

THE ROLE OF REACTANCE AND POSITIVE EMOTIONS IN PERSUASIVE
HEALTH MESSAGES: REFINING THE THEORY OF PSYCHOLOGICAL
REACTANCE AND THE POLITENESS THEORY AND TESTING THE THEORIES
OF POSITIVE EMOTIONS

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Dedication

This dissertation is dedicated to my father, Kang Young Lee. This humble work to his hope and sorrow, joy and silence, and happiness and patience.

Abstract

The purpose of this study is to expand research on persuasion 1) by examining psychological reactance as a function of threats to positive identity above and beyond threats to freedom and 2) by examining the role of positive emotions.

An online survey recruited 478 students from undergraduate courses at several universities in the U.S. The study included a 2 (high threat to positive identity vs. low threat to positive identity) X 2 (high threat to freedom vs. low threat to freedom) X 2 (positivity vs. none) with 2 topics (exercise and meditation) mixed design and participants were randomly presented with one of 16 survey types. The “working out” study advocated participation in a weekly exercise routine and the “stress relief” study encouraged practicing meditation for general mental/physical health.

H1-a, predicting the main effect of threat manipulation on perceived threats to identity was not supported for both topic conditions, but an interaction with curiosity appeal was significant in the exercise condition. H1-b, predicting a mediating role of perceived threat to identity between message manipulation and reactance, was not supported by both exercise and meditation data. H1-c, predicting the unique effect of perceived threat to identity on reactance was supported for the exercise, but not for the meditation condition. H1-d, predicting negative influences of perceived threats to identity on persuasion, was supported in the exercise condition and partially supported in the meditation condition. A series of mediation tests found that curiosity works as a mediator between trait reactance and Reactance on Freedom in the exercise condition, but not in the meditation condition. Thus, H2 was partially supported. H3, predicting the negative impact of curiosity on Reactance on Identity was supported in both topic conditions. H4,

predicting the mediating role of hope, was supported in both topic conditions. H5, predicting that message induced hope was positively associated persuasion, was supported in both topic conditions. Among the four measured emotions, hope was the only significant predictor that influences the outcomes of persuasion in the meditation data (thus, supporting H6-a), but the exercise data favored H6-b, showing that other discrete emotions such as fear and curiosity simultaneously affected the persuasive outcomes.

Although the exercise and meditation data did not show consistent results overall, it seems that curiosity appears moderate the effect of threatening message manipulation. Among the four personal factors, current behaviors were a key factor for both psychological reactance and persuasive outcomes within the exercising context and age was an important factor for psychological reactance within the meditating context.

One major contribution of this study is that this study extended the Theory of Psychological Reactance by incorporating the notion of threats to identity based on the Politeness Theory. It was found that a perceived threat to identity led psychological reactance and had direct influences on persuasive outcome. This study also highlighted the importance of studying curiosity and hope, which played key roles in mitigating psychological reactance and in promoting persuasion. Empirical tests of three major variables - identity threat, curiosity, and hope – that this study used were novel approaches in persuasion field and the findings demonstrated their promising roles in persuasion.

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CHAPTER 1

INTRODUCTION

Increasingly, researchers have become interested in identifying factors that hamper persuasive communication. Psychological reactance is one of these identified factors (e.g., Burgoon, Alvaro, Grandpre, and Voulodakis, 2002; Dillard & Shen, 2005; Grandpre, Alvaro, Burgoon, Miller, & Hall, 2003; Miller, Burgoon, Grandpre, & Alvaro, 2006; Miller, Lane, Deatruck, Young, Potts, & 2007; Quick & Considine, 2008; Quick & Stephenson, 2007; Rains & Turner, 2007; Reinhart, Marshall, Feeley, & Tutzauer, 2007; Worchel & Brehm, 1970). For example, Dillard and Shen (2005) found that when the participants received more reactance-inducing messages toward regular flossing and healthy drinking habit, they perceived these messages to be less persuasive. Participants' perceptions of less persuasive messages led to more negative attitudes and behavioral intentions toward the advocated behaviors. Quick and Considine (2008) also found that college students who experienced higher levels of reactance more negatively evaluated the effectiveness of exercise ads than did students who experienced lower levels of reactance. This line of research highlights the importance of psychological reactance as a psychological construct that can explain why attempts to persuade others often fail.

Psychological reactance is defined as "the motivational state that is hypothesized to occur when a freedom is eliminated or threatened" (Brehm & Brehm, 1981, p.37). This definition assumes that a perceived threat to freedom is "the proximal cause" of reactance (Dillard & Shen, 2005, p. 146) or "a necessary condition for reactance to occur (Rains & Turner, 2007, p.244)." The notion of psychological reactance has been further explained

through a process of emotional and cognitive responses after receiving threatening messages. That is, when freedom is threatened, state reactance is measured along with anger and unfavorable cognitions, which in turn trigger certain behaviors that attempt to restore the threatened freedom (Dillard & Shen, 2005; Quick & Considine, 2008; Quick & Stephenson, 2007; 2008). Overall, past research has provided strong evidence that perception of a threat to one's freedom is a critical antecedent either of direct reactant behaviors or of indirect reactant behaviors through state reactance in Psychological Reactance Theory.

This study, however, questions whether a perceived threat to freedom is the *only* proximal cause of reactance and attempts to expand discussion on the antecedents of state reactance. As Dillard and Shen noted, "reactance has been defined primarily in terms of its antecedents and outcomes" (2005, p.146), implying another source of reactance may increase our understanding of reactance and its working mechanism in persuasion. Politeness Theory, suggesting multiple sources of threats, states that any influencing behaviors interfere with not only one's desire to be autonomous (threatening negative face), but also with the desire to be liked and respected (threatening positive face) (Brown & Levinson, 1978; 1987). From this perspective, the need for positive face and avoidance of potential threats to one's positive face is viewed as distinct from, but related to, the need for autonomy in influencing situations, especially in advice-giving situations (Goldsmith, 2000; MacGeorge, Lichtman, & Pressey, 2002; Wilson, Aleman, & Leatham, 1998; Wilson & Kunkel, 2000). Consistent with this logic, the present study proposes that threats to identity may lead to a similar process of psychological reactance and result in similar restorative behaviors in persuasion, in comparison with the more commonly

examined source, perceptions of threats to freedom. With an extended literature review, this current study identifies psychological reactance triggered by threats to identity as Reactance on Identity that is distinguished from Reactance on Freedom, psychological reactance triggered by threats to freedom.

Although the role of emotion on persuasion has long been examined, the persuasive effects of discrete positive emotions rather than negative emotions have been overlooked. Nabi pointedly stated that “nearly all of the positive emotions have been virtually ignored as intentionally evoked, message-relevant discrete emotions” (2002a, p.291). This is unfortunate because discrete positive emotions have “particular implications for the process and direction of persuasive influence due to their unique adaptive functions” (Nabi, 2002, p.289). Consequently, several scholars also suggested that a potential approach to reducing reactance could be “to employ tactics that increase positive feelings (e.g., enthusiasm)” (Rains & Turner, 2007, p. 263). Reinhart et al. (2007) also implied that eliciting positive emotions such as altruism through gain framing would be more effective in persuasion than eliciting negative emotions through guilt appeal. Most recently, Shen and Bigsby (2010) pointed out the shortage of positive emotions in past studies (only happiness in Dillard & Peck, 2001; Shen & Bigsby, 2010; Shen & Dillard, 2007), suggesting that future studies use relevant emotions that share similar cognitive mechanisms but may differ in valence and action tendency. Taking the limitations of previous studies into consideration, this study believes that searching for positive emotions that are specifically pertinent to persuasive effects will help to better understand the role of emotional appeals in persuasion research.

For example, past studies found that surprise is an interesting construct that either functions to encourage behaviors or inhibit behaviors depending on situation valence. Curiosity is similar to surprise because it corresponds to novel stimuli, but curiosity seems to capture the core of positive aspect in surprise and forthcoming emotion toward the reward. Thus, this study employs curiosity as a more pertinent construct to promote effective persuasion than surprise.

For another example, one commonly examined variable in social influence is self-efficacy. Self-efficacy is viewed as a critical feature of effective messages in health campaign in numerous studies (see Albarracín et al., 2003; Bandura, 1997; Fishbein et al., 2001; Fishbein & Yzer, 2003, Noar, Benac, & Harris, 2007). Despite the theoretical importance of self-efficacy in effecting behavioral change, few studies have clarified the affective mechanism associated with self-efficacy. Self-efficacy refers to an individual's *expectations* about the ability to successfully execute selected courses of action (Bandura, 1982; 1998). Conceptually, the closest emotion related to an individual's expectations and confidence of one's self is *hope*. Hope also has a similar relational theme with fear in that both hope and fear are evoked in the face of uncertain and uncomfortable reality, which suggests that hope can be a pertinent construct in persuasion. However, to date, few studies directly address the persuasive effect of hope (Nabi, 2002a; Poels & Dewitte, 2008).

In general, research in positive psychology is rapidly accumulating empirical evidence that positive emotions serve numerous adaptive benefits in human functioning, though much remains to be learned about specific discrete, positive emotions that help us to better understand the persuasion process. Theoretically, this study is based on the view

that discrete emotions as unique emotion states are the key motivators of affective and cognitive processing in persuasion. Discrete models view emotion as being categorical based on the unique pattern of cognitive appraisals or underlying thought patterns (e.g., Frijda, 1986; Lazarus, 1991; Levenson, 1994). Appraisal theories contend that cognitive appraisal leads to particular patterns of thought about the environment relative to one's goals, which leads to certain states of action readiness.

This study seeks to emphasize the role of positive emotions, specifically curiosity and hope, as tools to promote desirable outcomes and alleviate reactance responses. Given the abundant evidence of past studies on fear and reactance in persuasion this study also explores the dynamics between the positive emotions of curiosity and hope with the negative emotions of fear and anger.

In sum, the objectives of the study are twofold: 1) to better understand the reactance process as a barrier to effective persuasion and 2) to clarify the affective mechanism of two positive emotions, curiosity and hope, in persuasive contexts. More specifically, this study examines whether perceived threats to positive identity play a role above and beyond perceived threats to freedom as an antecedent of reactance and whether positive emotions – curiosity and hope – alleviate reactant responses and promote overall effectiveness of persuasive messages. The following section will briefly summarize these two study objectives and propose hypotheses prior to an extensive literature review in Chapter 2.

Summary of objectives and hypotheses

The Role of Perceived Threat to Identity in Reactance and Persuasion

Reactance theory posits that threatened freedom is the main cause of reactance. However, revised politeness theory, which is aware of this autonomy threat, also suggests another source of reactance that concurrently arises in influence situations – that is, the threatened positive regard of message recipients (Wilson, Aleman, & Leatham, 1998; Wilson & Kunkel, 2000). Thus, the first objective of this study is to investigate a threat to positive identity as another source of reactance. Identity threats are manipulated as containing less positive regard for message recipients. The subsequent hypotheses are presented.

H1-a: Messages that contain more threats to identity will lead participants to perceive more threats to identity.

H1-b: Messages that contain more threats to identity will have an indirect effect on state reactance via perceived threat to identity.

Theoretical distinctiveness between threats to identity and threats to freedom in influencing psychological reactance is of main interest in this study. Thus, the unique effect of perceived threats to positive identity on state reactance is hypothesized, controlling for the effect of threats to freedom.

H1-c: There is a significant effect of perceived threats to identity on state reactance above and beyond an effect of perceived threats to freedom on state reactance.

Moreover, literature on advice show that advice perceived as more face threatening to positive face is perceived less favorably (Goldsmith, 2000; Goldsmith &

MacGeorge, 2000; MacGeorge et al., 2002) and lessening threats either to negative or positive face (facework; less bold in directives, supportive for freedom of action and positive identity) exerts positive effects on the influencing process in general (MacGeorge et al., 2002; 2004). Based on the evidence, the associations between perceived threat to positive identity and persuasive outcomes are hypothesized.

H1-d: A perceived threat to identity is negatively associated with perception of message effectiveness, attitude toward message advocacy, intention to act, and intention to talk.

Although it is not the theoretical focus of this study, several covariates are included to achieve better statistical control. In addition to trait reactance, age, sex, and current exercise or meditation behaviors may moderate the effectiveness of message types (Quick & Bates., 2010; Shen, 2010; 2011). Accordingly, the first research question is advanced.

RQ1: Does an individual's trait reactance, age, sex, or previous exercising behaviors or meditating behaviors interact with threat messages on the outcome variables of interest?

The Role of Curiosity and Hope as Mediators in Persuasion

The second objective of this study is to examine the role of positive emotions when individuals process persuasive messages in a health context. This study specifically explores how the reactance process can be buffered by positive emotions. More specifically, this study suggests that curiosity may lead people who are prone to reactance to accept a persuasive message less aversively. Similarly hope is expected to enhance the

effectiveness of persuasive messages as well as reduce psychological reactance.

Collectively, the second and fourth sets of hypotheses test the moderating effects of curiosity and hope in reactance responses and persuasion.

H2: State curiosity mediates the relationship between trait reactance and psychological reactance such that:

H2-a: Trait reactance is positively associated with perceived threat to freedom and psychological reactance (the total effect). But this relationship weakens in strength via state curiosity.

H2-b: Trait reactance is negatively associated with state curiosity.

H2-c: State curiosity is negatively associated with a perceived threat to freedom and psychological reactance.

Regarding H2-a, the positive association between trait reactance and psychological reactance has been empirically documented in past studies (Dillard & Shen, 2005; Quick & Stephenson, 2007; 2008). The negative association between trait reactance and state curiosity (H2-b) is based on past studies on surprise and the broadening hypothesis. Curiosity, similar to surprise, may inhibit the functions of intrinsic negative emotions such as trait reactance (H2-b). The broadening hypothesis proposed by Broaden-and Build theory (Fredrickson, 1998; 2001) provides a theoretical ground that curiosity, like other positive emotions, may broaden the scope of thought-action repertoires through reducing negative reactions to message threats (H2-c).

Given that the role of a perceived threat to identity is a novel approach in psychological reactance, there is no evidence of a link between trait reactance and a perceived threat to identity. Based on the broadening hypothesis, however, state curiosity

is expected to have impact on perceived threat to identity and psychological reactance like H2-c. Thus,

H3: State curiosity is negatively associated with perceived threat to identity and psychological reactance.

Hope is also expected to buffer the effect of negative emotion (H4-b) and facilitate cognitions that are related to persuasion - perceived effectiveness, attitude, and behavioral intentions. Thus, the fourth set of hypotheses predicts the mediating role of state hope between psychological reactance and persuasion and the fifth hypothesis predicts the positive contribution of hope appeal in persuasion.

H4: State hope mediates the relationship between psychological reactance and persuasion such that:

H4-a: Psychological reactance is negatively associated with persuasion (the total effect). But this relationship weakens via state hope.

H4-b: Psychological reactance is negatively associated with state hope.

H4c: State hope is positively associated with persuasion.

While hypotheses 4 test the effect of state hope on persuasion controlling for trait hope through mediation tests, hypothesis 5 includes a message manipulation factor in the model. The term, message-induced, is used for the indication of hope appeal dealt as an exogenous variable.

H5: Message-induced state hope is positively associated with persuasion.

Compatibility of Multiple Emotions

According to the broaden-and-build theory, the undoing hypothesis predicts that positive emotions correct or undo the after-effects of negative emotions (Fredrickson & Levenson, 1998; Fredrickson, Mancuso, Branigan, & Tugade, 2000). The basic assumption of the undoing hypothesis is that positive emotions are incompatible with negative emotions (Baron, 1976; Solomon, 1980; Wolpe, 1958), because negative emotions narrow the momentary thought-action repertoire whereas positive emotions broaden this same repertoire. When these emotions are expected to be induced in order, then the last emotion evoked, hope, should be the only emotion that activates the outcomes of persuasion. Thus,

H6-a: Only state hope, not curiosity, fear, and anger, positively influences perceived effectiveness of a message.

Other studies, however, challenge the concept of incompatibility between positive affect and negative affect that is based on the undoing hypothesis of positive emotion. First, empirical studies on discrete emotions assumed that people report experiencing multiple emotions in response to PSAs and measured independent levels of each felt emotion simultaneously, which in turn led a differential effect on the outcome of persuasion (Dillard & Peck, 2000; Shen & Bigsby, 2010; Shen & Dillard, 2007). Second, fear appeal messages are found to be most effective when perceptions of danger accompany judgment of one's self-efficacy (Witte, 1992; 1994). This potentially suggests that both fear and hope simultaneously affect the outcomes of persuasion. Moreover this study predicts the impact of curiosity and anger (as one component of state reactance) on

persuasion, thus if multiple emotions can exist, each emotion can yield distinctive effect on persuasive outcomes.

Contrary to the undoing hypothesis of positive emotions, but in line with studies of fear appeals and reactance studies, the following hypothesis is advanced:

H6-b: There are direct relationships between each emotion and perceived effectiveness. Curiosity, fear, and hope are positively related with perceived effectiveness, but anger will be negatively associated with perceived effectiveness.

CHAPTER 2

LITERATURE REVIEW

Two goals of the present study are 1) to address the missing part of the picture in explaining how a reactance process occurs when people are persuaded and 2) to investigate the role of curiosity and hope to mitigate the reactance process. To meet the first goal, the Theory of Psychological Reactance and the Politeness Theory will be discussed and illuminate the possibility of two faces to the reactance process – Reactance on Freedom triggered by threats to freedom and Reactance on Identity by threats to positive identity. Next, attribution theories of emotions and the Broaden-and-Build Theory of positive emotions will be reviewed along with literature on hope and curiosity.

The Role of Psychological Reactance in Persuasion

Psychological Reactance Theory

Brehm defined psychological reactance as “a motivational state directed toward the re-establishment of the free behaviors which have been eliminated or threatened with elimination” (1966, p. 9). Accordingly, four core elements compose reactance theory: Freedom, threat to freedom, reactance, and restoration of freedom (Brehm & Brehm, 1981). According to this theoretical map, a figure 2.1 is presented and each element will be explained.

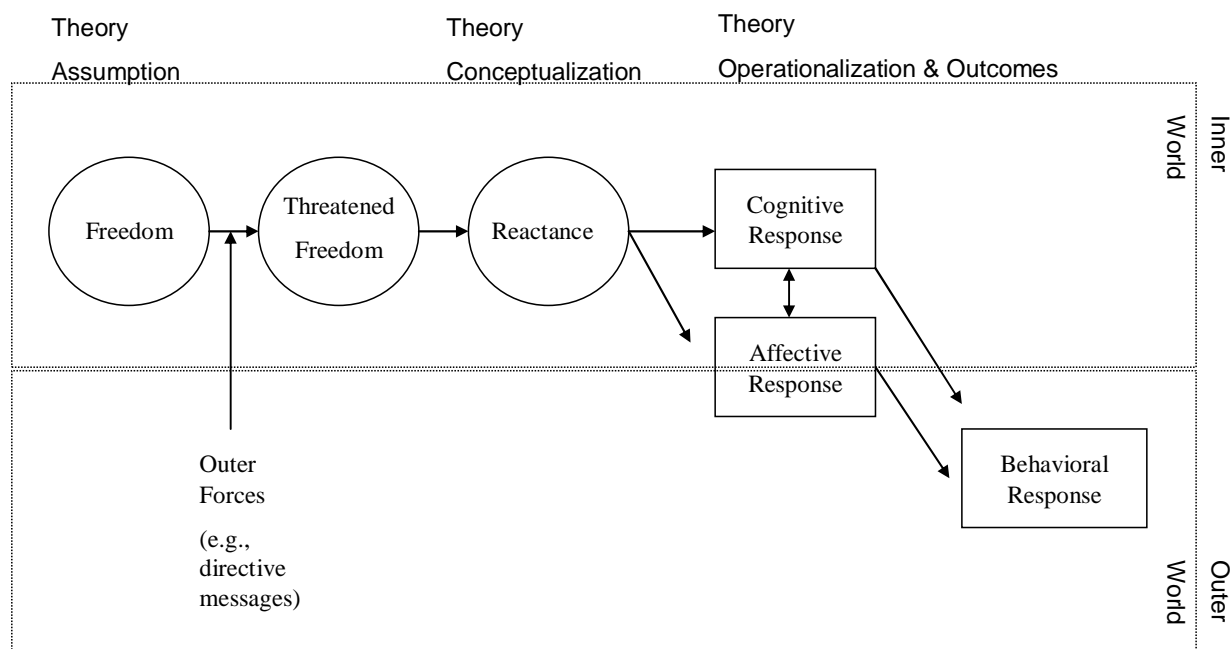


Figure 2.1. The Process of Psychological Reactance

Freedom. The concept of freedom in reactance theory has an important theoretical implication. An individual expects to have the freedom to act autonomously in order to scan multiple possibilities for action and can make a choice among them as one pleases. Freedom is defined as “a belief that one can engage in a particular behavior” (Brehm & Brehm, 1981, p.35). Similar to a belief, freedom is subjective and specific rather than objective and general as “an expectance” (Brehm & Brehm, 1981, p.35). Thus, reactance can be aroused in a person only to the extent that the individual believes s/he has freedom or control over a potential outcome (Brehm & Brehm, 1981).

Threats to Freedom. Individuals generally expect freedom to maximize their need satisfaction. This need is only satisfied with multiple possibilities and multiple choices in action. Thus if a person’s behavioral freedom is reduced or threatened, one will be

motivated to act on this threat. Any social influence attempt poses a threat to freedom to the recipient of that message because the influence attempt tries to influence an individual to make changes in their attitudes, beliefs, or behaviors that would otherwise remain untouched. Brehm and Brehm (1981, p.31) noted that “any kind of attempted social influence, any kind of impersonal event, and any behavior on the part of the individual holding the freedom that work against exercising the freedom can be defined as threats.” One important aspect of threats to freedom is that receivers should perceive a threat to be a threat. Thus, “threat is not a property of messages, but rather a judgment made by members of the target audience” (Dillard & Shen, 2005, p.162). It is also worth noting that a perceived threat to one’s freedom is an antecedent or a necessary condition for reactance, but not reactance itself (Dillard & Shen, 2005; Rains & Turner, 2007). Therefore, two important assumptions of reactance theory are that individuals have a desire for freedom and any attempt to persuade automatically threatens this intrinsic desire.

Reactance. Brehm conceptualized reactance as an aroused state that operates to protect from the further loss of freedom or to recover from reduction in freedom. Brehm and Brehm originally argued that reactance is the “hypothesized” motivational state that “cannot” be directly measured, but its existence manifests in “a variety of behavioral effects”. (1981, p. 37). Because of this measurement limitation, reactance as a hypothetical construct had been used as an explanatory framework to understand its outcomes. It was neither operationalized nor directly measured until Dillard and Shen (2005) proposed an operational definition of reaction as a combination of cognition and affect. Dillard and Shen loosely conceptualize reactance as “the negative cognitions and

affect resulting from a threat to one's freedom" (Rains & Turner, 2007, p. 242) and operationalize reactance as "a combination of self-report cognitive (negative thoughts) and emotional measures (anger)" (2005, p. 160, parentheses added). Based on Dillard and Shen's (2005) study, Rains and Turner provided a specific definition by conceptualizing reactance as "the cognitions and affect individuals experience in response to, and directed at, a message, source, or action that is perceived to be freedom threatening or limiting" (2007, p.244).

Restoration of Freedom. As the outcomes of aroused reactance, previous studies showed that individuals engage in behaviors that protect their original freedom or prevent further loss of that freedom. As a direct means, individuals can reject an influencing attempt by message rejection or by behavioral revolt against the advocated position (Worchel & Brehm, 1970). Individuals also can increase liking for the choice that was threatened or choose a product that is hard to get (e.g., Brehm & Weinraub, 1977; Hammock & Brehm, 1966), derogate the source (Kohn & Barnes, 1977), deny the presence of the threat (Worchel, Andreoli, & Archer, 1976), and enact a different freedom to gain a feeling of choice and control (Wicklund, 1974). Types of restorative acts can also differ among individuals. For example, Tormala and Petty (2004) contend that counterarguing is an active strategy that involves careful consideration of the evidence compared with other forms of resistance. Individuals who are low in motivation and ability may use other strategies such as source derogations or assertion of their own position. Similarly, Cameron, Jacks, and O'Brien (2002) identified five unique kinds of reactance responses: counterarguing (direct rebuttal of message arguments), attitude bolstering (support arguing), source derogation (insulting the source, dismissing his or

her expertise or trustworthiness, or otherwise rejecting his or her validity as a source of information), negative affect (getting angry, irritated, or otherwise upset), and assertions of confidence (explicitly asserting that nothing or no one could ever change one's opinion).

In sum, researchers have documented the direct means of restorative behaviors with direct refusal, behavioral revolt, or counterarguing and the indirect means of restorative behaviors with alternated choice, source derogation, assertions on own position, or negative affect. One thing to note is that earlier evidence of restorative behaviors is mixed with state reactance that was later operationalized by Dillard and Shen (2005) and reactance outcomes. For example, both Cameron et al.'s (2002) and Tormala and Petty's (2004) research included all negative cognitions, such as counterarguing and source derogation, as restorative behaviors and Cameron et al. even included negative affect as one outcome of reactance.

The Role of Reactance in Persuasion Research

In response to the Theory of Psychological Reactance proposed by Brehm, communication scholars have mainly focused on three areas with respect to reactance: 1) the detrimental effects of reactance in persuasion, 2) the message features that are associated with reactance, and 3) the operationalization of reactance. The most important implication of reactance theory in persuasion research is that freedom restoration responses often directly fail or weaken the effects of persuasive messages (see Burgoon et al., 2002). Due to this obstacle, researchers have sought to identify specific message characteristics that trigger threats to one's freedom. Message features that are likely to

induce threats to freedom, for example, are controlling/ forceful/ dogmatic language (Dillard & Shen, 2005; Grandpre et al., 2003; Miller et al., 2006; Miller et al., 2007; Quick & Considine, 2008; Quick & Stephenson, 2007; 2008), vivid language (Quick & Stephenson, 2008); and source-verifying message (Rain & Turner, 2007). To mitigate reactance, using autonomy restoration postscripts (Miller et al., 2007), using gain-framed messages (Reinhart et al., 2007), using message-induced empathy (Shen, 2010; 2011), and using humor (Skalski, Tamborini, Glazer, & Smith, 2009) were found to be effective in different health contexts.

In terms of measurements, state reactance was traditionally defined as a hypothetical construct so it was not directly measured for several decades and reactance proneness was measured only as personal trait (Thomas, Donnell, & Buboltz, 2001; Hong & Feadda, 1996). However, Dillard and Shen (2005) developed a measurement of state reactance as a combination of anger and negative cognition. Since then, studies have provided evidence that state reactance occurs as both emotional and cognitive responses to perceived threats and that these emotional/cognitive responses work together toward consequent attitude and behavioral outcomes rather than as distinct phenomena through a parallel process (Dillard & Shen, 2005; Quick & Stephenson, 2007; Rains & Turner, 2007). That is, reactance is best explained as cognition-and-affect amalgam rather than cognitive entity and emotional entity separately.

In sum, reactance has traditionally been viewed as the motivational state that occurs after a freedom is perceived to be threatened and prompts certain responses to restore the threatened freedom by direct and indirect means. By definition, the reactance state is triggered only by a threat to freedom in this sense. Despite the advancement in

measurement and theory, no identified study in the communication field has questioned the possible compounds of threat elements that may trigger the same reactance responses.

Interestingly, however, some psychology scholars articulated a challenge to the mechanism involved in reactance effects. The question was whether individuals are motivated to preserve freedoms as reactance theory postulates or, instead, only to project an image of autonomy to others (Baer, Hinkle, Smith, & Fenton, 1980; Heilman & Toffler, 1976; Nail et al., 1996; Schlenker, 1980). In other words, restoration behaviors can be reinterpreted not only the effect of reactance but also as impression management. The following section will examine this argument of impression management as an alternative explanation for the reactance mechanism and will further review the Politeness Theory to extend discussion on another source of psychological reactance.

Challenge to Reactance Account

As discussed in the previous section, freedom in reactance theory has an important theoretical implication. In its definition, freedom is the belief to have multiple choices toward a specific act or control over a potential outcome (Brehm & Brehm, 1981). According to Baer, Hinkle, Smith, and Fenton (1980), psychological reactance has traditionally "been conceptualized as an effectance motive" (p, 416). That is, a threat to one's behavioral freedom really represents a threat to one's *competence* in dealing with the environment. In this sense, freedom is similar to a sense of control rather than a need for control itself. This explanation suggests that freedom can be interpreted as not only intrinsic motive but also extrinsic motive.

For example, when a person's freedom is threatened by another, he or she may not so be interested in reestablishing an intrinsic control motive per se, but instead project an image of autonomy to others and is concerned for one's own image. In this case, a threat to freedom indicates subordination to the threatener, so reactance is a way of indicating one's refusal to accept this lower status in the eyes of public (Heilman & Toffler, 1976). This competing interpretation emphasizes displaying the motivation of freedom in interpersonal relationships and self-presentational considerations rather than intrinsic motivation of freedom for certain reactance phenomena.

In accordance with the self-presentational interpretation of reactance, several experimental studies expected that reactance effects would occur when the participants' post-threat behaviors are public, such as under the surveillance or anticipated surveillance of the source of the threat or significant others (i.e., the experimenter). For example, Baer et al, (1980) exposed participants to a persuasive message that was either high or low in threat in either a public or private response condition. As expected, the only group to show a significant boomerang attitude change was the public, high threat group. In contrast, attitude scores of the other three groups – private setting with high threat, private setting with low threat, and public setting with low-threat – remained statistically unchanged. Furthermore, Nail, Van Leeuwen, and Powell (1996) replicated this finding and even ruled out other reactance explanations such as the increased level of importance of the issue, and the increased level of perceived threats. The importance of the issue and perceived threats were not statistically significant across private and public settings. In a nutshell, this position posits that people are more concerned with managing the impression of freedom than they are with actually maintaining freedom.

