gives

us a chance to continuously gauge our performance against the performance of another, and comparisons shift as perceived relative status shifts.

To systematically explore evolving comparisons to media targets that change over time, we chose to examine the context of a transformational weight loss reality program featuring a transitional character. At the beginning of an education entertainment program (such as a weight loss program fostering pro-social, healthful behaviors), transitional characters are uncertain about engaging in the pro-social behavior being promoted (such as healthy diet and exercise behaviors). These characters begin in a difficult life situation, realize that change is imperative, and then struggle to change their negative behaviors to more positive and desirable ones over the course of the narrative or program (Haider, 2005).

Studying transitional characters is an ideal way to address several limitations of existing media research—particularly those limitations dealing with measurement and manipulation of social comparison behavior. Utilizing programs featuring transitional characters is a relatively straightforward way of manipulating comparison direction, measuring specific comparison targets, and measuring comparisons at multiple points in time, as these programs tend to provoke downward comparisons to a character at one point in time, and upward comparisons to the same character at a later point in time, after the character's transformation. Thus, the proposed model of social comparison and affect will be tested in the context of a transformational reality program featuring a transitional character.

Applying AMSC to the Reality Weight Loss Program Context

As argued earlier, the AMSC model uses Lazarus' (1991a) emotion typology to explain the crucial psychological link between specific comparison-induced emotions and action. Testing the model in the context of a transformational weight loss reality program

(*The Biggest Loser*), we propose that viewers will compare downward to the pre-transformation, overweight character at the beginning of the program. We predict that comparisons will be made in both health domains (i.e. those dealing with fitness and attractiveness) and perseverance domains (i.e. those dealing with determination and positive attitude). In contrast, we predict that viewers will compare upward to the newly slim, self confident, and healthy character at the end of the program (in both health and perseverance domains). In line with Festinger (1954), it is expected that female undergraduate participants will engage in comparisons because the comparison target is similar to participants in terms of age and gender, and because we reason that the comparison domains of health and perseverance are self-relevant for most female undergraduate subjects. Thus, we predict:

H1a: Young women will make more downward comparisons to the female transitional character when viewing the beginning of the program relative to the ending.

H1b: Young women will make more upward comparisons to the female transitional character when viewing the ending of the program relative to the beginning.

Given that comparisons are predicted to shift over the course of the study, the AMSC model contains two branches—an upward comparison branch and a downward comparison branch (see Figure 2b). Beginning our discussion with the upward branch, recall that upward comparisons can lead to a variety of emotions, including envy and hope. The emotion felt is partly determined by one's perceived attainability of becoming similar to the better off comparison target. In line with psychological research on upward comparisons (i.e., Lockwood & Kunda, 1997; Taylor & Lobel, 1989) and media effects research on upward comparisons (i.e., Morrison et al., 2004; Smeesters et al., 2010) we suggest that upward comparisons to a weight loss reality program contestant inspire personal improvement by

demonstrating that success is possible—in essence, such programs can foster perceptions of high attainability. Thus, given that success in health domains is likely perceived as attainable (particularly for our relatively fit and healthy undergraduate sample), coping potential and future expectations are both likely favorable. Based upon this pattern of appraisals, and in line with Nabi and Keblusek (2014), the model predicts that corrective emotions, such as envy and hope, are most likely following upward health-based comparisons to the media target in our study.

Envy consists of desiring what someone else has (Lazarus, 1991a). In a comparison context, this means longing for the success of an upward comparison target. When envious, coping potential is favorable, as action meant to ameliorate the negative situation is possible. This action involves seeking out the object of one's desire—in this case, success in health and perseverance-related comparison domains, obtained through self-improvement behaviors. Envy is also associated with favorable future expectations, for envious individuals feel that the threatening situation can be improved, particularly if one engages in coping behaviors that enhance one's comparative status in the target domain.

Hope also fits the aforementioned appraisal pattern. Hope is defined as “fearing the worst but yearning for better” (Lazarus, 1991a, p.122). When one feels hopeful he or she has experienced a setback (such as an unfavorable upward comparison) but believes that restorative action leading to the desired outcome is possible. In this sense, coping potential is uncertain but somewhat favorable. However, future expectations associated with hope are uncertain, as the hopeful individual is unsure of whether the current negative situation will improve in the future (Lazarus, 1991a), but remains optimistic that it will.

The downward comparison branch of the AMSC model follows a similar pattern. According to the social comparison literature, downward comparisons can lead to a plethora of emotions, including pride and happiness. One's perceived susceptibility of one day becoming similar to the worse-off comparison target shapes emotional responses to downward comparisons. In the context of a reality weight loss program, there is likely a bias toward low susceptibility. At the beginning of the show, the contestants are typically morbidly obese and facing severe health problems, which would likely not prompt the average viewer to perceive himself/herself as highly susceptible to becoming similarly heavy and unhealthy. This is particularly likely for healthy undergraduate subjects who generally see themselves as invincible to harm. Indeed, Elkind (1967) suggests that adolescent risk-taking and perceived invincibility are a normal component of human psychological development, leading adolescents to fail to recognize that adverse consequences of risky behavior could befall them. Thus, we believe that low susceptibility is primed in the weight loss reality program context. In line with this, we reason that non-corrective emotions associated with low perceived susceptibility—and hence unnecessary coping potential and unnecessary or favorable future expectations—will likely be experienced after making downward comparisons to the program contestant. These emotions include pride, happiness, and compassion.

Pride consists of enhancing one's ego by taking credit for a valued achievement (Lazarus, 1991a)—in this case, the achievement of relative success in terms of health and perseverance, as individuals are crediting themselves for their success in the downward comparison domain. Coping potential is unnecessary because a proud individual is not experiencing a threat that needs to be addressed through coping behavior. Future

expectations are unnecessary but somewhat positive, as no imminent threats to self-esteem are foreseeable.

Happiness follows a similar appraisal pattern. Happiness is defined as “making reasonable progress toward realization of a goal” (Lazarus, 1991a, p.122). Presumably this can include making progress toward and eventually achieving the goal of success in the downward comparison domain. Coping potential is unnecessary, as there are no situational threats to address. To be happy we must have positive future expectations, or expectations that our success will continue (Lazarus, 1991a).

Finally, compassion also fits the aforementioned appraisal pattern. Lazarus (1991a) defines compassion as “being moved by another’s suffering and wanting to help” (p.289). In a social comparison context, this might involve being moved by the plight of a worse off comparison target. As was the case for happiness and pride, coping potential is unnecessary because compassion is a generally positive emotion state with which we do not need to cope. Future expectations are somewhat positive insofar as individuals think that they will be praised for their kind deeds in the future (Lazarus, 1991a). Sympathetic and compassionate individuals might recognize that they could become worse off one day, treating worse-off others as they would like to be treated if a similar fate ever befell them. However, compassionate people ultimately remain somewhat detached from worse-off others, recognizing that they are better off than those they seek to assist.

It is important to note that the coming hypotheses do not include all emotions that individuals can feel following upward and downward comparisons. For the sake of simplicity, a few emotions have been selected because they seem particularly likely given past research, the specific media context chosen, and logical reasoning on perseverance and

health-based social comparisons. Overall, the aforementioned discussion of comparisons and resulting emotions is summarized in the following hypotheses:

H2: More upward comparisons will associate with greater arousal of corrective emotions, specifically envy and hope.

H3: More downward comparisons will associate with greater arousal of non-corrective emotions, specifically pride, happiness, and compassion.

In addition to social comparison direction and the resulting discrete emotions, another crucial component of the AMSC model is behavior. Based on the social comparison literature, Lazarus' theory, and Tesser's SEM model, we suggest that upward comparisons are threatening and contribute to corrective emotions that drive us to want to engage in status-improving behaviors. As the present study explores health and perseverance comparison domains, both are included in the following hypotheses:

H4a: After making more upward health comparisons, health behavioral intent will increase.

H4b: After making more upward perseverance comparisons, intent to persevere will increase.

While upward comparisons can inspire improvement in the comparison domain, we predict that downward comparisons do not have the same effect. Because individuals are already comparatively better off, restorative action meant to ameliorate threat is unnecessary. We reason that favorable comparisons might provide an affective boost or feeling of superiority that leads to no change in behavioral intent:

H5a: After making more downward health comparisons, health behavioral intent will remain unchanged.

H5b: After making more downward perseverance comparisons, intent to persevere will remain unchanged.

Arguably the most important component of the AMSC model is the mediating role of emotion. In line with Lazarus' theorizing, the model poses that comparisons lead to specific emotions, and these emotions lead to behavioral intent and overt behavior. Recall that corrective emotions are those for which coping potential is favorable and restorative action meant to return the threatened individual to a less-threatening, more goal-congruent state is possible. Of the aforementioned emotions, envy and hope fit this classification, so I suggest that these are corrective emotions that motivate action following upward comparisons.

Further supporting this notion, Lazarus (1991a) notes that envy and hope are both associated with action tendencies to seek the desired outcome or object. Envy drives us to obtain what another person has (Lazarus, 1991), including superior fitness and attractiveness in the case of the present study. Similarly, hope leads us to move toward the outcome we desire or wish for (Lazarus, 1991a). Overall, we hypothesize that these so-called corrective emotions will mediate the relationship between upward comparisons and resulting behavioral intent.

H6a: Corrective emotions, specifically envy and hope, will mediate the relationship between upward health comparisons and health behavioral intent.

H6b: Corrective emotions, specifically envy and hope, will mediate the relationship between upward perseverance comparisons and intent to persevere.

Recall that non-corrective emotions are those for which coping potential is deemed uncertain, unfavorable, or unnecessary. For non-corrective emotions, restorative action meant to improve a threatening situation is deemed difficult, or preventative action meant to ameliorate potential future threat is unnecessary because the current situation is not

threatening. Happiness, pride, and compassion all fit this criterion. For these emotions, the motivation to act is low or nonexistent, so individuals experiencing them are unlikely to act to improve their relative status in the comparison domain. Indeed, for the aforementioned emotions, coping potential is unnecessary because the current situation is positive and non-threatening. Further supporting this notion, Lazarus (1991a) generally defines the action tendencies of happiness, pride, and compassion as being drawn to others. Pride leads individuals to boast about past success, happiness drives individuals to be outgoing, and compassion motivates us to help others in need (Lazarus, 1991a). Thus, when we are experiencing these positive emotions we are prompted to share the positivity with those around us, but we are not moved to improve our already favorable standing in the comparison domain. Given that downward comparisons are expected to yield emotions that are unlikely to impact behavior change, we do not pose a mediation hypothesis for downward comparisons.

