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Risk Comparisons: The Role of Self-Threat vs. Self-Affirmation in Shaping Responses to Social Comparative Risk Information

by

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Submitted to the Graduate Faculty as partial fulfillment of the requirements for the Master of Arts Degree in Psychology

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An Abstract of

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Risk information can provide a useful tool for changing self-evaluations and motivating behavioral change. For instance, learning that you are at high risk for gum disease may lead to more negative self-evaluations, more worry, and greater intentions to change one’s habits. However, risk information is often ambiguous and vague, requiring a relevant reference point for interpretation. According to social comparison theory, much of what we desire to learn about ourselves can only be accomplished by examining information about others. Despite this logical premise, the evidence is mixed with regard to whether social comparative risk information is more influential than absolute or self-risk information alone. In the current work, we examined the moderating role of self-threat vs. self-affirmation in terms of changing people’s interest in and sensitivity to social comparison information. In the study, participants answered health-relevant questions upon which feedback was ostensibly based. After this, participants completed a supposedly unrelated writing task wherein we manipulated self-affirmation vs. -threat
by having participants write about displaying a valued trait (self-affirmation), not displaying a valued trait (self-threat), or a situation where another person displays a non-valued trait (control). After this, participants received above- or below-average risk feedback for periodontal (gum) disease and answered questions related to their self-evaluations of dental health, emotional reactions to the risk information, behavioral intentions, and behaviors aimed at reducing the risk. Thus, participants were randomly assigned to a 3 (self-threat: threat, control, affirmation) X 2 (comparative risk: above or below average). Results did not reveal any systematic main effects or interactions for self-evaluations, emotions, or behavioral intentions; however, on the behavioral measure (taking a dental health pamphlet) there was tentative evidence of an interaction between self-threat condition and risk feedback. Results are interpreted, and theoretical and practical implications are discussed.
For Gabriel: You have always been and continue to be my inspiration, my love, and my light.
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Chapter 1

Literature Review

1.1 Introduction

When making important health decisions, people often rely on risk assessments, calculations, and information (Janz & Becker, 1984; Weinstein, 1988). For example, if a person knows that his/her risk level for periodontal (gum) disease is 90%, this might prompt proactive steps to ensure healthy teeth (e.g., purchasing a specialized toothpaste). Although risk information can often be concrete and clear with regard to whether someone has a high (e.g., 90%) or low risk level (e.g., 10%), many times risk information is more ambiguous. For instance, what conclusions should a person draw if their risk level for a particular health outcome is 30%? How about 60%? Moreover, it is also the case that risk assessments, calculations, and interpretations are sometimes not associated with concrete and objective figures at all. Instead, people must sometimes rely on subjective risk assessments and calculations that are uncertain and imprecise. In both cases, then, there can be tremendous ambiguity in interpreting risk information. Under such situations, how might people go about making sense of and utilizing risk-relevant information in health contexts?
Notably, it has been suggested that people use various reference points to interpret risk (and other types of) information (e.g., Festinger, 1954; Kahneman & Miller, 1986; Kahneman & Tversky, 1984; Klein, 1997; Weinstein, 1980). Critical for the current research, we suggest that people are influenced by social comparative reference points. For instance, if you learned the average risk level for periodontal disease for people like you is 15%, this might facilitate comprehension and understanding of your risk, and subsequently impact emotion, cognition, and behavior. The current research examined a critical factor that was expected to moderate people’s interest in and sensitivity to social comparative risk information. Specifically, we investigated the role of self-threat vs. self-affirmation in shaping social comparative processes.

1.2 Social Comparison

Social comparison is a basic component of all of our lives. Festinger (1954) introduced the idea of social comparison as a drive in humans to evaluate themselves, their opinions, and beliefs. He argued that much of the information that we desire to obtain about ourselves can only truly be discovered through social comparison. For instance, describing someone as smart, funny, and athletic implies that they are more intelligent, funny, and athletic than others. One critical caveat to Festinger’s theory was that self-evaluation may be driven by objective, non-social information if such information is available. For example, people may use exam scores to evaluate their intelligence or marathon times to evaluate their athleticism. However, it has been argued that even objective information is often supplanted by comparative-relevant information (Klein, 1997) and that social comparisons are made even when unintended (Gilbert,
Giesler, & Morris, 1996). For example, exam scores and running times are more meaningful when learning percentile rank or central tendency information.

Importantly for the current research, it is suggested that people will use comparative reference points when interpreting their risk level for a health outcome. Indeed, although people often receive concrete and objective risk information, knowing that we are above or below average in our risk for a health disease, illness, accident, or other malady is often more meaningful than knowing absolute or objective risk information alone (French, Hevey, Sutton, Kinmonth, & Marteau, 2006; French, Sutton, Marteau, & Kinmonth, 2004; Lipkus et al., 2000; Lipkus, Lyna, & Rimer, 2000; Mason, Prevost, & Sutton, 2008). For example, Fagerlin, Zikmund-Fisher, and Ubel, (2007) found that comparative risk information alters people’s hypothetical decisions about whether to take a risky treatment. In particular, participants were more inclined to take the risky treatment for breast cancer upon learning that their risk level was above-average than when their risk was below-average—despite having identical absolute or objective risk levels in both conditions.

Despite this logical set of findings where people show sensitivity to social comparative risk information, not all research is supportive of this. Indeed, whereas some research supports that social comparative risk is more influential than absolute risk (e.g., Blalock, DeVellis, Afifi, & Sandler, 1990; Harris et al., 2002 Study 1; Klein, 1997; 2002; 2003; Lipkus & Klein, 2006; Lipkus, Klein, Skinner, & Rimer, 2005; Rose, 2010), other research suggests that absolute or objective risk is more influential than comparative risk (e.g., Gerrard, Gibbons, Vande Lune, Pexa, & Gano, 2002; Harris & Smith, 2005; Harris, Sparks, & Raats, 2002 Study 2a). Thus, it appears that, for some
people or situations, social comparative reference points are not useful or influential and that absolute/objective risk is more impactful. There has been some attempt to reconcile these mixed results. For instance, previous research has discovered moderating variables that alter the way social comparison information is used and considered. Known moderator variables include how far removed an individual is from a comparative other (Mason et al., 2008), the type of outcome variable (Klein, 1997), and individual differences in interhemispheric interaction (Rose & Nagel, 2013). In the current research, we explored the role of self-threat vs. self-affirmation in motivating interest in and sensitivity to social comparative risk information.

1.2.1 Social Comparison and Self-Threat

The self is the lens through which one views the world and organizes his/her behavior (Swann, 2005). An important goal of this process is to perceive the self accurately and reduce ambiguity. In times of self-threat, people are uncertain and should be motivated to engage in self-evaluation maintenance. Festinger (1954) argued that social comparison processes are a primary way in which people attempt to resolve ambiguity and increase accuracy in self-evaluation, which may include establishing, maintaining, and refining the self-concept (Zell & Alicke, 2009) or validating that they have processed and integrated information correctly (Fazio, 1979). In sum, because of an increase in ambiguity and uncertainty, people should be especially interested in and sensitive to social comparative information following a situation where they have experienced a self-threat. There is some support for this notion in the literature.

First, people with low self-esteem—who can be viewed as being chronically under self-threat—are more likely to use social comparative information (Wayment &
Taylor, 1995). Second, stressful and threatening situations are more likely to engage social comparative processes (French et al., 2006; Taylor, Buunk, and Aspinwall, 1990). For example, when people are under stress they use their social environment systematically and selectively, seeking out more information in threatening situations to either help them rebuild their self-image (Pyzczynski, Greenberg, & LaPrelle, 1985), minimize the threat (French et al., 2004), or cope with the situation (Schacter, 1959). Although this evidence is supportive of the possibility that self-threat should increase interest in and sensitivity to social comparative risk information, there is no study that has directly examined this issue.

