Seeing Isn't Always Believing:

Effects of Self-Awareness on Defensive Processing in Response

to a Personally Relevant Health Message

by

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ABSTRACT

This research examines the effects of using similar vs. dissimilar models in health messages on message compliance. I find that level of self-awareness moderates the effect of model similarity on message compliance. Across three studies, I demonstrate that when self-awareness is high, a health message that contains a similar model leads to higher compliance than the same message containing a dissimilar model. On the other hand, when self-awareness is low, a health message that contains a similar model leads to lower message compliance than the same message containing a dissimilar model. Additionally, I demonstrate that the increased compliance observed when self-awareness is high and a similar model is used is associated with self-enhancing behavior and increased engagement with the ad, while the decreased compliance observed when self-awareness is low and a similar model is used is associated with disregarding the ad.

To my parents, I would like to thank you for your constant love and support.

You have taught me the meaning of unconditional love and to always have faith

in my own strength.

James, without you I would never have started down this path.

Thank you for your love, for all your sacrifices on my behalf (both big and small),

for cheering me on and lending a hand, and for your unwavering confidence in

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Naomi, thank you for always treating me as a colleague.

You have been the ideal mentor and friend throughout this process and I will

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INTRODUCTION

In recent years, there has been increasing concern over the obesity epidemic in the United States. Recent data suggest that as many as 68% of adult Americans can be classified as overweight or obese, with more than 35% of the adult population classified as obese (Flegal et al. 2010). Given the great individual and societal costs associated with obesity, it is important to develop strategies to help consumers make better food choices. One way that the government has tried to address this issue is through the use of public service announcements (PSA), or health messages, promoting a healthier lifestyle. Many of these messages emphasize the types of eating behaviors that help to promote healthier living. These recommendations include eating more whole foods, limiting saturated fats, and staying within daily caloric needs. This paper seeks a greater understanding of how external cues contained in these health messages influence consumption decisions and which factors are most likely to lead to more healthful food choices. In particular, I am interested in both how the model used in the message and the level of self-awareness at the time of exposure to the message interact to influence message compliance.

An interesting challenge inherent to designing health messages is that those for whom the health message is most relevant are most likely to disregard the message (c.f. Liberman and Chaiken 1992; Block and Williams 2002; van Koningsbruggen, Das and Roskos-Ewoldsen 2009). This effect is due to individuals attempting to protect themselves against the threat of knowing that their health might be at risk. This heightened perception of personal risk, rather

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than leading to behavioral change in an attempt to reduce the risk, often leads to biased processing of the message. In response to the perceived threat posed by the message, individuals attempt to process the message in a manner that is less threatening to the self, by avoiding the message (Nielsen and Shapiro 2009; Donohew, Lorch and Palmgreen 1991), denying personal susceptibility (Stuteville, 1991), or questioning the claims made in the message (Liberman and Chaiken 1992). Thus, marketers designing health related messages are faced with a challenging problem: How does one design a health message that encourages viewers to engage with the message in a positive rather than defensive manner, leading to higher message compliance?

I propose that one way in which compliance with a health message can be increased is through increased self-awareness. The reason that health messages are often ineffective is that individuals are attempting to protect themselves against the ego-threat posed by the health message. While heightening self-awareness does not decrease the threat posed by a health message, it does provide consumers with additional tools for dealing with the threat, and it also shifts the focus of any defensive processing away from the ad and towards the self. In particular, there are three behavioral responses to high self-awareness that are likely to lead to increased compliance with a health messages. First, when self-awareness is high, people are more sensitive to personally relevant information (Hull and Levy 1979), suggesting that when consumers are exposed to a personally relevant health message when self-awareness is high they should be more sensitive to the information contained in the health message. Second, while

this heightened sensitivity to the information contained in the health message might potentially increase the perceived threat of the message, heightened self-awareness also increases motivation to decrease any perceived discrepancies between the self and the salient standard (Duval and Wicklund 1972). This suggests that when self-awareness is high, rather than ignoring or disregarding the threat posed by the health message, individuals experiencing high self-awareness should feel motivated to change their behavior to decrease the discrepancy between the current self and the desired healthy end state. Finally, when self-awareness is high, people attribute more causal agency to the self (Duval and Wicklund 1973), suggesting that they will feel more empowered to effect change when self-awareness is high than when it is low. For these reasons, I expect that increasing self-awareness will lead to increased compliance with a health message when the message contains self-relevant cues. On the other hand, when self-awareness is low, the default state, participants will not show increased compliance when the message contains self-relevant cues.

Another issue addressed in this paper is how personal relevance of the health message is manipulated through the visual cues contained in the ad. One very salient visual cue is the type of model pictured in the ad. Often messages are paired with images of other people, and since individuals have an innate need to compare themselves with relevant others (Festinger 1954), the mere presence of a model within a health message should lead those viewing the message to engage in social comparison between themselves and the featured model. Previous research has demonstrated that social comparison between the self and models in

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advertising can influence both self-judgments (Smeesters and Mandel 2006; Mills et al. 2002) and general consumption (Mills et al. 2002; Seddon and Berry 1996; Strauss et al. 1994) but no previous research has investigated how the model used in an ad impacts compliance with the specific message contained in the ad. This is an important distinction, since most research on advertising focuses on attitudes towards the ad, without explicitly considering the effectiveness of the ad in terms of eliciting specific desired behaviors. Most of the previous research on how models influence both self-judgments and consumption has explicitly focused on the size of the model depicted, and the findings have been somewhat contradictory. Recent work (Smeesters and Mandel 2006; Smeesters, Mussweiler and Mandel 2010) demonstrates that an important driver of how thin versus heavy models influence self-judgments is whether individuals feel similar to or different from the model depicted. I build on these findings by using the size of the model pictured in the ad to manipulate perceived similarity between the self and the model, which I argue in turn influences the personal relevance of the ad and subsequent behavior. Specifically, I propose that when a moderately attractive, moderately thin model is depicted, viewers are likely to see themselves as similar to the model pictured, making the ad more self-relevant. On the other hand, when a moderately attractive but extremely heavy model is depicted, viewers are likely to see themselves as dissimilar to the model, making the ads less self-relevant.

This research contributes to the literature in several ways. First, I examine a new mechanism through which compliance with health messages can be increased. Previous research has proposed the use of both self-affirmation (e.g.

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Harris and Napper 2005; van Koningsbruggen et al. 2009) and having consumers focus on the negative consequences of non-compliance (Block and Williams 2002) to increase compliance with self-relevant health messages. I propose that heightened self-awareness is another mechanism through which compliance with a self-relevant health message can be increased. This new mechanism, heightened self-awareness, constitutes an important contribution to the literature since, unlike the other two mechanisms which have been shown to increase compliance, heightening self-awareness does not necessitate the intervention of a third party to redirect processing, thus easing implementation. Second, I examine the specific process through which heightened self-awareness shifts the focus of ego-defensive processing of the threatening message. In particular, I propose that when self-awareness is high individuals respond to the potential threat posed by the message by automatically bolstering the self, allowing for active engagement with and processing of the message, while when self-awareness is low, the same potential threat posed by the message causes individuals to disengage from the message, leading to decreased compliance. Finally, I explore how changing the visual cue provided by the model in the ad impacts self-relevance of the health message and consequent behavior. Specifically, this is the first paper to explore how changing the type of model pictured in the ad impacts compliance with the specific message of the ad rather than more general consumption behaviors unrelated to the specific content of the ad (e.g. Mills et al. 2002; Seddon and Berry 2006), or self judgments (e.g. Richins 1991; Smeesters and Mandel 2006; Smeesters, Mussweiler and Mandel 2010).

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THEORETICAL BACKGROUND

Social Comparison and Advertising

When observing an ad, individuals use the visual cues within the ad to make judgments about whether the ad is personally relevant and thus worth processing further (Forehand and Deshpandé 2001). One such cue is how similar the model pictured in the ad is to the self. The basic premise of social comparison theory (Festinger 1954) is that human judgment is comparative in nature. That is, we can only judge how good or bad something is in comparison to how good or bad something else is. This tendency to use comparison as a basis for evaluation is so ingrained that researchers have found strong effects both when they explicitly ask participants to make comparisons and when the comparisons occur spontaneously (Mussweiler 2003). In fact, participants compare the stimuli or themselves to a salient standard even when the stimuli are below the threshold of consciousness (Stapel and Blanton 2004; Dehaene et al. 1989). Previous research on the impact of models in advertising has focused on either self-esteem (e.g. Richins 2001; Smeesters and Mandel 2006) or general behavior (Mills et al. 2002; Seddon and Berry 2006) without explicitly considering how the type of model in the ad impacts the effectiveness of the message. To the best of my knowledge, the present paper is the first to explore how the type of model depicted in the ad impacts compliance with the ad's message. Additionally, the majority of previous research on the impact of models on self-judgments and behavior has tended to

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focus primarily on the impact of traditional, thin, models without considering the impact of less traditional (e.g. overweight or less attractive) models. This previous research on how upward comparisons to idealized thin media images impact self-esteem has been somewhat divergent. On the one hand, Richins (1991) found that when young women are exposed to advertisements featuring idealized, thin models they become less satisfied with their own attractiveness. Similarly, Trampe, Stapel and Siero (2007) found that women in general, and body-dissatisfied women in particular, not only report comparing their bodies to the bodies of others, but also found that these comparisons to attractive thin others lead to decreased self-evaluations.

On the other hand, research by Mills et al. (2002) found that after exposure to idealized body images, restrained eaters rated their current body size as smaller. Smeesters and Mandel (2006) provided two possible explanations for these seemingly contradictory findings. Their research found that the extremity of the comparison standard impacts how idealized images influence self-esteem. The findings of Smeesters and Mandel (2006) are important because they suggest that the degree of perceived similarity between the self and the model significantly influences the impact that the model has on the viewer's self-esteem. I build on this finding by further suggesting that perceived similarity to the model, which I manipulate primarily by changing the weight of the model pictured, should also influence the viewer's compliance with the message, not just the self-esteem of the viewer.