The hypotheses above involve behavioral intent, but the present study measures overt eating behavior as well. We reason that eating will indeed be impacted by comparison behavior, such that those who compare upward eat less overall or simply choose to eat more healthy food and less unhealthy food when various options are presented. While the cognitive-motivational-relational perspective suggests that downward comparisons will lead to no change in eating behavior because there is no immediate threat to address, we also want to see if downward comparisons will impact eating behavior such that those who compare downward will eat more overall, or will choose to consume more unhealthy foods because they are already comparatively better off so can “afford” to do so. Extant research does not clearly predict one outcome over the other, so the following research questions are posed:

RQ1: Will individuals a) eat less after making upward health comparisons, or will they b) just eat more healthy food?

RQ2: Will individuals a) eat more after making downward health comparisons, will they b) just eat more unhealthy food?

Our third and final research question involves the potential mediating role of emotions in the relationship between social comparisons and overt eating behavior:

RQ3: Do discrete emotions mediate the relationship between social comparisons and overt eating behavior?

Method

Design and Participants

In the present experiment, comparison direction was manipulated through random assignment to one of four message conditions designed to stimulate different social comparison directions (described below). Participants were a convenience sample of female undergraduate communication students at the University of California Santa Barbara. Participants were recruited from undergraduate communication courses and the study was posted on the Department of Communication's research participation website, where interested students signed up to participate. Participants received credit in their communication courses for their voluntary participation.

Stimulus Materials

To promote similarity (and hence comparisons) between the participant and comparison target, the experimental stimulus selected was Season 6 of *The Biggest Loser*, featuring the transformational journey of age-matched female contestant Michelle Aguilar, who lost 110 pounds and eventually won the contest. In editing the program, other reality

show participants were removed from the clip as much as possible to ensure that Michelle was the target of comparisons. This eliminated the problem of multiple social comparison targets contributing to different emotional and behavioral outcomes. Commercials were also removed, as they could influence individuals' emotions and prompt additional unwanted comparisons.

The control stimulus selected was *Life of Birds*, a BBC nature program. This stimulus was chosen because it is devoid of humans, so would not prompt social comparisons. The program was also emotionally neutral (see results below). Overall, then, the control program served as a thermometer of initial baseline affect and behavioral intentions against which the experimental (social comparison) treatments were assessed. Ultimately, four study conditions were created: beginning only (in which subjects watched a 10-minute clip of the beginning of the season of *The Biggest Loser*), ending only (in which subjects watched a 10-minute clip of the end of the season of *The Biggest Loser*) beginning and ending condition (in which subjects watched both the 10-minute clip from the beginning of the season then the 10-minute clip from the end of the season of *The Biggest Loser*), and control (in which subjects watched *Life of Birds*).

Procedure

All participants came to the laboratory to complete the one-hour study, which included a total of 20 minutes of television viewing and approximately 40 minutes of questionnaires. All videos appeared on the computer and all questionnaires were completed on the computer using Qualtrics software. Students completed the study individually in isolated computer rooms. Three bowls of snacks were pre-measured and placed in each cubby prior to participants' arrival to the laboratory. Research assistants mentioned to

subjects that because this was an hour-long study, snacks had been provided for their comfort.

Subjects in all four conditions completed a 10-minute pretest questionnaire measuring demographics, height, weight, current health behavior, health behavioral intentions, body satisfaction, self-esteem, attainability, susceptibility, self-relevance and satisfaction in health and perseverance domains, and television viewing habits (descriptions of all measures follow). After completing the questionnaire, subjects viewed the first stimulus video.

Subjects in the beginning only, ending only, and control condition first watched a 10-minute clip of *Life of Birds*, a nature show devoid of humans in which social comparison presumably would not occur. Individuals in the beginning-and-ending condition viewed a 10-minute clip featuring segments from the beginning of season 6 of *The Biggest Loser*.

After this first exposure, subjects in all conditions completed the second 10-minute questionnaire on discrete emotions felt. Participants in the beginning only, ending only, and beginning-and-ending conditions then viewed a 10-minute clip of *The Biggest Loser*. Those in the beginning only condition viewed a 10-minute clip from the beginning of the season, whereas those in the ending only and the beginning-and-ending conditions viewed a 10-minute clip from the end of the season. Individuals in the control condition viewed another 10-minute clip from the show *Life of Birds*.

Finally, subjects completed a third questionnaire. Individuals in the beginning only, ending only, and beginning-and-ending conditions (who just viewed a clip from *The Biggest Loser*) were asked about emotions felt, social comparison behavior, satisfaction in health and perseverance domains, behavioral intentions, attainability, susceptibility, body satisfaction, identification with the contestant, and reality TV viewing habits. Those in the control

condition were asked all of the same questions, with the exception of identification and social comparison items. After subjects left the laboratory, researchers used electronic scales to weigh the total amount of snacks remaining in each of the three snack bowls for each subject.

Measures

Current health behavior. *Weekly exercise* and *current health behavior* were used as covariates in some analyses. To assess *weekly exercise*, subjects were asked two open-ended questions: one regarding how many times per week they exercised, and the other regarding the duration (in minutes) of each bout of exercise ($M = 221.64$, $SD = 222.49$). Responses on these two items were multiplied to create the scaled weekly exercise variable. To assess *current health behavior*, subjects' responses to five questions measured on a seven-point scale were averaged ($\alpha = .86$, $M = 3.95$, $SD = 1.25$). Sample items included: "How healthy were your eating habits in the past week?" (1 = *Extremely unhealthy*, 7 = *Extremely healthy*), "Overall, I believe that I get enough exercise," and "Overall, I believe that I have healthy eating habits" (1 = *Strongly disagree*, 7 = *Strongly agree*).

Behavioral intentions. Posttest measures of behavioral intent were used to test hypotheses regarding the impact of social comparison direction and resulting emotions on subsequent intent to act, and pretest measures of behavioral intent were included as covariates in some analyses. Two domains of behavioral intent were measured, specifically a health domain including items involving exercise and healthy eating habits, and a perseverance domain including items involving positive attitude and determination/perseverance. Six behavioral intention scales were created: general pretest, health pretest, perseverance pretest, general posttest, health posttest, and perseverance posttest behavioral intentions. What we call "general" behavioral intent includes items from

both the health and perseverance domains. To create a scale of *general pre- and posttest behavioral intentions*, responses on eight seven-point Likert scale items were averaged (pretest general $\alpha = .85$, $M = 5.64$, $SD = .77$, posttest general $\alpha = .87$, $M = 5.76$, $SD = .75$). Items included: “I intend to exercise more in the next week,” “I intend to eat healthier in the next week,” “In the next week, I would like to adopt a more positive attitude,” and “In the next week, I would like to work harder toward my goals.”

Pre- and posttest health behavioral intent was measured by averaging responses to four intent items dealing with exercise and healthy eating. Sample items included: “I intend to exercise more/eat healthier in the next week” and “In the next week, I would like to exercise more/eat healthier” (pretest health $\alpha = .85$, $M = 5.41$, $SD = 1.01$, posttest health $\alpha = .86$, $M = 5.64$, $SD = .933$).

Pre- and posttest intent to persevere was measured by averaging responses to four intent items dealing with positive attitude and determination/perseverance. Sample items included: “I intend to work toward a more positive attitude in the next week,” “I intend to work harder to meet my goals in the next week,” and “In the next week, I would like to adopt a more positive attitude/work harder toward my goals” (pretest perseverance $\alpha = .84$, $M = 5.87$, $SD = .80$, posttest perseverance $\alpha = .89$, $M = 5.87$, $SD = .83$).

Body satisfaction. *Pretest body satisfaction* was used as a covariate in some analyses. It was measured using averaged scores on eight items from the body dissatisfaction subscale of the Eating Disorder Inventory (Garner, Olmstead, & Polivy, 1983). This subscale accurately and validly operationalizes body-related behaviors and attitudes (Garner, 1983) without asking participants about clinical eating disorders, and has been successfully utilized by other researchers (Egbert & Belcher, 2012; Smeesters et al., 2010). Eight items

on a six-point scale (1 = *Never*, 6 = *Always*) were taken from the subscale, including “I think my thighs are too large” (reverse coded), “I feel satisfied with the shape of my body,” and “I think that my hips are just the right size” ($\alpha = .87$, $M = 3.61$, $SD = 1.01$).

Satisfaction in comparison domains. Two domains of satisfaction were measured: a health domain featuring items involving exercise and healthy eating habits, and a perseverance domain featuring items involving positive attitude and determination/perseverance. The “general” domain includes items from both health and perseverance domains. *General pretest satisfaction* was included as a covariate in some analyses, and was measured by averaging responses from the following six Likert items on a seven-point scale: “I am satisfied with my current level of physical attractiveness/level of physical fitness/ degree of physical health/ eating habits/how positive my attitude is/how determined and persevering I am” ($\alpha = .82$, $M = 4.53$, $SD = 1.12$).

Domain self-relevance. *General self-relevance*, examining the personal relevance of the health and perseverance comparison domains, was included as a covariate in some analyses. It was measured in the pretest by averaging responses to eighteen seven-point Likert scale items, including: “My physical attractiveness is an important part of who I am,” “My physical fitness is an important part of who I am,” “My general health is an important part of who I am,” “My positive attitude helps define me as a person,” “My determination/perseverance helps define me as a person,” and “I take pride in my eating habits” ($\alpha = .88$, $M = 5.12$, $SD = .78$).

Attainability. *General pretest attainability* of success in perseverance and health domains was included as a covariate in some analyses. Perceived attainability was measured by averaging responses to six seven-point Likert questions, including: “My ideal degree of

physical fitness is something I can achieve” and “My ideal degree of determination/perseverance is something I can achieve” ($\alpha = .86$, $M = 5.94$, $SD = .85$).