1.2.2 Social Comparison and Self-Affirmation

As stated above, it is anticipated that interest in and sensitivity to social comparative information will increase when under self-threat. However, another critical question that has not been considered in this literature is what happens to social comparative processes when the self is affirmed (vs. threatened). Self-affirmation is the idea that people can buffer against negative self-relevant information by affirming the self on an unrelated dimension (McQueen & Klein, 2006; Steel, 1988). Previous research has shown that offering the opportunity to self-affirm on valued traits (e.g., writing about an occasion in which one has successfully demonstrated honesty) has numerous downstream consequences, including greater acceptance of health information (Sherman, Nelson, & Steele, 2000), less cognitive dissonance after writing a counter-attitudinal essay (Tesser and Cornell, 1991), and reduced post-choice rationalization (Steele, Spencer, & Lynch, 1993).
There has not, heretofore, been any research examining the impact of self-affirmation on responses to social comparative risk information. How might self-affirmation change people’s interest in and sensitivity to social comparative risk information? Based on the literature and our extrapolation from it, we have determined that there are two competing hypotheses that will be directly tested against one another in the current research. First, when provided with the opportunity to self-affirm, this may satiate any desire to perform other self-evaluative behaviors in response to self-threat—such as using social comparative information to self-evaluate or self-enhance. Thus, a person who has been self-affirmed may feel self-assured, certain, and positive, hence losing interest in using social comparative information to achieve such states. Moreover, even if social comparative information is provided, perhaps its perceived value will be discounted and less influential upon being self-affirmed.

Second, an equally valid possibility is that self-affirmation will increase interest in and sensitivity to social comparative information. This hypothesis is tenable given that past research has shown that people become more (not less) willing to accept negative health information after self-affirmation (Sherman et al., 2000). Specifically, Sherman and colleagues (2000) found that individuals who received a threatening health-relevant message (e.g., their caffeine consumption puts them at risk for breast cancer) were less defensive and more willing to change behaviors after self-affirmation. Put differently, people who are self-affirmed are less likely to perceive other situations as self-threatening and are subsequently more willing to accept information that could be potentially negative but useful for self-preservation. In the context of the current research, a person who is self-affirmed may be quite interested in and sensitive to social
comparative risk information because this information could help to clarify whether the risk information implies that they should be concerned.

1.3 Current Research

Past research has revealed that people use social comparative reference points to place absolute/objective risk information into context and impact emotion, cognition, and behavior. However, it has also been revealed that people do not always appear sensitive to comparative risk information. The current research examined a novel moderator—self-threat vs. self-affirmation—in terms of shaping interest in and sensitivity to social comparative risk.

In the study, participants first provided information about their health habits, upon which risk feedback presented later is presumed to be based. We chose to use dental health feedback because this was a context that would be believable and important to college students, but also related to other important health outcomes such as cancer and heart disease (e.g., Desvarieux et al., 2005). Next, as an ostensibly unrelated filler task, participants were asked to write an essay about a time in which they acted in accordance with a valued trait (affirmation condition), they acted in violation of a valued trait (threat condition), or another person acted in accordance with a non-valued trait (control condition). Note that another person was chosen rather than the self for the control condition to ensure further separation of the individual from the trait about which they wrote. This constituted our manipulation of self-affirmation vs. self-threat. Next, participants were told that they would shortly receive feedback about their level of risk for periodontal (gum) disease and indicate their interest in and motivation to learn about the risk level for other University of Toledo (UT) students. Participants then received
false feedback about their own level of risk for periodontal (gum) disease, and learned that their risk level was above or below other UT students of the same age/sex. Finally, participants responded to questions involving their emotional responses, self-evaluations, and behavioral intentions in the context of gum disease. Additionally, participants had the opportunity to take a pamphlet about gum disease upon leaving the lab. As stated previously, the literature points to two competing hypotheses for the interplay between comparative risk and self-affirmation/threat that we will directly test between.

1.3.1 Hypothesis Set 1. First, we consider the potential impact of the self-threat condition on participant interest in and motivation for learning about the risk level for other students (note that comparative risk information is not a factor here because the manipulation occurs after the measurement of this variable). One possibility is that participants who are self-threatened will respond by showing more interest in and motivation for learning about the risk level for other students, compared to the self-affirmation condition and the control condition. A second possibility is that participants in both the self-threat and self-affirmation conditions will show more interest in and motivation for learning about social comparison information than will participants in the control condition.

1.3.2 Hypothesis Set 2. Second, we consider the potential impact of the self-threat and comparative risk information on emotions, self-evaluations, behavioral intentions, and behaviors. One possibility is that participants who are self-threatened will show the most sensitivity to the comparative information, compared to the self-affirmation condition and the control condition. That is, in the self-threat condition, participants in the above-average risk condition should show greater negative emotions, poorer self-evaluations,
and greater intentions and behaviors aimed at reducing their risk level compared to the below-average risk condition; participants in the control and self-affirmation conditions would show no difference across these measures between the above- and below- average risk conditions. A second possibility is that participants in both the self-threat and self-affirmation conditions will show more sensitivity to the comparative information, compared to the control condition. That is, participants in the self-threat and self-affirmation conditions should show greater negative emotions, poorer self-evaluations, and greater intentions and behaviors aimed at reducing their risk level in the above-average condition compared to the below-average risk condition; participants in the control condition would show no difference across these measures between the above-and below- average risk conditions.
Chapter 2

Method

2.1 Participants and Design

Participants were 94 undergraduate students who earned partial course credit in an introductory psychology course in exchange for their participation. Participants were randomly assigned to one cell of a 2 (comparative risk: above or below average) x 3 (self-threat: threat, control, affirmation) completely between-participants design.

2.2 Procedures, Manipulations, and Measures

The study was presented as an effort to collect information on the health habits and general wellness of the student body at the University of Toledo. Participants were told that they would answer a series of questions dealing with their health habits and that feedback would be supplied in an effort to create a more positive experience at the University of Toledo through awareness of the contribution of habits to health and well-being. Participants were greeted by a research assistant when they arrived at the lab and first completed an informed consent document. Following this, each participant was seated individually in front of a computer on which they navigated through a MediaLab program.
First, participants completed a “Health Habits Questionnaire” (used in Scherzer & Rose, 2012). Most important for the current study, participants answered a number of questions about their dental habits (e.g., How frequently do you replace your toothbrush? What type of toothpaste do you use?). These questions varied widely in type (e.g., multiple choice, open-ended) and topic (e.g., dental habits, sugar consumption) in order to make the feedback seem more realistic. Moreover, participants also answered a variety of questions about their diet (e.g., frequency of daily fruits/vegetable servings), exercise (e.g., amount of moderate daily exercise), and smoking (e.g., frequency of daily nicotine consumption). This latter set of items was included to make the health habits survey seem richer and also because these variables could be linked to dental health, making the calculation of feedback seem more plausible. See Appendix A.

2.2.1 Self-Threat Manipulation. Next participants were exposed to the self-threat manipulation, which was described as a filler task to be completed while the research assistant gathered information to provide health risk feedback. The affirmation/threat manipulation was presented as an unrelated study that sought to understand student values and the contribution of previous experiences on the importance of these values. As in prior research on self-affirmation (Briñol, Petty, Gallardo, & DeMarree, 2007; McQueen & Klein, 2006; Reed & Aspinwall, 1998), participants were given a list of 10 traits that are generally considered valued traits (e.g., honesty, loyalty, kindness) and provided rank orders of subjective importance to each trait. Next, participants were given a packet in which the topic of their essay was presented.

In all conditions, participants were asked to write a short essay based on one of the traits they subjectively ranked. As previous research has varied in exactly how much
writing is to be expected (e.g., Sherman et al. 2000 had a 5-minute time frame, Cohen et al. 2000 asked participants to write a short story, Shrira and Martin, 2005 asked participants to write one paragraph), we asked participants to write two, 3-5 sentence paragraphs. Although not given an explicit time frame by the research assistant upon starting the task, participants were limited to 5 minutes due to restrictions in the timing of the study.

In the self-affirmation condition, participants were asked to describe their most valued trait from the list and then describe examples of how they express this value or instances in which they have displayed this trait. The contents of the affirmation condition packet read:

“Please write two 3 to 5 sentence paragraphs about why this value is important to you. Take a few minutes to think about this value and how it has influenced your past behaviors or attitudes. Please write about how you use this value in your everyday life: at work, at home, with friends, or in dealing with strangers. Also, try to recall and write about specific occasions on which this value determined what you did.”

In the control condition, participants were asked to write about the trait which they rated of lowest importance and why this trait may be of importance to someone else. The contents of the control condition packet read:

“Please write two 3 to 5 sentence paragraphs about why this value could be important to another person. Take a few minutes to think about how this value may influence this person’s behaviors or attitudes. Please write about how this person may use this value in everyday life; at work, at home, with friends, or in
dealing with strangers. Only think about why this value might be important to another person, and not why it is unimportant to you.”