Although some experimental designs in reactance literature genuinely exclude the self-presentational view over the reactance account (e.g., two-year old boy participants do not have the concern for impression management according to their developmental stage or in several experiments, or participants reactions were not open to public at all) and all reactance phenomena cannot be subsumed under an impression management framework (Nail et al., 1996), the data from several studies supported the idea that other concerns or motives beyond freedom or autonomy concern can affect the expression of reactance via interpersonal processes.

Unlike the above studies, the present study neither focuses on interpersonal processes based on public/private display of reactance nor examines the process of impression management. However, the impression management account of reactant behaviors provides evidence that questioning the source of reactance is reasonable and important to understand the mechanism of psychological reactance. Furthermore, the impression management account points out one important need of human beings – that is, the concern for self image. This need for positive image is keenly related with the next topic, Politeness Theory.

Politeness Theory

Brown and Levinson (1978; 1987) proposed their politeness theory, claiming two important human needs interplay in social interaction – positive face and negative face. *Positive face* is the desire to be approved, respected, liked, and included by others, whereas *negative face* is the desire to not be imposed upon by others and to maintain one's own autonomy. According to Politeness Theory, any attempts to influence are

intrinsically face threatening because the target's autonomy or likability can be challenged by a request. For example, telling another person to exercise is a directive that threatens negative face (autonomy) and can also imply a criticism of the current hearer's health, lifestyle, or weight, thus threatening positive face. Since any influence attempt such as asking a favor, giving advice, or reinforcing an obligation is bound to threaten face, rational speakers are often motivated to engage in polite requests rather than bold requests.

Research grounded in the Politeness Theory elaborated complexity regarding threats to face and face needs. For example, Baxter (1984) found that individuals manage their complex desires both to maintain positive face and negative face at the same time, demonstrating that people can enact different face saving strategies simultaneously. Similarly, Craig, Tracy, and Spisak (1986), Leichthy and Applegate (1991), and Lim and Bowers (1991) also observed that message producers use complex strategies to save positive face and redress the negative face of a target at the same time. The fact that people use multiple strategies implies that they assume message recipients perceive multiple face threats and a single message can create more than one type of face threat or face redress simultaneously (e.g., Wilson et al., 1998).

More recent studies directly tested whether message sources demonstrated concern about the multiple threats that are posed in compliance-gaining situations (Wilson et al., 1998; Wilson & Kunkel, 2000). For example, Wilson et al. (1998) found that when giving advice, participants anticipated more potential threats to the target's positive and negative face and consequently provided reasons to justify their request. In contrast, when pursuing other influence goals, such as asking favors or enforcing

unfulfilled obligations, fewer reasons or justifications were provided. When asking favors, participants perceived potential threats to the target's negative face and displayed strong concern for not imposing too much on the target's autonomy. When enforcing unfulfilled obligations, participants expressed less approval and exerted greater pressure for their target to comply, even though they anticipated potential threats to their friend's negative and positive face. Across different social influence situations, though varied in degree, both threats to positive face and negative face were perceived distinctly and reflected in different types of message strategies. Similar patterns of perceived threat and message production were replicated in a later project (Wilson & Kunkel, 2000). This finding also suggests that advice-giving situations can be characterized as not only having potential for both threats to positive face and threat to negative face, but also threatening the positive face of the target more than other influence situations.

Positive Face and Negative Face in Advice-Giving Situations

Advice-giving situations highlight the importance of potential threats to positive face in comparison with other influential situations. Research findings have also shown that advice messages are generally more threatening to positive face than to negative face of the target (Goldsmith, 2000; Goldsmith & MacGeorge, 2000; MacGeorge et al., 2002). For example, Goldsmith and MacGeorge (2000) found that across the 12 types of advice messages, a perceived threat to positive face was ranked higher means than a perceived threat to negative face. For a perceived threat to negative face, none of the messages had a mean rating above the midpoint of the scale, and only 31% of subjects gave ratings of perceived threat to negative face that were above the midpoint. In contrast, the overall

mean rating for a perceived threat to positive face was near the midpoint of the scale and was significantly higher than the mean rating for a perceived threat to negative face. There was also greater variability in ratings of perceived threat to positive face than in ratings of perceived threat to negative face.

Perception of face threats in advice giving situations are influenced by several factors. Although verbal directives are most obviously associated with perceived threats to face, all directives are not alike in their implications for face. The interpreted goals of the adviser can influence how much threat and what types of threat advice is actually perceived as (Wilson et al., 1998). Specifically, advice messages can be perceived as threatening to negative face if the adviser's goal is interpreted as "being noisy" or "butting in." On the other hand, advice messages can be perceived as threatening to positive face if the adviser's intention is viewed as critical, blaming, or "unsupported" in nature (Goldsmith & Fitch, 1997; Wilson & Kunkel, 2000). For instance, if the content of message either explicitly or implicitly blames an advisee on neglecting his/her responsibility for the problem, this matters in judging how the level of regard the message has positive face.

For example, Goldsmith and MacGeorge (2000) inspected messages that were rated as high or low in regard for positive face in a "failed exam" scenario. They speculated that blame for the problem was salient to assessing positive face threat. The messages showing the least regard for positive face (thus more threat) were all advising the message recipient to take some action that he or she should probably already have taken: "Study harder," "go to class," and "talk to people in class." In contrast, the message rated as showing the most regard for positive face (thus less threat) is neutral, or

future-oriented while avoiding any explicit blame on the advisee. “Talking to the professor”, for example, leaves the possibility that the student may not be at fault for failing the exam.

Similarly, MacGeorge et al., (2002) again examined the evaluation of three types of advice messages; face-aggravating (face threatening), blunt, and face-mitigating (politeness or face supporting) in a “failed exam” scenario, and included three types of advice content to enhance the generalizability of the previous findings. Results showed that advice that mitigated threats to face was preferred over advice that was blunt or overtly aggravating to face. There was also a substantial main effect for content: At each level of facework, advice to “talk to the professor” was preferred over advice to “study harder,” which was preferred, in turn, over advice to “drop the class.” This finding suggests that something about the advised actions affects how the messages are evaluated. MacGeorge and her colleagues speculated that dropping the class was evaluated as the least favorable because it was viewed as not feasible or as having significant limitations to implement the advised action. Moreover, “drop the class” or “study harder” sees the message receiver as the one who is solely responsible for the problem, whereas “talk to the professor” avoids the topic for blaming and opens up the new possibility to succeed.

In conclusion, these two consecutive studies show that when the content of advice message places blame on the message recipient for the problem, recipients perceive the message more threatening to positive face and consequently less effective in persuasion. People are generally motivated to protect their positive image or identity and thus no matter how useful the given advice is, it has potential to be rejected.

The relationship between perceived face threat or concern and perceived quality of advice has been empirically documented (Goldsmith & MacGeorge, 2000; MacGeorge et al., 2002). In general, advice messages that convey regard for positive face are positively associated with the perceived effectiveness, appropriateness, helpfulness, and sensitivity of advice given to a distressed other. Especially, given that the advice messages appeared to pose greater potential threat to positive face than to negative face, Goldsmith and MacGeorge (2000) found that perceived regard for positive face had a stronger relationship to message effectiveness than did perceived regard for negative face.

Furthermore, MacGeorge et al. (2004) examined the effect of advice content on three different outcomes of facework (reducing threats) from the perspectives of message recipients: perceived quality of the advice message, perceived facilitation to cope with the problem, and intention to implement the advised action. They found that the strongest effect of facework is on facilitation of coping rather than evaluation of advice quality or intention for the advised action. Based on this result, they further argued that facework may have a stronger impact on recipients' emotional/ motivational outcomes than on evaluative or persuasive outcomes. In other words, messages mitigating face threat help recipients to feel better and engage in problem-solving but they had less impact on overall judgments of the advice or decisions about what action should be taken.

Given that the value that people typically place on their identity as competent and autonomous, advice perceived as more face threatening is perceived as less effective. In contrast, previous studies on advice have provided evidence that facework (less bold in directives, supportive for freedom of action and positive identity) exerts positive effects on the influencing process in general. The empirical evidence is, however, limited in

delineating what are distinctive effects of threats to positive identity and threats to freedom on message outcomes or what are differential effects of positive facework (targeting positive face) and negative facework (targeting negative face) on persuasion outcomes.

In sum, literature on the Politeness Theory suggests that people often perceive not only threats to one's autonomy but also threats to positive face. Furthermore, successful messages tend to redress these multiple threats at the same time. Clearly, empirical evidence shows that potential threats to positive face and the concept of positive face exist in people's perception separately from threats to negative face in compliance-gaining situations. Consistent with the view of these two faces presented in the Politeness Theory, this study argues that state reactance that is theorized in the Theory of Reactance can arise from threatened identity of message recipients (positive face) as well as one's threatened freedom (negative face).

Two Faces of Threats and Hypotheses 1

Based on the literature review, this study argues that there are two major sources of psychological reactance and thus two types of reactance. As Brehm (1966) originally proposed, *Reactance on Freedom* is a motivational state that occurs after threats to personal freedom. The Politeness theory adds *Reactance on Identity* that is a motivational state that occurs after threats to identity. As an initial step, this study aims at empirically testing the possible confounds of the two threats type in past studies.

In previous studies, threats to freedom have been manipulated by specific message *features* such as controlling the language or intensity of directives (Dillard &

Shen, 2005; Miller et al., 2007). Manipulation of certain message features, however, may inevitably manipulate other characteristics of messages. For example, let's consider the following two sentences: "Any reasonable person has to stop smoking" and "Most people agree that smoking is bad." The former not only presents a greater autonomy threat through "have to", but also manipulates the positive identity attached to "reasonable" people, as compared with the latter statement. Non-compliance with the first sentence may cause targets to perceive a different connotation about "reasonability" of their identity, whereas the second sentence does not have the same connotation for one's identity.

In fact, Dillard and Shen (2005) briefly noted the slight possibility that they might manipulate other message variables in their study at the expense of stronger manipulation. Messages in the high threat condition may trigger a threat to one's positive identity. For example, the message of "*any reasonable person has to* agree that over-consumption of alcohol is..." in the high threat condition may threaten recipients' ability to judge what a reasonable person would consider over-consumption, compared with "*most people* agree that over-consumption of alcohol..." in the low threat condition. Similarly, "*Stop the denial*" in the high threat condition may accuse recipients of wrongdoing if they do not comply, compared with "*one that is hard to deny*" in the low threat condition (Dillard & Shen, 2005; Quick & Stephenson, 2008). Thus, manipulation for autonomy threats might concomitantly manipulate the positive identity of message recipients for some campaign messages in the past studies.

As such, the psychological reactance predicted by the manipulation of threats to freedom may be confounded with threats to positive identity. Based on the politeness

theory and speculation on the messages features in the past reactance studies, this study proposes that 1) the two sources of reactance - threats to freedom and threats to positive identity are empirically distinguishable and 2) threats to positive identity also lead to reactance responses. Accordingly, the Figure 2.2 is presented in the next page, based on these propositions.

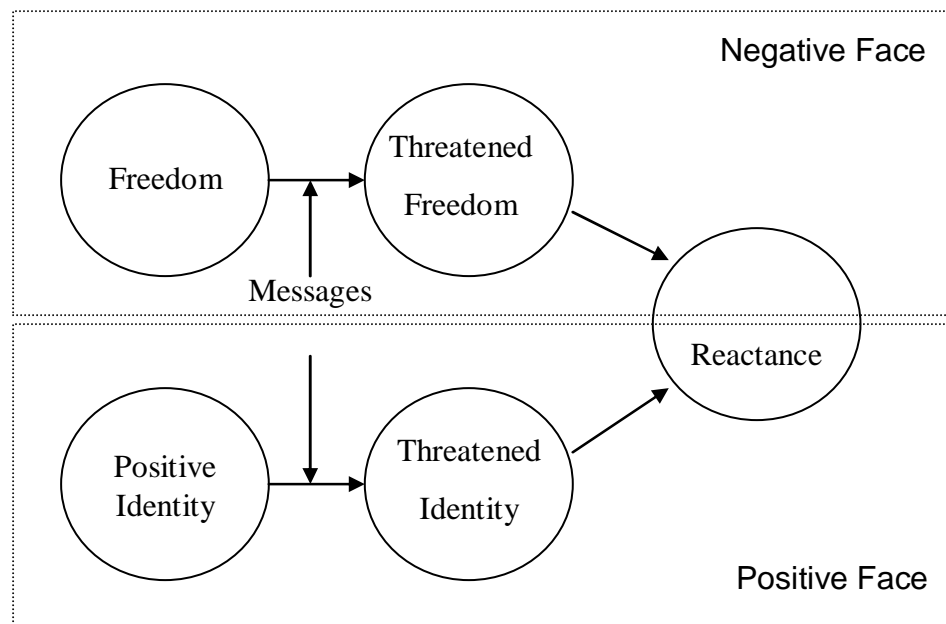


Figure 2.2. Two Faces of Threats in a Process of Reactance

Consequently, the first three hypotheses are advanced with respect to the threatened positive identity of recipients as another antecedent of state reactance. It is expected that perceived threats mediates the association between message feature and state reactance.

H1-a: Messages that contain more threats to identity will lead people to perceive more threats to identity.

H1-b: Messages that contain more threats to identity will show an indirect effect on state reactance via perceived threat to positive identity.

Theoretical distinctiveness between threats to identity and threats to freedom in influencing psychological reactance is of main interest in this study. Thus, the unique effect of perceived threats to positive identity on state reactance is hypothesized controlling for the effect of threats to freedom.

H1-c: There is a significant effect of perceived threats to identity on state reactance above and beyond an effect of perceived threats to freedom on state reactance.

Given that the impression management account allows the same restorative behaviors of threatened freedom in psychological reactance theory (Baer et al., 1980; Heilman & Toffler, 1976; Nail et al., 1996), another hypothesis is advanced regarding the effect of threatened identity on persuasive outcomes. Moreover, literature on advice shows that more threatening advice to positive face is perceived less favorably (Goldsmith, 2000; Goldsmith & MacGeorge, 2000; MacGeorge et al., 2002), whereas advice having facework (facework; less bold in directives, supportive for freedom of action and positive identity) exerts positive effects on the influencing process in general (MacGeorge et al., 2002; 2004). Based on the evidence, the hypothesis between perceived threat to positive identity and outcome variables is advanced.

H1-d: Perceived threat to positive identity is negatively associated with perception of message effectiveness, attitude toward message advocacy, intention to act, and intention to talk.

Although it is not the theoretical focus of this study, several covariates are included to achieve better statistical control. Past studies found that high trait reactant individuals are more likely to experience state reactance than low trait reactant individuals (Dillard & Shen, 2005; Quick & Stephenson, 2008; Rains & Turner, 2007).

Although trait reactance is believed to be associated with valuing independence, autonomy, and freedom (Dowd, Wallbrown, Sanders, & Yesenosky, 1994), it is possible that reactance arousal is greater among individuals who believe they are competent and knowledgeable enough to make their own decisions on the matter (Burgoon et al., 2002). In addition to trait reactance, age, sex, previous or current behaviors of exercise or meditation may moderate the effectiveness of message types (Quick & Bates., 2010; Shen, 2010; 2011). Accordingly, the first research question is advanced.

RQ1: Does an individual's trait reactance, age, sex, or previous exercising behaviors or meditating behaviors interact with condescending message on the outcome variables of interest?

The Role of Emotions

Definitions of emotions or affect vary among researchers (for a full review, see Cornelius, 1996; Ekman & Davidson, 1994). In general, emotions can be viewed as the syndromes of complex components, such as experiential, expressive, cognitive, physiological, and motivational components (Roseman, 2001; Scherer, 2001). Emotions differ from moods, sentiment, or temperament in terms of duration, threshold for arousal, expression, and awareness of antecedents (Davidson, 1994; Ekman 1994; Goldsmith, 1994). *Emotions* stay very briefly, typically lasting a matter of seconds or at most minutes, may occur most frequently during a particular mood, have a unique facial expression, and people can usually specify the events that call forth an emotion. In contrast, *moods* can last much longer than emotions, result from certain emotions, lower the threshold for the arousal of emotions, do not have any specific facial expression (though they might have

unique vocal signal for each mood) and moods can be brought forth unconsciously, such as changes in one's neurohormonal or biochemical state. Temperament (or trait/disposition) lasts over periods ranging from months to years, activates in relevant contexts, varies in expression from person to person, and is the result of differences in genotype and/or experience (Goldsmith, 1994).

From the various perspectives of emotions (Cornelius, 1996), this study takes a functional view of emotions based on appraisal theories. Emotions are associated with urges to act in particular ways either physically, called *action tendencies* (Frijda, 1986; Frijda, Kuipers, & ter Schure, 1989; Lazarus, 1991; Levenson, 1994; Tooby & Cosmides, 1990) or cognitively, called *momentary thought-action repertoire* (Fredrickson, 1998; 2001). Emotions prepare the “optimal physiological milieu to support the particular behavior that is called forth” in response to a situation (Levinson, 1994, p.124). For instance, anger creates action readiness to attack, fear creates action readiness to escape, and disgust creates action readiness to expel. Anger tends to serve a function of removing obstacles, fear protecting, and disgust rejecting. Thus, some negative emotions are vital to survival from life-threatening situations that require quick and decisive action. Meanwhile, positive emotions such as happiness creates action tendencies to approach and thus functions as a self-reward system (Dillard & Peck, 2001).

Moreover, some positive emotions spark changes primarily in cognitive activity, with changes in physical activity (if any) following from these cognitive changes. (Fredrickson, 1998). This function of positive emotions is adaptive because changes in cognitive activity often lead individuals to discard time-tested or automatic behavioral scripts, instead broadening the scope of attention, and building physical, intellectual, and

social resources accessible for the future (Fredrickson, 1998; 2001; Isen, 1990).

Fredrickson suggests this adaptive model of positive emotions through her Broaden-and-Build Theory.

Although research is rapidly accumulating empirical evidence that positive emotions serve numerous adaptive benefits in human functioning, much remains to be learned about specific discrete, positive emotions that help us to better understand in persuasion. For example, Nabi (2002a, p.299) suggested that “exploring the conditions under which emotions, *particularly positive ones*, might lead to attentive processing would most certainly be a worthy pursuit for persuasion scholars.” As briefly discussed, discrete emotions are expected to perform specific functions per se; hence the following section explains what discrete emotions mean and why they are important in persuasion research.

Discrete Emotion as Message-Induced Emotion in Persuasion

Affect can be message irrelevant or message induced (Dillard & Wilson, 1993). Message-irrelevant affect as an incidental affect has been studied in the two ways – mood and unintended effect. Mood is usually evoked prior to the presentation of a message on an unrelated topic (see Hullett, 2005, for a meta analysis on the impact of mood on persuasion). Unintended affect is regarded as side-effect emotion that is not necessarily result of interest in effective persuasion such as reactance (Cho & Salmon, 2007). Message-induced affects have been used interchangeably with discrete emotions (Shen & Bicsby, 2010).

Traditionally, negative emotions have been intensely studied as message-induced and discrete affect influencing message processing, such as fear appeals (e.g., Boster & Mongeau, 1984; Eagly & Chaiken, 1993; Leventhal, 1970), guilt (e.g., Boster et al., 1999; O'Keefe, 2000), and anger (e.g., Nabi, 1999; 2002b). In comparison, positive emotions have been understudied as message-induced affects. Instead, positive *mood* has gained some attention as having impact on low-involvement issues, such as commercial advertising or for individuals with low levels of motivation (Cacioppo & Petty, 1989; Mackie & Worth, 1991). Positive moods were induced by message-irrelevant manipulation such as pleasant vs. sad movies, recalls on happy vs. sad events (e.g., Forgas, 1999), or winning a lottery vs. neutral (Mackie & Worth, 1989; 1991).

Action Tendencies of Discrete Emotions in Persuasion

Nabi (2002; 2010) argues that adopting a discrete perspective is most reasonable to study the outcomes of interest in persuasion research. This study is based on the discrete view that discrete emotions as unique emotion states are the key motivator of affective and cognitive processing in persuasion. Currently, scholars study emotions based on the two different models of emotion: dimensional and discrete. Dimensional models view emotion either positive or negative based on the two organizing dimensions; arousal (high/low activation) and valence (pleasure/ displeasure; e.g., Lang, Greenwald, Bradely, & Hamm, 1993; Russell, 1980; Watson, Clark, & Tellegen, 1988) or intensity and direction (Dickinson & Dearing, 1979). For example, the behavioral activation/behavioral inhibition (BAS/BIS) model provides the basis for positive and negative affects respectively (Cacioppo & Berntson, 1994; Thayer, 1989). According to

this camp, studies have showed that the behavioral activation system (BAS) is the source of positive emotional experience and the behavioral Inhibition system (BIS) is the source of negative emotional experience.

On the other hand, discrete models view emotion categorical based on the unique pattern of cognitive appraisals or underlying thought patterns (e.g., Frijda, 1986; Lazarus, 1991; Levenson, 1994). Appraisal theories contend that cognitive appraisal leads to particular patterns of thought about the environment relative to one's goals, which leads to certain states of action readiness. Together with action tendencies, the associated physiological changes motivate perceptions, cognitions, and behaviors in ways consistent with each particular emotion's adaptive goal.

In general, the dimensional models better explain the biological organization of the human affect system that also focuses on brain processes in encountering an emotional stimulus (for discussion, see Bolls, 2010). In the context of message perceptions, the dimensional perspective suitably explained issues of emotion elicitation in that individuals chronically activated in BIS corresponded with negative emotional responses to the messages, whereas individuals chronically activated in BAS corresponded with positive emotional responses to the messages (e.g., Dillard & Peck, 2001). In the same study, however, the discrete emotion perspective was better-suited than the dimensional approach in explaining persuasive outcomes because positive and negative emotions did not uniformly explain perceived effectiveness of messages rather each emotion varied in both the sign and magnitude of its effects on message outcomes (Dillard & Peck, 2001). More recent studies have supported evidence that the dimensional approach of BIS/BAS shows a rather complex pattern of associations with

emotions than a dual pattern of either positive vs. negative or approach vs. avoidance aspect of affect to predict attitude and behavioral intention (Shen & Bicsby, 2010; Shen & Dillard, 2007).

As such, in order to test rival hypotheses around dimensional versus discrete emotions, past studies documented action tendencies of discrete emotions relevant to persuasion (Dillard & Peck, 2000; Shen & Bicsby, 2010; Shen & Dillard, 2007). The following table summarizes frequently used emotions in persuasion studies.

Table. 2.1. Functions and Action Tendencies of Major Discrete Emotions (Shen & Bicsby, 2010 p.4)

Emotion	Relative theme	Action Tendency	Function	Valence
Anger	A demanding offense against me and mine	Attack/Reject	Remove obstacle	Negative
Fear	Facing uncertain, Existential threat/danger	Revise existing plan/ create new plan	Protection	Negative
Disgust	Taking in or being too close to an indigestible object or idea	Reject substance/ withdraw	Maintain gustatory goal	Negative
Guilt	Having transgressed a moral imperative	Strive to attain standard	Self-sanction	Negative
Sadness	Having experienced an irrevocable loss	Review plan/ convalesce	Learning/ recuperation	Negative
Surprise	Novel Stimuli	Allocate attention	Orient	Open
Happiness	Making reasonable progress toward the realization of a good	Bask/bond	Self-reward	Positive

As Table 2.1 shows, issues of approach and avoidance should be contextualized and specified with questions of “approach what, for what reason, and to what end” rather than with a question of whether emotions are either positive or negative (Nabi, 2010, p.154). For example, both fear and anger are negative emotions and thus expected to inhibit behavioral system (BIA: avoid) based on the dimensional approach; however, empirical studies have shown that fear tends to promote certain health behaviors to

protect from illness (e.g., Boster & Mongeau, 1984; Eagly & Chaiken, 1993) and anger has mixed results for effective persuasion (DeSteno et al., 2004; Dillard et al., 1996; Nabi, 2002b). When anger was an unintended effect of messages, anger functions as rejecting the advocated message (for example, reactance theory), whereas anger would promote persuasion if it is an intended effect of messages such as persuading people to act against social injustice or unfairness.

The discrete approach on emotion, therefore, allows us not only to include the dimensional perspective in terms of valence and intensity but also to capture the additional elements such as appraisals on relational theme (the person-environment relationship) or thought patterns about one's goals, and predict action tendencies as outcome of certain emotional experiences. The discrete view provides the nuance necessary to explain affective, cognitive and behavioral aspect of human experience more fully (Nabi, 2010). Evidence to support the discrete view has been accumulating in recent years.

For example, Shen and Dillard (2007) examined the role of message framing (advantage/disadvantage) and individual differences in chronic emotion activation (the behavioral *inhibition* system versus the behavioral *approach* system) on affect, cognition, attitude, and behavioral intention. Predictions were made based on the dimensional view in that that negative emotions such as states of fear, anger, disgust, sadness, and surprise would be associated with the behavioral inhibition systems (BIS) and happiness as positive emotion be associated with the behavioral approach system (BAS). Although the result was consistent with expectation on the relationship between framing and emotional valence, the patterns of results regarding the relationship between the BIS/BAS systems

and emotion did not provide consistent support for either the valence model (negative versus positive) or the motivational model (negative-avoidance versus positive-approach).

More specifically, Shen and Dillard (2007) found that framing led to expected effect of the BAS/BIS system on dominant cognition. Advantage framing (gain-framed) messages captured the process whereby the BAS influences dominant cognition, whereas disadvantage framing (loss-framed) messages captured the process whereby the BIS (but not BAS) influences cognitive thoughts. Unexpectedly, however, in the advantage framing condition the BAS was positively correlated with fear and additionally the BIS yielded significant effects of anger and fear that consequently influenced attitude and intention. Their results also showed that both framing messages promoted a process of attitude/ intentional change through increased fear but reduced anger. In the advantage message, happiness as a positive discrete emotion did not yield any effect on the outcome. One possible explanation why happiness as a positive emotion does not directly affect attitude and behavioral change is that the variance of happiness was too small in magnitude. It is known that when a variable is restricted in its range, the power to detect the significant link of that variable with dependent variables becomes weaker.

Another caveat of the study in relation with happiness was that the only positive emotion measured in the study was happiness, even though this emotion has not been specifically related to the processing of persuasive messages, both empirically and logically. In the subsequent study similar to Shen and Dillard's (2007), Shen and Bigsby (2010) pointed out the shortage of positive emotions in their study, suggesting that future studies use relevant emotions that share similar cognitive mechanisms but may differ in valence and action tendency. They provided examples such as anger vs. compassion,

shame vs. guilt, and fear vs. hope. Their speculation on these examples is important to this current study because hope is the emotion that this study targets to test as one of major positive emotions.

Another interesting result of the past studies in dimensional vs. discrete view of emotions is about surprise (Dillard & Peck, 2001; Shen & Bigsby, 2010; Shen & Dillard, 2007). If a person encounters an unfamiliar situation and judge the stimuli are novel, surprise may be elicited. Earlier, Gray (1990) theorized that sensitivity to novelty operates only in the BIS but not in the BAS because the BIS is sensitive to cues of punishment, nonreward, and novelty. One study by Shen and Dillard (2007) supported Gray's prediction that surprise correlated with BIS, but not BAS.

However, in contrast to Gray's position, Dillard and Peck (2001) predicted and found that both BIS and BAS would exhibit associations with surprise. According to them, surprise arises from an unexpected change in the environment. It encourages the allocation of the stimulus for the purpose of evaluating its relevance to the individual's goals. Because surprise motivates the assessment of the (un)desirability of the stimulus, it can be equally relevant to both systems. Consistent with this view, Shen and Bigsby (2010) found that overall both BIS and BAS predicted surprise and more specifically message valence moderated the impact of BIS/BAS such that BIS was a significant predictor for both positive and negative valenced situations, whereas BAS became nonsignificant in negatively valenced situations. This nuanced result explained the contradicting previous result of Shen and Dillard's (2007). In their project, they only used fear-threat appeals and this negatively valenced situation would be predicted only by BIS, not BAS. In short, findings on surprise seem to suggest that judgment on novelty

activates BAS when it comes with positive emotions or positively framed situations, but judgment on novelty does not have any impact on BAS when it comes with negative emotions or negatively framed situations.

In conclusion, the empirical studies on dimensional/ discrete approaches on emotion have provided three important implications that are central to this study: 1) more variance and different kinds of positive emotions should be included in future studies, 2) specific emotions that are relevant to persuasion studies should be tested, and 3) the role of discrete emotions should be clarified in terms of affective and cognitive routes to predict action tendencies. Taking the limitations of previous studies into consideration, this study examines the role of positive emotions in promoting health messages and explores the dynamics between the positive emotions of curiosity and hope with the negative emotions of fear and anger.

Given that fear is an important emotion in persuasion, this study employs hope as having a similar relational theme to fear, but is positive in valence. Fear is evoked in the face of uncertain, existential threat or danger and hope is evoked in the face of a dismal reality or need for improvement. This study also employs curiosity as a similar construct to surprise. Curiosity is similar to surprise because it corresponds to novel stimuli but curiosity seems to capture the core of positive aspect that exists in surprise and forthcoming emotion toward the reward, which are more pertinent to promote effective persuasion.

Curiosity and Hope as Positive Emotions

Though definitions of positive emotions tends to be more diffuse than negative emotions, four positive emotion *families* can emerge – happiness/joy, interest, contentment, and love (Fredrickson ,1998). Curiosity and hope are fairly considered within the emotion family of *interest* (Richman, Kubzansky, Maselko, & Kawachi, 2005). First, interest in general will be briefly discussed and then curiosity will be presented, which is used interchangeably with interest for some scholars.