In addition to self-judgments, previous research has also shown that the size of the model in an ad can influence the amount of food that one eats. This is particularly relevant in the current context, as I am investigating compliance with a health message advocating healthful food choices. While some recent work shows that exposure to pictures of an overweight prime can lead to increased consumption, compared to exposure to underweight primes (Campbell and Mohr, working paper), due to stereotype activation, several studies also demonstrate that exposure to ads containing thin models can also lead to increased consumption (Mills et al, 2002; Seddon and Berry 1996. Strauss et al. 1994). While these studies found that the size of models that one sees can influence consumption decisions, none of these previous studies consider the specific message of the ads they expose participants to, and most do not even specify the nature of the ads. Because the message can be used to activate different goals, it is important to consider how the model used influences compliance with the specific message contained in the ad, as I do in this paper, rather than simply looking at more general behavior unrelated to the specific message domain of the ad. Of particular interest to the present paper, Strauss et al. (1994) did find that exposure to diet ads containing thin models did lead to disinhibited consumption (message non-compliance). One possible explanation for this finding by Strauss et al. is that feeling that a diet commercial is personally relevant leads to the same type of ego-threat and subsequent non-compliance that is experienced in response to feeling that a health message is personally relevant when self-awareness is low.

In the present paper I use the model pictured in the ad to manipulate the self-relevance of the ad. Previous research has found that social comparison effects are more likely occur when the comparison other is seen as similar to the self (e.g. Brown, Novick, Lord and Richards 1992; Mandel, Petrova and Cialdini 2006). Building on these findings, I expect participants to engage more with the ad when it contains a model that is perceived as similar to the self. Consequently, in the similar condition I pair the health message with a thin, moderately attractive model, to whom the majority of participants are likely to feel more similar, while in the dissimilar condition I pair the health message with an extremely heavy model to whom the majority of participants are likely to feel dissimilar.

Defensive Processing of Personally Relevant Messages

Within the health message literature there is the well established, and frustratingly paradoxical, finding that those at whom a health message are directed are the least likely to comply with the message. Previous research has demonstrated that this lack of compliance is due to defensive processing in response to the threat posed by the message. Specifically, when consumers are faced with a personally relevant yet threatening message, such as a health message or an ad that employs a fear appeal, they are likely to engage in defensive processing in an attempt to decrease the threat posed by the ad (e.g. Liberman and Chaiken 1992). Defensive processing can take a variety of forms including "seizing and freezing" on the threat posed by the message (Block and Williams 2002), attempting to discredit the claims made in the message

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(Liberman and Chaiken 1992), downplaying the seriousness of the risk (Kunda 1987), avoiding the message all together (Nielsen and Shaipro 2009; Donohew, Lorch and Palmgreen 1991), or generating additional positive thoughts about the self (Schwinghammer et al. 2006).

Interestingly, while early researchers theorized that the behavioral backlash observed in response to personally relevant health messages was due to individuals simply defensively ignoring the message (Berkowitz and Cottingham 1960), more recent research suggests that rather than simply ignoring the message, people who feel the message is personally relevant will process the information in the ad in a biased self-serving manner (Liberman and Chaiken 1992). In particular, when individuals feel threatened by a message, they will process the information contained in the message in a manner that reduces this perceived threat. Because high relevance individuals are processing the information in a manner that safeguards their present state (Kruglanski and Webster 1996), the message is discredited in the minds of these individuals, which allows them to disregard the message and consequently behave in a manner contrary to that suggested by the ad. One possible explanation for these findings is that these studies involved having participants read lengthy essays about the health risk, creating a situation in which avoidance is not an option. Most health messages are only a single page, any information is likely to be bulleted and easy to process, and there are unlikely to be any counter arguments, all of which would seem to make the likelihood of individuals who feel personally threatened by the ad actually engaging in extensive protective processing seem rather unlikely when

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simply ignoring it is easier. In fact, recent research by Nielsen and Shapiro (2009), has shown that the most likely response to a threatening health ad is avoidance. In accordance with the findings of Nielsen and Shapiro (2009), I propose that unless an ad contains both a personally salient cue, such as a similar model, and self-awareness is high, disengagement, and subsequent non-compliance, is the most likely outcome.

Recently, several researchers have suggested different ways through which these negative effects of defensive processing in response to a health message might be mitigated. Agrawal and Duhachek (2010) found that a match between incidental shame or guilt and message framing leads to greater levels of defensive processing, suggesting that a mismatch between incidental negative emotion and the message is more effective. Block and Williams (2002), who built on previous work demonstrating that defensive processing is due to individuals "seizing" and "freezing" on any information that supports past knowledge (Kruglanski and Webster 1996), argued that if high relevance individuals could be induced to elaborate on the consequences of non-compliance that they would "unfreeze," allowing for a greater degree of persuasion to occur. As predicted, when high relevance participants were asked to elaborate on "the problem," they were more willing to comply with the message, as measured by willingness to engage in the behaviors suggested by the message, compared to high relevance individuals who were asked to elaborate on "the solution."

Another stream of research has explored self-affirmation as a means to reduce defensive processing in response to threatening health information. These

researchers argue that since defensive processing is due to a desire to maintain a positive self-view, providing an ego enhancing bolster prior to the threat creates an emotional "cushion", thus reducing the need to engage in defensive processing. Indeed, several researchers have found that when individuals engage in self-affirmation in an unrelated domain prior to exposure to a health message, these self-affirming thoughts do lead to higher acceptance of and willingness to comply with the message (e.g. Harris and Napper 2005; Sherman et al. 2000). Furthermore, van Koningsbruggen et al. (2009), found that individuals who engaged in self-affirmation prior to exposure to a threatening message had increased accessibility to threat-related cognitions, increased perceptions of message quality, and indicated higher willingness to comply with the message. I propose that heightened self-awareness should also lead to increased compliance with a personally relevant health message. Specifically, I propose that self-awareness will moderate the effect of including a similar vs. a dissimilar model in the ad. When self-awareness is high and a similar model is depicted in a health message, individuals should automatically self-affirm to defend themselves against the treat, allowing for greater engagement with the message, and increased compliance compared to when a dissimilar model is depicted in the health message. On the other hand, when self-awareness is low, participants will simply disengage from the message, particularly when a similar model is depicted, leading to lower compliance when a similar vs. dissimilar model is depicted.

Self Awareness

As previously mentioned, there are three behavioral responses to high self-awareness that are likely to lead to higher compliance when a similar model is depicted in a health message: greater sensitivity to self relevant information, increased motivation to decrease discrepancies between the current state and the desired state, and greater causal attribution to the self. Research in the area of self-awareness and self-discrepancies is particularly relevant to the present research. In general, high self-awareness leads to selective encoding that makes the individual more sensitive to environmental information that is potentially self relevant (Stapel and Tesser 2001), in this case a health message depicting a model that is similar to the self. These findings are consistent with the self-awareness theory of Duval and Wicklund (1972) which proposes that when individuals are aware of a discrepancy between their present state or present behavior and a desired end state they will experience an aversive drive state. To avoid this state, individuals will either seek to escape self-awareness or seek to diminish the discrepancy and consequently diminish the drive state. When individuals believe there is a possibility of meeting the salient standard, they will increase efforts to meet the standard, but when they believe that meeting the standard is unlikely, they withdraw and seek to escape from self-awareness (Duval et al. 1992). These earlier findings suggest that when self-awareness is high, a health message depicting a similar model should lead participants to behave in a manner that allows them to approach the behavioral standard promoted by the health message, provided participants feel that the standard is attainable. When self-awareness is

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low, which is our default state, I expect to replicate earlier findings: namely that when the health-message contains the self-relevant cue of a similar model, participants will be more likely to disengage from the message resulting in decreased compliance compared to when a dissimilar model is depicted.

In the present research, I manipulate the similarity of the model to the consumer in order to create visual cues of high self-relevance of the message (similar model) or low self-relevance (dissimilar model). When the model in the health message is perceived as similar to the self, participants should view the message as more self-relevant than when the model is perceived as dissimilar to the self. This perceived similarity between the self and the model in the ad should drive the expected results. However, I further propose that self-awareness will moderate these effects. Specifically, a health message featuring a model that is perceived to be similar to the self should pose more of a threat than a health message featuring a model that is perceived to be dissimilar to the self and self-awareness should moderate how this threat is coped with. When self-awareness is high, a health message containing a similar model should lead to greater engagement and consequently higher compliance with the message than the same message containing a dissimilar model. On the other hand, when self-awareness is low, a health message containing a similar model should lead to greater disengagement and consequently lower compliance with the message than the same message contains a dissimilar model.

H1: Self-Awareness will moderate the relationship between model

similarity and message compliance.

H1a: When SA is high, participants will exhibit more compliance

with a similar model than with a dissimilar model

H1b: When SA is low, participants will exhibit less compliance with

a similar model than with a dissimilar model.

Self-Awareness and Self-Esteem

I propose that when self-awareness is high, defensive processing of the ad

will be directed more towards bolstering the self, rather than towards disengaging

from the ad. Previous research has found that individuals whose self-concepts

have been activated (i.e. have been made self-aware) and who view a potentially

ego threatening images are more likely to generate positive thoughts about the

self, resulting in higher self-evaluations than are individuals whose self-concepts

have not been activated (Schwinghammer et al. 2006). Similarly, Mills et al.

(2002) found that restrained eaters, who are arguably highly aware of their bodies,

particularly when comparing themselves to others, rated their current body size as

smaller after exposure to idealized thin models compared to a control group which

was not exposed to thin models. In both cases, exposure to potentially ego-

threatening information led to the generation of positive thoughts about the self,

resulting in increased self-esteem. Based on these previous findings, I expect that

when exposed to an ego threatening message, individuals whose self-awareness is

high will defend themselves against the threat posed by viewing a health message

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containing a similar model by bolstering the self rather than disengaging from the health message. Specifically, they will generate more positive thoughts about themselves, compared to participants viewing the message containing the dissimilar model, thereby boosting their self-esteem, allowing them to more effectively process the health message. On the other hand, when self-awareness is low, participants exposed to the same message containing a similar model will respond to the threat by simply disengaging from the message, resulting in decreased self-esteem compared to participants viewing the health message containing the dissimilar model who do not experience a threat in response to the message.

> H2: Self-Awareness will moderate the relationship between model similarity and self-esteem.
>
> H2a: When SA is high, participants' self-esteem will be higher after viewing a similar model versus a dissimilar model.
>
> H2b: When SA is low, participants' self-esteem will be lower after viewing a similar model versus a dissimilar model.

Since recent work suggests that the most likely response to a threatening message is simple avoidance, any effective intervention should increase actual processing of the health message. When self-awareness is heightened prior to exposure to a health message containing a model that is perceived as similar to the self, I propose that it should not only lead to heightened self-esteem but that this

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should, in turn, lead to increased processing of the message. Previous research has shown that self-affirmation, which is a form of ego boost, prior to exposure to a relevant health message can lead to increased processing of the message (e.g. Harris and Napper 2005). I propose that the spontaneously generated heightened self-esteem in response to a health message containing a similar model when self-awareness is high should lead to increased processing of the ad, as measured by recall for the message, compared to when the health message contains a dissimilar model. On the other hand, when self-awareness is low, a health message containing a similar model should lead to greater disengagement resulting in decreased recall for the message compared to a health message containing a dissimilar model.