In the self-threat condition, participants were asked to write about their most valued trait but instead of writing about how they have displayed this trait, they were asked to describe instances in which they acted in contrast with or in violation of this trait. The content of the self-threat condition packet read:

“Please write two 3 to 5 sentence paragraphs about why this value is important to you. Take a few minutes to think about this value and how it has influenced your past behaviors or attitudes. Also, try to recall and write about specific occasions on which this value should have determined what you did but you acted against it. Please write about times when you have failed to use this value in your everyday life: at work, at home, with friends, or in dealing with strangers.”

Finally, as there is no definitive and consistent manipulation check for self-affirmation, three measures were used. First, we coded whether participants completed the task correctly (e.g., Did participants write about the trait they were assigned? Did participants write about instances in which they or others displayed or did not display the trait?) Second, we used an adaptation of Campbell’s (1996) self-concept clarity measure. For this measure, participants rated their extent of agreement (1 = completely disagree; 5 = completely agree) that four statements described how they were feeling right now (“My beliefs about myself conflict with one another”; “I feel that I am not really the person that I appear to be”; “My beliefs about myself seem to change”; “If I were asked to describe my personality, my description might end up being different today compared to another day”). Third, we used Heatherton and Polivy’s (1991) state self-esteem measure. For this
measure, participants rated the extent to which (1 = not at all; 5 = extremely) 20 statements described how they were feeling right now (e.g., I feel that others respect and admire me; I feel inferior to others at this moment; See Appendix B).

2.2.2 Interest in Social Comparative Information. After completing the self-affirmation/threat manipulation, participants were told that they were about to receive feedback about their risk level for one relevant area of health from the previous habits survey. They were told the topic of the feedback was randomly decided by the program and that they had been chosen to receive feedback on their risk for periodontal (gum) disease. Before receiving this feedback, participants were asked to indicate their interest in and motivation for learning about the risk level for other UT students of their age/sex. Participants were told that they may or may not receive this information, but that we were interested in whether they believed the information would be informative or helpful to them. Specifically, these items included: 1) How interested would you be in learning about the risk level for other UT students your age/sex (1 = not at all; 7 = very); 2) How useful would you find learning about the risk level for other UT students your age/sex (1 = not at all; 7 = very); and 3) How informative would you find learning about the risk level for other UT students your age/sex (1 = not at all; 7 = very)

2.2.3 Comparative Risk Feedback Manipulation. Next, participants were provided with feedback regarding their risk for periodontal (gum) disease. The research assistant provided a print-out of feedback to each of the participants individually, which is, again, ostensibly based on their answers to the habits surveys given earlier. See Appendix C for an example of the feedback sheet. The research assistant then explained:
“You were selected to receive information on your risk for periodontal disease. You were also chosen to receive information about other UT students. Your risk information is here [research assistant points to student’s risk] and information about other UT students is located here [research assistant points to other UT students’ risk.]

There are one hundred ovals in each grouping. Each oval represents one percentage point of risk. The total number of ovals that are filled in represents the risk level. If you have any questions about the feedback, please ask.”

To keep the absolute risk level constant, all participants were told that their risk for developing periodontal (gum) disease was 31% over the next 10 years (i.e., 31 of the 100 ovals on the feedback sheet were filled in). In the above-average condition, participants’ risk levels were higher than the average UT student’s risk level, which was 13% (i.e., 13 of the 100 ovals on the feedback sheet were filled in). In the below-average condition, participants’ risk levels were lower than the average UT student’s risk level, which was 49% (i.e., 49 of the 100 ovals on the feedback sheet were filled in). As a manipulation checks, participants were asked to 1) rate the risk level of other UT students who have completed this study on a Likert-type scale (1 = very low; 7 = very high) and 2) provide the exact risk percentage for other UT students who have completed this study (0-100%).

2.2.4 Main Dependent Measures. Upon receiving the risk feedback, participants were given a post-feedback questionnaire in which they were asked to make a series of judgments. These included self-evaluative measures, emotional measures, and behavioral intentions. See AppendixD.
First, self-evaluative measures were designed to tap into participants’ evaluations of the dimension of relevance. For instance, participants were asked to evaluate their own oral care habits: “How would you rate your oral care habits? (1 = very poor; 7 = very good); “How would you rate your oral health?” (1 = very poor; 7 = very good); and “How important is oral care to you?” (1 = not at all important; 7 = very important).

Additionally, participants indicated their thoughts about the feedback, such as how believable, trustworthy and accurate it was (1 = not at all; 7 = very). This often serves as a measure of the extent to which a person is minimizing the threat (Jemmott, Ditto, & Croyle, 1986).

Second, to assess emotional responses, participants completed a post-manipulation affect survey. Specifically, participants were asked to judge the extent to which they are currently feeling 20 different positive and negative emotions (e.g., nervous, proud) on a 5-point scale (1 = not at all; 5 = extremely; PANAS; Watson et al., 1988). See Appendix E.

Third, to assess behavioral intentions we included several measures that were closely derived from prior research on social comparison (Klein, 2002; Rose, 2010) and the theory of planned behavior (Ajzen, 1991). Specifically, these items included: “Indicate how interested you are in receiving information about proper dental care habits?” (1 = not at all; 7 = very); “Indicate how likely are you to seek out information about proper dental care habits” (1=not at all; 7= very); “I have decided to see a dentist in the next 6 months?” (1 = disagree; 7 = agree); “I intend to see a dentist in the next 6 months?” (1 = not at all likely; 7 = very likely); “I will try to go to the dentist in the next 6 months? (1 = improbable; 7 = probable); “I have decided to change my oral care habits
in the next 6 months?" (1 = disagree; 7 = agree); “I intend to change my oral care habits in the next 6 months?” (1 = not at all likely; 7 = very likely); and “I will try to change my oral care habits in the next 6 months? (1 = improbable; 7 = probable).

Fourth, as a behavioral measure, we recorded whether participants took a dental health pamphlet upon leaving the laboratory (yes = 1; no = 0).

Finally, participants answered a number of open-ended questions to gauge suspicion with elements of the procedure and feedback. Upon answering these questions, participants were fully debriefed, thanked, and dismissed.
Chapter 3

Data Analysis, Results, and Discussion

3.1 Preliminary Analyses

Complete data was collected for 94 participants. Of these, 18 were eliminated for some combination of 1) performing the affirmation/threat task incorrectly, either by writing about a value other than assigned, not writing in the valence assigned, or writing with respect to a target other than that which was assigned and/or 2) answering the state self-esteem and self-concept clarity items prior to performing the affirmation task or answering these items incorrectly. Thus, our final data set consisted of 76 participants, 19 males (25%) and 57 females (75%). Participants ranged in age from 17 to 36 years with a mean age of 19.5 years (median = 19 years).

3.2 Manipulation Checks

3.2.1 Self-threat Manipulation Check. Recall that we assessed the self-threat manipulation in three different ways. First, as indicated above, participants were removed from the data analysis for performing the affirmation/threat task incorrectly. Second, of the participants remaining in the dataset, we assessed their self-concept clarity (SCC). Presumably, if threatened, the SCC score should be higher than if not threatened. After aggregation (α = .72), responses were submitted to a 2 (comparative risk: above
average or below average) X 3 (self-threat: self-threat, self-affirmation, or control) completely between-participants ANOVA. Most important was the fact that the self-threat condition was significant, $F(2, 70) = 3.22, p = .05, \eta^2 = .09$. The self-affirmation condition ($M = 7.89; SD = 3.29$) was lower than the control condition ($M = 10.13; SD = 3.38$), $t(50) = 2.41, p = .02$, indicating greater self-concept clarity after self-affirmation. Additionally, participants in the self-threat condition had marginally higher SCC ratings ($M = 9.76; SD = 3.69$) than did participants in the self-affirmation condition, $t(47) = 1.87, p = .06$, indicating poorer self-concept clarity after self-threat. However, the control condition did not significantly differ from the self-threat condition, $t(43) = .35, p = .73$, suggesting that self-threat was not amplified beyond some baseline level. Moreover, the comparative risk main effect was not significant, $F(1, 70) = .28 p = .60, \eta^2 = .004$, but the comparative risk X self-threat manipulation was, $F(2, 70) = 6.19 p = .001, \eta^2 = .16$. The nature of this result was such that, among the control participants, those in the below-average condition had higher SCC scores than did participants in the above-average condition; however, among the self-threat participants, those in the below-average condition had lower SCC scores than did participants in the above-average condition. Participants in the self-affirmation condition appeared to have roughly similar SCC scores across the above- and below-average conditions. This latter interaction pattern is unexpected and difficult to interpret, given that the comparative risk manipulation came after this manipulation check item. The most logical conclusion is that there must have been a random assignment issue causing participants across the comparative risk conditions to differ.
Third, we also assessed participants’ state self-esteem (SSE) following the self-threat manipulation. Presumably, if threatened, SSE should be lower than if not threatened. After aggregation (α = .86), responses were submitted to a 2 (comparative risk: above average or below average) X 3 (self-threat: self-threat, self-affirmation, or control) completely between-participants ANOVA. Unlike with the SCC measure, there were no significant main effects or interactions (Fs < 1.23, ps > .29, η²s < .036).