Discrete emotions. Discrete emotions were measured to test affect-related hypotheses. Emotional arousal was measured twice for each subject using a 37-item modified emotion adjective checklist previously utilized by Nabi and Keblusek (2014). The items were introduced as follows: “Please indicate how much you tended to feel each emotion listed below when you watched the video clip that was just shown” (0 = *Not at all*, 5 = *Extremely*). Emotions measured included: encouraged, anxious, excited, envious, ashamed, scared, distressed, embarrassed, happy, worried, repulsed, jealous, shocked, guilty, nervous, pity, frustrated, sad, upset, disgusted, inspired, disappointed, satisfied, angry, compassion, surprise, astonished, sympathetic, revolted, hopeful, contemplative, irritable, fear, contempt, relief, calm, and pride.

Scores on groups of emotions that loaded together in factor analyses were averaged to create the following scaled emotion variables: *envy* (envious and jealous, $\alpha = .88$, $M = .73$, $SD = 1.08$), *happiness* (happy and satisfied, $\alpha = .83$, $M = 1.91$, $SD = 1.37$), *compassion* (compassion and sympathetic, $\alpha = .72$, $M = 1.55$, $SD = 1.12$), and *hope* (inspired, hopeful, and encouraged, $\alpha = .94$, $M = 2.48$, $SD = 1.61$). Because no other emotions from the emotion checklist loaded with pride, the *pride* variable consisted of a single item ($M = .87$, $SD = 1.30$).

To test hypotheses involving emotion, additional emotion variables were computed for both the beginning and ending and the control condition such that the posttest 1 and posttest 2 emotion scores were averaged in the beginning-and-ending and control conditions to account for the fact that emotion was measured twice in these conditions for the same type

of programming. For the beginning only and ending only conditions, only subjects' responses to the *second* set of emotion questions were included in this variable, as subjects responded to the second set of emotion questions after viewing *The Biggest Loser*, the main program of interest.

Social comparison frequency. Six social comparison frequency scales were created to test comparison-related hypotheses. These scales were also used as covariates in some analyses. *Frequency of general upward comparison* was measured using the following seven items on a seven-point scale (1 = *Never*, 7 = *Extremely often*): “I thought about how I am generally worse off than Michelle,” “While watching, I thought about how I was worse off than Michelle in terms of attractiveness/fitness/general health/eating habits/positive attitude/determination and perseverance” ($\alpha = .87$, $M = 2.43$, $SD = 1.29$). *Frequency of upward health comparisons* was measured by averaging scores on four of the aforementioned items involving attractiveness, fitness, and health, such as: “While watching, I thought about how I was worse off than Michelle in terms of fitness/general health” ($\alpha = .87$, $M = 2.33$, $SD = 1.47$). *Frequency of upward perseverance comparisons* was measured by averaging scores on two of the aforementioned items involving positive attitude and determination/perseverance, such as: “While watching, I thought about how I was worse off than Michelle in terms of positive attitude/determination and perseverance” ($\alpha = .77$, $M = 2.88$, $SD = 1.65$).

Frequency of general downward comparison was measured by averaging scores on seven items (1 = *Never*, 7 = *Extremely often*): “I thought about how I am generally better off than Michelle,” and “While watching, I thought about how I was better off than Michelle in terms of attractiveness/fitness/general health/eating habits/positive attitude/determination and

perseverance” ($\alpha = .88, M = 3.62, SD = 1.37$). *Frequency of downward health comparisons* was measured by averaging scores on four of the aforementioned items dealing with fitness, such as: “While watching, I thought about how I was better off than Michelle in terms of general health/eating habits” ($\alpha = .88, M = 3.76, SD = 1.52$). Finally, *frequency of downward perseverance comparisons* was measured by averaging scores on two of the aforementioned items dealing with positive attitude and determination/perseverance: “While watching, I thought about how I was better off than Michelle in terms of positive attitude/perseverance and determination” ($\alpha = .88, M = 3.18, SD = 1.71$).

Social comparison direction. Six social comparison direction scales were created to test comparison-related hypotheses. Some of these scales were also used as covariates in some analyses. *General downward comparison direction* was measured by averaging scores on the following seven Likert items on a seven-point scale: “Compared with Michelle, I am generally better off” and “Compared with Michelle, I am more attractive/fit/healthier/have healthier eating habits/have a more positive attitude/am more determined and persevering” ($\alpha = .89, M = 4.27, SD = 1.19$). *Downward health comparison direction*, or downward comparison in health domains, was measured by averaging scores on four of the aforementioned items dealing with attractiveness fitness, health, and eating habits: “Compared with Michelle, I am more attractive/fit/healthier/have healthier eating habits” ($\alpha = .88, M = 4.38, SD = 1.41$). *Downward perseverance comparison direction*, or downward comparison in perseverance domains, was measured by averaging scores those two aforementioned items dealing with positive attitude and determination/perseverance: “Compared with Michelle, I have a more positive attitude/am more determined and persevering” ($\alpha = .81, M = 3.90, SD = 1.31$).

General upward comparison direction was measured by averaging scores on the following seven seven-point Likert items: “Compared with Michelle, I am generally worse off” and “Compared with Michelle, I am less attractive/less fit/less healthy/have less healthy eating habits/have a less positive attitude/am less determined and persevering” ($\alpha = .90$, $M = 3.04$, $SD = 1.21$). *Upward health comparison direction*, or upward comparison direction in health domains, was measured by averaging scores on four of the aforementioned items dealing with attractiveness fitness, health, and eating habits: “Compared with Michelle, I am less attractive/less fit/less healthy/have less healthy eating habits” ($\alpha = .89$, $M = 3.01$, $SD = 1.35$). *Upward perseverance comparison direction*, or upward comparison direction in perseverance domains, was measured by averaging scores on the two aforementioned items involving positive attitude and determination/perseverance: “Compared with Michelle, I have a less positive attitude/am less determined and persevering” ($\alpha = .85$, $M = 3.25$, $SD = 1.51$).

Overt eating behavior. Overt eating was measured using four variables (almonds consumed, M&Ms consumed, Goldfish consumed, and total food consumed) to explore research questions involving eating behavior. To record food consumption, researchers measured the total amount of almonds, M&Ms, and Goldfish remaining in each of the three snack bowls after the subject’s time in the laboratory. Amount of food consumed (in ounces) was subtracted from amount of food in the bowls at the beginning of the study (1 ounce almonds, 1.5 ounces M&Ms, and 1.1 ounces Goldfish—a serving size of each snack) to calculate how much of each snack was consumed during the study (almonds $M = .27$, $SD = .34$, M&Ms $M = .37$, $SD = .46$, Goldfish $M = .37$, $SD = .40$). Consumption of the three snacks was summed to calculate total amount of food consumed ($M = 1.01$, $SD = .98$).

In addition to all of the aforementioned items, the questionnaires also included a variety of items regarding demographics (age, year in school, race, etc.), height and weight (to calculate body mass index), transformational reality TV viewing habits, and exercise-related reality TV viewing habits to distract participants from the purpose of the study and to serve as covariates in statistical analyses. Items were pretested by research assistants prior to the launch of the study to assure that they were clear, comprehensible, and unbiased.

Pilot test

A pilot test was conducted to answer the following three questions: (1) Were comparison manipulations effective? Specifically, did subjects compare downward when viewing the beginning of the program and upward when viewing the ending? (2) Could comparison instruction enhance subjects' degree of social comparison? and (3) Were the control videos emotionally neutral? In other words, were the control videos appropriate controls?

The pilot study was a 2 (instruction/no instruction) x 2 (beginning only/ending only) experimental design. In instruction conditions, participants were told: "while watching, think about how you compare to Michelle, the character in the program." Those in beginning only conditions watched a clip from the beginning of a season of *The Biggest Loser*, whereas those in the ending only conditions watched a clip from the ending of a season of the program. Immediately afterward, they answered questionnaire items regarding their social comparisons and emotional arousal. Subjects then watched the nature clip (*Life of Birds*) and answered items regarding their emotional responses to that clip. Participants consisted of 80 female undergraduate Communication students at the University of California Santa Barbara.

To answer the first question regarding whether experimental condition impacted comparison direction, an ANOVA of general downward comparison frequency by condition was computed. Analyses revealed a significant main effect of condition, $F(3, 134) = 28.97$, $p < .001$. Pairwise comparisons revealed that those in the beginning only condition ($M = 4.64$, $SD = .83$) compared downward significantly more frequently than those in both the ending only condition ($M = 3.69$, $SD = .88$, $p < .001$) and the ending only with instruction condition ($M = 3.35$, $SD = .83$, $p < .001$). This suggests that the beginning only video was effective in eliciting downward comparisons. Next, an ANOVA of general upward comparison by condition was computed. Analyses revealed a significant main effect of condition, $F(3, 134) = 3.03$, $p = .032$. Pairwise contrasts indicated that those in the ending only with instruction condition ($M = 3.00$, $SD = 1.62$) were significantly more likely to compare upward than both those in the beginning only condition ($M = 2.21$, $SD = 1.22$, $p = .02$) and those in the beginning only with instruction condition ($M = 2.15$, $SD = 1.02$, $p = .008$). This confirms that the ending only video is a successful upward comparison manipulation, particularly when paired with comparison instructions. Indeed, the pairwise comparison between the ending only ($M = 2.44$, $SD = 1.38$) and beginning only condition was not significant ($p = .48$), nor was the comparison between the ending only and beginning only with instruction condition ($p = .37$). However, simple means were in the expected direction, with those in the ending only groups reporting more upward comparison on average than those in the beginning only groups.

To see if instruction enhanced frequency of social comparison, a 2 (instruction/no instruction) x 2 (beginning/ending) ANOVA with frequency of general comparison as the dependent variable was computed. Results indicated that instruction did not significantly

influence social comparison frequency ($p = .32$). Similarly, program condition did not significantly influence comparison frequency ($p = .37$), nor did the interaction between instruction and program condition ($p = .64$). Although the mean differences are not significant, simple means generally indicate that subjects who received instructions compared more frequently (beginning with instruction: $M = 4.27$, $SD = .83$, ending with instruction: $M = 4.33$, $SD = .76$) than those who did not receive instructions (beginning without instruction: $M = 4.05$, $SD = 1.02$, ending without instruction: $M = 4.25$, $SD = .85$). This suggests that comparison instructions may help boost comparison behavior. Due to this finding, comparison instructions were provided to subjects (except for those in the control condition) in the main study.