> H3: Self-Awareness will moderate the relationship between model similarity and message recall.
>
> H3a: When SA is high, participants will exhibit greater message recall regarding an ad with a similar model than with a dissimilar model.
>
> H3b: When SA is low, participants will exhibit lower message recall regarding an ad with a similar model than with a dissimilar model.

One of my key proposals is that the type of model used in the ad influences the perceived relevance of the message. However, if my hypothesis is correct that when self-awareness is high exposure to the health message

containing the similar model causes participants to enhance the self in order to cope with the threat posed by the message, then the perceived relevance of the message should change over time when self-awareness is high and the health message contains a similar model, but not when health message contains a dissimilar model. This predicted shift in perceived relevance in the high similarity/high self-awareness condition is due to the individual engaging with and processing the message in a manner that reduces the threat to the self. When self-awareness is high, participants should initially consider the health message to be more personally relevant, and consequently more threatening to the self, when it contains a similar model than when it contains a dissimilar model. However, a delay allows participants in the high self-awareness similar model condition to engage and comply with the message. This should lead to a reduction of the threat and consequently a reduction in the perceived personal relevance of the message, causing participants to regard the messages containing the similar and dissimilar models as equally (ir)relevant when self-awareness is high and relevance is measured late. When self-awareness is low, there should be no difference in perceived relevance of the message based on either model similarity or timing of the relevance measure because participants should simply disengage from the message when self-awareness is low, regardless of model similarity.

> H4: There will be a three-way interaction between level of self-awareness, perceived similarity to the model, and the timing of the relevance measure. Specifically, when relevance is measured early and self-

awareness is high, participants should perceive the message as more relevant with a similar model vs. a dissimilar model. When relevance is measured early and self-awareness is low, there should be no difference in perceived relevance with a similar vs. dissimilar model. When relevance is measured late, there should be no differences across conditions.

I test these hypotheses in three studies. Study 1 tests the effects of using similar versus dissimilar models in messages promoting healthful eating habits under high versus low levels of self awareness (hypothesis 1). Study 2 replicates the findings of study 1 while also providing initial evidence that these effects are driven by greater processing, resulting in higher recall for the message in the high self-awareness/high relevance condition compared to the other three conditions (hypothesis 3). In addition, study 2 demonstrates that level of self-awareness also moderates the effects of using a similar, versus dissimilar model, on self-esteem (hypothesis 2) . In study 3, I replicate my findings with a non-student sample, increasing the generalizabilty of my findings. One advantage of using a non-student sample in study 3 is that I ended up with 27 participants indicating a BMI that classifies them as Class 2 obese (BMI ≥35). This allows me to explore my hypotheses with individuals who perceived themselves as more similar to the heavy model (dissimilar model for the majority of participants) than to the thin model (similar model for the majority of participants). Additionally, in study 3 I demonstrate that for a health message containing a model that is similar to the

self, the perceived relevance of the message shifts over time when self-awareness is high, but not when self-awareness is low (hypothesis 4).

STUDY 1

The purpose of study 1 was to find preliminary support for my hypothesis that level of self awareness moderates the effect of model similarity on message compliance (hypothesis 1). Specifically I test whether high self-awareness leads to greater compliance with a health message depicting a similar model than a dissimilar model (H1a), while low self-awareness leads to lower compliance with a health message depicting a similar model than a dissimilar model (H1b). In order to enhance social comparison effects, I selected both male and female models, so that participants would only see messages portraying models of their own gender. I selected similar models to reflect both the "average" participant in our subject pool and to be typical of the types of people pictured in health messages. These models were moderately attractive, fairly young and fit. For the dissimilar model, I selected models that were moderately attractive but significantly more overweight than most of the participants in our subject pool of undergraduate business majors and, in the case of the female dissimilar model, a different race than the majority of the participants in our subject pool.

Method

In study 1, 20 female and 40 male students at a northeastern university participated for partial course credit. I randomly assigned each participant to one

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of four conditions in a 2 (model: similar vs. dissimilar) x 2 (self-awareness: low vs. high) between-subjects design. The first task was a self-awareness manipulation adopted from Fenigstein and Levine (1984). All participants spent between 3 and 5 minutes writing a story incorporating as many words as possible from a list of 20 words. In the high self-awareness condition, five of the words were self-referent (I, me, my, myself, and alone). In the low self-awareness condition five of the words were gender consistent but other-referent (he or she, him or her, his or hers, himself or herself and together). The remaining 15 words were identical for all groups (e.g. afternoon, rough, walk, park, and voice). After finishing the story, participants examined a full page, full color copy of a health message with the tagline, "Eat healthy foods and live a longer life." The health message also contained several specific suggestions on how to maintain a healthful diet (e.g. "Emphasize fruits, vegetables, whole grains, and fat-free or low-fat milk and milk products"). The right side of the health message featured one of four images: a dissimilar male, a similar male, a dissimilar female, or a similar female. All participants saw an ad containing a model of their own gender to facilitate social comparison effects. See Appendix A for examples of the ads used. After examining the health message, participants completed five items measuring attitude toward the health message on a scale from 1-7, anchored by unappealing/appealing, attractive/unattractive, not at all persuasive/persuasive, ineffective/effective, and not convincing/convincing.

After responding to the above items about the health message, the participants completed a second self-awareness manipulation which reinforced the

earlier self-awareness manipulation and provided a delay that allowed time for the goal made active by the health message (healthful food choices) to fully activate. Participants rated themselves (high self-awareness) or the average school-teacher (low self-awareness) on 20 different traits (Brown 1988). Participants then imagined that they had to pre-select their afternoon snacks for the next two weeks (i.e. 14 choices) from a vending machine (Kahn and Isen 1993). Participants chose between 10 possible snack options. Pre-tests identified three options (All Energy Trail Mix, Nature Valley Oat Bar, and wheat crackers) as "healthful" options ($M_{healthiness}$= 5.0), and the remaining 7 options as "unhealthful" (e.g. Oreo Cookies, Potato Chips, Skittles; $M_{healthiness} = 2.51$; $t(93) = 27.65$, $p < .001$) on a seven point scale with higher numbers indicating higher perceptions of healthfulness. As my key dependent variable I counted the total number of healthful items that were selected for the 14 choices (i.e. the highest possible is 14). Participants then responded to a series of filler questions, followed by demographic questions including whether they were currently trying to gain or lose weight, and whether they had any food allergies.

Results

     I ran a 2 (model similarity: similar vs. dissimilar) x 2 (self-awareness: high vs. low) between-subjects ANOVA on attitude toward the health message and the number of healthful snack options chosen from the vending machine task.

Attitude toward the health message. There were no significant effects of either model similarity or level of self-awareness on attitude toward the health message.

Healthful snack options chosen in vending machine task. As a measure of message compliance, participants selected two weeks' worth of snacks from a hypothetical vending machine. Specifically, the more healthful options selected, out of a total of 14 possible selections, the more participants complied with the health message. There was a significant interaction between model similarity and level of self-awareness ($F(1, 56) = 3.93$, $p = .05$) on the number of healthful items selected. When self-awareness is high, participants chose directionally, but not significantly, more healthful items when the similar model was depicted ($M = 6.75$) than when the dissimilar model was depicted ($M = 5.14$; F (1, 56) = 1.40, $p = .24$), providing directional, but not statistically significant support for hypothesis 1a. Additionally, when self-awareness was low, participants selected directionally fewer healthful options when a similar model was depicted ($M = 5.33$) than when a dissimilar model was depicted ($M = 7.53$; F (1, 56) = 2.63, $p = .110$), providing directional, but not statistically significant support for hypothesis 1b. See figure 1.

Discussion

The results from study 1 provide preliminary directional support for hypothesis 1. Specifically, I found that when self-awareness is high, depicting a similar model in a health message is directionally more effective in inducing

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people to make more healthful food choices than depicting a dissimilar model (H1a). Additionally, I found that when self-awareness is low, depicting a similar model in a health message encouraging healthful eating is directionally less effective than depicting a dissimilar model (H1b). While I only found directional, but not statistically significant, support for H1, the interaction between model size and level of self-awareness was statistically significant. Additionally, there were three elements of the design of this study that made it a particularly strict test of my first hypothesis. First, the sample for study 1 is rather small at only 60 participants. Second, there were significantly more unhealthful than healthful snacks in the vending machine task (only three healthful compared to seven unhealthful options). Finally, both males and females participated in this first study. Because comparison between the self and others based on size are less centrally relevant to self-image for males compared to females (Owens, Allen and Spangler 2010), including both males and females in this first study provided a particularly stringent test of hypothesis 1. In study 2, I address these three issues by increasing my sample size, using different dependent variables, and by narrowing the focus of the study to include just female participants. By narrowing my focus to include just female participants, I am able to get a clearer picture of the mechanisms underlying my results. Additionally, in study 2, I attempt to extend these findings by using a different manipulation of self-awareness and new dependent variables.

STUDY 2

The purpose of study 2 is to extend the findings of study 1 by introducing a new manipulation of self-awareness and new dependent variables. Specifically, in study 2, I used large mirrors, rather than written manipulations, to heighten self-awareness. The use of mirrors to heighten self-awareness is well-established (e.g. Duval and Wicklund 1972; Pryor et al. 1977, Mandel and Smeesters 2008) and I felt it was particularly relevant to the present study, given the emphasis placed on physical health and appearance in the context of ads encouraging healthful eating.

Additionally, in study 2 I selected a third model that is less extremely dissimilar than the dissimilar model used in study 1. I included this new model for two reasons. First, she is the same race as majority of the participants (as well as the similar model), which allows the possibility of ruling out race as a driver of my effects. Second, the new model is less overweight than the previously selected dissimilar model. Based on Smeesters and Mandel (2006), I was curious to see if participants would perceive themselves to be similar to a moderately heavy model, causing a pattern of behavioral response similar to that found with the thin model in study 1. Based on the results from a pre-test, I selected a female model that was rated significantly thinner ($M = $ -1.57) than the previously selected dissimilar female model ($M = $ -2.20; t (50) = 4.68, $p < .001$) and significantly heavier than the previously selected similar female model ($M = 3.27$; t (50) = 20.76, $p < .001$). See Appendix 1 for the health message containing the

moderately dissimilar model. I also included a measure of perceived similarity between the model and the self. In addition, I measured compliance with the health message using a more general measure of intentions to eat healthfully in the coming week. Additionally, study 2 investigated the interaction between level of self-awareness and model similarity on self-esteem (hypothesis 2). Finally, study 2 investigated the interaction between level of self-awareness and model similarity on actual processing of the health message, as measured by message recall (hypothesis 3).