In sum, it appears that our manipulation was somewhat successful at altering participants’ certainty about their personalities but not at all successful in altering momentary self-esteem. Thus, the extent to which we were successful in manipulating self-threat vs. self-affirmation in the current study is tentative at best. We return to this issue in Chapter 4.

3.2.2 Comparative Risk Manipulation Check. Recall that we assessed the comparative risk manipulation check in two different ways. First, we asked participants to indicate the risk level of other UT students who had participated in the study (1 = very low; 7 = very high). When submitting responses to a 2 (comparative risk: above average or below average) X 3 (self-threat: self-threat, self-affirmation, or control) completely between-participants ANOVA, the expected main effect of comparative risk condition occurred, F(1, 70) = 115.61, p = .001, η² = .62. As anticipated, participants in the below-average comparative risk condition had higher risk ratings for other UT students overall (M = 4.54; SD = .78) than did participants in the above-average risk condition (M = 2.29; SD = 1.02). The self-threat condition main effect and the self-threat X comparative risk interaction were non-significant (Fs < .64, ps > .52, η²s < .02).
Second, participants also provided an exact risk percentage for other UT students (0-100%). When submitting responses to a 2 (comparative risk: above average or below average) X 3 (self-threat: self-threat, self-affirmation, or control) completely between-participants ANOVA, the expected main effect of comparative risk condition occurred, $F(1, 70) = 1411.271, p = .001, \eta^2 = .95$. Participants in the below-average comparative risk condition ($M = 48; SD = 2.30$) accurately indicated a higher risk percentage for the other students relative to participants in the above-average condition ($M = 14.63; SD = 5.21$). Unexpectedly, there was also a smaller main effect of self-affirmation condition, $F(2, 70) = 3.42, p = .04, \eta^2 = .09$. Participants in the self-affirmation ($M = 31.61$) and self-threat conditions ($M = 32.64$) appeared to provide slightly higher risk percentage ratings for other UT students than did participants in the control condition ($M = 29.76$). Importantly, however, the self-threat X comparative risk interaction was not significant, $F(2, 70) = .18, p = .84, \eta^2 = .005$. In sum, these results suggest that our manipulation of comparative risk was quite successful.

3.3 Main Analyses

Recall that there were several main dependent variables in the study: 1) interest in social comparison information; 2) self-evaluation measures; 3) emotional responses; 4) behavioral intentions; and 5) a behavioral measure (i.e., taking a dental pamphlet). With exception of the interest in social comparison information dependent variable and the behavioral measure, each of these variables was analyzed using a series of 3 (self-threat condition: self-threat, control, or self-affirmation) X 2 (comparative risk: above average or below average) completely between-participants ANOVAs. See Table 1 for means and SDs. For these analyses, we were testing between two competing hypotheses and, for both, anticipated an interaction between comparative risk and self-threat. One
hypothesis was that self-threatened participants would show the most sensitivity to the comparative information (vs. self-affirmation and control participants), whereas the other hypothesis was that both self-threatened and self-affirmed participants would show more sensitivity to the comparative information vs. control participants.

3.3.1 Interest in Social Comparison Information. First, recall that participants indicated how interested they would be in, and how useful and informative they would find receiving information about other students immediately following the self-threat manipulation but just prior to the comparative risk manipulation. Our competing hypotheses were that either self-threatened participants would show the most interest (vs. self-affirmed and control participants) or that both self-affirmed and self-threatened participants would show the most interest (vs. control participants). To examine these competing hypotheses, the three items were aggregated (α = .61) and submitted to a one-way ANOVA with self-threat condition as an independent variable (note that the social comparative risk factor was not included because this measure was taken before comparative risk feedback was provided). Contrary to both hypotheses, the overall ANOVA was not significant, $F(2,73) = .16, p = .56, \eta^2 = .004$. Although participants in the self-threat condition did show the highest interest in social comparative information overall ($M = 5.01; SD = 1.12$), participants in the self-affirmation condition ($M = 4.84; SD = 1.23$) and the control condition ($M = 4.86; SD = 0.99$) also showed a relatively high degree of interest.

3.3.2 Self-Evaluation Measures. Recall that participants answered two distinct sets of self-evaluative questions. First, participants evaluated their own oral care habits (e.g., “How would you rate your oral care habits?”). The set of items was aggregated (α = .83) and submitted to a 3 (self-threat: self-threat, control, or self-affirmation) X 2
(comparative risk: above average or below average) completely between-participants ANOVA. The main effect of comparative risk condition was not significant, $F(1, 70) = .18, p = .67, \eta^2 = .003$. There was, however, a marginal main effect of self-threat condition, $F(2, 70) = 1.93, p = .15, \eta^2 = .052$. Specifically, self-affirmation participants had higher ratings of their habits ($M = 5.33; SD = .95$) than did control participants ($M = 4.83; SD = .90$), $t(61) = 2.14, p = .04, d = .54$. Self-threat participants ($M = 5.06; SD = .93$) did not differ from control participants nor self-verified participants ($t(61) < 1.2, ps > .22, ds < .30$). However, inconsistent with hypotheses, the comparative risk X self-threat interaction was not significant, $F(2, 70) = .09, p = .92, \eta^2 = .002$.

Second, participants indicated their thoughts about the feedback, such as how believable, trustworthy and accurate it was—an indicator of minimization (Jemmott, Ditto, & Croyle, 1986). The set of items was aggregated ($\alpha = .89$) and submitted to a 3 (self-threat: self-threat, control, or self-affirmation) X 2 (comparative risk: above average or below average) completely between-participants ANOVA. The main effect of self-threat condition was not significant, $F(2, 70) = .13, p = .08, \eta^2 = .002$. There was, however, a significant main effect of comparative risk information, $F(1, 70) = 16.77, p = .001, \eta^2 = .19$. Specifically, participants had poorer feedback evaluations (greater minimization) upon learning their risks were above-average ($M = 4.09; SD = 1.25$) than when they were below-average ($M = 5.32; SD = 1.38$), consistent with a minimization-under-threat result pattern. However, inconsistent with hypotheses, the comparative risk X self-threat interaction was not significant, $F(2, 70) = .84, p = .44, \eta^2 = .023$.

**3.3.3 Emotional Responses.** To assess emotional responses, recall that participants completed the PANAS (Watson et al., 1988) post-manipulation. Responses to the positive affect items ($\alpha = .88$) and the negative affect items ($\alpha = .85$) were separately
aggregated for inclusion in a 3 (self-threat: self-threat, control, or self-affirmation) X 2 (comparative risk: above average or below average) X 2 (affect dimension: positive affect or negative affect) mixed-model ANOVA.

First, in terms of the main effects, there was a robust main effect of affect dimension, $F(1, 70) = 43.44, p = .001, \eta^2 = .38$, such that participants had higher positive affect ratings overall ($M = 2.79; SD = .81$) than negative affect ratings ($M = 2.01; SD = .69$). Second, there was also a main effect of comparative risk condition, such that participants had higher affect ratings overall in the below-average comparative risk condition than in the above-average comparative risk condition, $F(1, 70) = 4.00, p = .04, \eta^2 = .05$—although this latter result is not particularly meaningful since it collapses across positive and negative affect. Finally, the self-threat condition main effect was not significant, $F(1, 70) = .26, p = .78, \eta^2 = .007$.