Although some theories do not view interest as an emotion in and of itself (e.g., Ortony, Clore, & Collins, 1988), interest is important in understanding emotions that are central to curiosity, exploration, learning, and information seeking (Fredrickson, 1998; Izard, 1977; Izard & Ackerman, 2000; Silvia, 2005; Tomkins, 1962). According to Silvia (2005), interest has a reliable expressive component in both infants and adults with physiological markers of heightened engagement. Interest also has motivational components affecting what people choose to read, promoting the use of deep-level processing strategies, and enhancing the comprehension of text. In sum, interest fulfills a broadening function by creating the urge to explore, taking in new information and experiences, and expanding the self in the process (Csikszentmihalyi, 1990; Izard, 1977; Ryan & Deci, 2000).

In previous studies, the term interest is often equated with curiosity. Curiosity is also considered a trait or state. Trait curiosity is defined as “a positive emotional-motivation system associated with the recognition, pursuit, and self-regulation of novel and challenging opportunities” (Kashdan, Rose, & Fincham, 2004). Kashdan et al. (2004) noted that being curious is associated with positive subjective experiences; positive

evaluations of the self, world, and future; beliefs that goals are attainable and obstacles can be circumvented; general tendencies to enjoy effortful cognitive endeavors and being open to new experiences and ideas; and self-determined tendencies to recognize, pursue, and thrive in pleasure, excitement, and challenge. Due to this adaptive quality of positivity, curiosity drives people to seek out personally meaningful cues and activities in response to novel, uncertain, complex, and conflicting situations. Moreover, like other positive emotions, curiosity is associated with approach behavior and experiences of reward (Loewenstein, 1994; Peterson & Seligman, 2001).

Hope is a forward-looking emotion characterized by positive future expectations and the sense that one is likely to be able to meet situational demands (Ellsworth & Smith, 1988; Smith, Haynes, Lazarus, & Pope, 1993). Hope encompasses optimism and positive points of view for success (Smith et al., 1993). One interesting aspect of hope is that hope arises from negative environments, representing yearning for a better situation than one's current situations (Lazarus, 1991).

Hope is an emotion. According to Lazarus (1991; 1999), hope functions like other positively-toned emotions such as happiness, pride, and love because it flows from conditions that facilitate or promote goals. In particular, hope partly arises from a strong desire to be in a better situation than the present, and from the impression that the end state is possible, either as a result of one's efforts or external forces. Lazarus also argued that hope is an emotion because the experience of hope usually involves a change in the intensity of one's mental state, which can be evident in behavior, subjective affect, and physiology. Although experience of hope may not be as intense as joy, rage, or anxiety,

Lazarus contended that hope can vary in intensity from a small degree of activation to an intense physiological response such as yearning.

Appraisal theories posit that people experience certain emotions when they assess their environment with the several appraisal dimensions. Hope is particularly related to the dimensions of goal-congruency, uncertainty, and importance. Research based on appraisal theories of emotion has empirically confirmed that hope is a positive emotion (Shaver et al., 1987) that arises from environments or outcomes characterized as goal congruent (Ellsworth & Smith, 1988; Lazarus, 1991) and uncertain but possible (Roseman, 1991; Roseman, Spindel, & Jose, 1990). The goal-congruency dimension reflects the extent to which the environment is or is not conducive to goal fulfillment. Averill, Catlin, and Chon (1990) found that college students reported terminating hope when they were certain that the outcome would not happen and/or when they were certain that the goal could not be achieved. That indicates that outcomes regarded as certain will not evoke hope. Averill et al. (1990) also found that people no longer feel hope when they no longer desire the outcome.

Despite the definition of hope as an emotion or feeling, most theories in social science (including appraisal theories of discrete emotions), have paid more attention to the cognitive side of hope (Lopez, Snyder, & Pedrotti, 2003). Snyder and colleagues (Snyder et al., 1991), for example, have introduced a cognitive, motivation based model called hope theory. According to hope theory, hope reflects individuals' perceptions regarding their capacities to (1) clearly conceptualize goals, (2) develop the specific strategies to reach those goals (pathways thinking), and (3) initiate and sustain the motivation for using those strategies (agency thinking). From the cognitive perspective,

hope theory suggests that hope is closely related with goal-directed thinking and the motivational component of future behaviors.

This raises the question of whether there are empirical grounds for viewing hope as an emotion that entails physiological activation or certain behavioral coping. As scholars pointed out (Lazarus, 1999; MacInnis & de Mello, 2005; Nabi, 2002a), the various functions of hope have engendered little research, despite their relevance to human behavior in general. This study aims to fill this gap, focusing on how hope functions in message perception and attitude change in persuasion.

In sum, both hope and curiosity facilitate a more open approach toward environmental stimuli and prepare individuals' mindsets for a pursuit of their goals. Although the effect of curiosity and hope in persuasion research has not been directly documented, there are at least three indirect reasons that support their effect in the persuasion process: 1) relevance of hope with self-efficacy, 2) findings from psychotherapy, and 3) the broadening/undoing effect of curiosity and hope as positive emotions.

Hope and Curiosity as Potential to important emotions in Persuasion

First, the hope construct is closely related with the construct of self-efficacy, which facilitates the effectiveness of persuasive message (Bandura, 1997; Lazarus, 1999). Self-efficacy has been found to be an important feature of effective messages in health campaign in previous studies (see Albarracin et al, 2003; Bandura, 1997; Fishbein et al., 2001; Fishbein & Yzer, 2003, Noar et al., 2007). For instance, Noar et al. (2007) reviewed a growing body of literature on tailored print interventions for health behavior

change. Their meta-analysis focused on the effect of tailoring by identifying effective intervention concepts derived from several theories. One of the main findings showed that theoretical concepts such as attitudes (including decisional balance, benefits and barriers, outcome expectancies, behavioral beliefs), self-efficacy, social support, stage of change, and processes of change were most clearly associated with larger effect sizes of tailored interventions. Albarracín et al.'s (2003) meta-analysis also found similar results.

Messages that included attitudinal information and/or modeled behavioral skills (i.e., raised self-efficacy) motivated a health behavior (e.g., condom use), whereas messages that emphasized the threat of HIV/AIDS had no such effect. These two meta-analyses suggest that messages that increase *positive views* and feelings toward a health behavior (i.e., attitudes) and one's *confidence* in performing the behavior (i.e., self-efficacy) are more effective in facilitating changes in health behaviors than messages that emphasized the threat of a disease (Noar et al., 2007).

Conceptually, hope and self-efficacy are interrelated with the concept of expectancies at their core, but are not identical constructs (Magaletta & Oliver, 1999). Expectancies refer to individuals' beliefs that desired outcomes will occur, either due to one's own efforts or to other factors not under one's control (Magaletta & Oliver, 1999). In a similar vein, Bandura (1982) conceptually differentiated between expectancies of self-efficacy (one's belief in one's ability to perform a specific behavior) and expectancies of outcomes (one's belief that a specific behavior will produce a desired outcome). Self-efficacy or self-confidence is belief systems that mainly arise from expectancies about one's ability and tap cognitions on problem-focused coping actions (Lazarus, 1999). However, hope is more than simply a cognitive function because people

can hope even when they are helpless to affect the outcome. Hope occurs in the face of a dismal reality and its sustainability is an important issue. Thus, hope is unique in that it includes components of expectancies about both self-efficacy and outcomes.

Regarding expectancies about outcomes, Scheier and Carver (1985, 1992, 1998) developed a similar construct to hope – optimism. They defined optimism as a generalized expectancy that one will experience good outcome in life. Although both optimism and hope share a tendency toward constructive future-focused thinking, hope holds more regulatory functions with a sense of agency in relation to the future and specific pathways to that future when compared with optimism. Tapping the similarities and differences of these constructs – hope, optimism, and self-efficacy –, Magalette and Oliver's study (1999) showed that all are highly correlated but each construct contributes unique variance independent of the others in predicting personal well-being. Similarly, Bryant and Cvenegros (2004) found that a two-factor measurement model of both optimism and hope provided the best fit index in relation to self-efficacy and well-being measures. They pointed out that hope has more to do with general self-efficacy than optimism, whereas optimism has more to do with positive reappraisal coping than hope. This result indicates that hope encompasses components of one's ability to performing certain acts compared with optimism.

In sum, hope is similar to self-efficacy and optimism, but it is not identical to those constructs. Hope seems to be better understood as having richer affective aspects than self-efficacy and at the same time preparing for more action tendencies than optimism. This highlights the need for more empirical studies to support its significance and contribution to adaptive human behaviors.

Second, beyond the evidence suggested in the fields of communication and psychology, the effectiveness of self-efficacy and hope in attitude/behavior change has been well supported in the psychotherapeutic tradition as well. Pervin (2002, pp. 227-231) argues that there are five elements common to all forms of psychotherapy intended to change people: hope, therapeutic alliance between patients and therapists, principles of learning, changes in self-efficacy beliefs, and disclosure of traumatic experiences by patients. Among them, two constructs – hope and changes in self-efficacy beliefs – are especially pertinent to persuasion research due to the one-way and temporary nature of social influence processes. Frank, in his earlier book on *Persuasion and Healing*, suggested that the all successful forms of psychotherapy help patients combat demoralization by restoring patient moral, hope, faith, and a sense of control over life events (Frank, 1973; Frank & Frank, 1991). This contention is closely tied with the development of self-efficacy beliefs as the common ground for successful therapy, suggested by Bandura (1982). Although little empirical research has tested the effect of hope in changing attitudes and behaviors in persuasion, this study speculates that hope primarily captures a fundamental perception and emotion of self-efficacy. Thus, the content that increases self-efficacy should be associated with increased hope.

Finally, positive emotions have been discussed as adaptive in human functioning. According to the Broaden-and-Build Theory (Fredrickson, 1998; 2001), positive emotions evolved through psychological adaptation that increased our human ancestors' odds of survival and reproduction. Empirical evidence showed that induced positive affect widens the scope of attention (Fredrickson & Branigan, 2005; Rowe, Hirsch, & Anderson, 2005), motivates openness to information (Estrada, Isen, & Young, 1997),

increases preference for variety and a broader array of behavioral options (Kahn & Isen, 1993), and broadens behavioral repertoires (Fredrickson & Branigan, 2005).

More specific to attention and learning, positive emotions broaden attention, whereas negative emotions predict local biases consistent with narrowed attention (Basso, Schefft, Ris, & Dember, 1996; Derryberry & Tucker, 1994). That is, positive emotions create experiential learning opportunities that can correct initial negative attitudes by promoting approach and exploration (Fredrickson & Losada, 2005), whereas negative emotions promote avoidance, by which opportunities to correct false impressions are passed over (Fazio, Eiser, & Shook, 2004). Thus, positive affect builds more accurate cognitive maps of what is good and bad in the environment by broadening exploratory behavior in a given moment and this knowledge becomes a lasting personal resource (Fredrickson & Losada, 2005).

Although the Broaden-and-Build theory does not directly test the effect of curiosity and hope on attention and learning, it is logical to predict the broadening effect of curiosity and in receiving persuasive messages. As discussed earlier, curiosity drives people to seek out information in response to novel, uncertain, challenging situations and hope is characterized as goal-driven emotion in response to uncertain and challenging situation. In this sense, curiosity may facilitate message reception or message attention at the beginning and hope may enhance goal-driven thinking in relation with the outcomes of persuasion. With this rational, detailed hypotheses are presented with some evidence in empirical studies in the following section.

Curiosity and Hypotheses 2 & 3

Given the adaptive roles of positive emotions in cognitive and behavioral activity and the lack of study on positive emotions, the current study investigates the function of curiosity and hope as major two positive emotions in the effectiveness of persuasive messages. The second set of hypotheses tests the effect of curiosity and hope based on the discrete model of positive emotions and the broadening hypothesis of positive emotions in health-promoting campaigns.

There is no direct evidence for the effect of curiosity in persuasion research to date. Given curiosity has a similar relational theme to surprise, it will be worth noting the result of surprise in persuasion to predict the effect of curiosity. As discussed earlier, surprise arises from an unexpected change in the environment, as does curiosity. Like surprise, curiosity may motivate the assessment of the (un)desirability of the stimulus and can be equally relevant to inhibition or approach system. Findings showed that surprise can both activate behavioral inhibition system and behavioral activation system in the context of positive valence (Dillard & Peck, 2001; Shen & Bigsby, 2010) but only activate behavioral inhibition system in the context of negative valence situations (Shen & Bigsby, 2010; Shen & Dillard, 2007). These results indicate that judgment (in case of surprise) or motivation (in case of curiosity) for novelty activates either avoidance or approach behaviors or both, contingent on situational factors.

Conceptually curiosity is an emotion that deals with knowing more about stimuli regardless of whether the outcome is good or bad. Given that any influencing attempt has potential to threaten one's autonomy or freedom, any persuasion message may activate one's dispositional reactance level. The broadening hypothesis predicts that interest, such

as curiosity, can be expected to enable individuals to broaden their momentary thought-action repertoires by loosening the hold that negative emotions have on a person's mind. Given this adaptive function of curiosity as positive emotion, the broadening hypothesis explains that curiosity can mitigate autonomy threats and consequently motivate people to more easily accept the arguments in persuasive messages. Specifically, curiosity could reduce one's proneness to reactance that arises from influence situations (H2-b). Thus, the second set of hypotheses is formulated based on the discrete model of curiosity, findings from past studies, and the broadening hypothesis of positive emotions.

H2: State curiosity mediates the relationship between trait reactance and psychological reactance such that:

H2-a: Trait reactance is positively associated with perceived threat to freedom and psychological reactance (the total effect). But this relationship changes in strength via state curiosity.

H2-b: Trait reactance is negatively associated with state curiosity.

H2-c: State curiosity is negatively associated with perceived threat to freedom and psychological reactance.

The relationship between trait reactance and psychological reactance has been well documented (H2-a). Individuals may differ in reactance responses because they vary in the level of autonomy they desire (Wicklund, 1974). A few studies showed an association between trait reactance and state reactance (Dillard & Shen, 2005; Quick & Stephenson, 2007; 2008). For example, Dillard and Shen (2005) reported that individuals high in trait reactance who perceived a message to threaten their freedom experienced greater amounts of state reactance than individuals low in trait reactance in the context of

flossing. Quick and Stephenson (2007) also found that trait reactance was a significant predictor of perceived threat and anger, but not unfavorable cognitions in the context of exercise, and sunscreen messages.

The negative relationship between trait reactance and state curiosity (H2-b) and between state curiosity and perceived threat to freedom (H2-c) is hypothesized based on both past studies on surprise and the broadening hypothesis. In the context of negative valence, surprise only activated the behavioral inhibition system (Shen & Bigsby, 2010; Shen & Dillard, 2007). The results may indicate that state curiosity, if induced prior to any message, can inhibit the chronic tendency of negative emotion such as reactance proneness (H2-b). The broadening hypothesis predicts that curiosity can be expected to enable individuals to broaden their momentary thought-action repertoires and this function may then mitigate autonomy threats and also loosen the hold that negative emotions and thoughts have on a person's mind in response to persuasive messages (H2-c). Given the evidence on the association between trait reactance and state reactance and others, thus, curiosity as a positive emotion is expected to buffer this link.

Parallel to the role of state curiosity in relation to threats to freedom, the next hypotheses are formulated in terms of threats to identity. Since threats to identity are a newer approach, there is no evidence between trait reactance and perceived threats to identity, thus the only broadening effect of state curiosity hypothesized predicts perceived threats to identity and reactance.

H3: State curiosity is negatively associated with perceived threat to identity and psychological reactance.

Like curiosity, hope is also expected to buffer the effect of negative emotion and facilitate cognitions that are related to persuasion - perceived effectiveness, attitude, and behavioral intentions. Thus, the fourth set of hypotheses predicts the mediating role of state hope between psychological reactance and persuasion.

H4: State hope mediates the relationship between psychological reactance and persuasion such that:

H4-a: Psychological reactance is negatively associated with persuasion (the total effect). But this relationship weakens in strength via state hope.

H4-b: State hope is negatively associated with psychological reactance.

H4c: State hope is positively associated with persuasion.

The fifth hypothesis predicts the positive contribution of hope appeal in persuasion. In hypothesis 4, state hope is predicted to mediate associations between reactance and persuasion controlling for trait hope, whereas the fifth hypothesis takes into consideration a manipulation factor in the model.

H5: Message-induced state hope is positively associated with persuasion.

Hope, Fear, and hypotheses 6

The broadening hypothesis also has an important implication in explaining how resilient people regulate their negative emotions or bounce back from stressful experiences (Tugade & Fredrickson, 2004). According to the broaden-and-build theory, the undoing hypothesis predicts that positive emotions correct or undo the after effects of negative emotions (Fredrickson & Levenson, 1998; Fredrickson, Mancuso, Branigan, & Tugade, 2000). The basic assumption of the undoing hypothesis is that positive emotions

are incompatible with negative emotions (Baron, 1976; Solomon, 1980; Wolpe, 1958), because negative emotions narrow the momentary thought-action repertoire whereas positive emotions broaden this same repertoire. When these two emotions conflict, positive emotions should function as an efficient means of dissipating the lingering effects of negative emotions.

Tugade and Fredrickson (2004) provided robust evidence for the undoing hypothesis, using six measures of cardiovascular (heart rate, two measures of finger pulse, ear pulse, and two measures of blood pressure) in two studies. They first induced anxiety and heightened cardiovascular reactivity of participants by having them prepare a 60 second speech and next showed four clips eliciting 1) contentment, 2) amusement, 3) neutral, and 4) sadness. Results showed that the groups that viewed the contentment clip and the amusement clip were significantly faster in cardiovascular recovery than the neutral and sadness groups. The results clearly indicated that both contentment and amusement, although different in intensity of positivity, can undo lingering negative emotional arousal.

Notably, the duration of cardiovascular reactivity was calculated as the time elapsed (in seconds) until each participant's indices of cardiovascular reactivity returned to his or her own baseline levels and remained within this interval for 5 of 6 consecutive seconds. By no means, however, do cardiovascular responses inform which discrete emotions an individual is experiencing. Instead, participants reported subjective experiences through the Emotional Report Forms or other emotional measures (Fredrickson et al., 2000; Tugade & Fredrickson, 2004) and showed distinctive emotional experiences in response to a speech task (anxiety), and different films (contentment,

amusement, neutral, sadness). Although the cardiovascular changes through patterns of sympathetic activation (e.g., heart rate, blood pressure) were focal measures in the two studies, this study takes evidence from the reported measure as good indicators of subjective emotions.

Thus, cardiovascular evidence showed that positive emotions have a unique ability to down-regulate lingering negative emotions. This current study induces multiple emotions in a sequential manner, thus the emotion induced last, hope, should have the most powerful and direct impact on the outcomes of persuasion. Based on the undoing hypothesis, state hope, but not other emotions, is expected to lead significant effect on persuasion.

H6-a: Only state hope, not curiosity, fear, and anger, positively influences on perceived effectiveness of message.

Although the undoing hypothesis claims that positive emotions are not compatible with negative emotions in terms of physical response, it is unclear whether people report their feelings completely independently of one another. Some discussion exists over mixed emotions. For example, Williams and Aaker (2002, Experiment 2) provided evidence that the mixed emotional appeal (happiness and sadness) marked the differential effect of the ads compared with one emotional appeal (happiness only or sadness only) and their study showed that participants felt both positive emotions and negative emotions at the same time through their three experiment designs and experiencing multiple emotions yielded differential effects on the outcome. Furthermore, empirical studies on discrete emotions assumed that people report experiencing multiple emotions in response to PSAs and measured independent levels of each felt emotion

simultaneously, which in turn led differential effects on the outcome of persuasion (Dillard & Peck, 2000; Shen & Bigsby, 2010; Shen & Dillard, 2007).

More importantly, studies on fear appeals imply that multiple emotions lead to distinctive effect on persuasion because fear appeals are known to be effective when accompanied by self-efficacy messages. Fear appeals have long gained attention as a useful motivator to eliminate the danger that is posed. As mentioned earlier, negative emotions such as fear have their adaptive benefits because people react quickly when they perceive a situation as life threatening. Thus fear motivates people to perform adaptive behaviors to increase possibility of survival. For example, messages with fear appeals increase individuals' awareness of the hazards of unhealthy practices such as smoking, thereby helping to trigger smoking cessation. In general, fear appeal messages have been found to be effective for behavioral change (Boster & Mongeau, 1984; Dillard, 1994; Roskos-Ewoldsen, Yu, & Rhodes, 2004). Fear appeal messages are found most effective when perception of danger accompanies judgment of one's self-efficacy (Witte, 1992; 1994). Witte called the effect of fear with self-efficacy a *danger control process*, whereas a *fear control process* would result when a person perceives only threat without feeling that one can carry out the proposed action. Thus, to be effective in persuasion, fear and self-efficacy should go hand-in-hand. This potentially challenges the concept of incompatibility between positive affect and negative affect that is based on the undoing hypothesis of positive emotion. Moreover this study predicts the impact of curiosity and anger on persuasion – thus if multiple emotions can exist, each emotion has some influence on persuasion results. Contrary to the undoing hypothesis of positive emotions, but in line with studies of fear appeals, the following hypothesis is advanced:

H6-b: There are direct relationships between each emotion and perceived effectiveness. Curiosity, fear, and hope are positively related with perceived effectiveness, but anger will be negatively associated with perceived effectiveness.

CHAPTER 3

METHOD

Participants

Students who enrolled in communication and sports/ leisure management courses at several universities in the United States participated in this study. Although 479 students completed the online questionnaire, one was eliminated due to no response in real data. In the final analyses, 478 participants were considered. There were 170 men (38%), and 281 women (62%) in the sample. On average, participants were 22.2 years old ($SD = 4.10$) and the range of age was 18 to 51. Participants consisted of 283 European American (59.2%), 51 African American (10.7%), 48 Asian/Pacific American (10%), 16 Hispanic American (3.3%), 2 Indian American (.4%), and 68 others (14.2%).

Participants consisted of 43 freshmen (9.5%), 103 sophomores (22.8%), 141 juniors (31.2%), 110 seniors (24.3%), and 55 graduates (12.2%). Most were recruited from communication courses at the University of Minnesota ($N=294$, 61.5%) through an email advertisement. Others were recruited from Florida State University ($N=51$, 10.7%),

University of Missouri at St. Louis (N=44, 9.2%), University of Toledo (N = 42, 8.8%), Middle Tennessee State University (N= 26, 5.4%), and Calvin College (N=21, 4.4%).

In exchange for participation, students were given extra credit in their respective courses at the discretion of course instructors. Sampling undergraduate students, as a majority of participants, is reasonable to study the effects of psychological reactance on persuasive messages because college students establish their identity as emerging adults and psychologically develop the importance they place on autonomy and privacy during this time period (Arnett, 2004).

Study Design

For both topics of studies, one described as a “working out right study” and the other described as a “stress relief study,” the study included a 2 (high threat to positive identity vs. low threat to positive identity) X 2 (high threat to freedom vs. low threat to freedom) X 2 (curiosity/ hope induction vs. no positive emotion induction) mixed design.

Manipulation of threats and positive emotions

The target messages are modified for the purpose of this study, based on the standard format for a fear appeal in that they consist of a threat-to-health component and an action or recommendation (Dillard & Shen, 2005; Quick & Stephenson, 2008; Rogers, 1983). The threat-to-health portion of the messages is twofold: 1) they contain threatening facts in a published news article; 2) they discuss the negative consequences of not exercising regularly. Manipulation occurred when describing the negative consequences and benefits of exercising regularly. In manipulating threats to freedom, controlling and definitive languages were used such as “simply cannot,” “just look,”

“must,” “simply have to,” and “definitely” whereas in low threat condition, the tone of voice is neutral and mild such as “there is evidence,” “fairly,” “more likely,” “if,” and “why not consider it?.”

To manipulate threats to identity, this study modified the wording of Quick and Stephenson’s (2008) exercise script. Manipulation occurred when describing the negative consequences. In manipulating threat to identity, derogatory or belittling phrasing of the messages was used such as “stop the denial,” “any reasonable person would not deny,” “be reasonable,” and “only lazy person wouldn’t do it” whereas in the low threat condition, the phrasing tried to rationalize why advocated actions are not easy and how the problem is widespread including “If you are not already participating in a weekly exercise routine, you are not alone.,” “This is not a problem of only one university,” and “Even a reasonable person could not be in it, due to many reasons”. The manipulated messages for threats to identity in the context of exercise and mediation are provided below. The messages for threats to freedom are provided in Appendix B.

Exercise (High Threat to Identity Condition)

“EXERCISE: REASONABLE PERSON DOES NOT DENY”

There is pretty compelling evidence that exercise saves you from dying of a massive heart attack, cancer, morbid obesity, and being stressed out of your mind. In fact, there is evidence right here on this campus of stressed out, overweight _____(University Mascot). Most people would agree that these are serious issues for students at XX University that *need to be addressed soon. Stop the denial! Any reasonable person would not deny all the evidence that there is a problem. So if you are not already participating in a weekly exercising routine, be smart and reasonable. Only a lazy person wouldn’t even try to live a much healthier life!*

Exercise (Low Threat to Identity Condition)

“EXERCISE: BE INITIATIVE”

There is pretty compelling evidence that exercise saves you from dying of a massive heart attack, cancer, morbid obesity, and being stressed out of your mind. In fact, there is evidence right here on this campus of stressed out, overweight _____ (University Mascot). Most people would agree that these are serious issues for students at XX University that *need to be addressed soon. Look closely! This is not a problem of only one university and you have a chance to be a part of the solution if you choose. If you are not already participating in a weekly exercise routine, you are not alone. Even a reasonable person could not be in it, due to many reasons. But by choosing to participate in a weekly exercise routine you are more likely to live a much healthier life for you and others too!*

Meditation (High Threat to Positive Identity)

“MEDITATE: REASONABLE PERSON DOES NOT DENY”

Recent research shows that meditation brings about dramatic effects in as little as a 10-minute session. Studies done by Harvard Medical School have demonstrated that people who mediated for a short time showed more relaxed brain waves, had a less anxious and depressed nervous system and were less likely to have a heart attack or stroke.

There is pretty compelling evidence that meditation saves you from dying of heart disease, depression, morbid obesity, and being stressed out of your mind. In fact, there is evidence right here on this campus of stressed out, anxious Gophers. Most people would agree that these are serious issues for students at the University of Minnesota that *need to be addressed soon. Stop the denial! Any reasonable person would not deny all the evidence that there is a problem. So if you are not already engaging in a daily meditation routine, be smart and reasonable. Only a lazy person wouldn't even try!*

Meditation (Low Threat to Positive Identity)

“MEDITATE: BE INITIATIVE”

Recent research shows that meditation brings about dramatic effects in as little as a 10-minute session. Studies done by Harvard Medical School have demonstrated that people who mediated for a short time showed more relaxed brain waves, had a less anxious and depressed nervous system and were less likely to have a heart attack or stroke.

There is pretty compelling evidence that meditation saves you from dying of heart disease, depression, morbid obesity, and being stressed out of your mind. In fact, there is evidence right here on this campus of stressed out, anxious Gophers. Most people would agree that these are serious issues for students at the University of Minnesota that *that needs to be addressed soon. Look closely! This is not a problem of only one university and you have a chance to be a part of the solution if you choose. If you are not already engaging in a daily meditation routine, you are not alone. Even a reasonable person*

could not be in it, due to many reasons. But by choosing to engage in a daily meditation routine you are more likely to live a much healthier life for you and others too!

Pre-script for curiosity and post-script for hope were used for the manipulation of positive emotions. To induce curiosity, the content of the pre-script was borrowed from Miller et al.'s (2007) freedom restoration postscript and adjusted for the exercise context. The autonomy restoration script is used for induction for curiosity because the content of the autonomy-granting script can capture the value of interest or curiosity while preparing readers for what is to come. Despite this reasoning, a pilot test showed that the curiosity induction failed, thus this study incorporated the cartoon figures together with the pre-script. Appendix A. displays the cartoons used for the curiosity induction. To induce hope, the postscript for hope contains a couple of suggestions on what to do next and an encouragement of action. The exact wordings of Curiosity and Hope are provided below. The meditation messages will be presented in Appendix B.

[Curiosity condition (curiosity vs. none)]

Exercise: You probably heard a lot about the benefits of exercising, but there is a lot of new research on this topic that you might not be aware of.

Meditation: How to be a happy person? Are you tired of waiting around for happiness to find you? Despite what fairy tales depict, happiness doesn't appear by magic. It's not even something that may happen to you. But it's something you can cultivate. The following messages will equip you with some ideas and tools to cultivate your happiness.

[Hope condition (hope vs. none)]

“DREAM TO BE FABULOUS: Exercise”

So if you have not exercised regularly, you can start from this moment. It is as easy as you wish. The first step is to click the website link to your recreation center and see which weekly programs are available to you. Just imagine yourself in great shape both physically and mentally! If you are already regularly exercising, keep up your good work. And talking to your roommates, classmates, friends, and family about the

benefits of exercising would be another good start for everyone. Be all that you can be and DREAM to be a help for others' problems, too!

Click, <http://www.recsports.umn.edu/facilities/reccenter.html>

“DREAM TO BE HAPPY: Meditate”

So if you have not practiced meditation regularly, you can start from this moment. Bring your attention to your breath – in and out. When you breathe in, focus on air coming in through your nose. When you breathe out, focus on air going out through your mouth. Now you've just done mindfulness meditation - just be open-minded toward different types of meditation and find the one right for you.