Method

A total of 156 female business majors from a large Southwestern University participated in study 2, in addition to several unrelated studies, in exchange for extra credit in a marketing course. Up to four students participated in the study at a time; each participant sat in an individual cubicle to minimize contamination between conditions.

I randomly assigned participants to one of 6 conditions in a 2 (level of self-awareness: high vs. low) x 3 (model similarity: similar vs. moderately dissimilar vs. extremely dissimilar) design. Each participant received a full page, full color health message advocating healthful eating with the image paired with the message varied by condition as in study 1. To manipulate self awareness, participants in the high self-awareness condition went to a separate room which contained cubicles outfitted with large mirrors that allowed participants to see their entire upper bodies while seated (Duval and Wicklund 1972; Mandel and

Smeesters 2008). Participants in the high self-awareness condition remained in front of the mirror for the entire study and were returned to the original room to complete the remainder of the experimental session. Participants in the low self-awareness condition remained in the original room and were never exposed to mirrors.

After examining the ad, participants responded to the same 5 items used in study 1 to measure attitude toward the ad, as well as the weight concern sub-scale from the Body Esteem Scale (Franzoi and Shields 1984). I selected the Body Esteem Scale to measure state self-esteem (hypothesis 2) due to both the high relevance of body esteem in a health food context and the high salience of physical appearance for participants seated in front of a mirror. In addition, participants made a series of 10 hypothetical dichotomous food choices between healthful and unhealthful foods (e.g. choosing between a donut and cold cereal or between baked chicken and a hot dog). As with the vending machine task, the dependent variable was calculated by counting the total number of healthful items (out of a total of 10) that were selected. Participants also indicated their likelihood of making healthful food choices in the coming week. I counterbalanced the order of the questions so that for half of the participants the Body Esteem Scale (BSE) came before any questions related to food choices, and for the other half came at the end of the study after completing all questions related to food choices. Finally, participants listed everything that they could recall about the ad and indicated how similar they felt themselves to be to the model pictured in the ad.

Results

Because it was possible that asking about body self-esteem (BSE) might impact food related decisions, I counterbalanced the order in which questions were presented with half of the participants completing the BSE scale before answering questions related to food, and the other half completing the BSE scale after answering all the questions related to food choices. An ANOVA revealed that the order in which the questions were presented had no impact on any of the key dependent variables including future eating intentions ($F (1, 154) = 0.14$, $p = 0.71$), the number of healthful items selected ($F (1, 147) = 1.72$, $p = 0.12$), or BSE ($F (1, 154) = 1.06$, $p = 0.31$). For this reason I combined responses from both sets of questionnaires for all analyses.

In addition, I was interested to see if the extent to which the model was perceived as dissimilar to the self had a significant impact on any of my key-dependent variables. Surprisingly, there was not a significant difference in the extent to which participants felt (dis)similar to the moderately dissimilar ($M = 2.41$) and the extremely dissimilar models ($M = 1.92$; $t (187) = 1.56$ $p = .121$), despite the fact that the moderately dissimilar model was objectively less dissimilar to the participants than the extremely dissimilar model. For these reasons, and in order to simplify the interpretation of the results, I combined the results for participants in the moderately dissimilar and extremely dissimilar conditions to form a single composite "dissimilar" condition. The composite dissimilar condition was perceived to be significantly less similar ($M = 2.16$) than the similar condition ($M = 3.51$; $F (1, 153) = 25.58$, $p < .001$).

I ran a 2 (model similarity: similar vs. dissimilar) x 2 (self-awareness: low vs. high) between subjects ANOVA on (a) attitude toward the health message, (b) intentions to eat healthfully in the coming week, (c) number of healthful snack items selected in the dichotomous choice task, (d) body self-esteem and (e) message recall.

Attitude toward the Ad. Unlike study 1, I found a significant main effect of model similarity on attitude toward the health message ($F(1, 152) = 34.51$, $p < .001$). Specifically, participants rated the ad depicting the similar model ($M = 3.74$) significantly higher than they rated the same ad depicting a dissimilar model ($M = 2.54$). However, neither level of self-awareness nor the interaction between self-awareness and model similarity had a significant impact on attitude toward the health message.

Number of healthful items selected. In study 2, participants made a series of 10 dichotomous food choices in which one item was healthful (according to the guidelines provided by the health message) and one was not. I counted the total number of healthful choices selected. In support of hypothesis 1, there was a significant interaction between model similarity and level of self awareness ($F(1, 145) = 5.24$, $p < .03$; see figure 2). A series of planned comparisons provided partial support for hypothesis 1. Specifically, in support of hypothesis 1a, when self-awareness was high, participants selected significantly more healthful options when a similar model was depicted ($M = 6.88$) than when a dissimilar model was depicted ($M = 5.97$; $F (1, 145) = 4.56$, $p < .04$). Additionally, when self-awareness was low, participants selected fewer healthful options when a similar model was

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depicted (M = 5.40) than when a dissimilar model was depicted (M = 6.12; F (1,

145) = 1.61, p = .06), providing marginally significant support for hypothesis 1b.

Intentions to eat healthfully in the coming week. Participants also indicated

how likely they were to eat healthfully in the coming week. Again, the interaction

between level of self-awareness and perceived model similarity was significant

(F(1, 152) = 3.79, p = .05; see figure 3). A series of planned comparisons again

provided partial support for hypothesis 1. Specifically, in support of hypothesis

1a, when self-awareness was high, participants were significantly more likely to

plan to eat healthfully in the coming week when a similar model was depicted (M

= 5.91) than when a dissimilar model was depicted (M = 5.27; F (1, 152) = 5.57, p

< .02). When self-awareness was low, there was no difference in intentions to eat

healthfully in the coming week based on model similarity ($M_{dissimilar}$ = 5.03;

$M_{similar}$ = 4.78; F (1, 152) = .47, p = .49).

Body Self-Esteem (BSE). In support of hypothesis 2, there was a

significant interaction between level of self awareness and model similarity on

BSE (F(1, 152) = 7.31, p < .01; see figure 4). A series of planned comparisons

provided partial support for hypothesis 2. Specifically, when self-awareness was

high, participants reported marginally higher BSE when a similar model was

depicted (M = 4.58) than when a dissimilar model was depicted (M = 4.15; F (1,

152) = 3.45, p = .06), providing marginally significant support for H2a.

Additionally, in support of H2b, when self-awareness was low, participants

reported significantly lower BSE when a similar model was depicted (M = 3.85)

than when a dissimilar model was depicted (M = 4.48; F (1, 152) = 3.97, p < .05).

Message recall. At the end of the study, participants listed everything that they could remember about the health message. A colleague blind to the hypotheses and each participant's condition read through each set of responses and counted the total number of thoughts, the number of references made to the appearance of the model, and the number of references to the content of the message of the health message. I also read through each set of responses and performed the same task of counting types of recall while blind to each participant's condition. After we both finished scoring the recall task, I compared score sheets that each of us had filled out for each participant looking for any discrepancies. If any discrepancies were found, I reread the participant's response and made a final judgment call, always blind to the specific condition that each participant was in. Interestingly, there were no significant effects on the number of references to the model; however, there was a marginal main effect of perceived model similarity ($F(1, 148) = 3.06, p < .09$) as well as a significant main effect of level of self-awareness ($F(1, 148) = 5.22, p < .03$) on message recall. These main effects were qualified by the predicted significant interaction between level of self-awareness and perceived model similarity on message recall ($F(1, 148) = 4.22, p < .05$; see figure 5). Specifically, in support of hypothesis 3a, when self-awareness was high, participants in the similar model condition demonstrated significantly higher recall for the message ($M = 2.64$) than participants in the dissimilar model condition ($M_r = 1.82, F(1, 148) = 10.61, p < .01$). Hypothesis 3b was not supported. When self-awareness was low, there was

not a significant difference in recall for the message based on model similarity

($M_{Similar}$ = 1.71; $M_{Dissimilar}$ = 1.77, $F(1, 148)$ = .036, p = .85).

Mediation Analyses

BSE: Because the effect of self-awareness on both message compliance

and BSE is moderated by model similarity, I tested for moderated mediation.

Additionally, I used model 2, following the rules outlined by Preacher, Rucker

and Hayes (2007), because the paths between the independent variable (model

similarity) and the mediator (BSE) are moderated by level of self-awareness. In

order to test for mediation, I must first establish an effect. Above I demonstrated

that model similarity significantly positively predicts healthful food choices when

self-awareness is high ($F (1, 145)$ = 4.56, $p < .04$) and marginally significantly

negatively predicts healthful food choices when self-awareness is low ($F (1, 145)$

= 1.61, p = .06), step 1 in the Baron and Kenny (1986) method. I also

demonstrated that model similarity has a marginally significant positive impact on

BSE, my proposed mediator, when self-awareness is high (M = 4.15; $F (1, 152)$ =

3.45, p = .06), and a statistically significant negative impact on BSE when it is

low ($F (1, 152)$ = 3.97, $p < .05$), step 2 in the Baron and Kenny (1986) method.

Next, I tested whether my proposed mediator, BSE, had a significant impact on

the number of healthful foods selected, step 3 in the Baron and Kenny (1986)

method. I regressed the number of healthful items selected on BSE which did not

significantly predict the number of healthful items selected (F (1, 147) = 1.536, p

= .217), which means that mediation did not occur. Additionally, the Hayes

moderated mediation macro demonstrates that BSE did not mediate the effect of

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model similarity when self-awareness was high ($z = .573$, $p = .57$) or when it was low ($z = .555$, $p = .58$).

I ran a similar analysis with intentions to eat healthfully in the coming week as the dependent variable. In this case, steps 1 - 3 of Baron and Kenny were satisfied, however step 4 was only partially supported. Specifically, above I demonstrated that model similarity significantly positively predicts intentions to eat healthfully when self-awareness is high ($F (1, 152) = 5.57$, $p < .02$), although it does not when self-awareness is low ($F (1, 152) = .47$, $p = .49$), step 1 in the Baron and Kenny (1986) method. This suggests that mediation of intentions to eat healthfully can only occur when self-awareness is high (moderated mediation). Consequently, I only tested mediation for the high self-awareness condition. In accordance with Baron and Kenny (1986) and Preacher and Hayes (2004), a first regression demonstrated the effect of model similarity (the independent variable) on intentions to eat healthfully (the dependent variable $\beta = .224$, $t (100) = 2.29$, $p < .03$). A second regression revealed a significant effect of BSE (the mediator) on intentions to eat healthfully ($\beta = .250$, $t (100) = 2.58$, $p < .02$). In a final equation, model similarity and BSE were entered simultaneously and showed that that the effect of BSE on intentions to eat healthfully was significant ($\beta = .216$, $t (99) = 2.23$, $p < .03$) whereas the effect of model similarity was reduced to marginal significance ($\beta = .184$, $t (99) = 1.89$, $p = .06$); however, this reduction was not significant ($z = 1.44$, $p = .15$). This suggests that BSE only partially mediates the effect of model similarity on intentions to eat healthfully when self-awareness is high.