Second, in terms of the interactions, there was an affect dimension X comparative risk interaction, $F(2, 70) = 6.80, p = .01, \eta^2 = .09$. Specifically, participants in the below-average comparative risk condition had much higher positive affect ($M = 3.06; SD = 0.81$) than negative affect overall ($M = 2.00; SD = 0.71$), $t(40) = 6.69, p < .001$. For participants in the above-average risk condition, their positive affect ($M = 2.49; SD = 0.71$) was also higher than their negative affect ($M = 2.03; SD = 0.67$) but the difference was not quite as large as in the below-average condition, $t(40) =3.04, p < .001$. Said differently, participants who learned that they were below-average felt much more positive affect than negative affect whereas participants who learned they were above-average in risk showed tempered positive affect in the face of the feedback. Although notable, this finding is not directly tied to our hypotheses. More relevant to our
hypotheses, all other interactions were not significant ($F$s $< .84$, $p$s $> .44$, $\eta^2$s $< .023$), indicating a lack of support for our core hypotheses.

3.3.4 Behavioral Intentions. Recall that participants were asked 8 different intention-related items. Upon submitting the items to an exploratory factor analysis, a three-factor solution emerged. The first factor related to intentions of changing their dental habits ($\alpha = .95$). The second factor related to intentions for visiting the dentist ($\alpha = .88$). Finally, the third factor related to seeking out and desiring information about proper dental habits ($\alpha = .85$). After aggregating the relevant subscales, these were submitted to a 3 (self-threat condition: self-threat, control, or self-affirmation) X 2 (comparative risk condition: high comparative risk or low comparative risk) completely between-participants MANOVA. The overall MANOVA did not reveal any significant main effects or interactions ($F$s $< .74$, $p$s $> .68$, $\eta^2$s $< .03$), nor did any individual ANOVAs when each dependent variable was analyzed separately ($F$s $< 1.78$, $p$s $> .18$, $\eta^2$s $< .04$).

3.3.5 Behavioral Measure (Pamphlet). For this analysis, a binary logistic regression was conducted involving whether or not participants took a pamphlet ($0 = no; 1 = yes$). See Table 2. Step 1 included the main effects of self-threat condition ($1 = self-affirmation; 2 = control; 3 = self-threat$) and comparative risk ($1 = below average; 2 = above-average$) and Step 2 included the self-threat X comparative risk interaction term (See Table 2). Step 1 of the model was non-significant overall (Nagelkerke $R^2 = .06$; $\chi^2 = 2.610$, $p = .27$), although there was marginal evidence of a main effect for self-threat condition ($B = .54$, $p = .12$; Odds Ratio $= 2.46$). Participants in the self-threat condition tended to be more likely to take pamphlets overall (27%) than did participants in the self-affirmation condition (10%) or the control condition (8%). Step 2 of the model, which
included the main effects and interactions was marginally significant (Nagelkerke $R^2 = .10, \chi^2 = 1.78, p = .18$). As in Step 1, the marginal main effect of self-threat remained ($B = .56, p = .12; Odds Ratio = 2.39$). Additionally, there was also a marginal self-threat X comparative risk interaction ($B = -.47, p = .19; Odds Ratio = 1.69$). As can be seen in Figure 1, participants in the self-threat condition tended to take pamphlets the most after learning they were below-average than when they were above-average; contrariwise, participants in the self-affirmation condition tended to take pamphlets the most after learning they were above-average than below-average. Although only marginally significant, the results do lend some support to the idea that self-threat interacts with comparative feedback and that it has the biggest interactive impact on behavior (vs. cognition or emotion).
Chapter 4

Overview of Findings, Explanations, Limitations, and Implications

4.1 Overview of Findings and Explanations

Does feeling threatened vs. affirmed change how people think about and respond to social comparative risk information? The current study tested between competing hypotheses regarding the moderating role of self-threat versus self-affirmation with regards to one’s interest in and sensitivity to social comparative risk information. One hypothesis was that self-threatened participants would show the most interest in and sensitivity to social comparison information, compared to self-affirmed and control participants. A second hypothesis was that both self-threatened and self-affirmed participants would show increased interest in and sensitivity to social comparison information, compared to control participants. Neither hypothesis was fully supported by the data as a whole, but the results were somewhat complex and appeared to depend upon the type of variable under investigation. Below we outline the core findings in the current study.

First, in terms of participants’ interest in social comparison information following the self-threat manipulation (but before getting comparative risk information), there was no evidence that self-affirmation vs. self-threat altered this. Rather, participants in all
conditions indicated relatively high interest in receiving social comparison information. One possibility for this result is that comparative information is often valued in ambiguous and uncertain situations (French et al., 2006; Schacter, 1959; Taylor et al., 1990). Perhaps the nature of the impending and uncertain feedback overwhelmed any impact of the self-threat/affirmation manipulation. Moreover, our manipulation checks were not fully supported and many participants (over 15%) did not follow task instructions. Thus, it is possible that our failure to detect an effect here could have been due to a weak self-threat/affirmation manipulation that was overwhelmed by the experimental situation.

Second, in terms of participants’ evaluations of their dental health and the risk feedback, the results did not support that self-threat/affirmation interacted with comparative risk feedback. We did, however, find evidence for minimization in the feedback evaluations (Jemmott et al., 1986). Specifically, participants who learned that their risk level was above-average evaluated the trustworthiness of the feedback as poorer than participants who learned their risk level was below-average. However, as stated above, this did not interact with the self-threat/affirmation condition, possibly due to a weak self-threat/affirmation manipulation.

Third, in terms of participants’ emotional reactions, the results did not support that self-threat/affirmation interacted with comparative risk feedback. Rather, as with the feedback minimization items, there was an impact of the comparative risk feedback. Participants who learned that their risks were above-average did not feel as positive as those who learned that their risks were below-average. This pattern of results is interesting in light of the minimization result. Participants who learned they were above-
average felt worse but simultaneously minimized the validity of the feedback, whereas participants who learned they were below-average felt better and did not minimize the validity of the feedback. One possible explanation is that participants felt most threatened in the above-average risk condition and, to cope with the undesirable emotions, they questioned the validity of the feedback (Jemmott et al., 1986).

Fourth, in terms of participants’ intentions related to learning more about dental health, changing their habits, and going to the dentist, there was no evidence that self-threat/affirmation interacted with comparative risk feedback. Moreover, unlike some of the other variables (e.g., emotions, minimization), there were no main effects of the comparative risk feedback. One possible explanation could be that cognitive intentions are not perfectly correspondent with emotions or behaviors, in terms of them being related and being predicted by different variables (for reviews of related ideas, see Bentler & Speckart, 1979; Kim & Hunter, 1993; Webb & Sheeran, 2006). Nevertheless, the null effect on the intentions measures is surprising.

Fifth and finally, in terms of our behavioral measure (taking a pamphlet or not), we found our first preliminary evidence that self-threat/affirmation interacts with comparison risk feedback. Specifically, participants who were self-affirmed were more likely to take pamphlets when they were told they were above-average than below-average, whereas participants in the self-threat condition were more likely to take pamphlets when they were below-average than when they were above-average. Participants in the control condition were least likely to take the pamphlets overall, and this did not appear to depend upon whether they were above- or below-average. Although only marginally significant and thus clearly tentative, the results suggest that,
after self-affirmation, participants saw the value in taking a pamphlet in the above-average condition compared to the below-average condition—a sensible decision to take a pamphlet when the above-average risk information helped place their risk in context. However, when under self-threat, the opposite pattern emerged such that participants were less likely to take the pamphlet upon learning they were above-average—an indication that participants were threatened and potentially using avoidance as a threat minimization technique. Of course, in light of the other results and the strength of this result, our findings are clearly tentative and necessitate further exploration.

4.2 Limitations and Future Directions

There are several limitations to the current study that could lead to important future directions. First, our manipulation of self-affirmation did not appear to work as intended based on the manipulation check items. Thus, it is unclear from the current study as to whether the lack of an interaction effect on most of our key variables was due to a conceptual issue about the link between self-affirmation/threat and social comparison or an issue relevant to our manipulations. There are several possibilities for why our manipulation of self-affirmation was not successful that could warrant follow-up research.

For instance, it could be argued that our control condition was not acting as a pure control condition, but instead as a different type of affirmation condition. Recall that, in the control condition, participants wrote about how their least valued trait applied to another person. Rather than this manipulation being distanced from the self (as intended), it is possible that participants may have used this as an opportunity for downward social comparison by thinking about how their values are superior to those of
the target other. Future studies would therefore benefit from having a more pure control such that participants are either writing about something completely unrelated like a description of the lab room or not having any writing task at all.