Last, to answer the third question regarding the emotional neutrality of the control video, we examined mean emotional arousal scores across all four experimental conditions. Subjects reported more calmness than any other emotion after watching the control video. Further, subjects reported more feelings of calmness after watching the control video ($M = 2.67$, $SD = 1.74$) rather than after watching the experimental videos ($M = 2.23$, $SD = 1.44$). A paired samples t-test indicated that the difference between these means was significant ($t(137) = -2.45$, $p = .016$, 95% CI from $-.80$ to $-.09$). Thus the control video appeared to be relatively emotionally neutral and calming relative to the experimental video.

Indeed, for thirty of the other emotions measured, arousal was greater following the experimental rather than control video, indicating that the control video was less emotionally arousing than the experimental videos on average (mean emotion scores for the control video were all between $.01$ and 2.67 , whereas mean emotion scores for the experimental videos were all between $.17$ and 3.54). This indicated that, as desired, the control video was

relatively emotionally neutral—presumably, it would not color emotional responses to future video clips. Overall, pilot testing indicated that stimulus materials were appropriate for the main study.

Results

All analyses were conducted using ANOVAs, ANCOVAs, partial correlations, and the Preacher and Hayes (2008) bootstrapping macro INDIRECT. For each hypothesis, covariates were selected based upon their correlating significantly with the variables of interest. For the partial correlations, covariates were retained if significant in subsequent regressions. For the ANCOVAs, covariates were retained if they were significant in the omnibus ANCOVA. All covariates were significant at $p < .05$.

H1: Comparison direction by experimental condition

H1a: Downward comparisons when watching the beginning of the program.

H1a predicted that individuals would engage in more downward comparisons when viewing the beginning versus the end of the program. An ANCOVA with frequency of general downward comparison as the depended variable revealed a significant main effect of experimental condition, $F(2,148) = 18.17, p < .001, \eta_p^2 = .20$ (controlling on initial general satisfaction). As predicted, those who viewed the beginning of the program ($M = 4.39, SD = 1.24$) reported more frequent general downward comparisons than those who viewed either the ending of the program ($M = 2.99, SD = 1.24, p < .001$) or both the beginning and ending of the program ($M = 3.51, SD = 1.28, p < .001$). In line with our expectations and further supporting H1a, those who watched both the beginning and ending of the program reported significantly more frequent general downward comparisons than those who viewed the ending only ($p = .02$).

A similar pattern of results emerged for downward health comparisons. Frequency of downward health comparisons differed significantly by experimental condition, $F(2,144) = 16.89, p < .001, \eta_p^2 = .19$ (controlling on initial general satisfaction). In line with our expectations, those who watched the beginning of the program ($M = 4.60, SD = 1.24$) compared downward in health domains significantly more frequently than those who watched both the beginning and ending of the program ($M = 3.65, SD = 1.45, p < .001$) and more frequently than those who watched the ending only ($M = 3.07, SD = 1.47, p < .001$). Further, in line with our expectations, those who watched the ending of the program reported significantly fewer downward health comparisons than those who viewed both the beginning and ending of the program ($p = .028$). This supports H1 for health comparisons.

Finally, an ANOVA revealed that frequency of downward perseverance comparisons differed significantly by experimental condition $F(2,147) = 5.63, p = .004, \eta_p^2 = .07$. As expected, those who viewed the beginning of the program ($M = 3.77, SD = 1.97$) made significantly more frequent downward perseverance comparisons relative to those who viewed the ending only ($M = 2.65, SD = 1.53, p = .001$). Counter to our expectations, those who watched both the beginning and ending of the program did not make any more or less frequent downward perseverance comparisons than those who watched the ending only ($p = .15$). However, in line with our expectations, those who saw the beginning only made more frequent downward perseverance comparisons than those who viewed both the beginning and ending of the program, as this contrast was borderline significant ($p = .06$). Additionally, mean differences were in the expected direction, with those who saw the beginning making the most frequent downward perseverance comparisons, followed by those who saw both the beginning and ending of the program ($M = 3.13, SD = 1.44$), then those who saw the ending

of the program. Overall, these results lend further support to H1a for downward perseverance comparisons (see Table 1).

H1b: Upward comparisons when watching the ending of the program. H1b predicted that subjects would make more upward comparisons when viewing the end versus the beginning of the program. An ANCOVA revealed that general upward comparison frequency varied significantly by experimental condition $F(2,148) = 12.86, p < .001, \eta_p^2 = .15$ (controlling on initial general satisfaction). As expected, subjects reported significantly more frequent general upward comparisons when watching the end of the program ($M = 2.78, SD = 1.43$) versus the beginning of the program ($M = 1.81, SD = .97, p < .001$. See Table 2). Also as expected, subjects reported significantly more frequent general upward comparisons when viewing both the beginning and ending of the program ($M = 2.67, SD = 1.23, p < .001$) versus the beginning only. These results support H1b.

This pattern of results also held for upward comparisons in health domains. An ANCOVA with frequency of upward health comparisons as the dependent variable revealed a main effect of experimental condition, $F(2,147) = 10.14, p < .001, \eta_p^2 = .12$ (controlling on year in school and initial general satisfaction). As expected, subjects made significantly more frequent upward health comparisons while viewing the ending of the program ($M = 2.75, SD = 1.65$) versus the beginning of the program ($M = 1.68, SD = 1.22, p < .001$), and while viewing both the beginning and ending of the program ($M = 2.54, SD = 1.34$) rather than just the beginning ($p = .001$).

Turning to perseverance domains, an ANCOVA indicated that frequency of upward perseverance comparisons differed significantly by experimental condition, $F(2,148) = 6.50, p = .002, \eta_p^2 = .08$ (controlling on initial general satisfaction). In line with our expectations,

subjects reported significantly more frequent upward perseverance comparisons when viewing the end of the program ($M = 3.12, SD = 1.75$) versus the beginning of the program ($M = 2.30, SD = 1.29, p = .002$). Also as expected, subjects made significantly more frequent upward perseverance comparisons when viewing both the beginning and the end of the program ($M = 3.16, SD = 1.75$) versus the beginning only ($p = .002$). Overall, H1b is supported.

H2: Emotions resulting from upward comparisons

H2 predicted that upward comparisons would associate with greater arousal of envy and hope. Envy was positively and significantly correlated with frequency of general upward comparisons, $r_p(147) = .41, p < .001$ (controlling on BMI, initial general satisfaction, and frequency of general downward comparisons) as well as with frequency of upward health comparisons, $r_p(146) = .35, p < .001$ (controlling on BMI, initial general satisfaction, year in school, and frequency of general downward comparisons) and frequency of upward perseverance comparisons, $r_p(147) = .36, p < .001$ (controlling on BMI, initial general satisfaction, and frequency of general downward comparisons, see Table 3). This supports H2.

ANCOVAs examining emotional arousal across conditions further support these findings. An ANCOVA with envy arousal as the dependent variable revealed a main effect of experimental condition, $F(3,196) = 12.76, p < .001, \eta_p^2 = .16$ (controlling on BMI, initial body satisfaction, and initial general satisfaction). As expected, those who viewed the end of the program reported significantly more envy ($M = 1.27, SD = 1.44$) than those who viewed the beginning of the program ($M = .36, SD = .72, p < .001$). Also as expected, those who

watched both the beginning and ending of the program ($M = 1.01$, $SD = 1.01$) reported significantly more envy than those who watched the beginning only ($p < .001$, see Table 4).

Turning to hope, a partial correlation between hope and frequency of general upward comparison was positive and significant, $r_p(146) = .29$, $p < .001$ (all analyses in this paragraph utilized most or all of the following covariates: initial behavioral intent, initial body satisfaction, initial general satisfaction, year in school, and frequency of general downward comparisons). The partial correlation between hope and frequency of upward health comparisons was also positive and significant, $r_p(147) = .22$, $p = .006$, as was the association between hope and frequency of upward perseverance comparisons, $r_p(146) = .24$, $p = .003$ (see Table 3). Thus, H2 is supported.

ANCOVA analyses involving hope arousal by experimental condition further support to these findings. As expected, there was a significant main effect of experimental condition on hope arousal, $F(3,198) = 94.50$, $p < .001$, $\eta_p^2 = .58$ (controlling on initial behavioral intent and initial body satisfaction). As expected, those who watched the ending of the program ($M = 3.38$, $SD = 1.10$) reported significantly more hope than those who watched the beginning of the program ($M = 2.94$, $SD = 1.30$, $p = .03$, see Table 4). This lends further support to H2.

H3: Emotions resulting from downward comparisons

H3 predicted that more frequent downward comparisons would associate with greater arousal of pride, happiness, and compassion. Counter to our expectations, pride was not significantly correlated with more frequent general downward comparisons, $r_p(147) = .14$, $p = .10$ (controlling on initial general satisfaction and frequency of general upward comparisons) nor was it significantly associated with more frequent downward health

comparisons, $r_p(145) = .13, p = .13$ (controlling on frequency of general upward comparisons). However, as expected, pride was positively and significantly associated with more frequent downward perseverance comparisons, $r_p(146) = .20, p = .01$ (controlling on frequency of general upward comparisons, see Table 3).

In an ANOVA examining pride arousal by experimental condition, a significant main effect was found, $F(3,199) = 14.83, p < .001, \eta_p^2 = .18$. Counter to our expectations, those who watched the end of the program ($M = 1.26, SD = 1.59$) reported significantly more pride than those who watched the beginning of the program ($M = .68, SD = 1.10, p = .02$). Also counter to our expectations, those who watched both the beginning and ending of the program ($M = 1.47, SD = 1.36$) reported significantly more pride than those who watched only the beginning of the program ($p = .001$, see Table 4). These results do not support H3, which would predict that those who view the beginning of the program experience the most pride, and those who view the ending of the program would experience the least, with those viewing both the beginning and ending of the program somewhere in between.

Like pride, happiness also was not significantly associated with frequency of general downward comparisons, $r_p(147) = .07, p = .40$ (controlling on transformational reality TV viewing, initial general satisfaction, and frequency of general upward comparisons) nor did it associate with frequency of downward health comparisons, $r_p(145) = .08, p = .34$ (controlling on transformational reality TV viewing and frequency of general upward comparisons) or with frequency of downward perseverance comparisons, $r_p(146) = .08, p = .36$ (same covariates as in the previous partial correlation, see Table 3). This does not support H3.