Message Recall: Again, because the effect of self-awareness on both message compliance and message recall is moderated by model similarity, I tested for moderated mediation. Again, I used model 2, following the rules outlined by Preacher, Rucker and Hayes (2007), because the paths between the independent variable (model similarity) and the mediator (message recall) are moderated by level of self-awareness. Finally, because there were no effects of model similarity on message recall when self-awareness was low (F (1, 148) = .015, p = .90), I only tested for mediation when self-awareness was high. In accordance with Baron and Kenny (1986) and Preacher and Hayes (2004), a first regression demonstrated the marginally significant effect of model similarity (the independent variable) on the number of healthful items selected (the dependent variable; β = 1.93, t (94) = 1.90, p = .06). A second regression revealed that message recall (the mediator) did not have a significant effect on the number of healthful items selected *(β = .085, t (94) = .824, p = .41)*, suggesting that mediation did not occur.

I next ran a similar analysis with intentions to eat healthfully in the coming week as the dependent variable. Again, because there were no effects of model similarity on message recall when self-awareness was low (F (1, 148) = .015, p = .90), I only tested for mediation in the high self-awareness condition (moderated mediation). In accordance with Baron and Kenny (1986) and Preacher and Hayes (2004), a first regression demonstrated the significant effect of model similarity (the independent variable) on intentions to eat healthfully (the dependent variable β = .224, t (100) = 2.29, p < .03). A second regression

revealed that message recall (the mediator) did not have a significant effect on intentions to eat healthfully $(\beta = .048$, $t\,(98) = .476$, $p = .64)$, suggesting that mediation did not occur.

Discussion

Study 2 provides additional support for hypothesis 1, using different dependent variables and a different manipulation of self-awareness. Consistent with hypothesis 1a, when self-awareness was high participants chose significantly more healthful items and reported marginally higher intentions to eat healthfully when they saw a health message depicting a similar model versus a dissimilar model. Furthermore, providing partial support for H1b, when self-awareness was low participants chose significantly fewer healthful items when a similar model was depicted in the health message compared to when a dissimilar model was depicted, although there was not a similar effect on healthful eating intentions.

Additionally, the findings support my prediction that the type of defensive processing in response to a health massage featuring a similar model will differ based on the level of self-awareness. These findings suggest that when self-awareness is high, exposure to a health message depicting a similar model will lead individuals to focus on bolstering the self as a means to defend against the threat posed by the health message containing a similar model, allowing for greater processing of the message and subsequently higher message compliance. On the other hand, exposure to the same message when self awareness is low will lead individuals to disengage from the message, causing decreased compliance. It

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is interesting to note that these findings were not driven by liking of the ad. In this study, I find that while participants consistently rated the health message with the similar model more highly than they rated the health message with the dissimilar model, the similar model was not always most effective in inducing behavioral change. In fact, when self-awareness was low (the default state) the preferred ad featuring the similar model was actually less effective for getting participants to make more healthful food choices than the less preferred ad featuring the dissimilar model.

Study 2 also provided support for hypothesis 2. I found that when self-awareness was high participants reported marginally higher BSE after seeing the health message containing the similar model than after seeing the health message containing the dissimilar model (H2a). These findings suggest that when self-awareness is high and individuals are confronted with a threatening message, rather than using defensive processing to disengage from the message, they use defensive processing to build up the self which then allows them to process the message in a less biased manner. Indeed, I found that when self-awareness was high, BSE partially mediated the relationship between model similarity and intentions to eat healthfully. Additionally, I found that when self-awareness was low, participants' BSE was significantly lower after exposure to the health message containing the similar model than after exposure to the message containing the dissimilar model (H2b). This supports my proposal that the health message containing the similar model does pose a threat to the ego when self-awareness is low.

This study also provided additional support for the idea that the way in which the information contained in the health message is processed varies based on both the level of self-awareness and model size. In particular, in support of hypothesis 3a, when self-awareness was high, participants demonstrated significantly greater recall for the message after exposure to a health message containing a similar model than a dissimilar model (H3a). This suggests that when self-awareness is high and the message features a similar model, individuals engage in greater processing of the message. On the other hand, when self-awareness is low, I did not find a significant difference in message recall based on model similarity. This suggests that when self-awareness is low, individuals are equally likely to disengage from the message, regardless of model similarity.

STUDY 3

I designed study 3 with two primary goals in mind. The first goal was to replicate my findings using a broader sample by expanding the sample to include non-students and individuals reflecting a broader array of body types. To this end, I contacted potential participants via the internet using both Mechanical Turk and a snowball sampling technique via Facebook. The second goal was to find additional support for my proposal that individuals are more likely to engage with the message when self-awareness is high and they are exposed to a health message containing a similar model, whereas disengagement is more likely to occur when either self-awareness is low, or the message contains a dissimilar

model. Hypothesis 4 is designed to find support for this proposal. Specifically, if participants engage more with the message when self-awareness is high and a similar model is used, then when relevance is measured early, the message should be perceived as more personally relevant when a similar model is shown than when dissimilar model is shown. When relevance is measured late and self-awareness is high, the delay during which participants have time to bolster themselves against the threat (H2) and actually make a series of food choices that follow the guidelines described in the ad (H1), should cause the message to decrease in personal relevance in the similar model condition such that the message is no longer seen a more personally relevant when a similar compared to dissimilar model is shown. When relevance is measure early and self-awareness is low there should not be a significant difference in personal relevance of the message based on model similarity because participants should simply disengage from the message, regardless of model similarity. Similarly, when relevance is measured late and self-awareness is low there should be no difference in perceived relevance based on model similarity.

To test this hypothesis, I replicated the procedure used in study 1, but added a measure of perceived personal relevance of the ad. In addition, to assess whether extended processing changes the way in which the message is perceived, I counterbalanced when I measured perceived relevance of the ad. For one half of the participants I measured relevance immediately after exposure to the ad, for the other half I measured relevance at the end of the study.

Another benefit of study 3 is that by including non-student participants I was able to collect data from individuals representing a wider array of body types. This provides me an opportunity to see if my predictions hold for participants for whom the heavy model is similar and the thin model is dissimilar.

In sum, in this study I employed a 2 (level of self awareness: low vs. high) x 2 (perceived model similarity: similar vs. dissimilar) x 2 (timing of relevance measure: immediately after exposure to ad vs. at the end of the study) between-subjects design.

Method

I conducted study 3 entirely on-line and a total of 268 female participants responded. I collected data in two phases. I began with a convenience snowball sample of friends and family members who were contacted through Facebook. My co-authors and I posted a link to the study on our Facebook pages and requested that our female friends participate in the study. Additionally, we asked our friends to re-post our request on their walls so that their friends might participate as well. This initial sample resulted in 68 participants and provided initial support for my hypotheses. Because this did not provide a sufficient sample to adequately test my hypotheses, I collected an additional 200 data points via Amazon's Mechanical Turk. Participants recruited via Mechanical Turk were all residents of the United States, all had a Mechanical Turk approval rating of 99% or better, and received $0.50 for completing the study. Because my similarity manipulation was largely based on the size of the model, I separated out all

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participants with a BMI of 35 or greater. Because individuals with a BMI of 35 or

greater are classified as being Class 2 Obese (U.S. Department of Health and

Human Services), they are more likely to feel similar to what I have identified as

the dissimilar model which should lead to a reversal of my results. A total of 27

participants reported height and weight information equal to a BMI of 35 or

higher. I ran all analyses on these participants as a separate group. This gave me a

main sample of 241 participants. In the main sample, BMI ranged between 17.51

and 34.96, with a mean of 24.53. Additionally, all participants ranged in age from

19 to 84, with a mean age of 35.

I used a 2 (level of self-awareness: high vs. low) x 2 (model size: similar

vs. dissimilar) x 2 (timing of relevance measures: immediately after exposure vs.

at end) between-subjects design. The procedure used was similar to that of study

1. Participants first completed the story-writing task to induce either high or low

self-awareness. They then saw one of the four versions of the health message.

Participants then rated the health message, after which half of the participants

answered the following question designed to measure perceived personal

relevance of the health message: (1) "How personally relevant is this ad to you?"

(1-7 scale, anchored by "not at all relevant" and "extremely relevant") . The other

half of the participants answered this same question at the very end of the study.

After answering questions related to the ad, participants then engaged in the rating

task used in study 1, in which they rate either themselves or the average teacher

on 20 traits, to reinforce the self-awareness manipulation and to create a sufficient

delay for the goal of healthful eating to become fully active. Next, participants

completed the vending machine task from study 1; however, for this study there were an equal number of healthful and unhealthful items from which to choose. After the vending machine task, participants answered a series of demographic questions, including height and weight.

Results

Manipulation Check. In the main sample, participants did perceive themselves to be significantly more similar to the similar model ($M = 3.14$) than to the dissimilar model ($M = 2.15$; $F(1, 237) = 20.75$, $p < .001$). As expected, when the participants with a BMI of 35 or greater are analyzed separately, the relationship reversed such that these participants rated themselves as significantly more similar to the "dissimilar" model ($M = 5.21$) than to the "similar" model ($M = 1.10$; $F(1, 23) = 107.30$, $p < .001$). Consequently, all analyses treated these participants as a separate sample since the similarity manipulation worked in a contrary manner for these participants. Level of self-awareness had no effect on perceived similarity to the model for either group.

Note that I tried doing analyses in which I included both the Class 1 and Class 2 obese participants in a single group. Because this group includes individuals who are more ambiguously overweight, the results were less straight forward. Most notably, there was a significant interaction between model similarity and self-awareness on perceived similarity ($F(1, 57) = 5.05$, $p < .03$). While participants perceived themselves to be equally dissimilar to the thin model, regardless of level of self-awareness ($M_{High} = 1.38$, $M_{Low} = 1.42$; $F(1, 57)$

= .010, *p* = .92), they perceived themselves to be more similar to the heavy model

when self-awareness was high (M = 5.20) than when it was low (*M* = 4.08; *F* (1,

57) = 8.45, *p* < .01). This suggests a more complex relationship between self and

model perception when these less overweight participants are included with the

class 2 obese participants. Thus, I maintained the moderately, Class 1, obese

participants in the main sample for the remainder of the analysis, and only

included the Class 2 obese participants in the hold-out sample.