An additional issue related to the self-affirmation manipulation is whether the unsuccessful manipulation was due to the presence of the manipulation check items. That is, it is possible that answering the state self-esteem items and/or the self-concept clarity items changed the effectiveness of the manipulation. For instance, perhaps the delay from answering these manipulation check questions weakened the effect of the manipulation upon receiving risk feedback and answering the main dependent variables. Moreover, perhaps the act of answering self-esteem and self-concept items hurt the manipulation. For instance, perhaps answering self-esteem items allowed participants in the self-threat condition to buffer against the threat they were feeling by reconfirming their positive self-esteem. The use of manipulation checks in the self-affirmation literature is sparse, and the literature is silent as to why no manipulation checks exist in these studies. Future research that attempts to examine whether manipulation check items diffuse self-affirmation/threat manipulations would be valuable.

Second, we included a range of dependent measure types in the current study, including self-evaluations, minimization, emotions, behavioral intentions, and behaviors. Complicating matters was the fact that the results appeared to depend upon variable type. For instance, behavioral intentions and self-evaluations showed virtually no impact of our manipulations; emotions and minimization were sensitive to the comparative risk manipulation but not the self-affirmation manipulation; and our behavioral measure (taking a pamphlet) showed an interaction pattern more consistent with what was
predicted. Indeed, consistent with this perspective, the variables were not perfectly correlated with one another (see Table 3). A priori we did not anticipate these differences based on variable type and, thus, it is difficult and, perhaps, inappropriate to interpret retrospectively. To our knowledge, there are no studies that have attempted to examine whether social comparison information and/or self-affirmation/threat have divergent effects on affect, cognition, motivation, and behaviors. Thus, future research should further explore when, how, and why different types of measures may be differentially impacted by self-affirmation/threat and social comparison information.

Third, there are limitations to related to the risk domain and how risk feedback in this domain was presented. For instance, we used dental health context because it is a common and important problem for most people, and because we thought feedback in this domain would be believable and self-relevant. In retrospect, other domains could have been optimal for this population, particularly involve health behaviors and their consequences (e.g., unsafe sexual practices, binge drinking). Future research should examine these research questions in health contexts that vary more widely along key dimensions (e.g., severity, likelihood) so that the feedback seems particularly relevant to participants. Moreover, risk feedback was presented in such a way that participants believed the domain was randomly selected from all topics related to the habits survey. When presented in this manner, it is possible that participants could more easily dismiss the feedback as not being personally relevant or serious (since it was, after all, just a random selection). Future research could make the risk feedback appear personally tailored, which should enhance its perceived importance and relevance.
4.3 Implications

Although some results from the current study are tentative and require follow-up research, we suggest that this research still has theoretical and practical implications. First, from a theoretical perspective, this study should contribute to two distinct lines of research: namely, the social comparison and self-threat/affirmation literatures. In terms of the social comparison literature, we provided further data that social comparative risk information has an impact on people’s thoughts and emotions beyond that of their own absolute or objective risk information (Fagerlin et al., 2007; French et al., 2006; French et al., 2004; Klein, 1997; 2002; Lipkus et al., 2000; Lipkus et al., 2000; Mason et al., 2008; Rose, 2010). Indeed, although some might argue that absolute information is or should be most critical when evaluating your situation, we found that being above-average in gum disease risk triggered less positive emotions and greater threat minimization. Moreover, our study was among the first to examine this issue using an experimental design with risk feedback, as opposed to relying on hypothetical scenarios or correlational designs. In terms of the self-threat/affirmation literature, we uncovered tentative evidence that affirmations and threats produce different downstream consequences for how people respond to above- vs. below- average risk feedback. In particular, consistent with prior research (Sherman et al., 2000) we found self-affirmation aided participants’ views that the above-average feedback was problematic and, hence, were more likely to take a dental health pamphlet than if told they were below-average.
Moreover, extending and building on this research, we found that, when under self-threat, participants minimized the threat produced by the above-average feedback and were less likely to take the pamphlet than if told they were below-average.

Second, this research may also have practical implications. In many contexts, risk information is provided, known, or estimated as a way to facilitate decision-making and to guide behavior. One challenge for health care providers is to present risk information in a manner that people understand, accept, and act upon. Using social comparison information as a reference point can, under some situations and for some people, help facilitate comprehension and utilization of risk information. The current research is useful in advancing our understanding of the situational factors that facilitate interest in and utilization of comparative risk information. For instance, we showed that learning that you are above-average produces lower positive emotions and subsequent minimization—suggesting a downside to presenting the comparative information. However, when coupled with a self-affirmation manipulation, we found tentative evidence that being above-average can trigger adaptive decisions, such as deciding to take a pamphlet to learn more about the disease. Although clearly more work will need to be done on this topic, health practitioners and researchers may use this knowledge to tailor or enhance the impact of their risk messages (for related ideas see Sherman et al., 2000).
References


I-C theory in an individualistic (U.S.) and a collectivistic (Philippine) culture. 

*Journal of Cross-cultural Psychology, 30 (4), 466-500.*


Appendix A

Demographic and Habits Questionnaire

The following questions were presented to participants ostensibly as a measure to assess their habits. All items and instructions are verbatim to what participants were given. No measures were actually calculated from these items except where indicated in the preceding document.

“This study is an effort by the University of Toledo to get a better picture of the health habits and general wellness of the student body. During this study, you will be asked questions about your health habits (e.g., diet, exercise, smoking, etc.). Your responses to these questions will be analyzed and you will receive personalized feedback on one aspect of health about which you answered questions. Please read the questions carefully and answer honestly.

If you have any questions at any point, please feel free to ask the experimenter. Thank you!”

Demographics

Age: ___________
Gender: ____ male ____ female
Height: _____ feet ______ inches
Weight: _________ pounds
Ethnicity: (check as many as appropriate)
  Hispanic or Latino ___
  White ___
  Black or African American ___
  Asian ___
  Native Hawaiian or other Pacific Islander ___
  American Indian or Alaskan Native ___
  Other (please indicate) __________
Habits Questionnaire

“The following questions involve your physical and mental health”:

Thinking about your physical health (which includes illness or physical injury), for how many days during the past 30 days was your physical health not good?

_________ Days out of the past 30

Thinking about your mental health (which includes stress, depression, and problems with emotions), for how many days during the past 30 days was your mental health not good?

_________ Days out of the past 30

During the past 30 days, for about how many days did poor physical or mental health keep you from doing your usual activities (such as self-care, work, or recreation)?

_________ Days out of the past 30

“The following questions involve your alcohol consumption”:

During the past 30 days, have you had at least one drink of any alcoholic beverage (such as beer, wine, a malt beverage or liquor)?

Yes______ No______ Don’t know/Not Sure _______

During the past 30 days, how many days did you have at least one drink of any alcoholic beverage?

______ Days out of the past 30

One drink is equivalent to a 12-ounce beer, a 5-ounce glass of wine, or a drink with one shot of liquor. During the past 30 days, on the days when you drank, about how many drinks did you have on the average?

______ Drinks

______ I did not drink at all during the past 30 days
Considering all types of alcoholic beverages, how many times during the past 30 days did you have 5 or more drinks on an occasion?

______ Times
______ I did not drink at all during the past 30 days

"The following questions involve your exercise/physical activity":

When you are at work, which of the following best describes what you do?

_______ Mostly sitting or standing
_______ Mostly walking
_______ Mostly heavy labor or physically demanding work
_______ N/A (not employed)

During the past 30 days, other than your regular job, how many of those days did you participate in any physical activities or exercise (such as running, calisthenics, golf, gardening or walking)?

_______ Days out of the past 30

We are interested in two types of physical activity - vigorous and moderate. Vigorous activities cause large increases in breathing or heart rate while moderate activities cause small increases in breathing or heart rate.

How many days per week do you do moderate activities for at least 10 minutes at a time (such as brisk walking, bicycling, vacuuming, gardening, or anything else that causes some increase in breathing or heart rate)?

_______ days per week

On days when you do moderate activities for at least 10 minutes at a time, how much total time per day do you spend doing these activities?

___ minutes per day

____ I don’t do any moderate activities

How many days per week do you do vigorous activities for at least 10 minutes at a time (such as running, aerobics, heavy yard work, or anything else that causes large increases in breathing or heart rate)?