Anyone can practice meditation. It's simple and inexpensive, and it doesn't require any special equipment. And you can practice meditation wherever you are and whatever you do – whether you're out for a walk, riding the bus, or waiting at the doctor's office. Why not enjoying it! Just imagine yourself happy and stress-free! And share this with your friends and loved ones if possible. DREAM to be one of the happiest in every moment!

Procedure and Materials

Participants were randomly assigned to one of 16 conditions corresponding to the 2 (threat to identity) X 2(threat to freedom) X 2(positive emotion vs. none) X 2 (topics) mixed design, where the four types of threats and the two topics were between-subjects designs and emotion manipulation was a within-subjects design. Thus, study yielded 16 different survey materials and participants were randomly presented with one of the 16 manipulated online messages after agreeing to the consent form. One topic message advocated participation in a weekly exercise routine and the second message encouraged practicing meditation for general mental/ physical health. Responding to the survey material, participants were first asked to respond to the personality measures. Next, participants were asked to respond to the curiosity measure right after a brief introduction either with a cartoon or without cartoon. Then participants were instructed to read one of the online messages including the threat-to-health articles (see Appendix C.) and the

threat-manipulated portion of messages. Immediately afterward, participants completed a 90-second thought-listing task, a state anger scale, a state fear scale, and threat induction check items. Individuals then read hope messages and were asked to respond to hope, fear, negative, and positive emotion items. Afterward, individuals responded to scales measuring perceived effectiveness of the message, their attitude toward the message advocacy, and their behavioral intention. Upon completion, participants were asked to respond to a self-efficacy measure and demographic questions. The three traits questions included the psychological reactance scale of Hong and Faedda (1996), Trait Curiosity (Kashdan et al., 2004), and Trait Hope (Snyder et al., 1991). Trait Curiosity and Trait Hope are included in order to control for any individual differences that could cause an emotional reaction beyond the study manipulation. Finally demographic information including gender, age, race, political orientation, and year in school was collected.

Table 3.1. Overall survey structure

	Content & Measures
Section I	Three personality measures: reactance, curiosity, and hope
Section II	Pre-attitude Current participation in exercise program or meditation
Section III	Message manipulation Measures of emotions and perceived threats
Section IV	Perceived effectiveness/ attitude/ behavior intention Self-efficacy Demographic information

Table 3.2. Message manipulation and immediate measures in survey section III

Message order	1	2	3	4
Manipulation	Curiosity	→ Fear appeal (identical)	→ Threats	→ Hope
Measures following messages	Curiosity	Fear	Thought list Anger Two perceived threats	Hope

Measures

Perceived Threat to Identity

Perceived threat to positive face was measured with six items created for this study. Participants were asked to rate how they perceived the message stimuli, responding to a 7-point semantic differential scale. Six items included two opposite poles of meanings responding to a sentence “After I read the message, I felt”: 1) bad about myself – good about myself, 2) unreasonable – reasonable, 3) unrespectable – respectable, 4) unacceptable – acceptable, 5) undesirable – desirable, and 6) unlikable – likable. This study showed that all six items were reliable indicators with alpha reliability of .94. The scale mean was 2.02 (SD = 1.37) in the exercise data and 2.32 (SD = 1.16) in the meditation data.

Perceived Threat to Freedom

In order to control for a main source of reactance, perceived threat to freedom were measured. Four semantic differential items were created based on previous studies (Dillard & Shen, 2005; Quick & Considine, 2008). Participants were asked to rate how they perceived the message stimuli with two opposite poles of meanings responding to each sentence. Four items included 1) threatened – supported, responding to “After I read the message, I felt that my freedom to decide is,” 2) limited – broadened, responding to “I felt that my options to choose are,” 3) controlling – uncontrolling, responding to “I felt that content of the message is,” and 4) comply – free to decide, responding to “I felt pressured to.” The four items were reliable with $\alpha = .86$. The scale mean was 2.57 (SD = 1.42) in the exercise data and 4.27 (SD = 2.73) in the meditation data.

Reactance

With respect to the affective responses of reactance, Anger was measured with four items (irritated, angry, annoyed, and aggravated) with a 7-point Likert scale (Dillard & Peck, 2000). This scale ranged from 1=none of this feeling and 7=a great deal of this feeling. The present study showed that these four items were reliable indicators with $\alpha = .90$. The scale mean was 2.94 (SD = 1.63) in the exercise data and 2.79 (SD = 1.48) in the meditation data.

Unfavorable cognitions were used as another indicator of reactance. The obtained mean score of negative cognition was .82 (SD = 1.17) in the exercise data and 1.00 (SD = 1.28) in the meditation data. A thought-listing procedure was used to measure cognition. For general cognitive responses, participants were asked to write down within approximately 90 seconds whatever was in their minds while reading the message. Two coders including the author coded participants' thoughts based on the four-step procedure suggested by Dillard and Shen (2005). Coders first identified thought units, and then distinguished cognitive responses from affective one. Affective responses from these thought lists were identified and removed in order to avoid redundancy between open-ended reports of affect with close-ended reports. For this step, the coders relied on a list of feeling terms compiled by Shaver, Schwartz, Kirson, & O'Connor (1987). Next, to eliminate irrelevant cognitions in the open-ended questions, the coders also evaluated whether or not the cognitive responses were relevant to the message. Finally, the coders coded each thought as favorable (in agreement with the message), unfavorable (not in agreement with the message), or neutral (neither in agreement nor in disagreement with the message). Following extensive training, 50 responses from a pilot test, which is an

equivalent amount of 10% of the sample, were used to establish intercoder reliability. Intercoder reliability and percentage agreement were established for each step. For thought units, coders reached 90 % of agreement with 0.004 of Guetzkow's U. Coders gained 98% agreement with .85 of kappa for identifying emotion terms from cognition, 98% agreement with 1 of kappa for relevant cognition from irrelevant cognition. For unfavorable cognition, kappa reached .81 with 95% agreement, 88% agreement with .61 of kappa for favorable cognition, and 92% agreement with .22 of kappa. For further analyses, the total number of unfavorable cognitions was used as the cognitive component of state reactance.

Trait Reactance (Reactance proneness)

For trait reactance, participants responded to the eleven-item Hong Psychological Reactance Scale (HPRS; Hong & Faedda, 1996). This seven-point scale was anchored by 1=strongly disagree, 4 = neutral, and 7=strongly agree. A series of factor analyses confirmed that the scale is either first-order multi-dimensionality (Hong, 1992; Hong & Faedda, 1996) or second-order uni-dimensionality (Dillard & Shen, 2005; Shen & Dillard, 2005). Sample items include: "It irritates me when someone points out things which are obvious to me," "I become angry when my freedom of choice is restricted," "I normally resist the attempts of others to influence me," "I consider advice from others to be an intrusion," "I become frustrated when I am unable to make free and independent decisions," and "Advice and recommendations usually induce me to do just the opposite." The alpha reliability of 11 items in this study was acceptable with $\alpha = .80$. The scale mean was 3.96 (SD = .82) in the exercise data and 4.02 (SD = .85) in the meditation data.

Curiosity

State Curiosity was measured with five items that were created for this study (interested, curious, inquisitive, intrigued, and open to the following message), based on the curiosity definition. Curiosity is defined as an affective state, similar to interest, that is related to wanting to investigate, to learn, and to incorporate new experiences. This scale was anchored at 1=none of this feeling and 7=a great deal of this feeling. The five items were reliable with $\alpha = .91$. The scale mean was 4.75 (SD =1.21) in the exercise data and 4.68 (SD =1.06) in the meditation data.

Trait Curiosity was also measured with 7 items (Kashdan et al., 2004). Sample items included: “Everywhere I go, I am out looking for new things or experiences,” and “I frequently find myself looking for new opportunities to grow as a person”. The 7 items of curiosity scale yielded alpha reliability of .68. After item-screening, one item was deleted (See Appendix D.). The six items showed an acceptability reliability with $\alpha = .78$. The scale mean was 4.75 (SD =1.21) in the exercise data and 4.68 (SD =1.06) in the meditation data.

Hope

State Hope were measured with five items on a 7-point Likert scale (hopeful, encouraged, confident, expectant, promising). This scale was anchored at 1=none of this feeling and 5=a great deal of this feeling. Three of five items, - hopeful, confident, and expectant - were derived from emotion scales developed by Ellsworth and Smith (1988). The five items of hope scale yielded alpha reliability of .65. With one item deleted

(promising), the four items gained reliable index with $\alpha = .87$. The scale mean was 4.69 (SD = .94) in the exercise data and 4.60 (SD = .87) in the meditation data

Trait Hope was also measured with 12 items (Snyder et al., 1991). Sample items included: “I energetically pursue my goals,” and “Even when others get discouraged, I know I can find a way to solve the problem”. The 12 items of hope scale yielded alpha reliability of .75. With four items deleted (See Appendix D.), the 8 items gained reliable index with $\alpha = .88$. The scale mean was 5.23 (SD = .98) in the exercise data and 5.30 (SD = .86) in the meditation data.

In the past study, curiosity and hope were correlated ($r = .70, p < .01$) suggesting that they share similar features and come from the same family of positive emotion (Richman et al., 2005). The current study also gained relatively high correlations. State curiosity and state hope were positively correlated with $r = .42, p < .001$, in the exercise data and $r = .30, p < .001$, in the meditation data. Trait curiosity and trait hope were positively correlated with $r = .60, p < .001$, in the exercise data and $r = .58, p < .001$, in the meditation data. The high correlations between curiosity and hope can be interpreted in terms of similarities between these two emotions: both are positive, goal-driven, and future-oriented emotions.

Fear

Fear was measured with three items (fearful, afraid, scared) on a 7-point Likert scale (Dillard & Peck, 2001). This scale was anchored at 1=none of this feeling and 7=a great deal of this feeling in this study. These items were reliable at $\alpha = .97$ (Dillard & Peck,

2001). The scale mean was 3.27 (SD = 1.64) in the exercise data and 2.94 (SD = 1.60) in the meditation data.

Perceived Effectiveness of Persuasive Message

For perceived effectiveness of the persuasive message, participants were asked to respond the four-item semantic differential scale (Dillard et al., 2007), anchored 1 through 7 indicating respectively: 1) not at all persuasive/very persuasive, 2) not at all convincing/very convincing, 3) effective/ineffective, and 4) compelling/not compelling. The four items were reliable with $\alpha = .95$. The scale mean was 4.65 (SD = 1.51) in the exercise data and 4.52 (SD = 1.53) in the meditation data.

Attitude toward the Message Advocacy

For attitude toward the message topic, participants were asked to respond the seven-item semantic differential attitude scale (i.e., “exercising regularly is”). The seven items with 7-point scale include: 1) bad-good, 2) foolish-wise, 3) unfavorable-favorable, 4) negative-positive, 5) undesirable-desirable, 6) unnecessary-necessary, and 7) detrimental-beneficial (Dillard & Shen, 2005). The alpha reliability was .96 in this study. The scale mean was 6.58 (SD = .74) in the exercise data and 5.60 (SD = 1.2) in the meditation data

Behavioral Intention

For behavioral intention, the likelihood one would exercise or meditate in the next week was assessed using the behavioral intention measure of Dillard and Shen (2005) on a percentage continuum. Participants were also asked to report on a percentage

continuum their likelihood of talking about the ad or program to any person in close relationships. The percentage continuum consisted of a scale of 0-100 with 0 = *definitely will not* and 100 = *definitely will*. For intention to act, the scale mean was 84.70 (SD = 26.16) in the exercise data and 53.46 (SD = 36.80) in the meditation data. For intention to talk, the scale mean was 49.86 (SD = 37.03) in the exercise data and 37.16 (SD = 33.10) in the meditation data.

CHAPTER 4

RESULTS

Preliminary Analyses

There are five sections for preliminary analyses: 1) item screening with reliability of continuous variables, 2) confirmatory factor analyses, 3) checks for normality, linearity and other assumptions, 4) descriptive statistics and correlation analyses, 5) manipulation checks, and 6) analyses on the two topics.

Initial Item Screening

First, an initial item screening was conducted using internal reliability analyses. Three criteria were employed to decide which items would be retained or deleted. These included corrected item total correlation of .4 or greater, a positive contribution to scale reliability, and the appearance of an approximately flat positive inter-item correlation matrix.

A series of internal reliability analyses showed that only three scales, Trait Curiosity, Trait Hope, and State Hope required some improvement with alpha of .68, .75, and .65, respectively. The original seven Trait Curiosity items were reduced to six items with $\alpha=.78$. The twelve Trait Hope items were reduced to eight items with $\alpha=.88$ and the five state Hope items were reduced to four items with $\alpha=.87$ (See Appendix D for deleted items). Two different topics - Exercise topic and Meditation topic – led to similar results regarding alpha reliabilities. Table 4.1 below summarizes descriptive statistics with alpha reliabilities.

Table 4. 1. Means, standard deviations, and alpha reliabilities for all the data.

Variable	Valid N	M	SD	alpha	Number of items	range
Threats to Identity	465	2.17	1.63	.95	6	1~7
Threats to Freedom	465	2.65	2.01	.86	4	1~7
Curiosity	469	4.71	1.14	.91	5	1~7
Fear	467	3.11	1.63	.97	3	1~7
Anger	464	2.86	1.55	.95	4	1~7
Hope	464	4.65	.91	.87	4	1.6~7
Effectiveness	455	4.59	1.52	.95	4	1~7
Attitude	455	6.08	1.11	.96	7	1.43~7
Intent to Act	451	68.91	35.57	-	1	0~100
Intent to Talk	451	43.44	35.63	-	1	0~100
Trait_Reactance	478	3.99	0.84	.80	11	1~7
Trait_Curiosity	478	4.65	0.82	.78	6	1.5~7
Trait_Hope	478	5.27	0.92	.88	4	1.88~7

Confirmatory Factor Analyses

A series of confirmatory factor analyses (CFA) were conducted. Structural equation modeling using AMOS 18 was used to test the measurement models. A good model fit is usually marked by a nonsignificant chi square distributed test statistic (χ^2); however, this statistic is biased by sample size (Hu & Bentler, 1995). Less biased indicators of good fitting models include a comparative fit index (CFI) above .95, a root mean squared error of approximation (RMSEA) value below .06 (Holbert & Stephenson, 2002; Hu & Bentler, 1995). Although the (RMSEA) values of .06 or below should be preferred, Bowne and Cudeck (1993) contended that of .08 or lower indicate reasonable fit.

To confirm measurement models, four separate CFA models were conducted: 1) a two-factor model with threats to identity and threats to freedom, 2) a three-factor model with trait reactance, trait curiosity, and trait hope, 3) a four-factor model with curiosity,

hope, anger, fear, and a two-factor model with message effectiveness and attitude. Analysis with a two-factor model corresponding to threats to identity and threats to freedom showed that all factor loadings for the measures were significant and fit index was decent (e.g., CFI = .974), with acceptable root-mean-square error of approximation, RMSEA = .076. Given the importance of these two threat constructs, a one-factor model for Threat construct was also run and yielded worse fit index and a RMSEA score, CFI = .820, RMSEA = .193. Therefore, I conclude that the two types of threats are discriminant. The three-factor model with three trait variables also yielded a reasonable fit. The four-factor model with all emotional measures and the two-factor model with two dependent measures also confirmed that measurements models are good fit. Although the index of chi-square were all significant, all measurement models were adequate in terms of several model fit index. Model fit index summaries are presented below in Table 4.2.

Table 4.2. Summary of measurement model fits with confirmatory factor analysis

Model	Df	χ^2	<i>p</i>	RMSEA	NFI	RFI	IFI	CFI
Two Independent	34	118	.000	.076	.964	.941	.974	.974
Three Traits	297	1590	.000	.096	.955	.947	.963	.963
Emotions	101	347	.000	.072	.984	.979	.989	.989
ALL Dependent	315	892	.000	.062	.979	.975	.986	.986

Normal distribution, outliers, and other assumptions

In preparation for correlation and regression analyses, the data were screened for normal distribution, outliers, and linearity following the recommendations established by Field (2005). For normality assumption, z-scores of skewness (lack of symmetry) and

kurtosis (pointyness) were calculated along with inspection on the shapes of the distributions of variables. An absolute z-score value greater than 1.96 is significant at $p < .05$, above 2.58 is significant at $p < .01$ and absolute value above than 3.29 are significant at $p < .001$. Given a fairly large sample size, this study treats z-scores greater than 3.29 as violation of normal distribution. Trait Hope, Curiosity, Effectiveness, Attitude, and Intent to Act had non-normal negative skews, whereas negative thoughts had non-normal positive skews. A negatively skewed distribution means that the frequent scores are clustered at the higher end of the scale and the tail points towards the lower more negative scores whereas a positive skewness indicates the frequent scores are clustered at the lower end of the scale. Threats to Identity, Fear, Anger, Intent to Act, and Intent to Talk had non-normal platykurtic distributions (negative kurtosis) showing flat curves, whereas Trait Reactance, Trait Curiosity, Trait Hope, and Curiosity had non-normal leptokurtic distributions (positive kurtosis) showing pointy curves. Z-scores of skewness and kurtosis of each measured variable are presented in Table 4.3 with descriptive statistics.

Outliers are scores very different from the rest of the data. Because outliers can bias the model we fit to the data, outliers were first identified with box plots and then calculated with z-scores. Box plots showed 11 outliers in Trait Reactance, 7 outliers in Trait Curiosity, 12 outliers in Trait Hope, 8 outliers in Curiosity, 4 outliers in Hope, 3 outliers in Attitude, and 5 outliers in Effectiveness. Further analyses were done with calculating z-scores. If z-scores are greater than 3.29, outliers should be seriously dealt with. Several multivariate outliers were identified following this procedure.

Given that the present data violate the assumption of normal distribution and have severe outliers, the decision was made to transform the data. Transforming the data was recommended because rather than changing a single score, we can carry out the same transformation on all scores, thus the data will not change the relationship between variables (Field, 2005; Fink, 2009).

All the scores were transformed with square root computation. Scores of negatively skewed variables were first reversed, then transformed, and the transformed scores were reversed back again. Square root transformation improved the normal distribution of negatively skewed data. The transformed data, however, neither corrected the kurtosis problem nor corrected for the effect of outliers. The transformed data even generated new skewness/ kurtosis problems for other variables. To look at more closely whether distribution of the transformed data are close enough to normality to be useful to further analysis, the Kolmogorov-Smirnov(K-S) test was performed. The K-S test tells whether the distribution as a whole deviates from a comparable normal distribution. All transformed data had a significant value at $p < .001$ except Trait Reactance and Trait Curiosity. The statistical value of these two variables was significant at $p < .05$. This result indicates that the transformed data still deviated from normality. Thus, transforming the data was not a viable option with the current data so the main analyses for the hypotheses will be tested by nonparametric methods if possible, following parametric methods.

When testing hypotheses, variance method assumes that the spread of scores are homogeneous and the correlation method assumes that the relationships between independent variables and dependent variables are linear. Homogeneity of variance was

mainly checked with Levene's test unless noted otherwise. Linearity assumption was checked by plotting a scatterplot.

Descriptive Statistics and Correlations

Means, Standard deviation, and valid sample sizes are presented in Table 4.3. The data were separated by survey topic, exercise and meditation.

Table 4.3. Means and standard deviations for two separate data

Variable		N	M	SD	N	M	S D	Skew -ness	Kurto- sis
		Exercise Data			Meditation Data			Z scores	
IV	Threats to Identity	230	2.98	1.37	235	2.32	1.16	-1.92	-3.66 ^{***}
	Threats to Freedom	230	2.57	1.42	235	2.73	1.41	-.58	-1.48
Med- iating	Curiosity	232	4.75	1.21	237	4.68	1.06	-3.97 ^{***}	3.68 ^{***}
	Fear	231	3.27	1.64	236	2.94	1.60	1.07	-4.5 ^{***}
	Anger	230	2.94	1.63	234	2.79	1.48	1.23	-4.86 ^{***}
	Negative thoughts	224	.82	1.17	231	1.00	1.28	11.22 ^{**}	5.52 ^{***}
	Hope	229	4.69	.94	235	4.60	.87	-2.08 [*]	2.70 [*]
DV	Effectiveness	225	4.65	1.51	230	4.52	1.53	-4.22 ^{***}	-1.11
	Attitude	225	6.58	.74	230	5.60	1.2	-9.28 ^{***}	2.22 [*]
	Intent to Act	223	84.70	26.16	228	53.46	36.80	-6.48 ^{***}	-3.84 ^{***}
	Intent to Talk	223	49.86	37.03	228	37.16	33.10	2.51 [*]	-5.39 ^{***}
Cova- riance	Trait_	237	3.96	0.82	241	4.02	0.85	.42	4.27 ^{***}
	Reactance								
	Trait_	237	4.63	0.81	241	4.67	0.83	-.62	2.22 [*]
	Curiosity								
	Trait_Hope	237	5.23	0.98	241	5.30	0.86	-5.98 ^{***}	4.18 ^{***}

* $p < .05$. ** $p < .01$. *** $p < .001$

Table 4. 4. Exercise data. Zero-order correlations (upper) and Tau-b correlations (down) among measured variables.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1.TI	1	.55***	.21**	-.37***	-.19**	-.34***	.25***	.19**	.33***	.28***	.12	-.05	.13*	.21***
2.TF	.43***	1	.20**	-.31***	-.30***	-.46***	.23***	.29***	.27***	.12	.16*	-.14*	.06	.15*
3.CU	.20***	.18***	1	.03	-.18**	-.12	.42***	.34***	.19**	.20**	.35***	-.09	.19**	.24***
4.FE	-.27***	-.22***	.01	1	.31***	.17**	.05	.07	-.05	-.08	.00	.16*	-.03	-.05
5.AN	-.15**	-.24***	-.15**	.24***	1	.20**	-.02	-.19**	-.23***	-.18**	-.10	.20**	.05	-.10
6.NE	-.25***	-.34***	-.13*	.16**	.20***	1	-.33***	-.30***	-.12	-.15*	-.28***	.06	.03	-.00
7.HO	.20***	.21***	.37***	.03	-.04	-.25***	1	.40***	.18**	.18**	.38***	.03	.14*	.10
8.EF	.14**	.21***	.28***	.06	-.15**	-.24***	.30***	1	.33***	.28***	.39***	-.06	.14*	.07
9.AT	.24***	.24**	.23***	-.08	-.21***	-.19*	.21***	.24***	1	.42***	.16*	-.15*	.12	.26**
10.IA	.30***	.15**	.19***	-.14*	-.18**	-.15**	.14**	.18***	.37***	1	.27***	-.17**	-.03	.13
11.IT	.09	.12*	.26**	.01	-.07	-.21***	.28***	.28***	.17**	.19***	1	-.13*	.00	.08
12.TR	-.04	-.08	-.09*	.10*	.15**	.06	-.01	-.06	-.16**	-.13**	-.07	1	.25***	.07
13.TC	.11*	.06	.15**	-.03	.02	.00	.12*	.11*	.13*	.00	.04	.16***	1	.60***
14.TH	.19***	.15**	.23***	-.03	-.07	-.04	.14*	.08	.18***	.14*	.11*	-.02	.43***	1

Note: Exercise Data. Upper correlations are zero-order correlations and under correlations are Tau-b correlations. TI = Threats to Identity; TF = Threats to Freedom; CU = Curiosity; FE = Fear; AN = Anger; NT = Negative Thoughts; HO = Hope; EF = Effectiveness; AT = Attitude; IA = Intention to Act; IT = Intention to Talk; TR = Trait Reactance; TC = Trait Curiosity; TH = Trait Hope. * $p < .05$. ** $p < .01$. *** $p < .001$

Table 4. 5. Meditation data. Zero-order correlations (upper) and Tau-b correlations (down) among measured variables.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1.TI	1	.53***	.17**	-.29***	-.27**	-.15*	.35***	.18**	.28***	.23**	.02	-.01	.20*	.28***
2.TF	.36***	1	.22**	-.15*	-.24***	-.37***	.40***	.36***	.25**	.22**	.17*	-.07	.12	.15*
3.CU	.14***	.17***	1	.02	-.13*	-.20**	.30***	.28***	.24**	.13*	.15*	-.08	.23***	.17***
4.FE	-.23***	-.12**	.00	1	.38***	.07	.03	.08	.05	.08	.11	.17**	-.04	-.09
5.AN	-.20***	-.18***	-.11*	.31***	1	.25***	-.12	-.13	-.10	-.10	-.00	.23***	-.14*	-.21**
6.NE	-.12*	-.30***	-.17**	.07	.20***	1	-.29***	-.45***	-.21**	-.17*	-.11	-.00	-.14*	-.10
7.HO	.27***	.29***	.25***	-.01	-.12*	-.26***	1	.45***	.41**	.37**	.22***	-.04	.22**	.22**
8.EF	.17**	.27***	.23***	.04	-.11*	-.33***	.33***	1	.47***	.35***	.21**	.01	.17*	.19**
9.AT	.24***	.22***	.14**	.02	-.08	-.17**	.33***	.38***	1	.57***	.28*	.00	.16*	.30***
10.IA	.17***	.18***	.08	.04	-.08	-.17**	.26**	.29***	.45**	1	.52***	.00	.18***	.26***
11.IT	.02	.13*	.11*	.08	.01	-.12*	.16**	.17***	.25**	.43***	1	-.07	.08	.15*
12.TR	-.01	-.05	.05	.16**	.19***	.03	-.02	.00	-.01	-.02	-.04	1	.34***	.07

13.TC	.13**	.08	.19***	-.04	-.09	-.10	.19***	.13**	.12*	.14**	.07	.18***	1	.58***
14.TH	.22***	.11*	.16**	-.10*	-.15**	-.09	.22***	.16***	.23***	.20**	.10*	-.01	.42***	1

Note: Meditation Data. TI = Threats to Identity; TF = Threats to Freedom; CU = Curiosity; FE = Fear; AN = Anger; NT = Negative Thoughts; HO = Hope; EF = Effectiveness; AT = Attitude; IA = Intention to Act; IT = Intention to Talk; TR = Trait Reactance; TC = Trait Curiosity; TH = Trait Hope.

* $p < .05$. ** $p < .01$. *** $p < .001$

Comparison of parametric method and non-parametric method on correlational analyses showed that there are some changes in strength (e.g., significant p value) and different results in statistical inferential statistics (e.g., insignificant relationships become significant or vice versa). In general, although the actual values of the tau-b correlation coefficient are smaller than Pearson's correlation coefficients, the insignificant results from Pearson correlations became significant in tau-b correlations. As shown in Table 4.4 and Table 4.5, the scores that are significantly different in significance tests depending on method are emphasized with bold italics. Since Pearson correlations assume that the data are normally distributed, the current non-normal data showed different significance results with Tau-b correlations. This result reinforces the reason why assumption of normality is important for formal tests, and why this study should incorporate non-parametric analyses, if possible.

Manipulation Check for Threats to Identity and Threats to Freedom

A manipulation check ensures whether independent variables are systematically manipulated in the sample. Four threat conditions (2 X 2), manifest in four different types of persuasive messages, were tested with two measures – Threat to Identity and Threat to Freedom. Before conducting an individual manipulation check on both Threat to Identity and Threat to Freedom, multivariate analysis of variance (MANOVA) was run. Box test

of equality of covariance matrices and Levine's tests confirmed that the two measured variables met the homogeneity assumption. The statistics of interest in the MANOVA, were not the results of the multivariate tests (overall test) but the univariate test statistics of untargeted threat measures to see whether threat manipulation successfully discriminated between the two threat constructs. For instance, messages manipulating Threat to Identity with threatening messages are supposed to exert effects only on perceived threats to identity measures, not on perceived threats to freedom. Messages manipulating Threat to Freedom with controlling messages are supposed to exert effects only on perceived threats to freedom measures, not on perceived threats to identity. Results show that neither did identity threat produce any significant mean difference of perceived threats to freedom nor freedom threat produced any significant mean difference of perceived threats to identity. Both exercise data and meditation data hold the same insignificant results. Given the high correlations between perceived threat to identity and perceived threat to freedom $r = .55, p < .001$ for exercise data, $r = .53, p < .001$ for the meditation data, insignificant findings for untargeted threat measures first ensure that the two threat constructs are distinctive in nature. All data were split between two topics of survey – exercise data and meditation data. See a summary table in Appedix E.

Threat to Identity. For threats to identity, manipulation checks followed two steps. Given that curiosity appeal was made prior to threat manipulation, two-way univariate Analysis of Variance (ANOVA) analysis was conducted to see main effects and interaction effect and two-way analysis of covariance (ANCOVA) with trait-reactance as a covariate was conducted to see what effects these manipulations have after the effect of the covariate.

In the exercise data, there was a non-significant main effect of identity manipulation on perceived threat to identity, $F(1, 103) = 2.29, p = .133, \eta^2 = .022$ and a non-significant main effect of curiosity appeal on the threat to identity, $F(1, 103) = .36, p = .552, \eta^2 = .003$. There was a significant interaction effect of threat X positivity with $F(1, 103) = 4.04, p < .05, \eta^2 = .038$. People felt significantly less respectable, less reasonable, and worse about themselves ($M = 2.27, SD = 1.35$) in the high threat condition than in the low threat condition ($M = 1.43, SD = 1.19$) followed by curiosity appeals. When they did not receive curiosity appeals, however, high threat messages ($M = 1.94, SD = 1.12$) did not yield any significant difference from low threat messages ($M = 2.05, SD = 1.23$) on perceived threat to identity. Higher means of threats to identity indicate more threatened feelings. In the meditation data, however, none of the effect was statistically significant. There was no main effect and interaction effect of message manipulation on threat measures.

Next, two-way ANCOVA analysis was done with trait reactance as a covariate and result showed that trait reactance was not a statistically significant covariate between the two manipulated conditions and threats to identity neither in the exercise data nor in the meditation data.