   Attitude Toward the Ad. For the main sample, there was a significant main

effect of model similarity on how the health message was rated. Specifically,

participants rated the ad containing the similar model significantly more favorably

(*M* = 3.33) than they rated the ad containing the dissimilar model (*M* = 2.72; *F* (1,

237) = 11.31, *p* < .01). Level of self-awareness did not have a significant impact

on how the health message was rated. Interestingly, when only the participants

with a BMI of 35 or higher were included (type 2 obese), participants again

significantly preferred the health message containing the model that they perceive

to be most similar to themselves (in this case the heavy model; M = 4.64) to the

health message containing the model that is perceived to be dissimilar (in this

case the thin model, *M* = 2.87; *F* (1, 23) = 5.98, *p* < .03). Again, level of self-

awareness did not have a significant impact on how the health message was rated

   Vending Machine Task: For the main sample, as predicted by hypothesis

1, there was a marginally significant interaction between perceived model

similarity and level of self-awareness on the number of healthful options selected

in the vending machine task (*F* (1, 237) = 3.70, *p* = .056). Hypothesis 1a was not

supported; when self-awareness was high, participants who saw the health message with the similar model selected directionally, but not significantly, more healthful items ($M = 11.15$) than participants who saw the health message with the dissimilar model ($M = 10.59$; $F (1, 237) = .87$, $p = .35$). When self-awareness was low, participants who saw the health message with the similar model selected directionally fewer healthful items ($M = 9.98$) than participants who saw the health message with the dissimilar model ($M = 11.09$; $F (1, 237) = 3.12$, $p = .078$), providing marginally significant support for H1b. See figure 6.

When the analyses were conducted for the hold-out sample of obese participants no relationships were statistically significant. That said, it is interesting to note that given the small sample ($N = 27$), the results do provide partial directional support for hypothesis 1. Specifically, when self-awareness was high, participants selected directionally more healthful items when the similar model was depicted (in this case the heavy model, $M = 10.89$) than when the dissimilar model was depicted (in this case the thin model, $M = 9.80$; $F (1, 23) = .328$, $p = .57$), providing directional support for H1a. On the other hand, when self-awareness was low, participants again selected directionally more healthful items when the similar model was depicted (in this case the heavy model, $M = 10.25$) than when the dissimilar model was depicted (in this case the thin model, $M = 8.0$; $F (1, 23) = .572$, $p = .46$), contrary to H1b.

Relevance. I measured perceived relevance of the ad using a single item. I analyzed the response to this item using a 2 (level of self-awareness: high vs. low) x 2 (model similarity: similar vs. dissimilar) x 2 (timing of relevance measures:

immediately after exposure to the ad vs. at the end of the study) ANOVA. For perceived personal relevance of the ad, the predicted 3-way interaction (hypothesis 4) was not statistically significant (F (1, 233) = 1.98, p = .161). While the 3-way interaction was not significant, an examination of the pattern of results revealed some interesting insights (see figure 8). When relevance was measured early, and self-awareness was high, participants rated the health message as significantly more personally relevant when the similar model was depicted (M = 4.47) than when the dissimilar model was depicted (M = 3.40; F (1, 233) = 5.46, p = .02). When relevance was measured early and self-awareness was low, there was not a significant difference in perceived relevance of the message based on model similarity (M_{sim} = 3.81, M_{dissim} = 3.76; F (1, 233) = .010, p = .92). On the other hand, when relevance was measured late and self-awareness was high, participants no longer perceived a significant difference in message relevance based on model similarity (M_{sim} = 3.73, M_{dissim} = 4.07; F (1, 233) = .468, p = .49). Similarly, when relevance was measured late and self-awareness was low, there was not a significant difference in perceived relevance of the message based on model similarity (M_{sim} = 3.67, M_{dissim} = 3.65; F (1, 233) = .001, p = .97). These results suggest that when self-awareness is high and the model is similar, individuals initially perceive the ad as more personally relevant, causing them to engage with and actively process the information contained in the ad to reduce the self threat posed by the highly relevant message. Thus over time, through active processing, the ad is seen as less personally relevant and thus less threatening, allowing for greater message processing and compliance. On the other hand,

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when a dissimilar model is depicted, or when self-awareness is low, participants simply see the message as not personally relevant, causing them to disengage from the message.

Because the sample of Class 2 participants was so small, not all cells were represented (no participants in the low self-awareness, dissimilar (thin), early measurement of relevance cell), so I was not able to run a 3-way interaction on this group.

Self Rating. The second self-awareness manipulation used also offered an opportunity to find further support for hypothesis 2a, that when self-awareness is high participants exposed to a health message with a similar model will cope with the threat posed by the message by bolstering the self, resulting in increased self-esteem compared to participants exposed to the health message with a dissimilar model. Recall that after viewing the ad, I reinforced the self-awareness manipulation and created a delay by having participants rate either themselves (high self-awareness) or the average school teacher (low self-awareness) on a variety of traits. While this manipulation does not allow me to compare self-ratings between the high and low self-awareness conditions, or within the low self-awareness condition, it does allow me to make comparisons in self-rating between the threatening (similar model) and non-threatening (dissimilar model) conditions within the high self-awareness condition. Additionally, it is important to note that not all of the items represent core values that provide an opportunity for individuals to affirm themselves; for example, while traits such as "cheerful," "efficient," "patient," and "warm" are all positive traits, they are unlikely to

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represent important self-relevant values that provide an opportunity to self-affirm (Steele and Liu 1983). Previous work has shown that self-rating tasks only work to affirm the self when the dimensions rated are related to values that are seen as highly self-relevant and central to self-concept. One of the traits stood out as a value likely to be both highly self-relevant for may people and central to self-concept: creativity. When I compared how participants rated themselves in terms of creativity, I found that on a scale of 1 to 4, individuals in the main sample rated themselves as significantly more creative after exposure to the threatening message, containing the similar model ($M = 3.10$), than after exposure to the non-threatening message, containing the dissimilar model ($M = 2.76$, $F(1, 124) = 5.42$, $p < .03$), providing additional support for H1a. It is interesting to note that while this was the only trait that showed a statistically significant rating between the threatening and non-threatening messages, for all other positive traits participants rated themselves directionally higher after being exposed to the threatening message than the non-threatening message. One possible explanation for these results only being directional is that there are individual differences in how these traits are valued.

There were no significant differences for any of the traits based on model similarity among the Class 2 obese participants.

Discussion

I had two main goals for study 3: to replicate my findings with a non-student sample and to find additional support for my hypothesis that when self-

awareness is high, exposing individuals to a health message containing a similar

model causes them to focus defensive processing towards bolstering the self

(hypothesis 2a), rather than disengaging from the message, which in turn allows

for greater processing of the message resulting in higher message compliance.

First, I was able to partially replicate my previous findings with a non-student

sample, which increases the generalizabilty of my findings. Specifically, I found

directional support for H1a, when self-awareness is high participants will show

greater message compliance when the health message features a similar compared

to a dissimilar model, and marginally significant support for H1b, when self-

awareness is low participants will show lower message compliance when the

health message features a similar compared to a dissimilar model. Additionally, I

found directional support for H1a among class 2 obese individuals, for whom the

obese model is the similar model.

The second goal of study 3 was to find additional support for my proposal

that the reason that heightened self-awareness leads to higher message compliance

with a similar model is that when self-awareness is high, individuals respond to

the threat posed by the message containing the similar model by engaging with

the message and bolstering the self, rather than disengaging from the message as

occurs when self-awareness is low or the model is dissimilar. There were several

findings from study 3 which support this proposal. First, in accordance with

hypothesis 4, I found that perceived personal relevance of the ad shifts over time

when self-awareness is high and a similar model is depicted, but does not change

in any other condition. This suggests that when self-awareness is high and a

similar model is depicted, while participant initially perceive the message as highly relevant, they processes the message in such a manner that over time the threat is diminished and the message is no longer perceived as relevant after a delay. Additionally, in accordance with hypothesis 2a, when self-awareness is high I found that participants rated themselves more highly on a key trait after exposure to the similar/threatening message than after exposure to the dissimilar/non-threatening message.

GENERAL DISCUSSION

This paper explores a new mechanism for increasing compliance with health messages that contain self-relevant cues: self-awareness. Specifically, I demonstrate that the type of processing displayed in response to an ego-threatening ad, in this case a health message advocating healthful food choices, differs based on the level of self-awareness. When self-awareness is high, and participant are exposed to a health message containing a similar model, they are more likely to direct defensive processing towards bolstering the self, rather than disengaging from the health message, providing a boost in self-esteem which in turns allows participants to more fully process the message itself. This increased engagement with and processing of the message leads to higher message compliance. On the other hand, when self-awareness is low, our default state, and the message contains a similar model, defensive processing is directed at disengaging from the message which allows viewers to disregard the message and

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maintain current, unhealthful, behaviors. While previous research has demonstrated that self-affirmation reduces defensive processing of threatening messages (e.g. Harris and Napper 2005; van Koningsbruggen et al. 2009), to the best of my knowledge, the present paper is the first to explore the possibility that increased self-awareness is one mechanism through which self-affirming thoughts in response to a threatening message might be spontaneously generated.

In one possible exception, Schwinghammer et al. (2006), found that when exposed to a highly attractive other, individuals who had previously been exposed to a neutral high self-awareness prime were more likely to rate themselves as attractive compared to a control condition in which self-awareness had not been activated. The authors found that when self-awareness was high, individuals were more likely to generate positive thoughts about themselves as a means to protect themselves from the ego-threat posed by the upward comparison standard. While these authors did find that individuals are likely to respond to a self-threat under heightened self-awareness by spontaneously generating positive thoughts about the self, they did not consider any behavioral consequences of these positive self-thoughts as I have done in this paper.

The fact that I used perceived similarity between the models and the viewer to manipulate relevance of the ad has several important implications, particularly for those designing health campaigns directed at minority groups. When designing campaigns directed at minorities, it makes sense to use models belonging to the same minority group as the target population. However, because this will raise perceived relevance of the message, the messages are likely to lead

to decreased compliance unless the ad in some way heightens the viewer's self-awareness. A fruitful area for future research would be to explore how the message itself might be manipulated to enhance self-awareness. One possibility for heightening self-awareness is to either create ads that contain mirrors or to place ads near mirrors, such as in public rest-rooms. Another possibility is to use the pronouns within the ad to enhance self-awareness. In the present study the health messages contained no pronouns, but it is possible that using first person pronouns within the health message might work to increase self-awareness.