_______ days per week
On days when you do vigorous activities for at least 10 minutes at a time, how much total time per day do you spend doing these activities?

- ___ minutes per day
- ___ I don’t any vigorous activities

“The following questions involve your food consumption”:

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<td>Once per month or less</td>
<td>2-3 times per month</td>
<td>1-2 times per week</td>
<td>3-4 times per week</td>
<td>5 or more times per week</td>
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How often do you consume…

- ___ sugary snacks and/or beverages (such as soda)?
- ___ green salad (like lettuce or spinach salad)?
- ___ fruit (not counting juice)?
- ___ potatoes (any kind, including baked, mashed, French fried)
- ___ any other vegetables (beans, peas, corn, broccoli)
- ___ eggs?
- ___ milk?
- ___ potato chips, corn chips, or peanuts?
- ___ poultry (chicken, turkey)?
- ___ beef?
- ___ cheese or cheese spreads?

Have you ever had/do you currently have an eating disorder?

- ___ Yes  ___ No

What is the nature of the disorder?

“‘The following questions involve your recreational activities’:

During the past 30 days, how many of those days did you study or do homework outside of your normal class time?

- ___ Days out of the past 30

During the past 30 days, how many of those days did you go out to eat with friends/family?

- ___ Days out of the past 30
During the past 30 days, how many of those days did you watch a movie?

________ Days out of the past 30

During the past 30 days, how many of those days did you sleep more than 8 hours?

________ Days out of the past 30

During the past 30 days, how many of those days did you go outside for more than an hour?

________ Days out of the past 30

During the past 30 days, how many of those days did you play video games?

________ Days out of the past 30

During the past 30 days, how many of those days did you attend a religious function?

________ Days out of the past 30

“The following questions involve your smoking/tobacco use habits”:

1. How would you classify yourself, in terms of smoking cigarettes, pipe tobacco (including hookahs), and/or cigars?

       _________ smoker     _________ non-smoker

2. How often would you say you smoke?

       _________ Never
       _________ Rarely
       _________ Some days
       _________ Every day

3. On average, how many cigarettes do you smoke per day?

       _________ cigarettes per day (note: 20 cigarettes = 1 pack)

4. On average, how many cigars and/or pipes (including hookahs) do you smoke per week?

       _________ cigars and/or pipes per week
5. On average, how often do you use smokeless tobacco?

    _______ Never
    _______ Rarely
    _______ Some days
    _______ Every day

“The following questions involve your oral health care”:
1.  How often do you brush your teeth?
    _______ three times a day or more
    _______ two times a day
    _______ once a day
    _______ every other day
    _______ once a week
    _______ once a month
    _______ less than once a month

2.  How much toothpaste do you use?


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<td>1</td>
<td><strong>Very small amount</strong> (e.g., pea-sized)</td>
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<td><strong>Very large amount</strong> (e.g., covers entire toothbrush)</td>
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3.  What type of toothpaste do you use?
    _______ paste
    _______ gel
    _______ other

4.  What type of toothpaste do you use?
    _______ generic brand
    _______ name brand (e.g., Colgate, Crest)

5.  When brushing your teeth, how often do you brush your gums and tongue?
    _______ always
    _______ sometimes
    _______ rarely
    _______ never
6. How frequently do you replace your toothbrush?
   _______ every three months or more frequently
   _______ every four to six months
   _______ every six months to 1 year
   _______ once a year
   _______ every other year
   _______ every six months to 1 year
   _______ every two years or more

7. How often do you floss?
   _______ three times a day or more
   _______ two times a day day
   _______ once a day
   _______ every other day
   _______ once a week
   _______ once a month
   _______ less than once a month

8. How often do you use mouthwash?
   _______ three times a day or more
   _______ two times a day day
   _______ once a day
   _______ every other day
   _______ once a week
   _______ once a month
   _______ less than once a month

9. How often do you see your dentist?
   _______ twice a year or more
   _______ once a year
   _______ every few years
   _______ only when I feel I have a problem

10. How often do you use a fluoride drops, tablets, or rinses?
    _______ once a day or more
    _______ every other day
    _______ once a week
    _______ every other week
    _______ once a month or less
    _______ never
11. How often do you use a water pick?
   ______ three times a day or more
   ______ two times a day
day
   ______ once a day
   ______ every other day
   ______ once a week
   ______ once a month
   ______ less than once a month

12. How often do you use whitening products?
   ______ three times a day or more
   ______ two times a day
day
   ______ once a day
   ______ every other day
   ______ once a week
   ______ once a month
   ______ less than once a month

13. Do you currently or have you ever had orthodontic work (e.g. braces or retainers)?
   ______ yes
   ______ no

14. Research shows drinking milk helps to strengthen teeth and bones. How many 8 ounce servings of milk do you drink?
   ______ one per MONTH
   ______ 2-3 per MONTH
   ______ 1-2 per WEEK
   ______ 3-4 per WEEK
   ______ 5 or more per WEEK

15. Do you chew gum with sugar in it? YES   NO
    If yes, how often? ______ times per day ______ times per week

16. How many meals do you eat on an average day?
    ______ meals per day

17. How many between meal snacks do you have on an average day (including drinks other than water)?
    ______ between meal snacks per day
Appendix B

State Self-Esteem

The following measure was given to participants as a measure of state self-esteem as described in the document above. All items and instructions are verbatim to what participants were given. Following the document are scoring instructions.

Using the following scale, place a number on the line to the right of the statement that indicates what is true for you at this moment:

1 = not at all, 2 = a little bit, 3 = somewhat, 4 = very much, 5 = extremely

1. I feel confident about my abilities.
2. I am worried about whether I am regarded as a success or failure.
3. I feel satisfied with the way my body looks right now.
4. I feel frustrated or rattled about my performance.
5. I feel that I am having trouble understanding things that I read.
6. I feel that others respect and admire me.
7. I am dissatisfied with my weight.
8. I feel self-conscious.
9. I feel as smart as others.
10. I feel displeased with myself.
11. I feel good about myself.
12. I am pleased with my appearance right now.
13. I am worried about what other people think of me.
15. I feel inferior to others at this moment.
16. I feel unattractive.
17. I feel concerned about the impression I am making.
18. I feel that I have less scholastic ability right now than others.
19. I feel like I'm not doing well.
20. I am worried about looking foolish.
Coding for State Self-esteem Scale

Reverse score: 2, 4, 5, 7, 8, 10, 13, 15, 16, 17, 18, 19, 20

Performance_SE:= 1, 4, 5, 9, 14, 18, 19

Social_SE:= 2, 8, 10, 13, 15, 17, 20

Appearance_SE:= 3, 6, 7, 11, 12, 16

State_SE:= Performance_SE + Social_SE + Appearance_SE
Appendix C

Example Feedback Sheet

The following is one example of the false feedback participants were given. The feedback sheets differed only by comparative condition (above- and below-average) and the order of the information given (self versus other), which were counterbalanced for a total of four versions.

Below you will find YOUR risk level for periodontal disease. You have also been chosen to receive information about the risk of OTHER UT STUDENTS of your age and gender that have participated in this study within the last year.

The average UT student of your age and gender’s risk for periodontal disease is 13 %
Your risk for periodontal disease is 31 %

*Output is an approximation of your results.

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Appendix D

Post-feedback Questionnaire

The following questions were presented to participants after feedback was provided. These items were utilized as dependent measures for the study as indicated in the preceding document.

“The following questions involve your reactions to the feedback provided earlier”:

How likely is it that you will develop periodontal (gum) disease?

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not at all likely</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Very likely</td>
</tr>
</tbody>
</table>

How likely is the average UT student who has participated in this study to develop periodontal (gum) disease?

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not at all likely</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Very likely</td>
</tr>
</tbody>
</table>

Compared to the average UT student who has participated in this study, how likely are you to develop periodontal (gum) disease?

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Much less likely</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Much more likely</td>
</tr>
</tbody>
</table>
How would you rate your oral health care habits?

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very poor</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Very good</td>
</tr>
</tbody>
</table>

How would you rate your oral health?

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very poor</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Very good</td>
</tr>
</tbody>
</table>

How important is oral health care to you?

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not at all important</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Very important</td>
</tr>
</tbody>
</table>

“The following questions involve your impressions of the feedback provided earlier”:

How accurate was the feedback?