Threat to Freedom. For threats to freedom, manipulation checks also followed two steps. Two-way univariate Analysis of Variance (ANOVA) analysis conducted to see main effects and interaction effect and two-way analysis of covariance (ANCOVA) with trait reactance as a covariate was conducted to see what effect these manipulations have beyond the effect of the covariate.

In the exercise data, there was significant main effect of the freedom manipulation on the threat to freedom, $F(1, 98) = 4.56, p > .05, \eta^2 = .044$. People felt significantly more controlled and constrained from making their own choice ($M = 3.16, SD = 1.44$) when they received high threat message than when they received low threat message ($M = 2.54, SD = 1.41$). Higher means of threats to freedom indicate more threatened feelings. No main effect of positivity induction and interaction effect were found.

In the meditation data, there was also significant main effect of freedom manipulation on the threat to freedom, $F(1, 102) = 19.588, p > .001, \eta^2 = .16$. People felt significantly more controlled and constrained ($M = 3.34, SD = 1.31$) when they received high threat message than when they received low threat message ($M = 2.23, SD = 1.26$). No main effect of positivity induction and interaction effect were found.

ANCOVA analysis was done with trait reactance as a covariate and the result showed that trait reactance was not a statistically significant covariate for the threat to freedom manipulation neither in the exercise data nor in the meditation data.

In sum, results showed that the manipulation of threats to freedom was successful regardless of another manipulated variable (curiosity appeal) and regardless of different topics, but the manipulation of threats to identity was more complicated. The manipulation of threat to identity was not successful alone, but a significant manipulation effect was found ($p < .05$) when considering the interaction effect with curiosity appeals in the exercise data. Trait reactance was not statistically significant to differentiate the manipulation effect of threats.

Manipulation Checks for Positive Emotions

Curiosity was manipulated by the presence of curiosity materials (a pre-script with cartoon) versus no curiosity material. Hope was manipulated by the hope post-script versus the control post-script. Each emotion was measured by Curiosity scale (state curiosity) and Hope scale (state hope). Two trait variables –Trait Curiosity, and Trait Hope – were also measured and tested to see whether these variables work as covariates in manipulating state curiosity and hope.

Curiosity. Prior to threat manipulation, a pre-script with cartoon that aimed to induce curiosity were presented and curiosity was measured before any message was presented. Thus, to examine the effect of curiosity manipulation, one-way ANOVA was conducted and one-way ANCOVA was also run with trait curiosity.

Result showed that there was no significant effect of curiosity appeals in either the exercise data or in the meditation data. When considering trait-curiosity as a covariate, trait curiosity was a significant contributor, $F(1, 208) = 8.33, p < .01, \eta^2 = .038$, thus the ANCOVA model was significant, $F(2, 208) = 4.23, p < .05, \eta^2 = .039$ but the positivity appeals still remained non significant for group differences in the exercise data. The pattern was replicated in the meditation data, showing trait curiosity contributes to the model significance, $F(1, 213) = 16.79, p < .001, \eta^2 = .073, F(2, 213) = 8.73, p < .001, \eta^2 = .076$ but there was no main effect of curiosity manipulation. These results indicate that curiosity measures varied as a function of trait curiosity, but not as a function of manipulation.

Hope. Hope manipulation was done with the hope post-script presented right after the measures of threat manipulation. Thus, two-way ANOVA analyses were conducted to

examine the effect of hope manipulation and two-way ANCOVA analyses followed with trait hope in the model.

Result indicated that there was a significant main effect of hope followed by messages containing threats to freedom, $F(1, 98) = 8.09, p < .01, \eta^2 = .076$ in the exercise data and $F(1, 102) = 4.07, p < .05, \eta^2 = .038$ in the meditation data. There was no main effect of threats to freedom and no interaction effect of hope X threats to freedom. This indicates that people who received a hope script followed by threat to freedom message felt more hopeful, encouraged, and confident ($M = 4.83, SD = .85$) than people who did not receive any hope script followed by threat to freedom message ($M = 4.36, SD = .98$) in the exercise data. In the meditation data, people who received hope script followed by threat to freedom message felt more hopeful, encouraged, and confident ($M = 4.81, SD = .73$) than people who did not receive any hope script followed by threat to freedom message ($M = 4.48, SD = .96$). But there was no significant main effect of hope when participants received the threat to identity messages for both topics.

When considering trait hope as a covariate, trait hope was statistically significant, $F(1, 101) = 11.08, p = .001, \eta^2 = .099$ only for the meditation data with threats to freedom in the model. In the model, positivity was again statistically significant, $F(1, 101) = 5.93, p < .05, \eta^2 = .055$. No other effect was found. There was no significant effect of hope as a covariate for the model of positivity X threats to identity.

Descriptive Statistics and Analyses across the Two Topics

Given that the two topics – exercise and meditation - did not show consistent results in terms of scale means, correlation coefficients, and message manipulation,

differences between the two data were inspected with descriptive statistics on topic exposure and current healthy behaviors and an ANOVA analysis on previous attitudes on topics before receiving message manipulation.

Before receiving any message manipulation, participants were asked about whether they received information either on the topic of physical activity or on the topic of stress reduction from their university, how many hours they work out or meditate a week on average, and their attitude on the topic of exercising or meditating.

First, regarding the topic exposure, 60% of participants had information about physical activity and 56% of participants had information about stress reduction from their universities. Second, the average number of hours of exercising had a mean of 6.6 (SD = 11.89) with a median of 4. According to frequency analysis, 47% of participants currently spend on average 3 hours or less in exercising per week (N = 211). A majority of participants (53%) reported they work out for 4 hours or more per week. Conversely, 44% of participants currently spend 0 hour in meditating, 36% of participants meditate one hour per week, and only 20% of participants regularly mediate 2 hours or more per week, showing a mean of 2.53 (SD = 14.04) and a median of 1 (N = 213).

In terms of previous attitude on the topics, the exercise data showed a mean of 6.5 (SD = .67) and the meditation data showed a mean of 5.33 (SD = 1.12) on a 7-point scale. This mean difference between the two topics was statistically significant, $F(1, 432) = 173.91, p < .001, \eta^2 = .20$.

In sum, participants in this study reported that they are similarly exposed to information that highlights the importance of both physical activity and stress reduction. Participants were, however, drastically different in terms of their actual engagement

toward exercising or meditating. Although participants reported highly positive pre-attitudes toward the both topics, attitudes toward exercising were more favorable than attitudes toward meditation. Given a long history of the heavy emphasis on physical activity and exercising and a rising interest on mental health and the benefits of meditation in American society, the current results seem legitimate. With differences between the two topics in mind, the following result and discussion sections should be understood.

Hypotheses Testing

To test proposed hypotheses, the overall model was first checked with the structural model that includes manipulation, perceived threats, reactance, and the persuasive outcomes – message effectiveness, attitude, and intentions. To specify individual relationships between variables, additional tests were conducted with bootstrapping procedures (nonparametric method) and a series of hierarchical regression (parametric method). Since the current data did not meet the normal distribution assumption, bootstrapping was performed to provide a test of mediation and indirect effects. Bootstrapping is a nonparametric approach to effect estimation and hypothesis testing that makes no assumptions about the shape of the distributions of the variables or the sampling distribution of the statistic (Hayes, 2009; Preacher & Hayes, 2004). Moreover simulation research shows that bootstrapping is one of the more valid and powerful methods for testing intervening variable effects (MacKinnon et al., 2004; Williams & MacKinnon, 2008). Each analysis was conducted separately in the exercise topic and the meditation topic.

Perceived Threat to Identity on Reactance and Persuasion

The first sets of hypotheses, H1-a through H1-c, investigated the mediating role of threats to positive identity in understanding the impact of threatening-identity message within the context of promoting an exercise routine or meditation routine. Hypothesis H1-d proposed how perceived threats to identity directly impact attitude and intention in the persuasion process. Research question 1 (RQ1) examined if an individual's trait reactance, age, sex, or previous exercising behaviors or meditating behaviors interacted with study manipulations (condescending and curiosity) across the dependent variables.

Results of the structural models, testing the impact of manipulations and a process of persuasion are shown in Figure 4.1 and figure 4.2. Combined with two topics, the overall model is an acceptable fit to the data, χ^2 (df = 848) = 1635, p = .000, RMSEA = .065, CFI = .869. Separately, the model for exercise showed χ^2 (df = 425) = 798, p = .000, RMSEA = .091, CFI = .876 and the model for meditation showed χ^2 (df = 425) = 845, p = .000, RMSEA = .094, CFI = .861.

Hypothesis 1-a, which predicted that threatening messages would lead to greater perceived threats to positive identity, was not supported, β = -.03, .07, n.s for both exercise data and meditation data. This result was already expected because the manipulation check for threats to identity showed that there was no main effect of threat manipulation on perceived threat for both topics. Instead, an interaction between curiosity and condescending message was found, thus an interaction term was included in the model. This interaction term yielded a positive relationship with perceived threats to identity, β = -.03, p < .01 in the exercise data, indicating people who received threatening messages felt greater threats to their identity after curiosity appeal. Without curiosity

appeal, the effect of message threats was not found. In the meditation data, however, this interaction effect was not replicated, $\beta = -.08$, n.s.

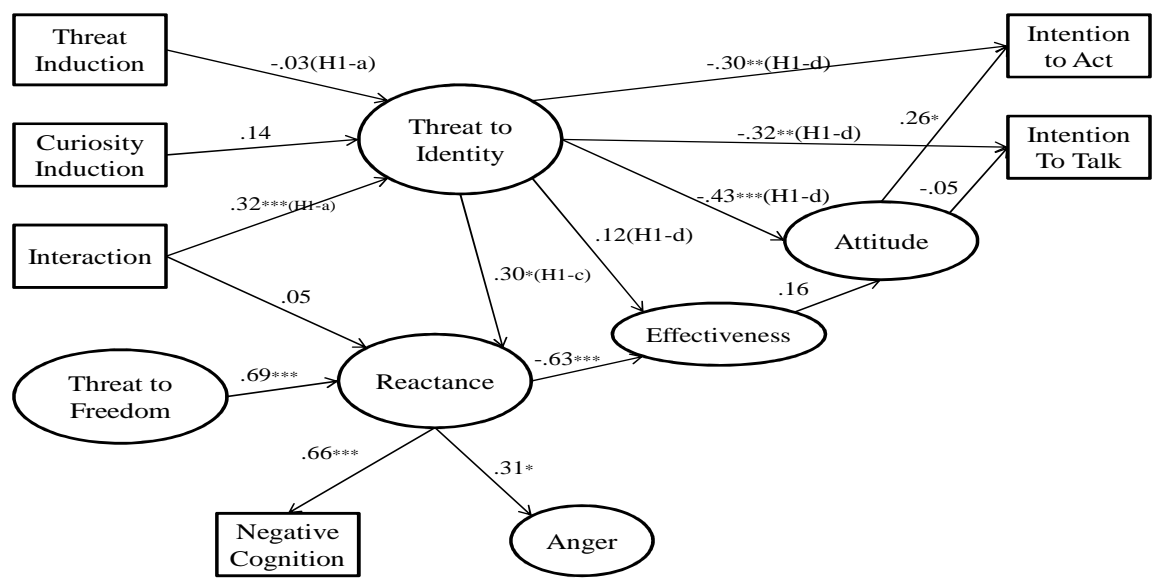


Figure 4.1 SEM: Threat to identity on persuasion with path coefficients (Exercise data).
Note: For threat induction, the low threat condition was coded 0 and the high threat condition was coded 1. For curiosity induction, no curiosity was coded 0 and curiosity was coded 1. The interaction variable was coded such that 0 represents the low threat/curiosity condition and 1 represents the other three Threat X Curiosity conditions. (* $p < .05$; ** $p < .01$; *** $p < .001$).

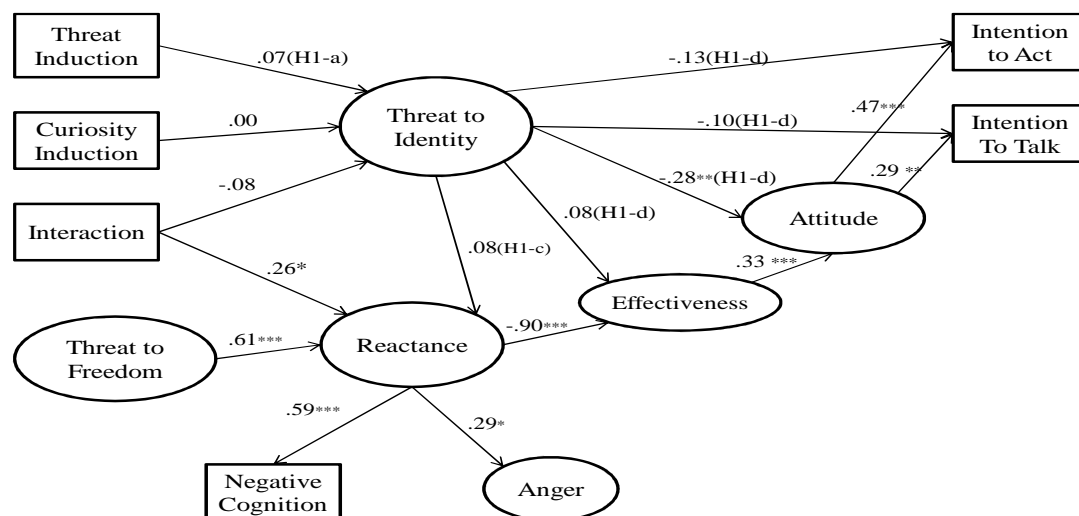


Figure 4.2 SEM: Threat to identity on persuasion with path coefficients (Meditation data).

Note: For threat induction, the low threat condition was coded 0 and the high threat condition was coded 1. For curiosity induction, no curiosity was coded 0 and curiosity was coded 1. The interaction variable was coded such that 0 represents the low threat/curiosity condition and 1 represents the other three Threat X Curiosity conditions. (* $p < .05$; ** $p < .01$; *** $p < .001$)

Hypothesis 1-b predicted the mediating role of perceived threat to positive identity between threatening message and state reactance. Based on the result of H 1-a and given no main effect of message threat, the interaction term was dealt with as an independent variable, the standardized reactance score between anger and negative cognition as a dependent variable, and a perceived threat to positive identity as a mediating variable. Bootstrapping results are based on 5000 bootstrapping samples drawn from study sample of 157 in the exercise data and 164 in the meditation data. The true indirect effect of perceived threats ($M = .0709$, $SE = .0660$) was estimated to lie between -.0552 and .2059 with 95% confidence, which indicates a non-significant result in the

exercise data. A non-significant result was also found in the meditation data, $M=0.135$, $SE = .0518$ between $-.0823$ and $.1286$, n.s. To conclude that the indirect effect is significantly different zero at $p < .05$ (two tailed), zero should not be in the 95% confidence interval. Thus, H1-b was not supported.

Hypothesis 1-c predicted the unique effect of perceived threats to positive identity on state reactance, controlling for the effect of threats to freedom. Supporting H1-c, the path coefficient of perceived threats to positive identity on state reactance was statistically significant, $\beta = .30$, $p < .05$ in the exercise data, after controlling for the strong and positive relationship between threatened freedom and reactance, $\beta = .61$, $p < .001$, but not in the meditation data. H1-c was only supported by the exercise data.

Hypothesis 1-d predicted a negative influence of perceived threats to positive identity on persuasion as measured by perceived message effectiveness, attitude toward message advocacy, intention to act, and intention to talk. As predicted, perceived threats to positive identity had a statistically significant association with attitude toward message advocacy, $\beta = -.43$, $p < .001$, intention to act, $\beta = -.30$, $p < .01$, and intention to talk, $\beta = -.32$, $p < .01$ in the exercise data. Given that there was no direct association with perceived effectiveness and based on well-documented results that perceived threats to message effects are mediated by state reactance, a mediation test was conducted. The impact of threats to identity on perceived effectiveness was completely mediated by state reactance, showing the indirect effect (Mean = $-.1075$, $SE = .0361$) lied between $-.1967$ and $-.0502$ with 95% confidence. A conceptual model of mediation with calculated coefficients is presented in Figure 4.3.

In the mediation data, perceived threats to positive identity were also negatively associated with attitude toward message advocacy, $\beta = -.28, p < .01$, but not with intention to act, $\beta = -.10, n.s.$, or intention to talk, $\beta = -.13, n.s.$ The impact of threats to identity on perceived effectiveness was completely mediated by state reactance, showing the indirect effect (Mean = $-.1374$, SE = $.0395$) lied between $-.2258$ and $-.0698$ with 95% confidence. Thus, H1-d was supported by the exercise data and partially supported by the meditation data.

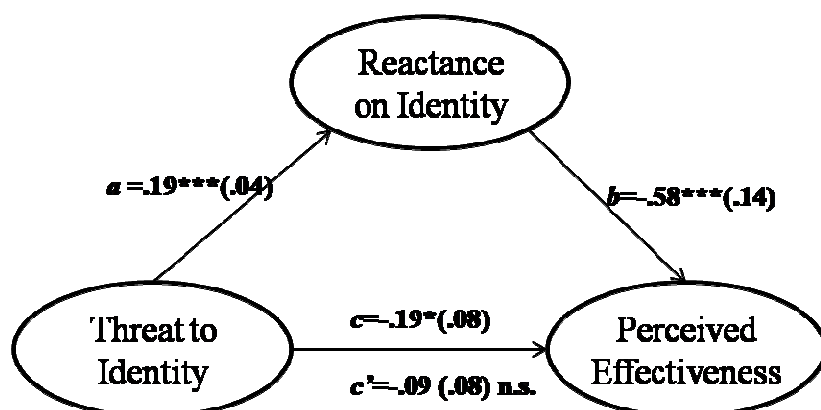


Figure 4.3. Exercise data. Mediated result of threat to identity on message effect.

Note. Standard errors in parentheses; c indicates the total effect of X (IV: Threat to identity) on Y (Perceived effectiveness); c' indicates the direct effect of X on Y after controlling for M (Mediator: Reactance); The true indirect effect of ab (M = $-.1075$, SE = $.0361$) lied between $-.1967$ and $-.0502$ with 95% confidence.

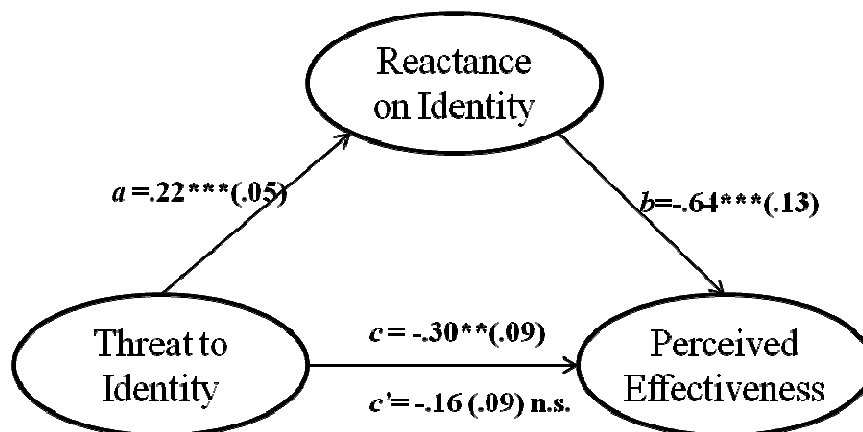


Figure 4.4. Meditation data. Mediated result of threat to identity on message effect.

Note. Standard errors in parentheses; c indicates the total effect of X (IV: Threat to identity) on Y (Perceived effectiveness); c' indicates the direct effect of X on Y after controlling for M (Mediator: Reactance); The true indirect effect of ab ($M = -.1374$, $SE = .0395$) lied between $-.2258$ and $-.0698$ with 95% confidence.

Trait Reactance, Current Health Behaviors, Age, and Sex as Moderators

The first research question (RQ1) asked whether an individual's trait reactance, age, sex, or previous exercising behaviors or meditating behaviors interacted with the threatening messages and the curiosity appeals on the outcome variables of interest. A series of hierarchical regressions were employed for these tests. In step 1, current health behaviors, age, and sex were entered. In step 2, trait reactance was entered. In step 3, threat message and curiosity appeal were entered. In step 4, the two-way interactions were entered, and in step 5, the three-way interactions were entered. When considering interactions, only significant results in each step were reported. Results of regression models are presented in Tables 4.6 through 4.12. All significant interaction effects were interpreted based on separate interaction plots.

Perceived Threat to Identity. In the exercise data, the amount of current hours spent exercising and the curiosity appeal were significant predictors of perceived threats to identity. The more hours people spent exercising, the less they perceived threats to identity. The curiosity appeal negatively influenced perceived threats to identity. People who received the curiosity appeal before the threat manipulation felt significantly fewer threats to identity than people who did not receive the curiosity appeal. One two-way interaction was found. As found in H1-a, the interaction between threat message manipulation and curiosity appeal predicted levels of perceived threats. Neither age, sex,

nor other interaction terms predicted perceived threats to identity.

In the meditation data, age was the only significant predictor of perceived threats to identity. The older people were, the lesser the threat to identity they felt. A two way interaction, age by threat manipulation, predicted a perceived threat to identity. People who are older than 21 years old showed fewer threatened feelings when they received a more threatening message than when they received a less threatening message.

Table 4.6. Hierarchical regressions for perceived threat to identity

	β	p	ΔR^2	p		β	p	ΔR^2	p
	Exercise data					Meditation data			
Step1			.11**	.009	Step1			.07	.07
Age	.04(.04)	.72			Age	-.20* (.03)	.045		
Sex ^a	.04(.26)	.73			Sex	.01(.24)	.93		
CB ^b	-.32** (.02)	.002			CB	-.18(.01)	.07		
Step 2			.00	.65	Step 2			.00	.53
TR ^c	.04 (.14)				TR	.06(.14)	.53		
Step3			.08*	.03	Step3			.00	.98
Threat ^d	-.07(.33)	.58			Threat	.06(.33)	.69		
Curio ^e	-.29* (.33)	.03			Curio	.03(.32)	.84		
ThXCur	.41* (.47)	.02			ThXCur	-.04(.46)	.82		
Step 4			.02	.90	Step 4			.11	.07
-					CB	-1.0* (.06)	.045		
-					Threat	1.93* (2.2)	.048		
					ageXth	-1.91* (.09)	.03		
Step5			.02	.53	Step5			.04	.22
-					Threat	2.73* (3.03)	.04		
-									

Note: Standard error for unstandardized B in parentheses.

^aMale = 1, Female = 2; ^bCurrent health behaviors; ^cTrait Reactance; ^dCondescending; message manipulation: low threat = 0, high threat = 1; ^eCuriosity manipulation: no presence = 0, presence = 1

* $p < .05$. ** $p < .01$.

State Reactance. State reactance was measured with anger and negative cognitions as indicators. In the exercise data, none of personal factors, trait reactance, message, or curiosity appeal predicted anger. One two-way interaction, age by curiosity

appeal, predicted anger. The effect of curiosity appeal was pronounced for people who are over 21 years than under 21 years old, triggering less anger. One three-way interaction, age by threat manipulation by curiosity appeal, was also found. For individuals under the age of 21, curiosity appeal reverse the effects of the threat manipulation such that a less threatening message triggered more anger than a more threatening message did. For individuals over the age of 21, curiosity appeal reduced the effect of threatening message on anger.

In the meditation data, age and trait reactance predicted anger. The older people were, the less anger they felt. Trait reactance was positively associated with anger.

Table 4.7. Hierarchical regressions for anger

	B	<i>p</i>	ΔR^2	<i>p</i>		B	<i>p</i>	ΔR^2	<i>p</i>
	Exercise data					Meditation data			
Step1			.02	.58	Step1			.07	.07
Age	.06(.05)	.58			Age	-.22* (.04)	.03		
Sex ^a	-.07(.35)	.50			Sex	-.13(.28)	.20		
CB ^b	-.12(.03)	.27			CB	-.13(.01)	.17		
Step 2			.01	.29	Step 2			.07**	.006
TR ^c	.11 (.19)				TR	.27** (.17)	.006		
Step3			.00	.89	Step3			.01	.89
Threat ^d	-.01(.47)	.93			Threat	-.11(.37)	.69		
Curio ^e	-.05(.46)	.72			Curio	-.05(.37)	.43		
ThXCur	-.03(.66)	.85			ThXCur	.09(.53)	.60		
Step 4			.08	.24	Step 4			.03	.77
-					-				
-					-				
Step5			.04	.23	Step5			.03	.43
ageXcur	-3.24(.17)*	.01			-				
ageX 2	3.11(.22)*	.04			-				

Note: Standard error for unstandardized B in parentheses.

^aMale = 1, Female = 2; ^bCurrent health behaviors; ^cTrait Reactance; ^dCondescending message manipulation: low threat = 0, high threat = 1; ^eCuriosity manipulation: no presence = 0, presence = 1.

* $p < .05$. ** $p < .01$.

In terms of negative thoughts, hours spent exercising, message threat manipulation, and a two-way interaction, age by threat manipulation were found to be statistically significant. The more hours people spent exercising, the fewer negative thoughts they had. People who received a more threatening message showed more negative thoughts than people who received a less threatening message. Individuals under the age of 21 who received a more threatening message showed more negative thoughts, but individuals over the age of 21 had fewer negative thoughts regardless of message manipulation. In the meditation data, none of personal factors, trait reactance, message, or curiosity appeal predicted negative cognitions.

Table 4.8. Hierarchical regressions for negative cognitions

	B	<i>p</i>	ΔR^2	<i>p</i>		B	<i>p</i>	ΔR^2	<i>p</i>
	Exercise data					Meditation data			
Step1			.09*	.03	Step1			.00	.94
Age	-.11(.04)	.29			Age	-			
Sex ^a	-.06(.26)	.60			Sex	-			
CB ^b	-.26* (.02)	.01			CB	-			
Step 2			.00	.79	Step 2			.01	.28
TR ^c	.11 (.19)	.79			TR	-			
Step3			.13**	.003	Step3			.08	.06
Threat ^d	.42** (.32)	.002			Threat	.01(.34)	.93		
Curio ^e	.05(.32)	.70			Curio	-.12(.34)	.40		
ThXCur	-.11(.45)	.53			ThXCur	.32(.48)	.07		
Step 4			.08	.16	Step 4			.02	.90
ageXth	-1.56* (.08)	.04			-				
-					-				
Step5			.03	.39	Step5			.06	.13
ageXth	3.08** (.12)	.009			-				
-					-				

Note: Standard error for unstandardized B in parentheses.

^aMale = 1, Female = 2; ^bCurrent health behaviors; ^cTrait Reactance; ^dCondescending message manipulation: low threat = 0, high threat = 1; ^eCuriosity manipulation: no presence = 0, presence = 1.

* $p < .05$. ** $p < .01$.

Perceived Effectiveness. In the exercise data, hours spent exercising predicted perceived effectiveness. The more hours people spent exercising, the more likely they were to perceive a persuasive message to be effective. One three-way interaction was found. A sex by message threat by curiosity appeal interaction predicted message effectiveness. In the curiosity condition, the negative effect of message threat was pronounced to predict message effectiveness for men, but for women, the negative effect of message threat was pronounced to predict message effectiveness in the absent condition of curiosity. That is, men who received a less threatening message with a curiosity appeal perceived the message to be more effective than the other three conditions – more threats with curiosity, more threats without curiosity, and less threat without curiosity. Meanwhile, women, when they received a less threatening message without a curiosity appeal, perceived the message to be more effective than the other three conditions – less threat with curiosity, more threats without curiosity, and less threat without curiosity.

Table 4.9. Hierarchical regressions for perceived effectiveness

	B	<i>p</i>	ΔR^2	<i>p</i>		B	<i>p</i>	ΔR^2	<i>P</i>
	Exercise data					Meditation data			
Step1			.07	.07	Step1			.02	.62
Age	.18(.04)	.07			Age	.03 (.04)	.79		
Sex ^a	.13(.32)	.21			Sex	.10(.31)	.33		
CB ^b	.23* (.03)	.03			CB	.09(.02)	.36		
Step 2			.00	.95	Step 2			.00	.56
TR ^c	.01 (.17)	.95			TR	-.06(.19)	.56		
Step3			.04	.25	Step3			.09*	.03
Threat ^d	-.20(.41)	.16			Threat	.01(.41)	.96		
Curio ^e	-.02(.41)	.88			Curio	.16(.40)	.24		
ThXCur	.00(.58)	.99			ThXCur	-.37* (.57)	.03		
Step 4			.07	.29	Step 4			.06	.34
Threat	-1.59(2.74)	.09			-				
CBXth	.36(.06)	.06			-				
Step5			.09*	.02	Step5			.04	.28

sexX2	1.58*	(1.26)	.016	-
				-

Note: Standard error for unstandardized B in parentheses.

^aMale = 1, Female = 2; ^bCurrent health behaviors; ^cTrait Reactance; ^dCondensing message manipulation: low threat = 0, high threat = 1; ^eCuriosity manipulation: no presence = 0, presence = 1

* $p < .05$.

In the meditation data, a two-way interaction, threat manipulation by curiosity appeal, predicted perceived message effectiveness. The curiosity condition made the effect of message threat pronounced regarding perceived message effectiveness. People who received a less threatening message with a curiosity appeal perceived the message to be more effective than people in the other three conditions – more threats with curiosity, more threats without curiosity, and less threat without curiosity.

Attitude toward Message Advocacy. In the exercise data, none of individual personal factors, trait reactance, or threat/ curiosity manipulation predicted favorable attitudes toward regular exercising. One two-way interaction was significant. A sex by message threat manipulation interaction predicted attitudes toward exercising. The effect of message threat was pronounced for a men group, but not for a women group. Men who received a less threatening message showed more favorable attitudes toward exercising regularly, but women showed favorable attitudes regardless of message manipulation. A three-way interaction, sex by threat manipulation by curiosity appeal, predicted attitudes. Men who received a more threatening message with a curiosity appeal showed the least favorable attitudes toward exercising regularly than men who were in the other three conditions - less threat with curiosity, more threats without curiosity, and less threat without curiosity. Women showed the least favorable attitudes toward exercising when

they received a less threatening message with a curiosity appeal than women who were in the other three conditions – more threat with curiosity, less threat without curiosity, and more threat without curiosity.