To further test H3, an ANCOVA with condition as the independent variable and happiness as the dependent variable revealed a significant main effect for happiness, $F(3,199) = 23.12, p < .001, \eta_p^2 = .26$ (controlling on transformational reality TV viewing). Counter to our expectations, however, those who viewed the end of the program ($M = 2.64, SD = 1.22$) reported significantly more happiness than those who viewed the beginning of the program ($M = 1.72, SD = 1.31, p < .001$). Further, subjects who viewed both the beginning and ending of the program ($M = 2.41, SD = 1.09$) reported significantly more happiness than those who viewed the beginning only ($p = .003$, see Table 4). Overall, this pattern of results runs counter to H3.

Finally, as expected, compassion was positively and significantly associated with more frequent general downward comparisons, $r_p(148) = .28, p < .001$ (controlling on initial general satisfaction and frequency of general upward comparison) as well as with more frequent downward health comparisons, $r_p(146) = .32, p < .001$ (controlling on frequency of general upward comparison), but was not significantly associated with more frequent downward perseverance comparisons, $r_p(147) = .08, p = .36$ (same covariates as in the previous partial correlation, see Table 3). These results provide mixed support for H3.

To further test H3, an ANCOVA of compassion by condition revealed a main effect of experimental condition, $F(3,197) = 26.64, p < .001, \eta_p^2 = .29$ (controlling on weekly exercise and exercise reality TV viewing). In line with our expectations, those who viewed the beginning of the program ($M = 2.28, SD = 1.06$) reported significantly more compassion than those who viewed the end of the program ($M = 1.48, SD = .99, p < .001$), and those who viewed both the beginning and ending of the program ($M = 1.86, SD = .95, p = .019$, see Table 4). This supports H3, suggesting that H3 is well supported for compassion, but not for

pride or happiness. H3 is supported for compassion in general and health domains, for pride in perseverance domains, but not for happiness in any comparison domain.

H4: Upward comparisons and behavioral intent

Domains of social comparison help determine domains of subsequent behavior—for example, if we make health comparisons, resulting behavior would likely be in health domains rather than, say, intelligence or creativity domains. Given the importance of domain specificity, the analyses below feature specific health comparison and perseverance comparison measures, rather than general measures of social comparison. Similarly, these analyses include specific health intent and perseverance intent measures, rather than general measures of behavioral intent.

H4a: Upward health comparisons and health behavioral intent. H4a predicted that health behavioral intent would increase following more frequent upward health comparisons. The partial correlation between frequency of upward health comparisons and posttest health behavioral intent was positive and significant, $r_p(144) = .18, p = .03$ (controlling on year in school, frequency of downward health comparisons, and initial general behavioral intentions), thus supporting H4a. Additionally, an ANCOVA with condition as the independent variable and posttest health behavioral intent as the dependent variable approached significance, $F(3, 197) = 2.26, p = .08$ (controlling on age and initial general behavioral intentions). Planned comparisons revealed that those who watched the ending of the program ($M = 5.73, SD = .93$) reported significantly higher posttest health behavioral intent than those in the control condition ($M = 5.43, SD = 1.02, p = .01$), as was predicted ($p = .21$). Those who watched both the beginning and ending of the program ($M = 5.72, SD = .86$) reported significantly higher health behavioral intent than those in the control

condition. Finally, counter to our expectations, those who watched the beginning of the program ($M = 5.70$, $SD = .91$) reported higher health behavioral intent than those in the control condition, and this difference was borderline significant, $p = .06$. Overall, while the contrasts are not all significant (non-significant p values range from $p = .06$ to $p = .60$), those who watched the beginning only, ending only, and both beginning and ending of the program reported higher health behavioral intent than those in the control condition, which is not precisely what was predicted. Ultimately, support for H4a is mixed.

H4b: Upward perseverance comparisons and intent to persevere. H4b predicted that more frequent upward perseverance comparisons would lead to increased intent to persevere. A partial correlation between frequency of upward perseverance comparison and posttest intent to persevere was not significant, $r_p(143) = .01$, $p = .93$ (controlling on initial general satisfaction, frequency of downward perseverance comparisons, initial general behavioral intentions, and attainability). Similarly, an ANCOVA did not reveal a significant main effect of condition on posttest intent to persevere, $p = .47$ (controlling on initial behavioral intentions and attainability). None of the planned contrasts were significant (significance values ranged from $p = .20$ to $p = .90$). Thus, H4b is not supported.

H5: Downward comparisons and behavioral intent

H5a: Downward health comparisons and health behavioral intent. H5a predicted that subjects who engaged in more frequent downward health comparisons would experience no change in subsequent health behavioral intent. A partial correlation between frequency of downward health comparisons and posttest health behavioral intent was positive and not significant, $r_p(145) = .13$, $p = .11$, but its notable magnitude suggests that downward comparisons might motivate health behavior, which is the opposite of what was expected

(controlling on frequency of upward health comparisons and initial general behavioral intentions). Recall from H4a that those who watched the beginning of the program ($M = 5.70$, $SD = .91$) reported higher health behavioral intent than those in the control condition ($M = 5.43$, $SD = 1.02$), and this difference was borderline significant, $p = .06$. This runs counter to our expectations. Overall, H5a is not supported.

H5b: Downward perseverance comparisons and intent to persevere. H5b predicted that those who made more frequent downward perseverance comparisons would experience no change in subsequent intent to persevere. In line with our expectations, the association between frequency of downward perseverance comparison and posttest intent to persevere was small in magnitude and not significant, $r_p(145) = .03$, $p = .76$ (controlling on frequency of upward perseverance comparison, initial general behavioral intentions, and attainability). Recall from H4b that an ANOVA of posttest perseverance intent by experimental condition was not significant ($p = .47$), nor were any of the contrasts. Thus, H5b is supported.

H6: Mediating role of emotions following upward comparisons

H6a: Mediating role of emotions following upward health comparisons. H6a predicted that envy and hope would mediate the relationship between frequency of upward health comparisons and subsequent health behaviors (conceptualized as health behavioral intent). To see if the data were suitable for mediation analyses, simple correlations between the potential mediators and health behavioral intent were computed. The correlations were significant for both envy, $r(202) = .20$, $p = .004$ and hope, $r(202) = .26$, $p < .001$, suggesting that mediation analyses were appropriate.

Controlling on envy, the positive and once-significant relationship between frequency of upward health comparisons and posttest health behavioral intent, $r_p(144) = .18, p = .03$ (from H4a) remained positive and became non-significant $r_p(143) = .08, p = .36$. It also decreased substantially in magnitude, from .18 to .08, suggesting mediation and supporting H6a. Controlling on hope, the positive and significant relationship between frequency of upward health comparisons and posttest health behavioral intent, $r_p(144) = .18, p = .03$ (from H4a), was also rendered non-significant, $r_p(143) = .15, p = .06$. However, the association did not decrease substantially in magnitude, suggesting that hope is unlikely to be a mediator.

We utilized the Preacher and Hayes (2008) INDIRECT macro for SPSS to further test H6a. Bootstrapping with 5000 resamples confirmed the mediating role of envy, (95% CI from .004 to .10, controlling on frequency of downward health comparisons, year in school, and pretest general behavioral intent), suggesting that envy fully mediates the relationship between frequency of upward health comparisons and health behavioral intent. Further confirming the mediating role of envy, the relationship between frequency of upward health comparisons and subsequent health behavioral intent was rendered non-significant and its magnitude was cut in half when controlling on envy (before controlling on envy: $\beta = .08, p = .03$, after controlling on envy: $\beta = .04, p = .36$, see Figure 3). As to hope, bootstrapping was not significant, as the confidence interval included zero (95% CI from -.004 to .03, same covariates as the analysis above). Thus, hope does not appear to be a mediator in this case. Overall, H6a was partially supported.

H6b: Mediating role of emotions following upward perseverance comparisons.

H6b predicted that envy and hope would mediate the relationship between frequency of upward comparisons in perseverance domains and subsequent intent to persevere. To see if

the data were suitable for mediation analyses, simple correlations between the potential mediators and perseverance intent were computed. The correlation was not significant for envy, $r(202) = .04, p = .59$, but it was significant for hope, $r(202) = .18, p = .01$, indicating that hope, but not envy, should be further tested for mediation.

Partial correlation mediation analyses were not conducted, as all partial correlation between perseverance comparisons and posttest intent to persevere were not significant ($p = .93$, from H4b). Bootstrapping analysis yielded a confidence interval including zero, confirming that envy is not a mediator, CI $-.04$ to $.05$ (controlling on frequency of downward perseverance comparisons, pretest general satisfaction, pretest general behavioral intent, and attainability). As to hope, bootstrapping yielded a confidence interval from $.001$ to $.06$ (same covariates as in the analysis above). This interval does not include zero, but the relationship between frequency of upward perseverance comparisons and posttest intent to persevere was non-significant in the model ($p = .93$), and this relationship decreased in magnitude ($\beta = .004$ was reduced to $\beta = -.02$) but remained non-significant when including hope as a mediator ($p = .64$). Given this, the analysis confirms that hope is an indirect mediator, which supports H6b. Overall, H6b was partially supported.

Research questions: Social comparisons and eating behavior

RQ1: Upward comparisons and eating. RQ1 asked whether subjects would (a) consume less food overall after making upward health comparisons, or whether they would (b) choose to eat healthier foods overall. Regarding total food consumed, the partial correlation between frequency of upward health comparison and total food consumed during the study was not significant, $r_p(143) = .07, p = .41$ (controlling on year in school, frequency of downward health comparisons, and race). Corroborating these results, an ANCOVA of

total food consumed during the study by experimental condition was not significant ($p = .26$, controlling on race). Overall, this suggests that the total amount of food consumed does not vary by frequency of upward comparisons or experimental condition.

Next, we examined whether subjects eat more *healthy* foods following upward health comparisons. Partial correlations indicate that more frequent upward health comparisons were positively and significantly associated with amount of almonds consumed, $r_p(143) = .17, p = .04$ (controlling on year in school, race, and frequency of downward health comparisons), but not with amount of goldfish consumed, $r_p(144) = -.05, p = .53$ (controlling on year, and frequency of downward health comparisons), or M&Ms consumed, $r_p(143) = .06, p = .48$ (controlling on year, relevance, and frequency of downward health comparisons. See Table 5). This supports the notion that frequent upward comparisons impact the type of food subjects choose to consume. No ANCOVAs with food consumption as dependent variables revealed a significant effect of experimental condition, suggesting that condition did not have a significant impact on type of food consumed: for almonds, $p = .18$ (controlling on race), for goldfish, $p = .12$ (controlling on year in school), or for M&Ms, $p = .39$ (controlling on self-relevance).