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not at all accurate</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Very accurate</td>
</tr>
</tbody>
</table>

How trustworthy do you find the source that provided you with the feedback?

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not at all trustworthy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Very trustworthy</td>
</tr>
</tbody>
</table>

How believable was the feedback?

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not at all believable</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Very believable</td>
</tr>
</tbody>
</table>

What did the feedback indicate was your risk for developing periodontal disease?

________ %

What did the feedback indicate was the average UT student’s risk for developing periodontal disease?

________ %
What did the feedback indicate regarding your overall risk of developing periodontal disease?

<p>| | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td><strong>Very Low risk</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>Very high risk</strong></td>
</tr>
</tbody>
</table>

What did the feedback indicate regarding the average UT student’s overall risk of developing periodontal disease?

<p>| | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td><strong>Very Low risk</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>Very high risk</strong></td>
</tr>
</tbody>
</table>

To what extent do you feel your dental habits contribute to your risk of developing periodontal (gum) disease?

<p>| | | | | | | |</p>
<table>
<thead>
<tr>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td><strong>Not at all</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>Very much</strong></td>
</tr>
</tbody>
</table>

To what extent do you feel your dental habits protect you from developing periodontal (gum) disease?

<p>| | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td><strong>Not at all</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>Very much</strong></td>
</tr>
</tbody>
</table>
“Indicate the degree to which you agree or disagree with the following statements at this exact moment:”

I have decided to change my oral health care habits in the next 6 months.

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Disagree</td>
<td>Agree</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

I intend to change my oral health care habits in the next 6 months.

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not at all likely</td>
<td>Very likely</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

I will try to change my oral care habits in the next 6 months.

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Extremely improbable</td>
<td>Extremely probable</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

I have decided to see a dentist in the next 6 months.

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Disagree</td>
<td>Agree</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

I intend to see a dentist in the next 6 months.

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not at all likely</td>
<td>Very likely</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

I will try to see a dentist in the next 6 months.

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Extremely improbable</td>
<td>Extremely probable</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Indicate how interested you are in receiving information about proper dental care habits

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not at all interested</td>
<td>Extremely Interested</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Indicate how likely you are to seek out information about proper dental care habits:

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not at all likely</td>
<td>Very likely</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix E

PANAS

The following measure was given to participants as a measure of state self-esteem as described in the document above. All items and instructions are verbatim to what participants were given.

This scale consists of a number of words and phrases that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word. Indicate to what extent you feel this way right now. Use the following scale to record your answers:

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very slightly or not at all</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>A little</td>
<td>Moderately</td>
<td>Quite a bit</td>
</tr>
</tbody>
</table>

1. _____ interested                                      8. _____ inspired
2. _____ irritable                                       9. _____ strong
3. _____ distressed                                      10. _____ nervous
4. _____ alert                                           11. _____ guilty
5. _____ excited                                         12. _____ determined
6. _____ ashamed                                         13. _____ scared
7. _____ upset                                           14. _____ attentive
15. _____ hostile
16. _____ jittery
17. _____ enthusiastic
18. _____ active
19. _____ proud
20. _____ afraid
Appendix F Tables and Figures

Table 1

*Main Dependent Variables as a Function of Comparative Risk and Self-Threat Conditions.*

<table>
<thead>
<tr>
<th>Self-Threat Condition &amp; Dependent Variable</th>
<th>Below Average Risk</th>
<th>Above Average Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td><strong>Self-Affirmation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Habit Evaluation</td>
<td>5.42</td>
<td>0.99</td>
</tr>
<tr>
<td>Feedback Evaluation</td>
<td>5.48</td>
<td>1.10</td>
</tr>
<tr>
<td>Positive Affect</td>
<td>3.14</td>
<td>0.87</td>
</tr>
<tr>
<td>Negative Affect</td>
<td>2.01</td>
<td>0.87</td>
</tr>
<tr>
<td>Intention Set 1</td>
<td>5.33</td>
<td>1.62</td>
</tr>
<tr>
<td>Intention Set 2</td>
<td>5.56</td>
<td>1.05</td>
</tr>
<tr>
<td>Intention Set 3</td>
<td>4.59</td>
<td>2.21</td>
</tr>
<tr>
<td><strong>Control</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Habit Evaluation</td>
<td>4.88</td>
<td>0.93</td>
</tr>
<tr>
<td>Feedback Evaluation</td>
<td>5.19</td>
<td>1.13</td>
</tr>
<tr>
<td>Positive Affect</td>
<td>3.02</td>
<td>0.93</td>
</tr>
<tr>
<td>Negative Affect</td>
<td>1.95</td>
<td>0.66</td>
</tr>
<tr>
<td>Intention Set 1</td>
<td>5.12</td>
<td>1.13</td>
</tr>
<tr>
<td>Intention Set 2</td>
<td>5.33</td>
<td>1.27</td>
</tr>
<tr>
<td>Intention Set 3</td>
<td>3.86</td>
<td>1.64</td>
</tr>
<tr>
<td><strong>Self-Threat</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Habit Evaluation</td>
<td>5.03</td>
<td>0.89</td>
</tr>
<tr>
<td>Feedback Evaluation</td>
<td>5.24</td>
<td>1.61</td>
</tr>
<tr>
<td>Positive Affect</td>
<td>2.98</td>
<td>0.58</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>----------------------</td>
<td>------</td>
<td>-----</td>
</tr>
<tr>
<td>Negative Affect</td>
<td>2.05</td>
<td>0.53</td>
</tr>
<tr>
<td>Intention Set 1</td>
<td>5.09</td>
<td>1.41</td>
</tr>
<tr>
<td>Intention Set 2</td>
<td>5.70</td>
<td>0.78</td>
</tr>
<tr>
<td>Intention Set 3</td>
<td>4.18</td>
<td>1.25</td>
</tr>
</tbody>
</table>
Table 2.

*Hierarchical Binary Logistic Regression Predicting Variance in Taking Pamphlets from Self-Threat Condition and Comparative Risk Condition*

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>S.E.</th>
<th>O.R.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Block 1: $\chi^2 = 2.61$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comparative Risk</td>
<td>-.04</td>
<td>.34</td>
<td>.013</td>
</tr>
<tr>
<td>Self-Threat</td>
<td>.54††</td>
<td>.34</td>
<td>2.46††</td>
</tr>
<tr>
<td>Block 2: $\chi^2 = 1.78$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comparative Risk</td>
<td>.08</td>
<td>.36</td>
<td>.05</td>
</tr>
<tr>
<td>Self-Threat</td>
<td>.56††</td>
<td>.36</td>
<td>2.39</td>
</tr>
<tr>
<td>Self-Threat X Comparative Risk</td>
<td>-.47±</td>
<td>.35</td>
<td>1.69±</td>
</tr>
</tbody>
</table>

*Notes.* Complete Model $\chi^2 = 4.39$, Nagelkerke $R^2$ for complete model = .10; **$p < .01$; *$p < .05$; †$p < .10$; ††$p < .15$; ±$p < .20$. Blocks were entered sequentially in the order shown in the table.
Table 3

*Correlations among Key Dependent Measures in the Study.*

<table>
<thead>
<tr>
<th></th>
<th>Habit Evaluations</th>
<th>Feedback Evaluations</th>
<th>Positive Affect</th>
<th>Negative Affect</th>
<th>Intentions Set 1</th>
<th>Intentions Set 2</th>
<th>Intentions Set 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Habit Evaluations</td>
<td>--</td>
<td>-.187</td>
<td>.025</td>
<td>-.307**</td>
<td>-.251*</td>
<td>-.157</td>
<td>-.159</td>
</tr>
<tr>
<td>Feedback Evaluations</td>
<td>--</td>
<td>.254*</td>
<td>-.101</td>
<td>.077</td>
<td>.113</td>
<td>.156</td>
<td></td>
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<tr>
<td>Positive Affect</td>
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<td>--</td>
<td>.104</td>
<td>.045</td>
<td>.020</td>
<td>.103</td>
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<tr>
<td>Negative Affect</td>
<td>--</td>
<td>--</td>
<td>.405**</td>
<td>.083</td>
<td>.305**</td>
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<td>--</td>
<td>.370**</td>
<td>.486**</td>
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<td></td>
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<tr>
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<td>.133</td>
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</tr>
</tbody>
</table>

*p < .05*; *p < .01**
Figure 1. Percentage of participants taking a pamphlet as a function of comparative risk condition and self-threat condition.