In the meditation data, a two-way interaction, age by threat manipulation, predicted attitudes toward mediating. People who were over 21 years old showed more favorable attitudes toward mediating regularly when they received a more threatening message than when they received a less threatening message. For the people under 21 years old, threat manipulation did not yield any significant mean difference of message manipulation.

Table 4.10. Hierarchical regressions for attitude toward message advocacy

	B	<i>p</i>	ΔR^2	<i>p</i>	β	<i>p</i>	ΔR^2	<i>p</i>
	Exercise data				Meditation data			
Step1			.02	.64	Step1		.05	.17
Age	-				Age	.11 (.03)	.30	
Sex ^a	-				Sex	.16(.24)	.12	
CB ^b	-				CB	.15(.01)	.14	
Step 2			.01	.36	Step 2		.00	.80
TR ^c	-				TR	-		
Step3			.05	.15	Step3		.05	.16
Threat ^d	-				Threat	.28* (.33)	.04	
Curio ^e	-				Curio	.25(.33)	.07	
ThXCur	-				ThXCur	-.28(.47)	.09	
Step 4			.10	.098	Step 4		.13*	.03
sexXth	.84* (.37)	.03			Age	-.56* (.09)	.03	
-					Threat	-2.04* (2.21)	.03	
					ageXth	2.14* (.09)	.01	
Step5			.06	.09	Step5		.02	.60
sexX2	1.34* (.71)	.04			-			
					-			

Note: Standard error for unstandardized B in parentheses.

^aMale = 1, Female = 2; ^bCurrent health behaviors; ^cTrait Reactance; ^dCondescending message manipulation: low threat = 0, high threat = 1; ^eCuriosity manipulation: no presence = 0, presence = 1

* *p* < .05.

Intention to Act. In the exercise data, age and hours spent exercising predicted intention to act. Younger people were more likely to intent to implement an exercising routine than older people were. People who exercised for more hours were more likely to report a higher percentage of intention to implement an exercise routine. Two two-way interactions were significant, sex by curiosity and age by curiosity. However, omnibus ANOVA did not yield any significant result of these two interactions. A three-way interaction, sex by message threat manipulation by curiosity appeal, predicted intention to act. Men who received a more threatening message with a curiosity appeal showed less intention to a regular exercise than men who were in the other three conditions - less threat with curiosity, more threats without curiosity, and less threats without curiosity. Women showed the highest percentage rate in intent to exercise when they received a less threatening message without a curiosity appeal.

In the meditation data, hours spent meditating predicted intention to act. People who meditated for more hours were more likely to reported an intent to implement a meditation routine. Two two-way interactions were significant, sex by message threat manipulation and current meditation by curiosity. Men were more likely to report an intent to meditate when they received a more threatening message than when they received a less threatening message. For women, a reverse effect was found. Women were more likely to report an intent to meditate when they received a less threatening message than when they received a more threatening message. Another two-way interaction, current meditation by curiosity appeal, was found. Individuals who did not meditate showed higher intent to meditate when they received a curiosity appeal than

when they do not receive a curiosity appeal, but individuals who mediated over an hour per week did not show any difference depending on curiosity appeals.

Table 4.11. Hierarchical regressions for intention to act

	β	p	ΔR^2	p		β	p	ΔR^2	p
	Exercise data					Meditation data			
Step1			.15	.00	Step1			.08*	.05
			***	1					
Age	-.20*(.65)	.04			Age	-			
Sex ^a	-.07(4.82)	.50			Sex	-			
CB ^b	.31**(.41)	.002			CB	.24*(.35)	.02		
Step 2			.00	.68	Step 2			.00	.95
TR ^c	-				TR	-			
Step3			.01	.77	Step3			.01	.82
Threat ^d	-				Threat	-			
Curio ^e	-				Curio	-			
ThXCu	-				ThXCu	-			
Step 4			.08	.17	Step 4			.14*	.02
Curio	-2.41**(42.9)	.008			sexXth	-.76*(14.4)	.05		
sexXcur	.77*(10.09)	.04			CBXcu	-1.26*(1.74)	.01		
ageXcur	1.61*(1.52)	.04							
Step5			.04	.18	Step5			.02	.61
sexX2	1.35*(19.94)	.04			-				
					-				

Note: Standard error for unstandardized B in parentheses.

^aMale = 1, Female = 2; ^bCurrent health behaviors; ^cTrait Reactance; ^dCondescending message manipulation: low threat = 0, high threat = 1; ^eCuriosity manipulation: no presence = 0, presence = 1

* $p < .05$. ** $p < .01$. *** $p < .001$.

Intention to Talk. In the exercise data, hours spent exercising was the only predictor that influenced intention to talk. People who currently exercised for more hours reported a higher percentage intent to talk about the issue of exercise to the people whom they are cared about.

In the meditation data, a three-way interaction was significant, current hours in meditating by message threat manipulation by curiosity appeal. Among individuals who

currently did not meditate, receiving a more threatening message with a curiosity appeal made them more likely to intend to talk than receiving any message in the other three conditions - less threat with curiosity, more threats without curiosity, and less threat without curiosity. For people who currently meditate over an hour per week, receiving a more threatening message without a curiosity appeal made them less likely to intend to talk than receiving any message in the other three conditions – less threat without curiosity, more threats with curiosity, and less threat with curiosity.

Table 4.12. Hierarchical regressions for intention to talk

	B	<i>p</i>	ΔR^2	<i>p</i>	β	<i>p</i>	ΔR^2	<i>p</i>
	Exercise data				Meditation data			
Step1			.09*	.03	Step1		.01	.84
Age	-				Age	-		
Sex ^a	-				Sex	-		
CB ^b	.27* (.69)	.01			CB	-		
Step 2			.00	.65	Step 2		.01	.38
TR ^c	-				TR	-		
Step3			.04	.21	Step3		.01	.77
Threat ^d	-.26(10.6)	.06			Threat	-		
Curio ^e	-				Curio	-		
ThXCu	-				ThXCu	-		
Step 4			.05	.52	Step 4		.06	.47
-					CBXcur	-.88(1.73)	.097	
Step 5			.00	.94	Step5		.06	.11
-					CBXth	-3.14*(8.47)	.049	
-					CBXcur	-1.07*(1.75)	.047	
-					CBX2	3.37*(8.50)	.036	

Note: Standard error for unstandardized B in parentheses.

^aMale = 1, Female = 2; ^bCurrent health behaviors; ^cTrait Reactance; ^dCondescending message manipulation: low threat = 0, high threat = 1; ^eCuriosity manipulation: no presence = 0, presence = 1.

**p* < .05.

State Curiosity as a Mediator

The second set of hypotheses tests the mediating role of state curiosity between trait reactance and psychological reactance. Bootstrapping procedure was conducted considering trait curiosity as a covariate. Figure 4.5 and 4.6 are presented with point estimates. In the exercise data, H2-a was supported. Trait reactance was positively associated with perceived threats to freedom and psychological reactance (path c as the total effect). H2-b, predicting that state curiosity is negatively associated with trait reactance, was supported. H2-c, predicting that state curiosity is negatively associated with perceived threats to freedom and psychological reactance, was also supported.

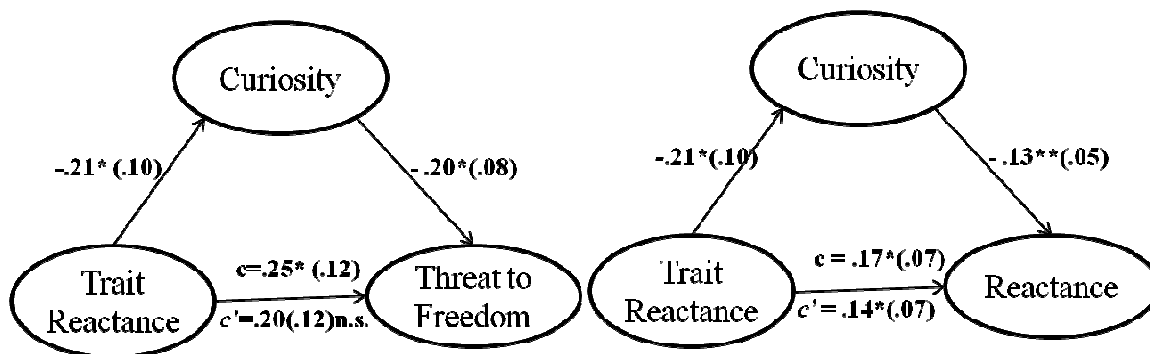


Figure 4.5. Exercise data. Mediating role of curiosity.

Note. Standard errors in parentheses; *c* indicates the total effect of X on Y (*c*); the direct effect (*c'*) of X on Y after controlling for mediator.

Although the significant result of the total effect (*c*) became non-significant (*c'*) when controlling for curiosity, the indirect impact of curiosity between trait reactance on threats to freedom did not yield a statistically significant result, showing the indirect effect ($M = .0433$, $SE = .0340$) lied between $-.0001$ and $.1427$ with 95% confidence. The

impact of trait reactance on psychological reactance, however, was statistically mediated by state curiosity, showing the indirect effect of trait reactance ($M=.0276$ $SE=.0183$) lied between .0011 and .0762 with 95% confidence. In the exercise data, therefore, hypotheses 2 that predicts the mediating role of curiosity is partially supported.

In the meditation data, H2-a was partially supported. Trait reactance was not statistically associated with perceived threats to freedom, but positively associated with psychological reactance. H2-b, predicting that trait reactance is negatively associated with state curiosity, was not supported. H2-c, predicting that state curiosity is negatively associated with perceived threats to freedom and psychological reactance, was supported. The impact of trait reactance on threats to freedom was not mediated by state curiosity, showing the indirect effect ($M = -.0078$, $SE = .0263$) lied between $-.0666$ and $.0421$ with 95% confidence. The impact of trait reactance on psychological reactance was not mediated by state curiosity, showing the indirect effect of trait reactance ($M = -.0042$, $SE = .0142$) lied between $-.0362$ and $.0213$ with 95% confidence. The mediating role of curiosity was not supported by the meditation data.

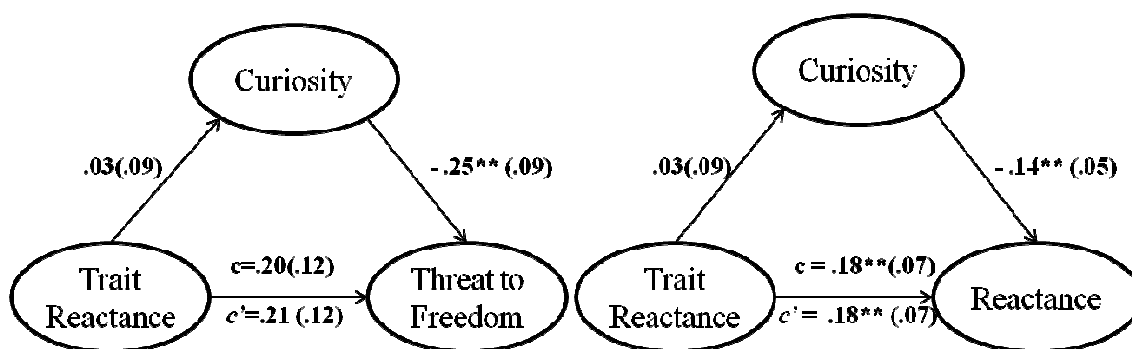


Figure 4.6. Meditation data. Mediating role of curiosity.

Note. Standard errors in parentheses; c indicates the total effect of X on Y (c); the direct effect (c') of X on Y after controlling for mediator.

State Curiosity and Threat to Identity

Hypothesis 3 (H3) predicted that state curiosity is negatively associated with perceived threats to identity and psychological reactance. The negative relationship between state curiosity and psychological reactance was already supported, while testing the hypothesis 2-c. Given the unknown effect of state curiosity on perceived threats to identity and that trait curiosity was a predictor of state curiosity as a result of manipulation check, hierarchical regression analysis was conducted with trait reactance and trait curiosity as covariates in step 1.

H3 was supported by the both exercise and meditation data. After controlling for trait reactance and trait curiosity, the main effect of state curiosity on both threats to identity and psychological reactance was negative and significant. Results are presented in Table 4.13 and Table 4. 14.

Table 4.13. Multiple regressions for threat to identity

	β	p	ΔR^2	p	β	p	ΔR^2	p
	Exercise data				Meditation data			
Step1			.02	.12			.07***	.000
trait reactance	.09(.13)	.19			.15* (.10)	.04		
trait curiosity	-.14(.13)	.06			-.29*** (.10)	.000		
Step 2			.04**	.005			.02*	.04
trait reactance	.07(.11)	.36			.15* (.10)	.04		
trait curiosity	-.09(.13)	.23			-.25** (.10)	.001		
curiosity	-.20(.08)**	.005			-.14* (.08)	.04		

Note: Standard error for B in parentheses.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 4.14. Multiple regressions for psychological reactance

	β	p	ΔR^2	p	β	p	ΔR^2	p
	Exercise data				Meditation data			
Step 1			.03*	.04			.06***	.001
trait reactance	.18*(.07)	.01			.19**(.07)	.007		
curiosity	-.04(.08)	.58			-.25**(.07)	.001		
Step 2			.04**	.004			.03**	.008
trait reactance	.15*(.07)	.03			.20**(.07)	.006		
curiosity	.01(.07)	.90			-.20**(.07)	.007		
curiosity	-.20(.05)**	.004			-.18*(.05)	.008		

Note: Standard error for B in parentheses.

* $p < .05$. ** $p < .01$. *** $p < .001$.

State Hope as a Mediator

The fourth set of hypotheses (H4) tests the mediating role of state hope between psychological reactance and persuasion. Outcomes of persuasion are indicated with four constructs, message effectiveness, favorable attitude toward message advocacy, intention to act, and intention to talk. Trait Hope was considered as a covariate for bootstrapping tests. Coefficients of estimates were presented in Figure 4.7 through Figure 4.10.

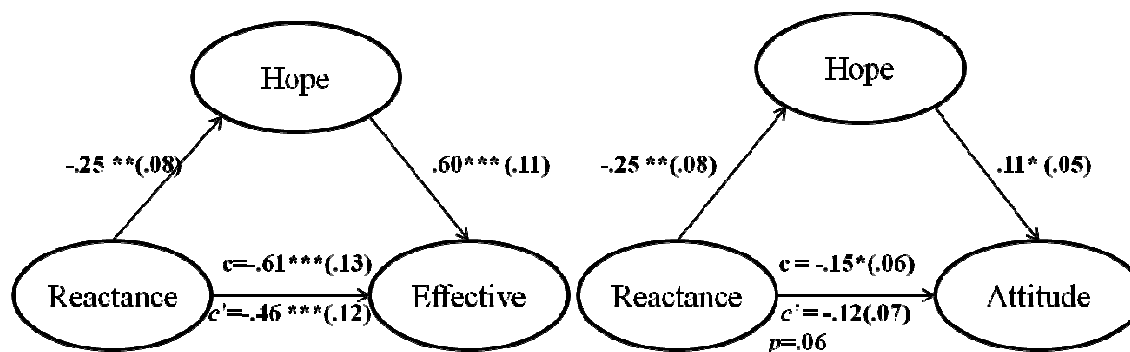


Figure 4.7. Exercise data. Mediating role of hope on effectiveness and attitude.

Note. Standard errors in parentheses; c indicates the total effect of X on Y; the direct effect (c') of X on Y after controlling for mediator.

* $p < .05$. ** $p < .01$. *** $p < .001$.

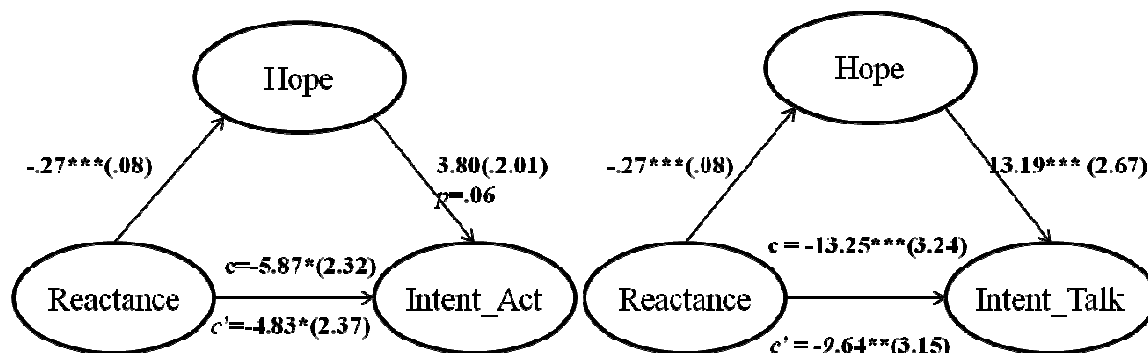


Figure 4.8. Exercise data. Mediating role of hope on intention.

Note. Standard errors in parentheses; c indicates the total effect of X on Y; the direct effect (c') of X on Y after controlling for mediator.

* $p < .05$. ** $p < .01$. *** $p < .001$.

In the exercise data, H4-a, predicting a negative association between psychological reactance and persuasion (path c as the total effect), was supported. Psychological reactance was negatively associated with effectiveness, $b = -.61$, $p < .001$, attitude, $b = -.15$, $p < .05$, intention to act, $b = -5.87$, $p < .05$, and intention to talk, $b = -13.25$, $p < .001$. H4-b, predicting that psychological reactance is negatively associated with state hope, was supported, $b = -.25$, $p < .01$ for effectiveness and attitude and $b = -.27$, $p < .001$ for intention to act and intention to talk. H4-c, predicting that state hope is positively associated with persuasion, was supported. State hope was positively associated with effectiveness, $b = .60$, $p < .001$, attitude, $b = .11$, $p < .05$, and intention to talk, $b = 13.19$, $p < .001$. Regarding intention to act, a positive association ($b = 3.80$) approached a significant level of .05 with p value of .061. Supplemental analysis found that this marginally insignificant level of intention to act was due to the significant result of Trait

hope as a covariate on intention to talk, $b=4.12$, $p=.023$. Without Trait Hope covariance in the model, the impact of state hope on intention to act was positive and significant, $b=4.19$, $p=.04$.

Results of bootstrapping tests supported the mediating role of hope (H4) in the exercise data. The impact of psychological reactance on persuasion was fully mediated by state hope, showing that within 95% confidence interval, the indirect effect of psychological reactance on effectiveness ($M=-.1495$, $SE=.0517$) ranged $[-.2659 -.0606]$, the indirect effect of psychological reactance on attitude ($M=-.0246$, $SE=.0151$) ranged $[-.0673 -.0042]$, the indirect effect of psychological reactance on intention to act ($M=-1.0391$, $SE=.6003$) ranged $[-2.6135 -.1633]$, and the indirect effect on intention of psychological reactance to talk ($M=-3.6091$, $SE=1.3218$) ranged $[-6.7501 -1.4546]$.

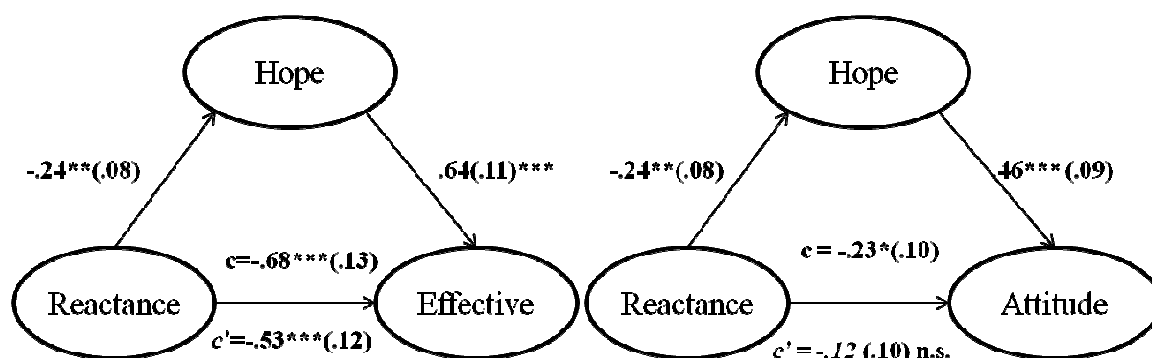


Figure 4.9. Meditation data. Mediating role of hope on effectiveness and attitude.

Note. Standard errors in parentheses; c indicates the total effect of X on Y; the direct effect (c') of X on Y after controlling for mediator.

* $p < .05$. ** $p < .01$. *** $p < .001$.

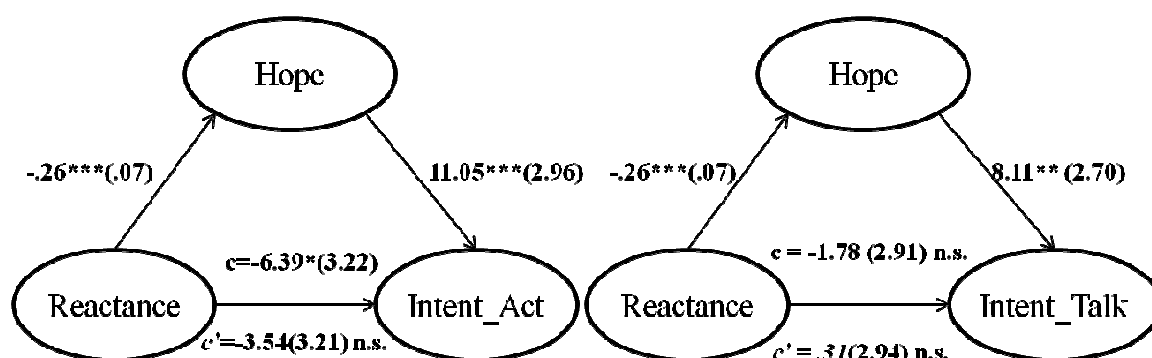


Figure 4.10. Meditation data. Mediating role of hope on intention.

Note. Standard errors in parentheses; c indicates the total effect of X on Y; the direct effect (c') of X on Y after controlling for mediator.

* $p < .05$. ** $p < .01$. *** $p < .001$.

In the meditation data, H4-a, predicting a negative association between psychological reactance and persuasion (path c as the total effect), was supported except intention to talk. Psychological reactance was negatively associated with effectiveness, $b = -.68$, $p < .001$, attitude, $b = -.23$, $p < .05$, and intention to act, $b = -6.39$, $p < .05$, but not with intention to talk, $b = -1.78$, *n.s.* H4-b, predicting that psychological reactance is negatively associated with state hope, was supported, $b = -.24$, $p < .01$ and $b = -.26$, $p < .001$. H4-c, predicting that state hope is positively associated with persuasion, was supported. State hope was positively associated with effectiveness, $b = .64$, $p < .001$, attitude, $b = .46$, $p < .05$, intention to act, $b = 11.05$, $p < .001$, and intention to talk, $b = 8.11$, $p < .01$.

Results of bootstrapping tests supported the mediating role of state hope (H4) in the meditation data. The impact of psychological reactance on persuasion was fully mediated by state hope, showing that within 95% confidence interval, the indirect effect of psychological reactance on effectiveness ($M = -.1541$, $SE = .0555$) ranged $[-.2808 - .0619]$, the indirect effect of psychological reactance on attitude ($M = -.1119$, $SE = .0397$)

ranged [-.2055 -.0459], the indirect effect of psychological reactance on intention to act (M=-2.8553, SE= 1.2554) ranged [-5.8205 -.8595], and the indirect effect of psychological reactance on intention to talk (M=-2.0976, SE=.9697) ranged [-4.5470 - .6684].

In sum, both exercise and meditation data supported that state hope contributed to the significant and negative indirect impact of psychological reactance on persuasion (H4). The significant result indicates that state hope mediates relationships between psychological reactance and outcomes of persuasive message. Negative direction indicates that state hope attenuates the negative impact of psychological reactance on persuasion.

Hope, Curiosity, Fear, and Anger and their Relative Impact on Persuasion

SEM was used to test hypothesis 5 and hypotheses 6. The model specified that hope appeal message (with hope appeal coded as 1 and control condition coded 0), curiosity, fear, anger, positive cognition and negative cognition are exogenous variables. Although positive and negative thoughts are not of major interest in these hypotheses, they are included to look at relative influence of each emotion on message effectiveness. The structural model showed a reasonable fit by both data; χ^2 (df = 912) = 1903, p =.000, RMSEA=.050, CFI = .913.

Hypothesis 5, predicting that message-induced state hope is positively associated with persuasion, was mostly supported by both data. In the exercise data, hope appeal message induced state hope $\beta = .17, p < .05$. Message-induced hope was positively and directly associated with effectiveness, $\beta = .40, p < .001$, intention to act, $\beta = .16, p < .05$,

and intention to talk, $\beta = .39, p < .001$. The direct relationship between hope and attitude was not significant, $\beta = .12, n.s.$ A bootstrapping test found that effectiveness completely mediated the impact of hope on attitude showing that the indirect mean ($M = .1049$, $SE = .0282$) is within 99% confidence interval $[.0470, .1940]$.

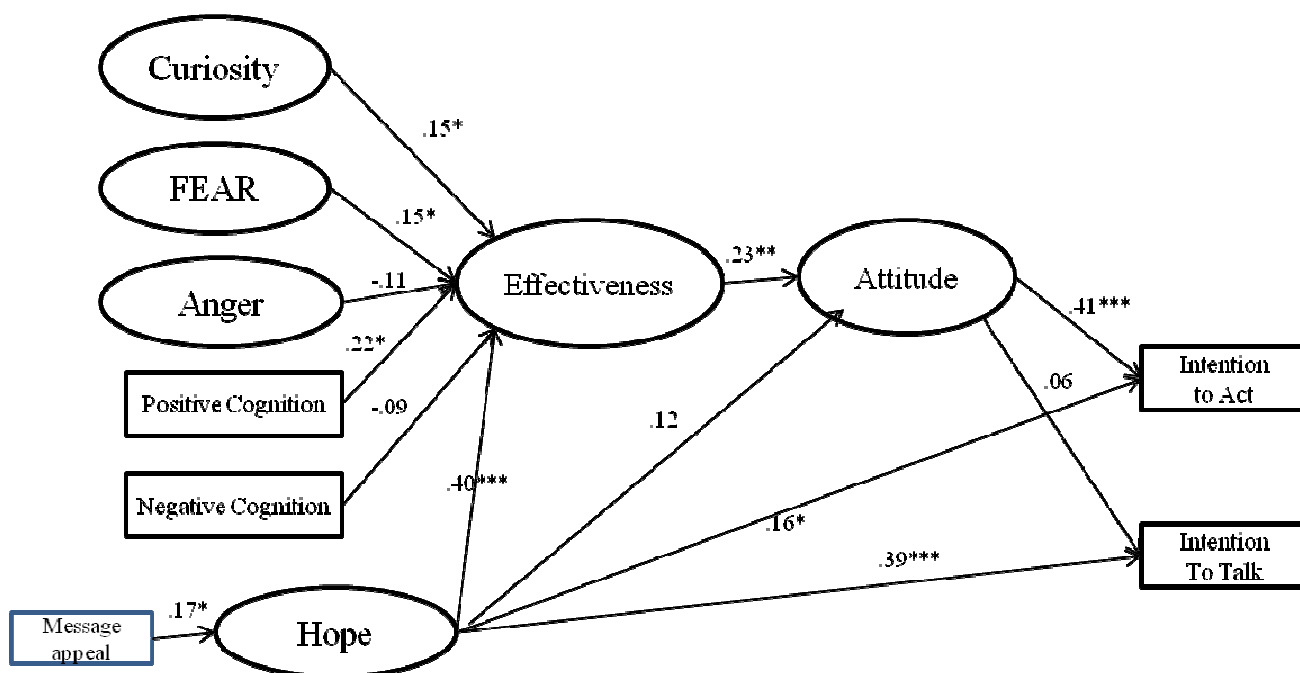


Figure 4.11. Exercise data. Multiple emotions on persuasion

In the meditation data, hope appeal messages induced state hope $\beta = .19, p < .05$. Message-induced hope was positively and directly associated with effectiveness, $\beta = .38, p < .001$, attitude, $\beta = .26, p < .001$, intention to act, $\beta = .24, p < .01$, and intention to talk, $\beta = .21, p < .01$. Thus, H5 was supported.

Given the significant results of curiosity and fear, additional paths were inspected between curiosity/fear and the rest of outcome variables. Curiosity directly associated with intention to act, $\beta = .21, p < .01$, and intention to talk, $\beta = .13, p < .05$. The added paths of curiosity made the significant path between hope and intention to act

insignificant, $\beta = .10$, *n.s.* although the association between hope and intention to talk remained significant, $\beta = .32$, $p < .001$. None of other paths from curiosity and fear were significant in the new model. In sum, curiosity and hope together predicted the intention outcomes in the exercise data.