RQ2: Downward comparisons and eating. Correlations were used to examine whether those who frequently compared downward ate more overall. The correlation between frequency of downward health comparison and total food consumed was positive but not significant, $r_p(144) = .03, p = .70$ (controlling on frequency of upward health comparisons and race). ANCOVA analyses did not lend support to the notion that downward comparisons impact total food consumption, either (an ANCOVA of total food consumed by

condition was not significant, $p = .26$, from RQ1). Overall, it does not seem that comparison direction or frequency impact the total amount of food consumed during the study.

Next, we examined whether downward comparisons might impact the type of food that subjects elect to consume. Partial correlations examining frequency of downward health comparisons and food consumption were not significant for almonds, $r_p(144) = -.12, p = .14$ (controlling on frequency of upward health comparisons and race), or Goldfish, $r_p(144) = .01, p = .88$ (controlling on frequency of upward health comparisons and year in school), but a positive and borderline significant relationship was found for M&Ms, $r_p(144) = .16, p = .06$ (controlling on self-relevance and frequency of upward health comparisons. See Table 5). Despite the fact that the ANCOVA in RQ1 examining M&M consumption by experimental condition was not significant ($p = .39$), this suggests that downward comparisons indeed impact the type of food one chooses to consume, as more downward health comparisons were associated with eating more M&Ms.

RQ3: Emotions mediating eating behavior. RQ3 asked whether specific discrete emotions would mediate any identified relationships between social comparisons and subsequent eating behavior. Recall from RQ1 that more frequent upward health comparisons were positively and significantly associated with amount of almonds consumed, $r_p(143) = .17, p = .04$. To see if the data were suitable for mediation analyses, simple correlations between the potential mediators and almond consumption were computed. The correlation was significant for envy, $r(201) = .16, p = .02$, but not for hope, $r(201) = .05, p = .50$, indicating that envy should be explored as a potential mediator.

Partial correlation mediation analyses indicated that when adding envy as a covariate, the aforementioned relationship between upward health comparisons and almonds consumed

was rendered non-significant, $r_p(142) = .11, p = .18$. Further, the correlation reduced a bit in magnitude, from .17 to .11, suggesting that envy might mediate the social comparison–almond consumption relationship. However, bootstrapping was not significant for envy, CI from -.01 to .04 (controlling on frequency of downward health comparisons, year in school, and race), as the confidence interval included zero. This suggests that envy is not a mediator in the upward health comparison-almond consumption relationship.

Recall from RQ2 that the partial correlation between frequency of downward health comparisons and M&Ms consumed was positive and borderline significant, $r_p(144) = .16, p = .06$. Thus, meditational analyses were conducted for the relationship between downward health comparisons and M&Ms consumption. To see if the data were suitable for mediation analyses, correlations between the potential mediators and M&Ms consumption were computed. The correlation was not significant for pride, $r(200) = .07, p = .31$, happiness, $r(201) = -.03, p = .65$, or compassion, $r(201) = .03, p = .70$. Further analyses were not conducted, as none of the variables were suitable for meditational analyses.

Discussion

The goal of this research was to test the relationship between specific types of media-stimulated comparisons and specific discrete emotions as well as the crucial link between comparison-induced emotions and health behaviors. Ultimately, the primary goal of the study was to test the newly proposed Affect Model of Social Comparison (AMSC). We found that, as predicted, different experimental conditions led to different comparison directions. Also as predicted, upward comparisons in health and perseverance domains resulted in envy and hope. Counter to our predictions, happiness was unrelated to downward comparison, and downward comparisons resulted in feelings of compassion and pride in only

certain comparison domains. As predicted, frequency of upward health comparison was positively and significantly associated with health behavioral intent. Frequency of downward health comparison was moderately associated with health behavioral intent as well, suggesting that, counter to our predictions, both upward and downward social comparisons can motivate behavior in certain contexts. Neither frequency of downward nor upward perseverance-based comparison was related to intent to persevere, however. In terms of overt eating, results indicated that frequency of upward health comparison was positively associated with almond consumption, and frequency of downward health comparison was associated with increased M&Ms consumption. Mediation analyses revealed that envy fully mediates the upward health comparison-health behavioral intent relationship, whereas hope indirectly mediates the relationship between upward perseverance comparisons and intent to persevere. In the coming section, I will address each of these key findings in turn.

Media stimulus and comparison direction

As predicted, we found that those who viewed a less desirable media model tended to make more downward comparisons to the character in the program, whereas those who viewed the same model in more desirable circumstances (e.g. after a physical transformation) tended to make more upward comparisons to the character, with those who viewed both depictions somewhere in between or indistinguishable from the ending only condition, suggesting a recency effect. Thus, we have evidence that a transformational media figure can elicit *both* downward and upward comparisons over the course of a program, depending upon when these comparisons are made. This finding is unique in comparison-based media effects research, as much of this research has only addressed upward comparisons to ideal media models (see Jones, 2001; Morrison, Kalin, & Morrison, 2004; Agliata & Tantleff-Dunn,

2004; Botta, 1999; Cattarin et al., 2000; Hawkins, Richards, Granley, & Stein, 2004; Tiggemann & McGill, 2004). Given that media characters change and evolve over the course of a program or series, it makes sense that our comparisons can also shift. While the results of the present study indicate that comparison directions can differ among those who view the beginning versus the end of the program, it seems possible that a *single* viewer can compare downward to a character before his or her transformation, and can later compare upward to the same character after the transformation. Additionally, comparison directions could shift from upward to downward for characters whose plight worsens over the course of a program. Future research should utilize within-subjects designs to explore this possibility, and to assess emotional and behavioral outcomes of shifting comparisons over time. For example, perhaps initial downward comparisons would contribute to weaker effects of later upward comparisons to the same character due to residual arousal of non-corrective emotions, or perhaps we would see a recency effect such that the most recent comparisons and emotions experienced would have the strongest impact on behavior, regardless of the comparisons previously made and emotions previously experienced. Alternatively, we might see that initial downward comparisons contribute to stronger behavioral effects of later upward comparisons to the same character because viewing the character's complete transformation enables viewers to see the action steps they can take to improve their own lives, and shows them that success is indeed possible, boosting perceived attainability.

Emotions resulting from social comparisons

As to the model testing, the prediction that specific comparison directions would lead to specific discrete emotions was supported for upward but not for downward comparisons. Indeed, those who made more frequent upward comparisons tended to feel more envy and

hope, regardless of the comparison domain. However, results were more mixed for downward comparisons. Indeed, many of the emotions we were predicting to result from downward comparisons actually often associated more with upward comparisons. As expected, more frequent general downward comparisons and health-based downward comparisons were associated with more feelings of compassion, though perseverance-based downward comparisons were not associated with compassion. Perhaps this is because viewers do not feel compassion toward those who are less persevering and have a less positive attitude than themselves—indeed, these individuals may be seen as whiny and complaining. Instead, more frequent downward perseverance comparisons were associated with greater pride, perhaps because viewers felt good about themselves and their perseverance levels.

Downward health comparisons were not associated with pride, perhaps because subjects interpreted pride as feeling proud *of the character* rather than proud of themselves. It is unlikely that subjects would be proud of the overweight character at the beginning of the program. Finally, counter to our expectations, frequency of downward comparison was not associated with happiness arousal, regardless of the domain of comparison. Perhaps this is because subjects interpreted happiness as feeling happy *for the character* rather than for oneself. Subjects likely would not feel happy for the overweight character at the beginning of the program, which may have led to the low happiness and pride arousal in the beginning only condition. The AMSC model was created under the assumption that the target of emotional arousal is a participant who is focusing on his or her *own* goals and feelings (for all emotions except compassion, which is inherently empathetic and other-directed). However, the does not hold when participants experience empathetic emotions wherein the

target of arousal is the media character, and participants feel happy for or proud of this character. Given this, emotion should be measured more carefully in future studies, taking into account the target of the arousal. Alternatively, it is also possible that the downward comparison branch of the AMSC model needs to be revisited, as the emotions predicted were not the ones that subjects felt following downward comparisons. These results are instructive, however, for while most media research to date has found that social comparisons lead to general negative affect, the present experiment found that different types of comparisons are associated with *specific* emotions, both positive (i.e., compassion, pride, and hope) *and* negative (i.e., envy).

Social comparison and behavioral intent

As to social comparison and behavioral intent, as expected, frequency of upward comparisons in health domains positively and significantly associated with health behavioral intent. However, ANCOVA analyses did not corroborate these results, perhaps because condition was not a perfect proxy for social comparison behavior. Indeed, subjects made downward comparisons most often, even when viewing the ending of the program. ANCOVA analyses of the proportion of downward versus upward comparisons by condition indicated that, controlling on initial general satisfaction, subjects made significantly more downward comparisons than upward comparisons in all conditions ($F(2,148) = 27.86, p < .001, \eta_p^2 = .27$). The proportion of downward versus upward comparisons was highest in the beginning only condition ($M = 2.57, SD = 1.77$), followed by the whole program condition ($M = .85, SD = 1.95$), then the ending only condition ($M = .21, SD = 2.04$). This finding makes sense in light of research suggesting that the pleasure of comparing downward is a fairly significant motivation for reality TV viewing among individuals who take pleasure in

the difficult life circumstances of those appearing on reality television programs (Nabi et al., 2003). Such individuals are likely to compare downward rather than upward regardless of the show's content. These results also make sense when considering that most of the experimental subjects were already quite fit and healthy (BMI $M = 22.12$, $SD = 3.34$, which is solidly in the "healthy weight" range).

Downward comparisons were positively associated with posttest health behavioral intent, and the correlation, while not significant, was notable ($r_p(145) = .13$). In fact, the magnitude was quite similar to that of the upward comparison-health intent correlation ($r_p(144) = .18$), indicating that, counter to our predictions, both upward *and* downward comparisons can motivate health behavior. In general, results suggest that upward comparison matters as a motivator, but simple means indicated increased posttest health behavioral intent from *all* experimental conditions relative to the control, suggesting that the program may have had a general motivating influence on viewers' health behavioral intentions regardless of comparison direction. Perhaps downward comparison prompted health behavior change due to high perceived susceptibility of becoming worse off in the future—this is a question for future research to explore.