Another important implication of the present research is the finding that attitude toward the ad is not a reliable predictor of message effectiveness. In studies 2 and 3 I consistently found that people prefer health messages that feature similar models. In study 3 I found that this is the case regardless of whether the similar model is obese or thin. However, I also found that the preferred message is not always the most effective for creating behavioral change. In fact, when self-awareness was low, our default state, participants actually showed lower message compliance after exposure to the preferred ad containing the similar model than they did after exposure to the less preferred ad containing the dissimilar model. This suggests that when test marketing health messages, or any potentially threatening message, managers need to look beyond mere attitude toward the ad, and investigate actual message compliance.

There are several interesting avenues for future research addressing the issue of how increased self-awareness impacts the way that personally relevant health messages are processed. One question is whether any ego-threatening

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message, not just those directed at health behaviors, would result in a similar pattern of results. For example, any ad for a product that is designed to "fix" a problem is likely to pose an ego threat to those who are in need of the product (e.g. anti-aging products, acne treatments, diet products, or medications). The mere fact that one has a need for these products might pose an ego threat, which would suggest that the more personally relevant the ad is perceived to be, the more likely the viewer is to disengage from the ad unless self-awareness is high. The present research would suggest that when designing ad campaigns for these types of products it is important to both use models that are perceived as similar to the self and increase self-awareness so that defensive processing is directed toward the enhancing self, allowing for greater processing of and compliance with the message, rather than simple disengagement from the ad.

One limitation of the present research is that the dissimilar model represents a downward comparison standard: someone who is heavy. A promising avenue for future research would be to investigate whether using an upward comparison standard, someone who represents a physical or social ideal, would lead to a different pattern of results than those found in the present research. In study 3 the hold-out sample of obese participants provides some initial results suggesting that even when the dissimilar model is an upward comparison standard the same pattern of results will be observed. Future research could collect a larger sample of obese participants to see if my results fully replicate when the similar model is obese, and the dissimilar model is thin.

Another potential limitation of the present research is that similarity was manipulated primarily through the weight of the model used. Future research could explore other means of manipulating model similarity to see if the results replicate. One other way that similarity could be manipulated is through the language used, for example using a local dialect or accent might enhance perceived similarity. Additionally, university affiliation might be used to enhance similarity on college campuses.

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U.S. Department of Health and Human Services,
http://www.nhlbi.nih.gov/health/public/heart/obesity/lose_wt/bmi_dis.htm

APPENDIX A

EXAMPLES OF ADS USED IN STUDIES 1-3

Ad containing model that is perceived as similar to the self, used in studies 1-3.

Ad containing model that is perceived as dissimilar to the self, used in studies 1-3.

Eat Healthy Foods

and live a longer life

To maintain a healthy diet, you should:
- Emphasize fruits, vegetables, whole grains, and fat-free or low-fat milk and milk products
- Include lean meats, poultry, fish, beans, eggs, and nuts
- Eat foods low in saturated fats, trans fats, cholesterol, salt (sodium), and added sugar
- Stay within daily calorie needs

Ad containing moderately dissimilar model, used in study 2.

APPENDIX B

IRB APPROVAL FORMS
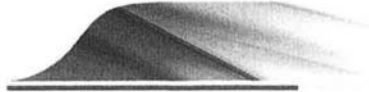
To:	Naomi Mandel BAC
From:	Mark Roosa, Chair Soc Beh IRB
Date:	10/13/2008
Committee Action:	**Exemption Granted**
IRB Action Date:	10/13/2008
IRB Protocol #:	0809003311
Study Title:	How Model to Self Size Comparisons Lead to Consumption Decisions

The above-referenced protocol is considered exempt after review by the Institutional Review Board pursuant to Federal regulations, 45 CFR Part 46.101(b)(2) (6) .

This part of the federal regulations requires that the information be recorded by investigators in such a manner that subjects cannot be identified, directly or through identifiers linked to the subjects.   It is necessary that the information obtained not be such that if disclosed outside the research, it could reasonably place the subjects at risk of criminal or civil liability, or be damaging to the subjects' financial standing, employability, or reputation.

You should retain a copy of this letter for your records.

IRB Protocol Number: 10.075.01e

DATE: September 10, 2009

TO: Elizabeth Miller

FROM: Office of Research Protections

RE: Use of Models in Advertising: Implications for Encouraging Healthier Food Choices

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Notice of Evaluation – [Exempt 45 CRF 46. 101(b)] 45 CFR 46.101(2)

The Office for Research Protections (ORP) has evaluated the project named above. According to the information provided, you intend to understand the impact that pairing models of various body size with a health message has on consumption decisions about food. This is a minimal risk study.

This study has been granted an exemption from Boston College IRB review in accordance with 45 CFR 46.101 (b) 45 CFR 46.101(2). This designation is based on the assumption that the materials that you submitted to the ORP contain a complete and accurate description of all the ways in which human subjects are involved in your research.

This exemption is given with the following conditions:

1. You will conduct the project according to the plans and protocol you submitted;
2. No further contact with the ORP is necessary unless you make changes to your project or adverse events or injuries to subjects occur;
3. If you propose to make any changes in the project, you must submit the changes to the ORP for IRB review; you will not initiate any changes until they have been reviewed and approved by the IRB;
4. If any adverse events or injuries to subjects occur, you will report these immediately to the ORP.

The University appreciates your efforts to conduct research in compliance with the federal

regulations that have been established to ensure the protection of human subjects in research.

Date of Exemption: Thursday, September 10, 2009

Sincerely,

Stephen Erickson
Interim Director
Office for Research Protections
TSL

FIGURE 1

STUDY 1 RESULTS: 2-WAY INTERACTION BETWEEN PERCEIVED

MODEL SIMILARITY AND LEVEL OF SELF-AWARENESS ON NUMBER

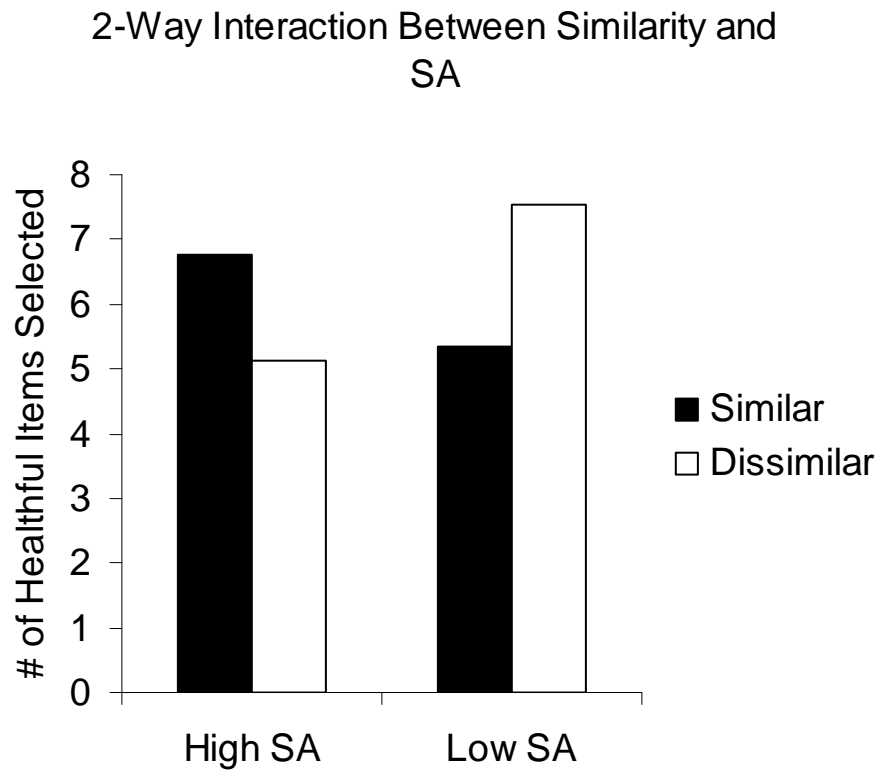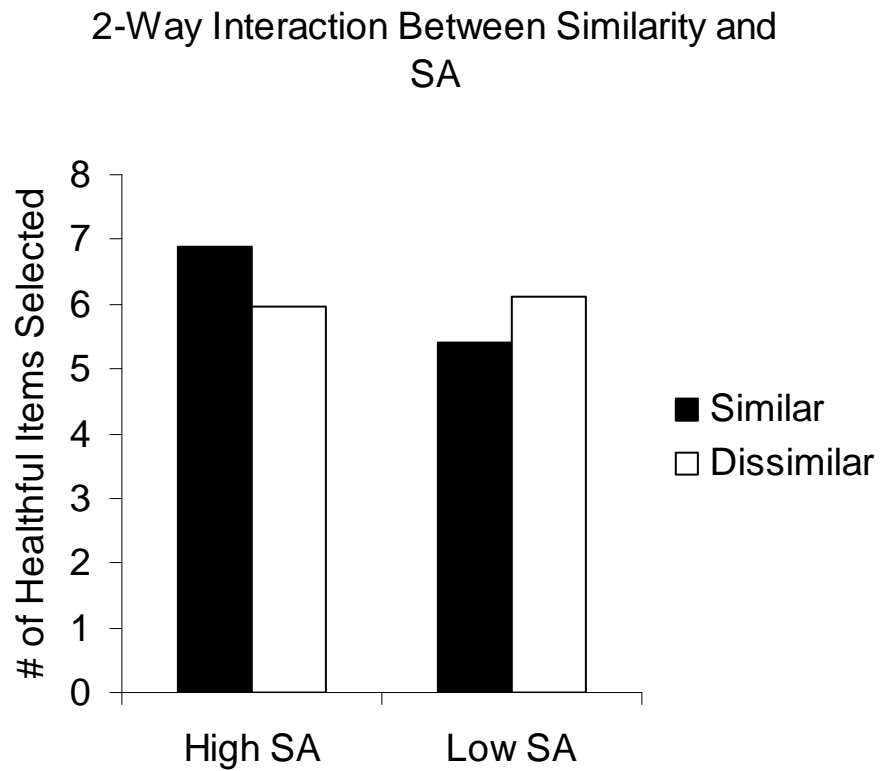OF HEALTHFUL ITEMS SELECTED FROM A VENDING MACHINE