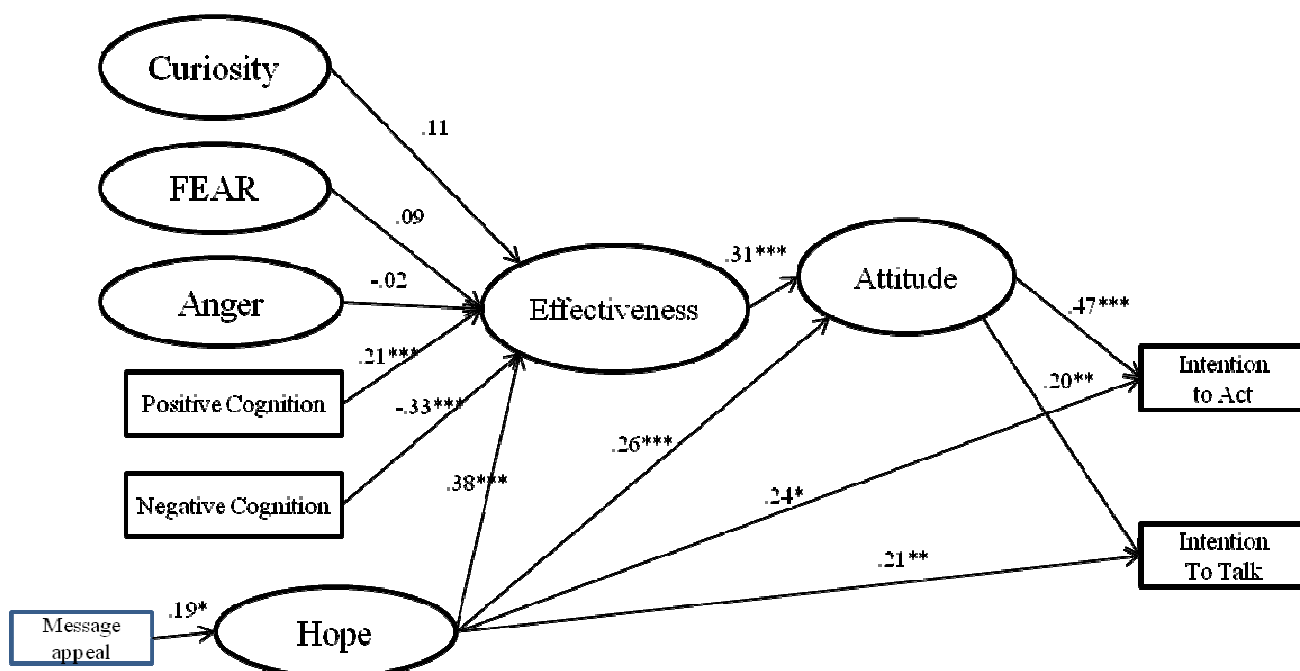


Figure 4.12. Meditation data. Multiple emotions on persuasion

The two rival hypotheses were advanced with respect to the functions of multiple emotions. H6-a, predicting that state hope, but not other emotions, has an influence on perceived effectiveness, was completely supported by the meditation data. Effectiveness was not significantly predicted by curiosity, $\beta = .11$ *n.s.*, fear, $\beta = .09$ *n.s.*, and anger, $\beta = -.02$ *n.s.* However, the exercise data yielded different results. Curiosity was positively associated with effectiveness, $\beta = .15$, $p < .05$ and fear, $\beta = .15$, $p < .05$. Anger showed a negative, but statistically not significant association with effectiveness, $\beta = -.11$, $p < .05$

The results of the exercise data partially support H6-b, which predicted the significant positive impact of curiosity, fear, and hope and the significant negative impact of anger on perceived effectiveness.

CHAPTER 5

DISCUSSION

I set out the first objective by investigating how threat to identity takes part in psychological reactance and persuasion, called Reactance on Identity. Since this study argues that threat to identity is either another source of psychological reactance or a confounded factor to threat to freedom, it is crucial to prove that threat to identity is distinctive from threat to freedom, theoretically and empirically. To examine threats to identity empirically, this study used threatening messages in the context of promoting a regular exercise routine and a meditation routine. In addition, this study tested if age, sex, current behaviors, or trait reactance moderate how these messages with curiosity appeals affect perceptions of message effectiveness and persuasive outcomes.

The second objective of this study was to examine how two discrete positive emotions - curiosity and hope – affect the reactance process and persuasion. The effect of curiosity on Reactance on Freedom and Reactance on Identity are examined and a mediating role of hope was of main interest. In addition, since this study measured four emotions in a sequential order – curiosity, fear, anger, and hope – the relative impact of each discrete emotion was tested to determine whether multiple emotions are compatible or incompatible in their influence on persuasive outcomes. Specific findings are discussed in detail below in light of the theoretical contribution of this study, limitations of the study, future directions, and implication for communication.

Explicating a Perceived Threat to Identity

The first important contribution of this study is that results found the significant role of threats to identity, distinct from threats to freedom. The two threat constructs are somehow related but empirically discriminating in their roles. At least, three empirical tests showed a distinction between threats to identity from threats to freedom. First, Confirmatory Factor Analyses (CFA) demonstrated that the two-factor model for threat measures was a better fit to the data than the one-factor model. Given that the two threat variables are highly correlated $r = .55, p < .001$ for exercise data, $r = .53, p < .001$ for the meditation data, the result of CFA assured that they are different constructs despite a high correlation. Second, preliminary analyses with MANOVA also confirmed that there was no unintended effect of threat manipulation. Results revealed that neither did identity threats produce any significant difference in perceived threats to freedom nor freedom threats produced any significant difference in perceived threats to identity.

Lastly and most importantly, the structural model revealed that perceived threats to identity had unique effect on state reactance, even controlling for the strong effect of threats to freedom in the exercise data (H1-c). Each path coefficient in a structural model indicates a unique and relative effect on the target variable. Unfortunately, the meditation data did not replicate the significant effect of identity threat. However, given that the message manipulation for threat to identity in the current study was not successful in overall (thus small effect size or low in power compared with threat to freedom), and the concept of threat to identity is relatively rudimentary compared with threat to freedom in Psychological Reactance Theory, the current significant finding of threats to identity on state reactance is small but meaningful.

Theoretically, these empirical findings reinforce more evidence that influence situations intrinsically operates people's autonomy need (negative face) and approval need (positive face) as proposed in revised Politeness Theory (e.g., Goldsmith & MacGeorge, 2000; Wilson et al., 1998; Wilson & Kunkel, 2000). The concept of threats to identity or need for positive identity is not novel in persuasion research. Katz (1960) contended that attitudes sometimes serve an ego-defensive function in order to protect one's self-concept from messages that challenge or attack the self-concept. That is, when one perceives that an essential element of the self has been threatened by counter-attitudinal information, one will attempt to maintain the self-concept in the face of these threats. Theorists agree that the ego-defensive attitudes are highly resistant to change (Eagly & Chaiken, 1993; Katz, 1960; Rosenberg, 1965; 1979). Empirically, Lapinski and Boster (2001) provided evidence that a message that threatens an important self-identity (e.g., a message challenging common beliefs on "good students" for college students) produces more negative thoughts about the message and consequently affected message discounting and source derogation.

Although threats to identity are not novel in persuasion, the direct testing of this ego-defensive function in a process of psychological reactance is a novel contribution with the notion of Threat to Identity. Since Psychological Reactance Theory (PRT) defines psychological reactance as aversive reactions to freedom threats, including threats to identity in PRT might be beyond the boundary of original intention of PRT. The fact that threats to identity or ego threats can result in similar reactions as threats to freedom, however, suggests that theorists and practitioners need to consider other types of threats or at least be aware of it when modeling persuasive processes or constructing persuasive

messages. Reactance that is triggered by threats to identity would be called Reactance on Identity as this study suggests.

Reactance on Identity and Persuasion

Reactance on Identity has been hypothesized, parallel to Reactance on Freedom. In terms of psychological reactance, this study supported previous research in two ways. First, the structural model reinforced the measurement of state reactance, supporting state reactance as a combination of anger and negative cognition (Dillard & Shen, 2005; Quick & Stephenson, 2007; Rains & Turner, 2007). Second, bootstrapping results showed that Reactance on Identity mediates the relationship between perceived threats and message effectiveness. This finding confirms that reactance is negatively associated with perceived effectiveness and also provides new evidence that reactance functions similarly in response to threats to identity as to threats to freedom in persuasion. This is consistent with the fundamental points of PRT. If people's needs are threatened, psychological reactance creates motivation toward the opposite or unintended direction of persuasion.

Another major contribution of this study, furthermore, was that threats to identity directly predicted persuasive outcomes (H1-d). Consistent with the predictions, the structural model showed that perceived threats to identity were negatively associated with attitude, intention to act, and intention to talk in the exercise data and attitude in the meditation data. This strengthens the argument that as advice is perceived to be more face threatening, people perceived that advice to be less effective and were less inclined to implement the advised action (Goldsmith & MacGeorge, 2000; MacGeorge et al., 2004).

Trait Reactance, Current Health Behaviors, Age, and Sex on Outcomes

The structural model examined main effects of threatening messages and curiosity appeals on a perceived threat to identity. Because the main effects of identity threat messages on other various outcomes in persuasion are generally unknown, the first research question (RQ1) assessed the direct relationship between message threat manipulation (threats to identity) and curiosity appeals and the other measured variables, controlling for trait reactance, age, sex, and current exercising behaviors or meditating behaviors. Although any clear-cut answers were not found with respect to RQ1, several findings need attention in detail.

Message Effect. In the exercise data, two main effects of message variables emerged: receiving a curiosity appeal led to fewer perceived threats to identity and receiving a threat message led to more negative cognitions. That is, people who received the curiosity appeal perceived less threat to their identity than people who had no curiosity appeal. People who received more threatening messages generated more negative cognitions than people who received less condescending messages. As shown in the structural model, an interaction effect between threat messages and curiosity appeals was replicated in hierarchical regression. People who received less threatening messages with a curiosity appeal felt the least threat to their identity than the other three groups.

In the meditation data, only one interaction between threat messages and curiosity appeals emerged- threat by curiosity was negatively associated with perceived effectiveness. People who received less threatening messages after a curiosity appeal perceived a message to be more effective than the other three groups. Although message features did not yield any effect on psychological reactance in the meditation data, the

direct effect of threat manipulation by curiosity appeals on effectiveness implies that there is possibility that threatened identity and curiosity not only influence the persuasive outcomes indirectly via psychological reactance but also directly.

Although the exercise and meditation data did not show consistent results overall, it seems that curiosity appeals moderate the effect of threatening message manipulation. After seeing a cartoon and curiosity manuscript, the effects of threatening messages appeared either in terms of threats to identity or in terms of message effectiveness, whereas without a curiosity appeal, the threat manipulation had no effect on perceived threat or effectiveness.

Four Personal Factors. Despite limited support for main effects for either message appeals, this study examined personal factors that may moderate the effectiveness of threat manipulation and curiosity appeals. The first factor, trait reactance was identified based on Psychological Reactance Theory. The results showed that trait reactance was positively associated only with anger in the meditation data. Contrary to the previous findings (Dillard & Shen, 2005; Miller et al., 2007; Quick & Bates, 2010; Quick & Stephenson, 2008), trait reactance did not play a major role in the effectiveness of persuasive messages. It is worth noting, however, that trait curiosity and state curiosity mediate or moderate the relationship between trait reactance and threats to identity/psychological reactance. The second factor, age, was considered as suggested in previous studies (Miller et al., 2007; Quick & Bates, 2010; Shen, 2010; 2011). In the exercise data, age alone was negatively associated with intention to act. The younger participants were, the more likely they were to report they would exercise in the next week. Age was negatively associated with a perceived threat to identity and anger in the meditation data.

The younger participants were, the greater they perceived threats to identity and the more anger they felt toward the persuasive message in favor of meditation. The third factor was sex as included in the previous studies (Miller et al., 2007; Shen, 2010; 2011). Sex alone did not affect either any response of psychological reactance or persuasive outcomes for both topics. The final factor was current health behaviors associated with the two topics, hours spent exercising per week and hours spent meditating per week. Hours spent exercising were negatively associated with a perceived threat to identity and negative cognitions, but positively associated with perceived effectiveness, intention to act, and intention to talk. Hours spent meditating were positively associated only with intention to act. Given that the preliminary analysis showed only 20% participants currently meditate over one hour, the poorer results of hours spent meditating may be due to restriction in range.

Overall, current behaviors were a key factor for both psychological reactance and persuasive outcomes within the exercising context and age was an important factor for psychological reactance within the meditating context. Participants who currently exercise for fewer hours experienced a more aversive reaction and less favorable perceptions toward the persuasion attempt. Younger participants reacted more aversively toward the meditation issue. Brehm (1966) directly stated that the magnitude of reactance is a direct function of the importance of the free behaviors which are eliminated or threatened. With the same token, the magnitude of reactance can be a direct function of the importance of the personal identity which are eliminated or threatened. Thus, participants who are not currently active in exercising may felt greater threats to identity and thus reactance because the issue of sedentary life versus exercising is important to

them. Regarding the issue of meditation, given that meditating population is less than 80%, younger people may feel they can identify themselves with other alternative ways to reduce stress, not meditation.

Interactions between Messages and Personal Factors. The main concern of RQ 1 was whether these four personal factors interacted with the message features in predicting the persuasive outcomes. In the exercise data, age interacted with message manipulation. The effect of threatening messages on negative thoughts was more pronounced for people under the age of 21 than for people over 21. Moreover, for individuals under the age of 21, curiosity appeals had an inverse effect of threat manipulation such that less threatening messages trigger more anger than more condescending messages. For individuals over the age of 21, curiosity appeals attenuated the effect of threatening messages on anger. It seems that curiosity appeals had a larger effect on anger, whereas threat manipulation had a larger effect on negative thoughts.

Sex also interacted with message threat manipulation mainly for the persuasive outcomes. The effect of threatening messages on attitude was more pronounced for men than for women. Men who received a less condescending message showed more favorable attitudes toward exercising regularly, but women showed favorable attitudes regardless of message manipulation. A three way interaction, sex by message threat by curiosity appeal confirmed this result predicting message effectiveness, attitude, and intention to act. Although the three way interactions showed complicated patterns on the persuasive outcomes, in general the effects of message manipulation were more pronounced as expected for men than for women. For instance, for men, a more threatening message led to less effective perception of the message, less favorable

attitudes, and lower intent to exercise. Women, however, showed more favorable attitudes toward exercising when they received a more threatening message. Whereas the effects of curiosity appeals were complicated for men, curiosity appeals negatively affected persuasiveness, attitudes, and intentions more consistently for women. Why would threatening messages have a more negative influence for men than for women? One explanation may lie in that exercising is more important for men in American society, thus a more personally sensitive issue for men. The data showed that men tend to exercise more hours than women. Thus, men are sensitive to the way the message depicts their images, which in turn, their message perception affects their attitude and intention more directly than women's perception.

In sum, curiosity appeals moderated the effect of threatening message manipulation with respect to threats to identity and message effectiveness. Among personal factors, current behaviors were a key factor for both psychological reactance and persuasive outcomes within the exercising context and age was an important factor for psychological reactance within the meditating context. Depending sex, the interaction effects of threat manipulation and curiosity appeals were complicated.

Hope and Persuasion

Several scholars contended that hope has rich potential to explain persuasion (Nabi, 2002), coping (Lazarus, 1999), and marketing (MacInnis & de Mello, 2005). Despite this, however, empirical research into the use of hope as an influencing tactic is very scarce (Poels & Dewitte, 2008). The findings in the current study highlight the importance of studying hope to understand the psychological mechanisms in persuasion

at least for two reasons. First, hope plays a critical role in psychological reactance and persuasion. Hope reduces psychological reactance and in turn strengthens the positive outcomes of persuasion regarding message effectiveness, attitude, and intentions. Results from a series of bootstrapping consistently showed that hope, as a mediator, attenuates the negative impact of psychological reactance on persuasion. Second, when hope is evoked at the end of persuasive message, hope is the most powerful construct to explain persuasive results. Hope was the strongest predictor of persuasion among the four measured emotions and cognitions - fear, anger, curiosity, positive cognition, and negative cognition. Results from the structural models showed that the path coefficients for hope were the largest in strength and were consistently significant across the two different topics – exercise and meditation.

The powerful findings on hope in the current study also show promise for potential future studies with self-efficacy and with other emotions in persuasion. For example, this study assumes that hope is related to self-efficacy although it is not directly tested in this study. Quick and Bates (2010) recently examined the influence of self-efficacy appeals in reducing psychological reactance, and found interaction effects of self-efficacy with age and message frames. For underage drinkers, efficacy appeals reduced a perceived threat to freedom and anger when they received a loss-frame message, but efficacy appeals increased a perceived threat to freedom and anger when they received a gain-frame message. Although these findings alone are meaningful, affective dimensions related to self-efficacy and message framing are unknown. In order to better explain the complexity of message frame and self-efficacy, it is imperative to measure related emotions. The hope findings from the current study will help to explain

why some types of self-efficacy work in persuasive contexts and or why other types do not in future research. According to Witte (1992) in her extended parallel process model, a health threat without a recommended response can lead to aversive reactions. For this reason, the current study included a fear component across all the message manipulation conditions. Thus, it would be interesting to ask whether the hope findings can be replicated as strong as they were in this study without a fear appeal prior to the hope manipulation. Future studies will be fruitful if they include all measures of self-efficacy, hope, and fear with message manipulation in this respect.

Role of Positive Emotions in Persuasion

Increasingly, scholars have pointed out that more positive emotions need to be studied in persuasion (Nabi, 2002; Rains & Turner, 2007; Reinhart et al., 2007; Shen & Bigsby, 2010). Some positive emotions recently have gained increasing attention such as empathy in organ donation (Bae, 2008), empathy in anti-smoking and drunken driving (Shen, 2010; 2011), and humor in political issues (Nabi, Moyer-Guse, & Byrne, 2007) and humor in drinking (Skalski, Tamborini, & Smith, 2009). In line with these studies, the current findings on curiosity, coupled with hope, strengthen the argument that positive emotions play important roles in persuasion. Results showed that curiosity reduced not only psychological reactance on freedom with less perceived threats to freedom but also psychological reactance on identity with less perceived threats to identity. These findings echo those of Shen (2010; 2011) and Skalski et al. (2009), who report that message-induced empathy and humor decreased psychological reactance.

Moreover, direct effects of curiosity and hope on persuasive outcomes are evident in the current study. Results from the structural models showed that either curiosity or hope, or both directly predict behavioral aspects in persuasion such as intention to act and intention to talk as well as message effectiveness, whereas fear exerted no direct effect on behavioral outcomes other than message effectiveness. These findings support the discrete view of emotions and the broadening hypothesis and partially support the dimensional view of emotions. Curiosity and hope are goal-driven positive emotions and the direct links between these two emotions and behavioral outcomes in persuasion provide evidence that their action tendencies (curiosity as opening up to a new plan and hope as enhancing a current or new goal) are pertinent to promote the goals that are consistent with their perception and attitude by broadening the momentary thought-action repertoire. Since the two positive emotions activated suggested behaviors in this study, the result is consistent with the prediction of BAS (behavioral approach system) in that positive emotions result in the behavioral approach system. However, results also showed that fear and anger did not affect the overall persuasive outcomes and the only significant link between fear and message effectiveness was positive. This finding is not consistent with the prediction that negative emotional experiences result in the behavioral inhibition system (BIS).

One may question the current findings of positive emotions based on the contexts that this study used. The two persuasion contexts in this study – exercising and meditation – are positively valenced by promoting beneficial behaviors rather than prohibiting detrimental behaviors (e.g., binge drinking or smoking). These positively valenced contexts might generate more variance in positive emotions rather than negative

emotions and the mood congruency effect might come into play due to relatively low risk issues in this study (Mayer, Baschke, Braverman, & Evans, 1992). Recently, Yan, Dillard, and Shen (2010) found that gain framing was most effective when message recipients were in a positive mood with a prescriptive behavioral advocacy (encourage to *do*), while loss framing was most effective when message recipients were in a sad mood with a restraint behavioral advocacy (advise *not to do*). Although the current studies mixed both gain (e.g., advantages of exercise and meditation) and loss frames (e.g., disadvantages of sedentary life or stressful life), the main recommended messages were mostly gain-frames. Thus, the powerful findings of positive emotions in the current study may be due to gain framing with a prescriptive behavioral advocacy. Future studies need to examine both positive emotions and negative emotions in the context of loss-framing with the message advocated restraint.

Limitations and Future Directions

Threat Manipulation. One limitation in this study was a weak manipulation. Unexpectedly, threat to identity manipulation was not successful, indicating that threatening messages were not directly associated with threats to positive identity. The weak manipulation presented limitations to finding the significant links that were hypothesized in this study. Several explanations are possible. First, the current manipulation was implied in the messages such as “stop the denial,” or “only a lazy person wouldn’t even try” rather than direct threats or derogation to targets. Message manipulation in this study mostly relied on previous studies, alluding controlling/dogmatic (threats to freedom) messages may be somewhat confounded with content of

threats to identity. Results in this study, in fact, showed that there were minimal confounds between threats to freedom and threats to identity in previous studies. Future research, thus, should include more direct threats or obvious derogation of message recipients in order to magnify the effect of the manipulation while at the same time carefully considering the validity of the study.

Second, the wording to ask perceived threats might contribute to weak and low effects of message manipulation. Descriptive statistics showed that the means of threats to identity were very low, much less than the midpoint of a 7 point Likert scale with 2.02 (SD = 1.37) in the exercise data and with 2.32 (SD = 1.16) in the meditation data. This indicates that participants felt generally good about themselves in the face of identity threat messages. Even for threats to freedom that were successfully manipulated in this study, means were below the midpoint with 2.57 (SD = 1.42) in the exercise data and with 2.73 (SD = 1.41). How can we explain these results? The current study did not replicate the past studies regarding the mean level of threats to freedom (e.g., means were 4.14 or 3.74 in Quick and Stephenson, 2008 compared with 2.57 and 2.73 in this study). One explanation may be that the changes in response scales that in this study caused lower levels of perceived threats for both identity and freedom. Past studies asked participants to rate on a 1 = strongly disagree to 7 = strongly agree Likert scale responding the statements such as “The message tried to threaten my freedom to choose.” This study, however, modified the items asking participants to rate on semantic differential scales from 1 to 7 in response to “After I read the message, I felt that my freedom to decide is threatened (1)supported (7).” The wording directly refers to the recipients’ feelings or emotional responses. Given that the two opposite poles of

meanings comprise the positives and the negatives, the lower means of threats indicate that people are generally geared toward the positive pole. Compared with “the message tried to threaten...”, the anchors of “after I read the message, I felt...” may systematically bias respondents’ responses toward what is socially acceptable and ideal. This phenomenon is called social desirability bias (Maccoby & Maccoby, 1954). Feelings of low self-worth or powerlessness can be a topic that is sensitive to social desirability bias and direct questioning to identify the emotional responses usually strengthens this bias (Fisher, 1993). Thus, a stronger manipulation and careful questioning in the survey may bring different results in the future.

Curiosity Manipulation. This study did not succeed in manipulating state curiosity either. Result showed that state curiosity was not a result of message-induced curiosity by a cartoon and a pre-script - rather trait curiosity led to state curiosity. Despite unsuccessful manipulation of curiosity, curiosity appeals exerted significant differences on perceived threats to identity interacting with threat messages in the context of promoting regular exercise routines. That is, despite weak message manipulations in the current study, curiosity appeal enhanced the effect of threatening messages on perceived threats to identity. After a curiosity appeal, more threatening messages yielded greater threats to identity than less threatening messages did. Without a curiosity appeal, threatening messages had no effect on perceived threats to identity. In sum, although curiosity appeals exerted some effects on threats to identity, it needs to be cautioned that curiosity appeals in this study refer to initial positivity manipulation that was either the presence of a cartoon with pre-script or the absence of any materials, but do not refer to antecedents of state curiosity.

Based on limitations of manipulation in this study, future studies should expand the knowledge of message features that can induce curiosity. Despite failure in curiosity manipulation, curiosity significantly predicts several persuasive outcomes. Thus, to maximize the utility of curiosity in persuasion and public health campaigns, future studies of audience analysis should explore what content features are effective to induce state curiosity and are realistic to a particular audience.

Challenges in Concepts and Theories. Since this study integrates the two different theories – Psychological Reactance Theory and Politeness Theory, one may question their fundamental distinction between the sub-concepts from their roots. Face is defined as the public self-image that everyone wants to hold (Goffman, 1967) and thus, although negative face maintains people’s desire for autonomy or freedom, negative face can be used in terms of public display or manifestation by definition. Meanwhile, the concept of freedom in Reactance Theory is defined as “a belief” or expectance that one can engage in a particular behavior (Brehm & Brehm, 1981, p.35) and this taps a psychological and hypothetical element in building or restoring threatened freedom. To integrate or compare the two theories more successfully, negative face and freedom should be more explicated in terms of how they differ in motivation - extrinsic or intrinsic - or in different settings - public or private.

Measurement Problem in State Reactance. One may also argue that measurement for state reactance can be overlapped with reactance outcomes. According to Dillard and Shen (2005), this study operationalized state reactance as combination of anger and negative cognition. Negative cognition contains unfavorable thoughts on messages or message advocacy such as counter-arguing, direct refusal, suggesting alternative choice,

or source derogation. All these thoughts are somewhat mixed with direct or indirect means of restorative behaviors and reactance outcomes. Accordingly, significant negative correlations between psychological reactance and persuasion outcomes (e.g., message effectiveness, attitude) can be tautological because state reactance directly reflects negative attitude toward either the advocacy of message or message itself. Researchers need to caution in picking types of reactance outcomes obviously different from reactance measurement.

Restoring Threatened Freedom or Restoring Liking? The current study proposed that threats to identity may lead to a similar process of threats to freedom and result in similar restorative behaviors in persuasion. The results were equivocal and were not consistent with predictions because of weak manipulation. Inconsistent results are also possible because threatening positive identity may lead to different reactant behaviors from threatening freedom. For instance, threatening identity may activate source derogation rather than other types of restorative behaviors such as counter-arguing or asserting their own position. Or when one is questioned on their likability, a message receiver may try to comply toward the message in order to restore one's liking by the eyes of others. Future study needs to test what types of restorative behaviors are differentially activated when their positive identity is threatened compared with when their freedom is threatened.

In sum, although the current study found a small effect of perceived threats to identity on state reactance, the findings are rather rudimentary. Threats to freedom showed a much stronger effect on psychological reactance and manipulation on identity was weak. With a stronger manipulation of identity, future studies need to add more

evidence as to what similarities or differences exist between Reactance on Identity and Reactance on Threat.

Implication for Communication Practice

It has been well-documented that public health campaigns are not always successful due to psychological reactance. Understanding the nature of psychological reactance is important to persuasion and equally imperative is uncovering how we can reduce psychological reactance. Threats to positive identity as an antecedent of psychological reactance and the roles of curiosity and hope found in this study have implications for strategic health communication planning. First, to minimize psychological reactance, campaign practitioners and theorists need to caution factors that threaten positive identity as well as freedom. Strong messages that imply negative identity attached to the targets and plan to change targets' identity, or such messages that are not congruent with targets' current identity may trigger unintended threats to identity. Future studies on threats to identity may be even fruitful in the context of interpersonal settings. Reports of failure in nation-wide health campaigns have questioned the efficacy of public mass communication and prompted examination of other channels to disseminate health knowledge and caution (e.g., U.S. Department of Agriculture, 2004). For instance, recent studies found that conversing and promoting healthy or unhealthy behaviors initiated from interpersonally intimate ones (e.g., friends, family, and spouse) can influence health behaviors such as drinking, smoking, healthy diet, and condom use (Dennis, 2006; Real & Rimal, 2007). The important role of interpersonal influence in health behaviors seems intuitive and natural, but in practice, few studies directly examine

this role and efficacy. Thus, when communication scholars examine psychological reactance in the context of interpersonal relationships (e.g., one partner's attempt to change another's current health behaviors or any attempt to change behaviors among family members), it is crucial to include threats to identity in addition to threats to freedom.

Second, to maximize the utility of curiosity and hope in persuasion and public health campaigns, knowledge of message features that can induce curiosity and hope should be expanded. In terms of curiosity, what content features are effective to induce state curiosity and are realistic to a particular audience remain unknown and require more audience analysis as previously stated. To induce or enhance hope, MacInnis and De Mello (2005) suggested a list of tactics which can be used in marketing by turning impossibility into possibility or enhance yearning. These tactics may be relevant to theorists and health practitioners who have to deal with message design as well. For both curiosity and hope, more formative research should be conducted to find out what kind of context, content, and style of message features would be easier for the message targets to attend and absorb. Such knowledge can offer guidelines for message production and useful tools in message selection and campaign planning.