The association between perseverance comparisons and perseverance intent were examined next. The relationship between frequency of downward perseverance comparisons and perseverance intent was small and not significant ($r_p(145) = .03$), suggesting that, in line with our predictions, downward comparisons do not alter individuals' intent to persevere. This is likely because downward comparison contributes to arousal of non-corrective emotions that do not motivate individuals to change their behavior for better or worse. Nearly identical results were found for upward perseverance comparisons and perseverance

intent ($r_p(143) = .01$), suggesting that the perseverance domain may simply be seen as more immutable and resistant to change and improvement than the health domain. Indeed, it may be that the *domain* of comparison is more important in shaping health behaviors than the comparison direction.

Social comparison and eating behavior

In addition to increased behavioral intent, impacts on overt health behavior were also seen. More frequent upward comparisons in health domains were significantly and positively associated with number of almonds consumed during the study. Interestingly, those who made more frequent health-based upward comparisons opted to consume the healthiest snack option provided (almonds). Further, those who made more downward comparisons in health domains opted to eat more of the least healthy snack option provided (M&Ms), suggesting that downward comparisons may lead to a “slacker” effect in which health behavior actually declines due to feelings of perceived health superiority. Individuals may feel that they can consume unhealthy food in the moment because they are already much healthier than the comparison target. Future research should explore if these effects can persist in the long run, or if subjects will begin to eat healthier shortly after exposure to the worse off comparison target. Ultimately, this finding highlights the potential power of media characters to influence not only viewers’ cognitions and feelings, but the specific types of food that they choose to consume.

Emotions as mediators

As to mediational analyses, results support the AMSC model for health-based upward comparisons—those who made more frequent upward health comparisons felt more envy, and this envy, in turn, contributed to increased health behavioral intent (intent to

exercise and eat healthy). This finding that envy is a mediator aligns nicely with Lazarus and other emotion scholars' notion that emotion drives action, reinforces our classification of envy as an approach or corrective emotion, and corroborates the results of Nabi and Keblusek (2014), who found that envy mediated the relationship between social comparison and desire for invasive cosmetic procedures.

Hope was identified as an indirect mediator in the relationship between frequency of upward perseverance comparisons and intent to persevere, suggesting that comparison-induced emotions can shape behavioral intentions in a variety of domains, ranging from the physical (i.e. exercise, healthy eating) to the psychological (i.e. determination, positive attitude). These findings mirror Nabi and Keblusek (2014), who found that envy fully mediates the social comparison-behavior relationship, whereas hope is an indirect mediator that inspires improvement. It may be the case that different corrective emotions drive action depending upon the comparison context. In this study, feeling envious of another's success drives health behavior change, whereas feeling hopeful that one's personality (determination and perseverance) can change drives perseverance behavior change. The motivating power of hope relates nicely to Dweck's (2006) work on the fixed versus growth mindset—future research could benefit from considering viewers' beliefs regarding the mutability or immutability of the comparison domain in question, and how that influences intent to change one's behaviors.

Given these findings, producers of media messages seeking to promote healthful behaviors should consider messages featuring characters that are not overly thin, but still somewhat better off than audience members in the relevant health domains being espoused (i.e., fitness, eating habits, etc.) to inspire feelings of envy, which drive action meant to

improve one's relative status. It is important to note, however, that there may be significant psychological costs associated with envy, including lowered self-esteem and increased hostility (Smith & Kim, 2007). Future research should explore the relative costs and benefits of envy to see if envy arousal is indeed a practical behavior change strategy. To inspire feelings of hope that also drive audience members to improvement-oriented action, producers might also consider featuring characters similar to audience members whose success seems somewhat attainable.

Strengths and shortcomings of the AMSC model

The AMSC model was not entirely supported for downward comparisons, as downward comparisons were not associated with all of the emotions in the model. Further, the model was not well supported for perseverance-related domains (i.e. intent to work harder toward one's goals and to adopt a more positive attitude). This may be because perseverance domains are seen as more immutable and resistant to change, and questions such as "I intend to adopt a more positive attitude in the future" may have been difficult for subjects to interpret. Finally, mediation models were not well supported for overt eating behavior. Perhaps this is because the laboratory environment may have been seen as an uncomfortable place to eat, so our results may not accurately reflect naturalistic eating behavior. Ultimately, however, results suggest that the AMSC model at least partially reflects the role of media-stimulated upward comparisons and emotion in contributing to behavioral intent.

The Affect Model of Social Comparison is the first media effects model to unite social comparison theorizing and research with Lazarus' (1991a, 1991b) discrete emotion typology and his cognitive-motivational-relational theory of emotion, and it explains the

specific mechanism through which comparisons induce behaviors. This is theoretically and practically important because it allows researchers and producers of media messages to better understand how health messages can spur or deter health behavior, depending upon specific psychological characteristics of audience members. Ultimately, this study helps demonstrate the importance of examining specific domains of comparison, as effects may be found in some domains but not others. Finally, the study shows that different directions of comparison contribute to distinct emotional and behavioral outcomes. Future research should continue to explore emotions and behaviors resulting from different comparison directions and domains.

Limitations and Directions for Future Research

The present study is not without limitations. One significant limitation involves ecological validity. We recognize that the laboratory environment does not reflect the everyday television viewing experience, particularly in that participants do not select their own media content and may be paying closer attention to the program than they normally would, which could limit generalizability. Further, scenes from the program have been edited and taken out of context in the present study, so future research should adopt a more naturalistic approach using unedited shows as stimulus materials. Future studies should specify the target of arousal when measuring emotion (asking “I feel happy for myself” versus “I feel happy for the character”) and should use more sophisticated eating measures, providing subjects with a wider variety of snack options and video recording food consumption.

Future research should also examine the behavioral and psychological effects of different types of “transformational” reality shows, and would benefit from within-subjects

designs to more closely examine temporal effects. Subsequent experiments could also manipulate perceptions of attainability and susceptibility, and could explore other positive behavioral outcomes resulting from social comparisons to media targets, such as motivation to achieve intellectually and socially. It seems plausible that different types of media-stimulated comparisons could contribute to a plethora of pro-social behaviors, such as increased time spent developing healthy relationships, doing homework, or honing important skills (athletic, musical, etc.). Future research should examine the notion that while media depictions could promote demoralization or inaction, they might also inspire viewers to improve their lives in a variety of ways. While the AMSC model was designed to apply to health behaviors, it could be expanded to include other types of pro-social outcomes resulting from different discrete emotions. Ultimately, the newly proposed AMSC model helps us to systematically predict health behaviors and behavioral intent from media-stimulated comparison direction and discrete emotions experienced, rendering it a novel and useful contribution to the media effects literature. The model demonstrates that our connections to media characters can influence our emotions and behaviors in significant ways, and it can pave the way for much novel exploration into media, social comparison, affect, and behavior change.

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Appendix

Lazarus' (1991a) Discrete Emotion Typology

Emotion	Core Relational Theme	Perceived Susceptibility	Perceived Attainability	Goal Congruency	Coping Potential	Future Expectations	Action Tendency
Hope	Fearing the worst but longing for better	Moderately high	Moderately high	Problematic	Slightly favorable; uncertain	Uncertain	Approaching the desired outcome
Envy	Desiring what someone else has	--	High	Goal Incongruent	Favorable	Favorable	Seeking the object of our desire
Anxiety	Facing uncertain, existential threat	Moderately high	Moderately low	Goal Incongruent	Uncertain	Uncertain	Avoidance; escape
Sadness	Have experienced irrevocable loss	--	Low	Goal Incongruent	Unfavorable	Unfavorable, but not entirely hopeless	Inaction; withdrawal
Compassion	Relating and reacting to another's suffering	Moderately low	--	Problematic	Unnecessary	Unnecessary, but could be favorable	Expressing sympathy; helping the other person
Pride	Taking credit for a valued achievement	Low	--	Goal Congruent	Unnecessary	Unnecessary	Bragging; showing off
Happiness	Making progress toward one's goals	Low	--	Goal Congruent	Unnecessary	Favorable	Outgoingness; desire to approach others

Figure 1. Lazarus' (1991a) Discrete Emotion Typology, including appraisals of goal congruency, coping potential and future expectation, as well as action tendencies. Note that hope and compassion are deemed “problematic” in terms of goal congruency, as they are somewhat “positive” emotions arising out of goal-incongruent situations for the self (in the case of hope) or for others (in the case of compassion). Emotions included in hypotheses are bolded.

Affect Model of Social Comparison (AMSC)