2-Way Interaction Between Similarity and SA

FIGURE 2

STUDY 2 RESULTS: 2-WAY INTERACTION BETWEEN PERCEIVED

MODEL SIMILARITY AND LEVEL OF SELF-AWARENESS ON NUMBER

OF HEALTHFUL ITEMS SELECTED

2-Way Interaction Between Similarity and SA

FIGURE 3

STUDY 2 RESULTS: 2-WAY INTERACTION BETWEEN PERCEIVED

MODEL SIMILARITY AND LEVEL OF SELF-AWARENESS ON

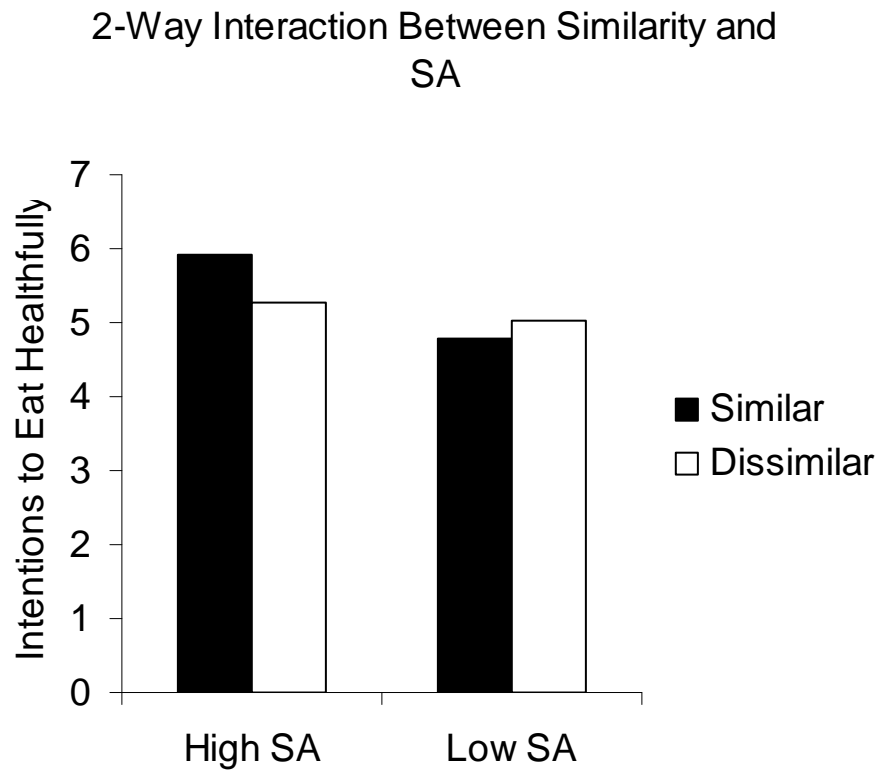INTENTIONS TO EAT HEALTHFULLY IN THE COMING WEEK

FIGURE 4

STUDY 2 RESULTS: 2-WAY INTERACTION BETWEEN PERCEIVED

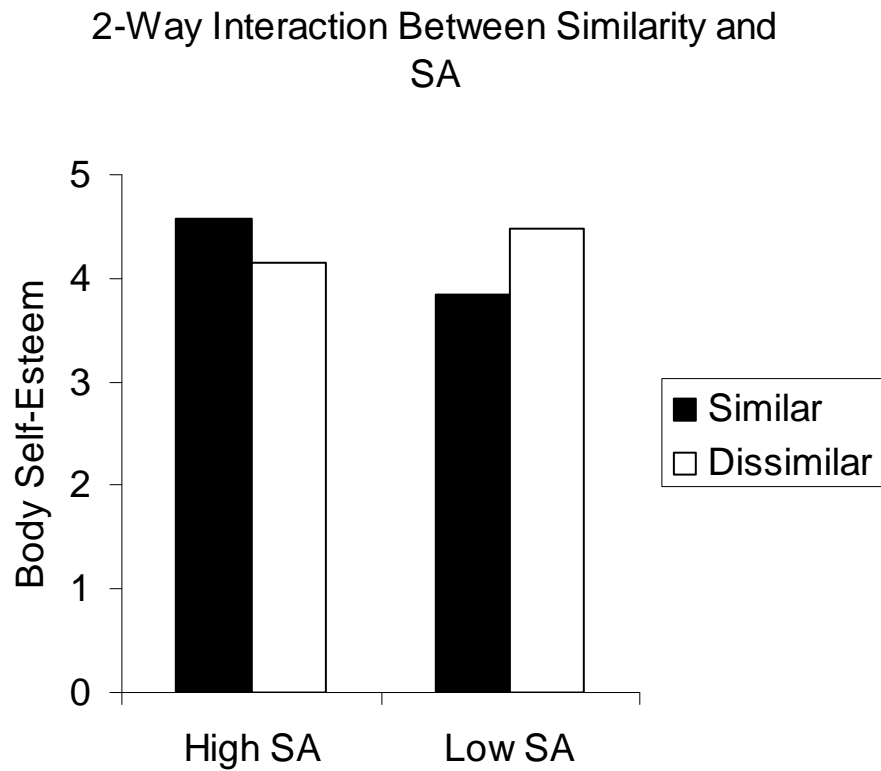MODEL SIMILARITY AND LEVEL OF SELF-AWARENESS ON BODY

SELF-ESTEEM

2-Way Interaction Between Similarity and SA

FIGURE 5

STUDY 2 RESULTS: 2-WAY INTERACTION BETWEEN PERCEIVED

MODEL SIMILARITY AND LEVEL OF SELF-AWARENESS ON MESSAGE

RECALL

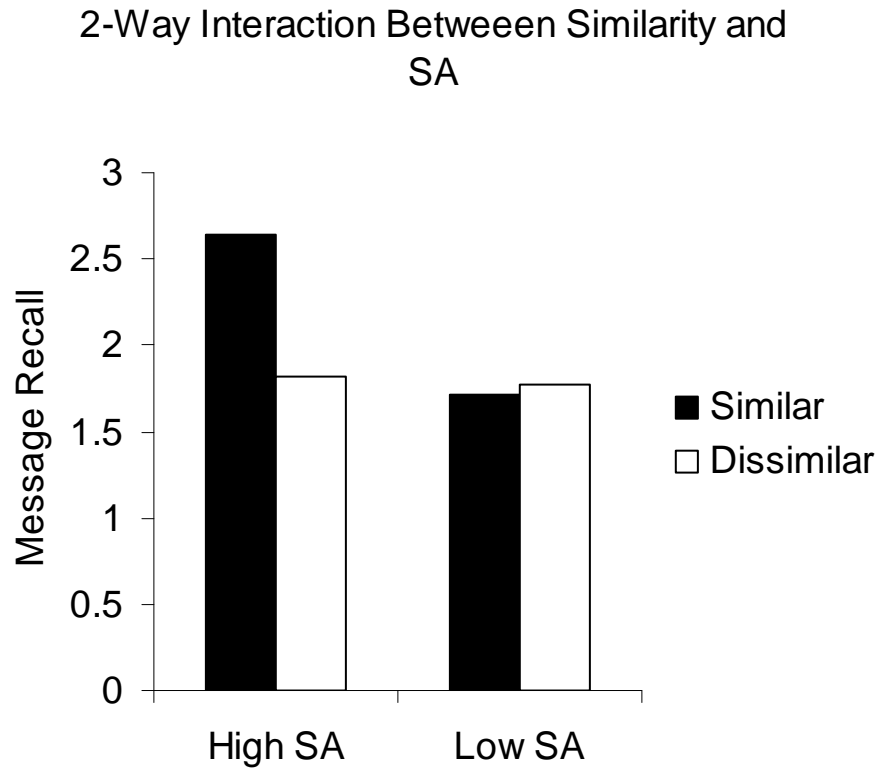2-Way Interaction Betweeen Similarity and SA

FIGURE 6

STUDY 3 RESULTS: 2-WAY INTERACTION BETWEEN PERCEIVED

MODEL SIMILARITY AND LEVEL OF SELF-AWARENESS ON THE

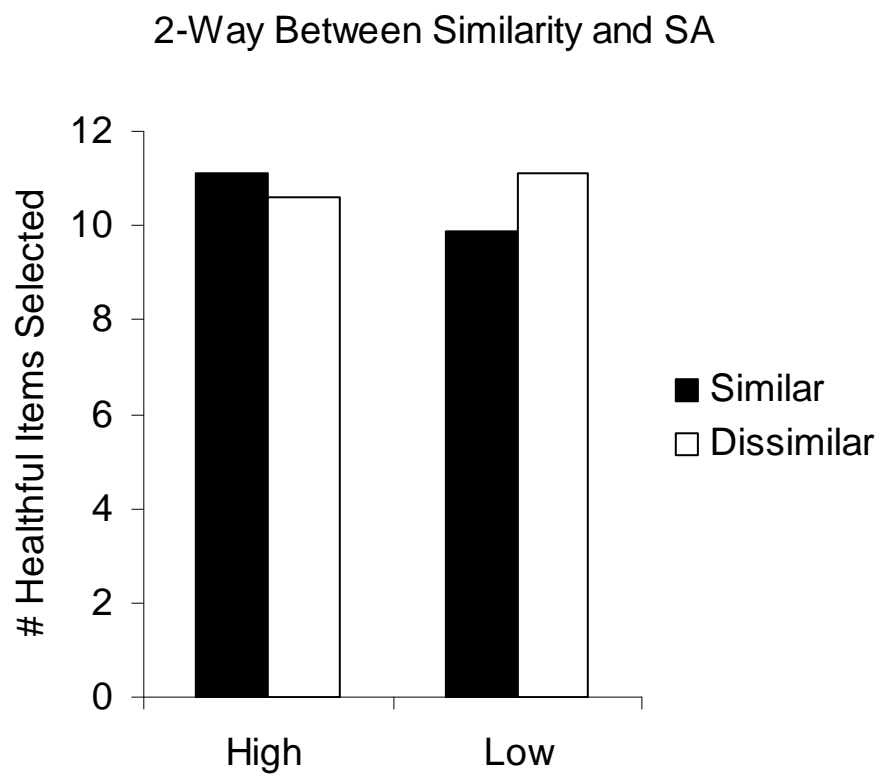NUMBER OF HEALTHFUL ITEMS SELECTED FROM A VENDING

MACHINE

2-Way Between Similarity and SA

FIGURE 7

STUDY 3 RESULTS: 3-WAY INTERACTION BETWEEN PERCEIVED

MODEL SIMILARITY, LEVEL OF SELF-AWARENESS AND TIMING ON

PERCEIVED RELEVANCE OF THE MESSAGE