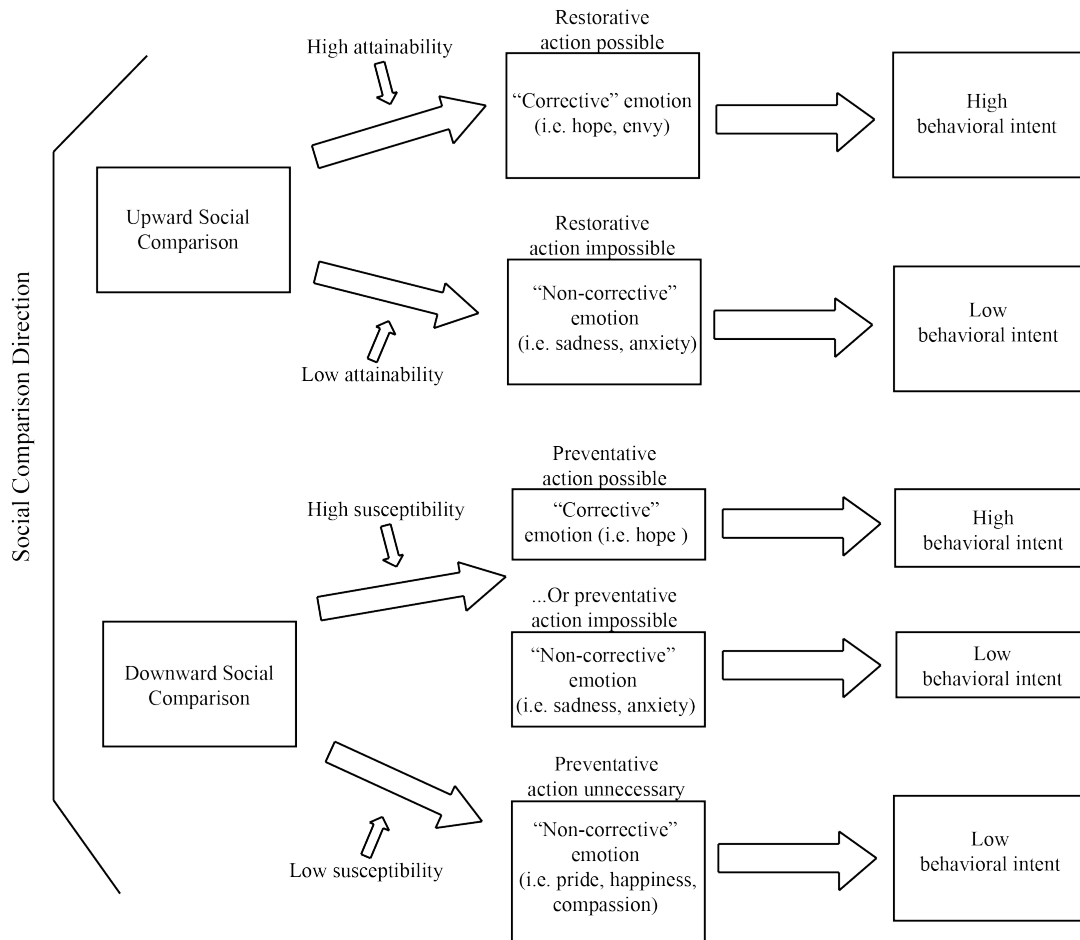


Figure 2a. The full Affect Model of Social Comparison (AMSC), containing four main branches: upward comparison with high attainability, upward comparison with low attainability, downward comparison with high susceptibility, and downward comparison with low susceptibility.

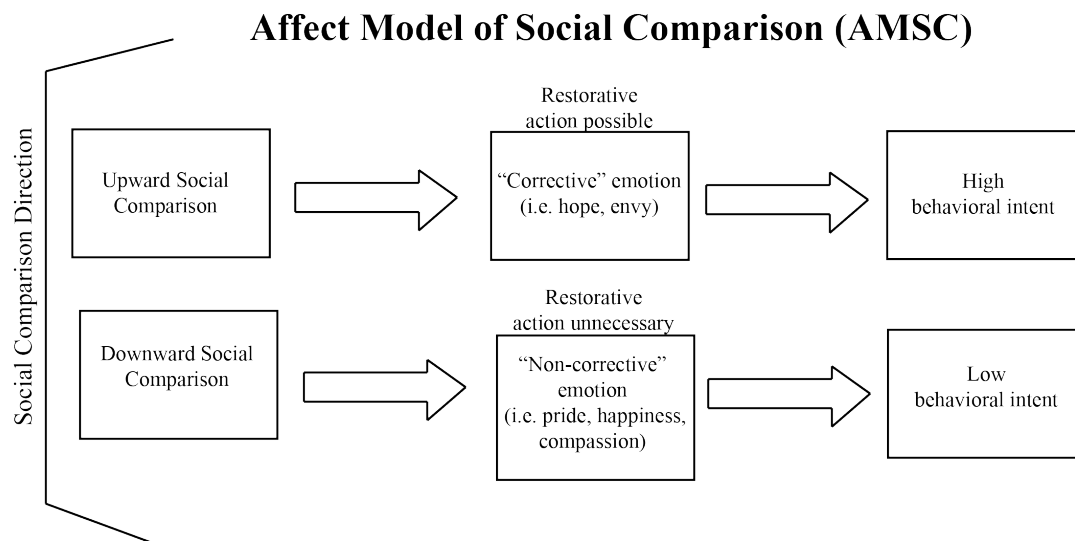


Figure 2b. The condensed Affect Model of Social Comparison (AMSC), tested in the present study. Discrete emotions mediate the social comparison-behavior relationship in both health and perseverance domains.

Envy mediating the relationship between upward comparison and health behavioral intent.

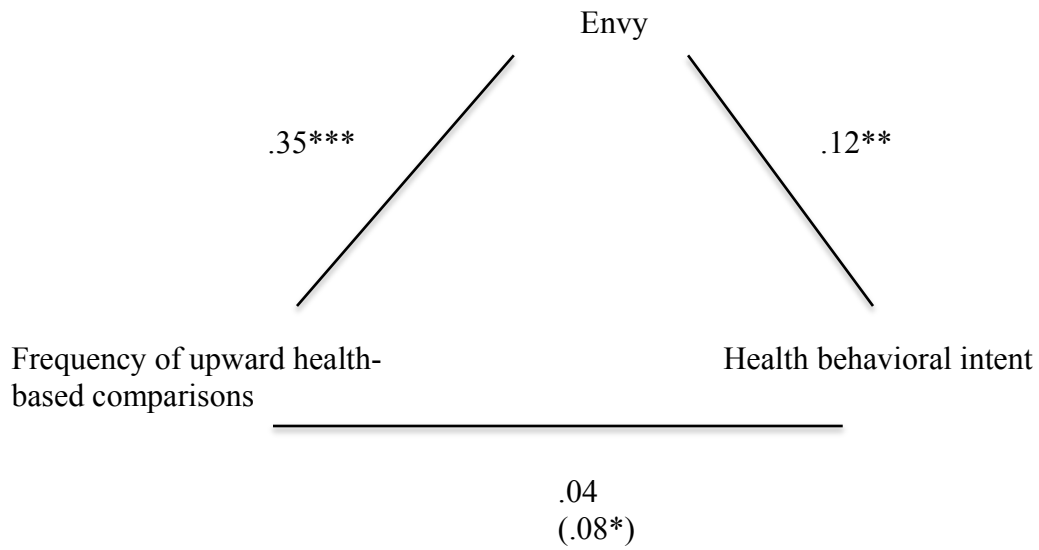


Figure 3. *** $p < .001$, ** $p < .01$ or $p = .01$, * $p < .05$

Table 1.

Frequency of Downward Comparison by Condition

Frequency of General Downward Comparison	Beginning Only	Ending Only	Beginning and Ending
M*	4.39 _a	2.99 _b	3.51 _c
SD	(1.24)	(1.24)	(1.28)
Frequency of Downward Health Comparison	Beginning Only	Ending Only	Beginning and Ending
M*	4.6 _a	3.07 _b	3.65 _c
SD	(1.24)	(1.47)	(1.45)
Frequency of Downward Perseverance Comparison	Beginning Only	Ending Only	Beginning and Ending
M*	3.77 _a	2.65 _b	3.13 _{a, b}
SD	(1.97)	(1.53)	(1.44)

* Means between conditions differ $p < .05$. Subscripts that differ within rows are significantly different at $p < .05$. See manuscript for covariates utilized in each analysis.

Table 2.

Frequency of Upward Comparison by Condition

Frequency of General Upward Comparison	Beginning Only	Ending Only	Beginning and Ending
M*	1.81 _a	2.78 _b	2.67 _b
SD	(0.97)	(1.43)	(1.23)
Frequency of Upward Health Comparison	Beginning Only	Ending Only	Beginning and Ending
M*	1.68 _a	2.75 _b	2.54 _b
SD	(1.22)	(1.65)	(1.34)
Frequency of Upward Perseverance Comparison	Beginning Only	Ending Only	Beginning and Ending
M*	2.3 _a	3.12 _b	3.16 _b
SD	(1.29)	(1.75)	(1.75)

* Means between conditions differ $p < .05$. Subscripts that differ within rows are significantly different at $p < .05$. See manuscript for covariates utilized in each analysis.

Table 3.

Correlations between Comparison Frequency and Emotional Arousal

	Downward (General)	Downward (Health)	Downward (Perseverance)	Upward (General)	Upward (Health)	Upward (Perseverance)
Anxiety	-.004	.03	-.08	.36**	.29**	.33**
Surprise	-.07	-.05	-.08	.34**	.25*	.38**
Envy	-.17*	-.17*	-.14	.41**	.35**	.36**
Embarrassed	-.08	-.06	-.14	.36**	.29**	.35**
Fear	-.01	-.01	-.05	.29**	.24*	.29**
Disgust	.20*	.23*	.02	-.06	-.11	.09
Anger	-.06	-.04	-.11	.28**	.23*	.26**
Sad	.04	.05	-.05	.21*	0.13	.29**
Hope	-.03	-.05	.01	.29**	.22*	.24*
Relief	.15	.16	.09	.17*	.13	.19*
Pride	.14	.13	.2*	.18*	.17*	.12
Happy	.07	.08	.08	.20*	.18*	.18*
Compassion	.28**	.32**	.08	-.04	-.10	.08

Note. * $p < .05$, ** $p \leq .001$. Hypothesized relationships involving emotional arousal include covariates as discussed in the manuscript. Correlations featuring emotions not included in the hypotheses do not include any covariates.

Table 4.

Emotional Arousal by Condition

Envy	Beginning Only	Ending Only	Beginning and Ending	Control
M*	0.36 _a	1.27 _b	1.01 _b	0.29 _a
SD	(0.72)	(1.44)	(1.01)	(0.71)
Hope	Beginning Only	Ending Only	Beginning and Ending	Control
M*	2.94 _a	3.38 _b	3.18 _{a, b}	0.43 _c
SD	(1.3)	(1.1)	(1.13)	(0.69)
Pride	Beginning Only	Ending Only	Beginning and Ending	Control
M*	0.68 _a	1.26 _b	1.47 _b	0.05 _c
SD	(1.1)	(1.59)	(1.36)	(0.23)
Happiness	Beginning Only	Ending Only	Beginning and Ending	Control
M*	1.72 _a	2.64 _b	2.41 _b	0.86 _c
SD	(1.31)	(1.22)	(1.09)	(1.12)
Compassion	Beginning Only	Ending Only	Beginning and Ending	Control
M*	2.28 _a	1.48 _b	1.86 _b	0.61 _c
SD	(1.06)	(0.99)	(0.95)	(0.74)

* Means between conditions differ $p < .05$. Subscripts that differ within rows are significantly different at $p < .05$. See manuscript for covariates utilized in each analysis.

Table 5.

Correlations Between Frequency of Health Comparisons and Food Consumption

Comparison Frequency	Total Food	Almonds	Goldfish	M&Ms
Upward (health)	0.07	.17*	-.05	0.06
Downward (health)	0.03	-.12	0.01	.16†

Note. † $p < .10$, * $p < .05$, ** $p < .00$. See manuscript for covariates included in each analysis.