Reference

- Albarracin, D., McNatt, P. S., Klein, C. T. F., Ho, R. M., Mitchell, A. L., & Kumkale, G. (2003). Persuasive communications to change actions: An analysis of behavioral and cognitive impact in HIV prevention. *Health Psychology, 22*, 166-177.
- Arnett, J. J. (2004). *Adolescence and emerging adulthood: A cultural approach* (2nd ed.). Englewood Cliffs, NJ: Prentice Hall.
- Averill, J. R., Catlin, G., & Chon, K. K. (1990), *Rules of Hope*. New York: Springer-Verlag.
- Bandura, A. (1982). Self-efficacy mechanism in human agency. *American Psychologist, 37*, 122-147.
- Bandura, A. (1998). Health promotion from the perspective of social cognitive theory. *Psychology and Health, 13*, 623-649.
- Baron, R. A. (1976). The reduction of human aggression: A field study of the influence of incompatible reactions. *Journal of Applied Social Psychology, 106*, 529-550.
- Basso, M. R., Schefft, B. K., Ris, M. D., & Dember, W. N. (1996). Mood and global-local visual processing. *Journal of the International Neuropsychological Society, 2*, 249-255.
- Baxter, L. A. (1984). An investigation of compliance-gaining as politeness. *Human Communication Research, 10*, 427-456.
- Baer, R., Hinkle, S., Smith, F., & Fenton, M. (1980). Reactance as a function of actual versus projected autonomy. *Journal of Personality and Social Psychology, 38*, 416-422.
- Bolls, P. D. (2010) Understanding emotion from a superordinate dimensional perspective: A productive way forward for communication processes and effects studies. *Communication Monographs, 77*, 146 -152.
- Boster, F. J., Mitchell, M. M., Lapinski, M. K., Cooper, H., Orrego, V., & Reinke, R. (1999). The impact of guilt and type of compliance-gaining message on compliance. *Communication Monographs, 66*, 168-177.
- Boster, F. J., & Mongeau, P. (1984). Fear-arousing persuasive messages. In R. N. Bostrom (Ed.), *Communication Yearbook 8* (pp.330-375). Beverly Hills, CA: Sage.
- Brehm, J. W. (1966). *A theory of psychological reactance*. New York: Academic Press.
- Brehm, S. S., & Brehm, J. W. (1981). *Psychological reactance: A theory of freedom and control*. New York: Academic Press.
- Brehm, S. S., & Weinraub, M. (1977). Physical barriers and psychological reactance: 2-year-olds' responses to threats to freedom. *Journal of Personality and Social Psychology, 35*, 830-836.
- Brown, P., & Levinson, S. C. (1978). Universals in language usage: politeness phenomena. In E. Goody (Ed.), *Questions and politeness: Strategies in social interaction* (pp.56-289). Cambridge: Cambridge University Press.
- Brown, P., & Levinson, S. C., (1987). *Politeness: Some universals in language usage*. Cambridge: Cambridge University Press.

- Browne, M. W. & Cudeck, R. (1993). Alternative ways of assessing model fit. In: Bollen, K. A. & Long, J. S. (Eds.) *Testing Structural Equation Models*. pp. 136–162. Beverly Hills, CA: Sage.
- Bryant, F. B., & Cvengros, J. A. (2004). Distinguishing hope and optimism: Two sides of a coin, or two separate coins? *Journal of Social and Clinical Psychology, 23*, 273-302.
- Burgoon, M., Alvaro, E., Grandpre, J., & Voulodakis, M. (2002). Revisiting the theory of psycholgocial reactance: Communicating threats to attitudinal freedom. In J. P. Dillard & M. Pfau (Eds.), *The persuasion handbook: Theory and practice* (pp. 213-232). Thousand Oaks, CA: Sage.
- Cacioppo, J. T., & Berntson, G. G. (1994). Relationship between attitudes and evaluative space: A critical review, with emphasis on the separability of positive and negative substrates. *Psychological Bulletin, 115*, 401-423.
- Cacioppo, J. T., & Petty, R. E. (1989). The elaboration likelihood model: The role of affect and affect-laden information processing in persuasion. In P. Cafferata & A. M. Tybout (Eds.), *Cognitive and affective responses to advertising* (pp. 69-90). Lexington, MA: Lexington Books.
- Cameron, K. A., Jacks, J. Z., & O'Brien, M. E. (2002). An experimental examination of strategies for resisting persuasion. *Current Research in Social Psychology, 7*, 205-224.
- Cho, H., & Salmon, C. T. (2007). Unintended effects of health communication campaigns. *Journal of Communication, 57*, 293–317.
- Cornelius, R. (1996). *The science of emotion*. New Jersey: Prentice Hall.
- Craig, R. T., Tracy, K., & Spisak, F. (1986). The discourse of requests: Assessment of a politeness approach. *Human Communication Research, 12*, 437-468.
- Csikszentmihalyi, M. (1990). *Flow: The psychology of optimal experience*. New York: Harper Perennial.
- Davidson, R. J. (1994). On emotion, mood, and related affective constructs. In P. Ekman & R. J. Davidson (Eds.), *The nature of emotion: Fundamental questions*. (pp. 56-58). New York: Oxford University Press. Estrada, C. A.
- Derryberry, D., & Tucker, D. M. (1994). Motivating the focus of attention. In P. M. Neidenthal & S. Kitayama (Eds.), *The heart's eye: Emotional influences in perception and attention* (pp. 167-196). San Diego, CA: Academic Press.
- DeSteno, D., Petty, R. E., Rucker, D. D., Wegener, D. T., & Braverman, J. (2004). Discrete emotions and persuasion: The role of emotion-induced expectancies. *Journal of Personality and Social Psychology, 86*, 43-56.
- Dickinson, A., & Dearing, M. F. (1979). Appetitive_aversive interactions and inhibitory processes. In A. Dickinson & R. A. Boakes (Eds.), *Mechanisms of learning and motivation* (pp. 203-231). Hillsdale, NJ: Erlbaum.
- Dillard, J. P. (1994). Rethinking the study of fear appeals: An emotional perspective. *Communication Theory, 4*, 295-323.
- Dillard, J. P., & Peck, E. (2001). Persuasion and the structure of affect: Dual systems and discrete emotions as complementary models. *Human Communication Research, 27*, 38-68.

- Dillard, J. P., Plotnick, C. A., Godbold, L. C., Freimuth, V. S., & Edgar, T. (1996). The multiple affective outcomes of AIDS PSAs: Fear appeals do more than scare people. *Communication Research*, 23, 44-72.
- Dillard, J. P., & Shen, L. (2005). On the nature of reactance and its role in persuasive health communication. *Communication Monographs*, 72, 144-168.
- Dillard, J. P., & Wilson, B. J. (1993). Communication and affect: Thoughts, feelings and issues for the future. *Communication Research*, 20, 637-646.
- Eagly, A. H., & Chaiken, S. (1993). *The psychology of attitude*. Orlando, FL: Harcourt Brace Jovanovich.
- Ekman, P. (1994). Moods, emotions, and traits. In P. Ekman & R. J. Davidson (Eds.), *The nature of emotion: Fundamental questions*. (pp. 56-58). New York: Oxford University Press.
- Ekman, P., & Davidson, R. J. (Eds.). (1994). *The nature of emotion: Fundamental questions*. New York: Oxford University Press. Estrada, C. A.
- Ellsworth, P. C., & Smith, C. A. (1988). Shades of joy: Patterns of appraisal differentiating pleasant emotions. *Cognition and Emotion*, 2, 301-331.
- Estrada, C. A., Isen, A. M., & Young, M. J. (1997). Positive affect facilitates integration of information and decreases anchoring in reasoning among physicians. *Organizational Behavior and Human Decision Processes*, 72, 117-135.
- Fazio, R. H., Eiser, J. R., & Shook, N. J. (2004). Attitude formation through exploration: Valence asymmetries. *Journal of Personality and Social Psychology*, 87, 293-311.
- Field, A. (2005). *Discovering Statistics Using SPSS* (2nd ed.). London: Sage.
- Fink, E. L. (2009). The FAQs on data transformation. *Communication Monographs*, 76, 379-397.
- Fishbein, M., & Yzer, M. C. (2003). Using theory to design effective health behavior interventions. *Communication Theory*, 13, 164-183.
- Fishbein, M., Traianidis, H. C., Kanfer, F. H., Becker, M., Middlestadt, S. E., & Eichler, A. (2001). Factors influencing behavior and behavior change. In A. Bau, T. A. Revenson, & J. E. Singer (Eds.), *Handbook of health psychology* (pp. 3-17). Mahwah, NJ: Erlbaum.
- Fisher, R. J. (1993). Social desirability bias and the validity of indirect questioning. *Journal of Consumer Research*, 20, 303-315.
- Forgas, J. P. (1999). On feeling good and being rude: Affective influences on language use and request formulations. *Journal of Personality and Social Psychology*, 76, 928-939.
- Frank, J. D. (1973). *Persuasion and healing*. Baltimore: Johns Hopkins University Press.
- Frank, J. D., & Frank, J. B. (1991). *Persuasion and healing* (3rd ed.). Baltimore: Johns Hopkins University Press.
- Fredrickson, B. L. (1998). What good are positive emotions? *Review of General Psychology*, 2, 300-319.
- Fredrickson, B. L. (2001). The role of positive emotions in positive psychology: The broaden-and-build theory of positive emotions. *American Psychologist*, 56, 218-226.
- Fredrickson, B. L., & Branigan, C. (2005). Positive emotions broaden the scope of attention and thought-action repertoires. *Cognition and Emotion*, 19, 313-332.

- Fredrickson, B. L., & Joiner, T. (2002). Positive emotions trigger upward spirals toward emotional well-being. *Psychological Science, 13*, 172-175.
- Fredrickson, B. L., & Levenson, R. W. (1998). Positive emotions speed recovery from the cardiovascular sequelae of negative emotions. *Cognition and Emotion, 12*, 191-220.
- Fredrickson, B. L., & Losada, M. F. (2005). Positive affect and the complex dynamics of human flourishing. *American Psychologist, 60*, 678-686.
- Fredrickson, B. L., Mancuso, R. A., Branigan, C., & Tugade, M. M. (2000). The undoing effect of positive emotions. *Motivation and Emotion, 24*, 237-258.
- Frijda, N. H. (1986). *The emotions*. New York: Cambridge University Press.
- Frijda, N. H., Kuipers, P., & ter Schure, E. (1989). Relations among emotion, appraisal, and emotional action readiness. *Journal of Personality and Social Psychology, 57*, 212-228.
- Goldsmith, D. (2000). Soliciting advice: The role of sequential placement in mitigating face threat. *Communication Monographs, 67*, 1-19.
- Goldsmith, D. J., & Fitch, K. (1997). The normative context of advice as social support. *Human Communication Research, 23*, 454-476.
- Goldsmith, D. J., & MacGeorge, E. L. (2000). The impact of politeness and relationship on perceived quality of advice about a problem. *Human Communication Research, 26*, 234-263.
- Goldsmith, H. H. (1994). Parsing the emotional domain from a developmental perspective. In P. Ekman & R. J. Davidson (Eds.), *The nature of emotion: Fundamental questions*. (pp. 56-58). New York: Oxford University Press. Estrada, C. A.
- Grandpre, J. R., Alvaro, E. M., Burgoon, M., Miller, C. H., & Hall, J. R. (2003). Adolescent reactance and anti-smoking campaigns: A theoretical approach. *Health Communication, 15*, 349-366.
- Hammock, T., & Brehm, J. W. (1966). The attractiveness of choice alternatives when freedom to choose is eliminated by a social agent. *Journal of Personality, 34*, 546-554.
- Hayes, A. F. (2009). Beyond Baron and Kenny: Statistical mediation analysis in the New Millennium. *Communication Monographs, 76*, 408-420.
- Heilman, M. E., & Toffler, B. L. (1976). Reacting to reactance: An interpersonal interpretation of the need for freedom. *Journal of Experimental Social Psychology, 12*, 519-529.
- Holbert, R. L., & Stephenson, M. T. (2002). Structural equation modeling in the communication sciences, 1995-2000. *Human Communication Research, 28*, 531-551.
- Hong, S. M., & Faedda, S. (1996) Refinement of the Hong Psychological Reactance Scale. *Educational and Psychological Measurement, 56*, 173-182.
- Hu, L., & Bentler, P. M. (1995). Evaluating model fit. In R. Hoyle (Ed.), *Structural equation modeling: Concepts, issues, and applications* (pp. 76-99). Thousand Oaks, CA: Sage.
- Hullett, C. R. (2005). The impact of mood on persuasion: A meta-analysis. *Communication Research, 32*, 423-442.

- Isen, A. M. (1990). The influence of positive and negative affect on cognitive organization: Some implications for development. In N. Stein, B. Leventhal, & T. Trabasso (Eds.), *Psychological and biological approaches to emotion* (pp. 75-94). Hillsdale, NJ: Erlbaum.
- Izard, C. E. (1977). *Human emotions*. New York: Plenum.
- Izard, C. E., & Ackerman, B. P. (2000). Motivational, organizational, and regulatory functions of discrete emotions. In M. Lewis & J. M. Haviland-Jones (Eds.), *Handbook of emotions* (2nd ed., pp. 253-264). New York: Guilford Press.
- Kahn, B. E., & Isen, A. M. (1993). The influence of positive affect on variety-seeking among safe, enjoyable products. *Journal of Consumer Research*, 20, 257-270.
- Kashdan, T. B., Rose, P., & Fincham, F. D. (2004). Curiosity and exploration: Facilitating positive subjective experiences and personal growth opportunities. *Journal of Personality Assessment*, 82, 291-305.
- Katz, D. (1960). The functional approach to the study of attitudes. *Public Opinion Quarterly*, 24, 163-204.
- Kohn, P. M., & Barnes, G. E. (1977). Subject variables and reactance to persuasive communications about drugs. *European Journal of Social Psychology*, 7, 97-109.
- Lang, P. J., Greenwald, M. K., Bradley, M. M., & Hamm, A. O. (1993). Looking at pictures: Affective, facial, visceral, and behavioral reactions. *Psychophysiology*, 30, 261-273.
- Lapinski, M. K., & Boster, F. J. (2001). Modeling the ego-defensive function of attitudes. *Communication Monographs*, 68, 314-324.
- Lazarus, R. S. (1991). *Emotion and adaptation*. New York: Oxford University Press.
- Lazarus, R. S. (1999). Hope: An emotion and a vital coping resource against despair. *Social Research*, 66, 653-660.
- Leichty, T. S., & Applegate, J. L. (1991). Social-cognitive and situational influences on the use of face-saving persuasive strategies. *Human Communication Research*, 17, 451-484.
- Levenson, R. W. (1994). Human emotions: A functional view. In P. Ekman & R. Davidson (Eds.), *The nature of emotion: Fundamental questions* (pp. 123-126). New York: Oxford University Press.
- Leventhal, H. (1970). Findings and theory in the study of fear communications. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 5, pp. 119-186). New York: Academic Press.
- Lim, T., & Bowers, J. (1991). Facework: Solidarity, approbation, and tact. *Human Communication Research*, 17, 415-450.
- Loewenstein, G. (1994). The psychology of curiosity: A review and reinterpretation. *Psychological Bulletin*, 116, 75-98.
- Lopez, S. J., Snyder, C. R., & Pedrotti, J. T. (2003). Hope: Many definitions, many measures.
- Maccoby, E. E., & Maccoby, N. (1954). The interview: A tool of social science. In G. Lindzey (Ed.), *Handbook of social psychology*. (Vol. 1 Theory and method, pp.449-487). Cambridge: Addison-Wesley.

- MacGeorge, E. L., Lichtman, R. M., & Pressey, L. C. (2002). The evaluation of advice in supportive interactions: Facework and contextual factors. *Human Communication Research, 28*, 451-463.
- MacGeorge, E. L., Feng, B., Butler, G. L., & Budarz, S. K. (2004). Understanding advice in supportive interactions: Beyond the facework and message evaluation paradigm. *Human Communication Research, 30*, 42-70.
- MacInnis D. J., & de Mello G. E. (2005). The concept of hope and its relevance to product evaluation and choice. *Journal of Marketing, 69*, 1-14.
- Mackie, D. M., & Worth, L. T. (1989). Processing deficits and the mediation of positive affect in persuasion. *Journal of Personality & Social Psychology, 57*, 27-40.
- Mackie, D. M., & Worth, L. T. (1991). Feeling good, but not thinking straight: The impact of positive mood on persuasion. In J. P. Forgas (Ed.), *Emotion and social judgments* (pp. 201-219). New York: Pergamon.
- MacKinnon, D. P., Lockwood, C. M., & Williams, J. (2004). Confidence limits for the indirect effect: Distribution of the product and resampling methods. *Multivariate Behavioral Research, 39*, 99-128.
- Magaletta, P. R., & Oliver, J. M. (1999). The hope construct, will and ways: Their relations with self-efficacy, optimism, and general well-being. *Journal of Clinical Psychology, 55*, 539-551.
- Mayer, J. D., Gaschke, Y. N., Braverman, D. L., & Evans T.W. (1992). Mood congruent judgment is a general effect. *Journal of Personality and Social Psychology, 63*, 119-132.
- Miller, C. H., Burgoon, M., Grandpre, J. R., & Alvaro, E. M. (2006). Identifying principal risk factors for the initiation of adolescent smoking behaviors: The significance of psychological reactance. *Health Communication, 19*, 241-252.
- Miller, C. H., Lane, L. T., Deatrack, L. M., Young, A. M. & Potts, K. A. (2007). Psychological reactance and promotional health messages: The effects of controlling language, lexical concreteness, and the restoration of freedom. *Human Communication Research, 33*, 219-240.
- Nabi, R. .L. (1999). A Cognitive-Functional Model for the effects of discrete negative emotions on information processing, attitude change, and recall. *Communication Theory, 9*, 292-320.
- Nabi, R. L. (2002a). Discrete emotions and persuasion. In J. P. Dillard & M. Pfau (Eds.), *The persuasion handbook: Theory and practice* (pp.289-308). Thousand Oaks, CA: Sage.
- Nabi, R. L. (2002b). Anger, fear, uncertainty, and attitudes: A test of the cognitive-functional model. *Communication Monographs, 69*, 204-216.
- Nabi, R. L., Moyer-Gusé, E., & Byrne, S. (2007). All joking aside: A serious investigation into the persuasive effect of funny social issue messages. *Communication Monographs, 74*, 29-54.
- Nail, P. R., Van Leeuwen, M. D., & Powell, A. B. (1996). The effectance versus the self-presentational view of reactance: Are importance ratings influenced by anticipated surveillance? *Journal of Social Behavior and Personality, 11*, 573-584.

- Noar, S. M., Benac, C. M., & Harris, M. S. (2007). Does tailoring matter? Meta-analytic review of tailored print health behavior change interventions. *Psychological Bulletin, 133*, 673-693.
- O'Keefe, D. J. (2000). Guilt and social influence. In M. E. Roloff (Ed), *Communication Yearbook 23* (pp.67-101). Thousand Oaks, CA: Sage.
- Ortony, A., Clore, G. L., & Collins, A. (1988). *The cognitive structure of emotions*. Cambridge, England: Cambridge University Press.
- Pervin, L. A. (2002). *Current controversies and issues in personality*. (3rd ed.). New York: John Wiley & Sons, Inc.
- Peterson, C., & Seligman, M. E. P. (2004). *Character strengths and virtues: A handbook and classification*. Oxford, UK: Oxford University Press.
- Poels, K., & Dewitte, S. (2008). Hope and self-regulatory goals applied to an advertising context: promoting prevention stimulates goal-directed behavior. *Journal of Business Research, 61*, 1030-1040.
- Preacher, K. J., & Hayes, A. F. (2004). SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavior Research Methods, Instruments, and Computers, 36*, 717-731.
- Quick, B. L., & Bates, B. R. (2010). The use of gain- or loss-frame messages and efficacy appeals to dissuade excessive alcohol consumption among college students: A test of psychological reactance theory. *Journal of Health Communication, 15*, 603-628.
- Quick, B. L., & Considine, J. R. (2008). Examining the use of forceful language when designing exercise advertisements for adults: A test of conceptualizing reactance arousal as a two-step process. *Health Communication, 23*, 483-491.
- Quick, B. L., & Stephenson, M. T. (2007). Further evidence that psychological reactance can be modeled as a combination of anger and negative cognitions. *Communication Research, 34*, 255-276.
- Quick, B. L., & Stephenson, M. T. (2008). Examining the role of trait reactance and sensation seeking on reactance-inducing messages, reactance, and reactance restoration. *Human Communication Research, 34*, 448-476.
- Rains, S. A., & Turner, M. M. (2007). Psychological reactance and persuasive health communication: A test and extension of the intertwined model. *Human Communication Research, 33*, 241-269.
- Reinhart, A. M., Marshall, H. M., Feeley, T. H., & Tutzauer, F. (2007). The persuasive effects of message framing in organ donation: The mediating role of psychological reactance. *Communication Monographs, 74*, 229-255.
- Richman, L. S., Kubzansky, L., Maselko, J., Kawachi, I., Choo, P., & Bauer, M. (2005). Positive emotion and health: Going beyond the negative. *Health Psychology, 24*, 422-429.
- Rogers, R. W. (1983). Cognitive and physiological processes in fear appeals and attitude change: A revised theory of protective motivation. In J. T. Cacioppo & R. E. Petty (Eds.), *Social Psychophysiology* (pp. 153-176). New York: Guilford.
- Roseman, I. J. (1991). Appraisal determinants of discrete emotions. *Cognition and Emotion, 5*, 161-200.

- Roseman, I. J. (2001). A model of appraisal in the emotion system: Integrating theory, research, and applications. In K. R. Scherer, A. Schorr, & T. Johnstone (Eds.), *Appraisal processes in emotion: Theory, methods, research* (pp.68-91). New York: Oxford University Press.
- Roseman, I. J., Spindel, M. S., & Jose, P. E. (1990). Appraisals of emotion-eliciting events: Testing a theory of discrete emotions. *Journal of Personality and Social Psychology, 59*, 899-915.
- Rosenberg, M. (1965). *Society and the Adolescent Self Image*. Princeton: Princeton University Press.
- Rosenberg, M. (1979). *Conceiving the Self*. New York: Basic Books.
- Roskos-Ewoldsen, D. R., Yu, H. J., & Rhodes, N. (2004). Fear appeal messages affect accessibility of attitudes toward the threat and adaptive behaviors. *Communication Monographs, 71*, 49-69.
- Rowe, G., Hirsh, J., & Anderson, A. K. (2005). Positive mood broadens the attentional spotlight. Manuscript in preparation. P.2 p.18
- Russell, J. A. (1980). The circumplex model of affect. *Journal of Personality and Social Psychology, 39*, 1161-1178.
- Ryan, R. L., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist, 55*, 68-78.
- Scherer, K. R. (2001). Appraisal considered as a process of multilevel sequential checking. In K. R. Scherer, A. Schorr, & T. Johnstone (Eds.), *Appraisal processes in emotion: Theory, methods, research* (pp. 92-120). New York: Oxford University Press.
- Scheier, M. F., & Carver, C. S. (1985). Optimism, coping, and health: Assessment and implications of generalized outcome expectancies. *Health Psychology, 4*, 219-247.
- Scheier, M. F., & Carver, C. S. (1992). Effects of optimism on psychological and physical well-being: Theoretical and empirical update. *Cognitive Therapy and Research, 16*, 201-228.
- Scheier, M. F., & Carver, C. S. (1998). On the power of positive thinking: The benefits of being optimistic. *Current Directions in Psychological Science, 2*, 26-30.
- Schlenker, B.L. (1980). *Impression management*. Monterey, CA: Brooks/Cole.
- Scioli, A., Chamberlin, C. M., Samor, C. M., Lapointe, A. B., Campbell, T. L., Macleod, A. R., & Mclenon, J. (1997). A prospective study of hope, optimism, and health. *Psychological Reports, 81*, 723-733.
- Shaver, P., Schwartz, J., Kirson, D., & O'Connor, C. (1987). Emotion knowledge: Further explorations of a prototype approach. *Journal of Personality and Social Psychology, 52*, 1061-1086.
- Shen, L. (2010). Mitigating psychological reactance: The role of message-induced empathy in persuasion. *Human Communication Research, 36*, 397-422.
- Shen, L. (2011). The effectiveness of empathy- versus fear-arousing antismoking PSAs. *Health Communication, 26*, 404-415.

- Shen, L. and Bigsby, E. (2010) Behavioral activation/inhibition systems and emotions: A test of valence vs. action tendency hypotheses. *Communication Monographs*, 77, 1-26.
- Shen, L., & Dillard, J. P. (2005). Psychometric properties of the Hong psychological reactance scale. *Journal of Personality Assessment*, 85, 74-81.
- Shen, L., & Dillard, J. P. (2007). The influence of BIS/BAS and message framing on the processing of persuasive health messages. *Communication Research*, 34, 433-467.
- Silvia, P. J. (2005). What is interesting? Exploring the appraisal structure of interest. *Emotion*, 5, 89-102.
- Silvia, P. J. (2006). Reactance and the dynamics of disagreement: Multiple paths from threatened freedom to resistance to persuasion. *European Journal of Social Psychology*, 36, 673-688.
- Skalski, P., Tamborini, R., Glazer, E., & Smith, S. (2009). Effects of humor on presence and recall of persuasive messages. *Communication Quarterly*, 57 (2). 136-153.
- Solomon, R. L. (1980). The opponent-process theory of acquired motivation: The costs of pleasure and benefits of pain. *American Psychologist*, 35, 691-712.
- Smith, C. A., Haynes, K. N., Lazarus, R. S., & Pope, L. K. (1993). In search of the "hot" cognitions: Attributions, appraisals, and their relation to emotion. *Journal of Personality and Social Psychology*, 65, 916-929.
- Snyder, C. R., Harris, C., Anderson, J., Holleran, S., Irving, L., Sigmon, S., Yoshinobu, L., Gibb, J., Langelle, C., & Harney, P. (1991). The will and the ways: Development and validation of an individual difference measure of hope. *Journal of Personality and Social Psychology*, 60, 570-585.
- Thayer, R. E. (1989). *The biopsychology of mood and arousal*. London: Oxford University Press.
- Thomas, A., Donnell, A. J., & Buboltz, W. C. Jr., (2001). The Hong psychological reactance scale: a confirmatory factor analysis. *Measurement and Evaluation in Counseling and Development*, 34, 2-13.
- Tooby, J., & Cosmides, L. (1990). The past explains the present: Emotional adaptations and the structure of ancestral environments. *Ethology and Sociobiology*, 11, 375-424.
- Tomkins, S. S. (1962). *Affect, imagery, consciousness: Vol. 1, The positive affects*. New York: Springer-Verlag.
- Tormala, Z. L., & Petty, R. E. (2004). Resistance to persuasion and attitude certainty: The moderating role of elaboration. *Personality and Social Psychology Bulletin*, 30, 1446-1457.
- Tugade, M. M. & Fredrickson, B. L. (2004). Resilient individuals use positive emotions to bounce back from negative emotional experiences. *Journal of Personality and Social Psychology*, 86, 320-333.
- Watson, D., & Clark, L. A. (1994). Emotions, moods, traits, and temperaments: Conceptual distinctions and empirical findings. In P. Ekman & R. J. Davidson (Eds.), *The nature of emotion: Fundamental questions* (pp. 89-93). New York: Oxford University Press.

- Watson, D., Clark, L.A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology*, *54*, 1063-1070.
- Wicklund, R. A. (1974). *Freedom and reactance*. Potomac, MD: Lawrence Erlbaum.
- Williams, P., & Aaker, J. L. (2002). Can mixed emotions peacefully coexist? *Journal of Consumer Research*, *28*, 636-649.
- Wilson, S. R. (2002). Seeking and resisting compliance. Thousand Oaks, CA: Sage.
- Wilson, S. R., Aleman, C. G., & Leatham, G. B. (1998). Identity implications of influence goals: A revised analysis of face-threatening acts and application to seeking compliance with same-sex friends. *Human Communication Research*, *25*, 64-96.
- Wilson, S. R., & Kunkel, A. W. (2000). Identity implications of influence goals: Similarities in perceived face threats and facework across sex and close relationships. *Journal of Language and Social Psychology*, *19*, 195-221.
- Witte, K. (1992). Putting the fear back into fear appeals: The extended parallel process model. *Communication Monographs*, *59*, 329-349.
- Witte, K. (1994). Fear control and danger control: A test of the extended parallel process model (EPPM). *Communication Monographs*, *61*, 113-134.
- Wolpe, J. (1958). *Psychotherapy by reciprocal inhibition*. Stanford: Stanford University Press.
- Worchel, S., Andreoli, V. A., & Archer, R. (1976). When is a favor a threat to freedom: The effects of attribution and importance of freedom on reciprocity. *Journal of Personality*, *44*, 294-310.
- Worchel, S., & Brehm, J. W. (1970). Effect of threats to attitudinal freedom as a function of agreement with the communicator. *Journal of Personality and Social Psychology*, *14*, 18-22.
- Worth, L. T., & Mackie, D. M. (1987). Cognitive mediation of positive affect in persuasion. *Social Cognition*, *5*, 76-94.
- Yan, C., Dillard, J. P., & Shen, F. (2010). The effects of mood, message framing, and behavioral advocacy on persuasion. *Journal of Communication*, *60*, 344-353.
- Thomas, A., Donnell, A. J., & Buboltz, W. C. Jr., (2001). The Hong psychological reactance scale: a confirmatory factor analysis. *Measurement and Evaluation in Counseling and Development*, *34*, 2-13.
- Tooby, J., & Cosmides, L. (1990). The past explains the present: Emotional adaptations and the structure of ancestral environments. *Ethology and Sociobiology*, *11*, 375-424.
- Tomkins, S. S. (1962). *Affect, imagery, consciousness: Vol. 1, The positive affects*. New York: Springer-Verlag.
- Tormala, Z. L., & Petty, R. E. (2004). Resistance to persuasion and attitude certainty: The moderating role of elaboration. *Personality and Social Psychology Bulletin*, *30*, 1446-1457.
- Tugade, M. M. & Fredrickson, B. L. (2004). Resilient individuals use positive emotions to bounce back from negative emotional experiences. *Journal of Personality and Social Psychology*, *86*, 320-333.

- Watson, D., & Clark, L. A. (1994). Emotions, moods, traits, and temperaments: Conceptual distinctions and empirical findings. In P. Ekman & R. J. Davidson (Eds.), *The nature of emotion: Fundamental questions* (pp. 89-93). New York: Oxford University Press.
- Watson, D., Clark, L.A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology, 54*, 1063-1070.
- Wicklund, R. A. (1974). *Freedom and reactance*. Potomac, MD: Lawrence Erlbaum.
- Williams, J., & MacKinnon, D. P. (2008). Resampling and distribution of the product methods for testing indirect effects in complex models. *Structural Equation Modeling, 15*, 23-51.
- Wilson, S. R. (2002). *Seeking and resisting compliance*. Thousand Oaks, CA: Sage.
- Wilson, S. R., Aleman, C. G., & Leatham, G. B. (1998). Identity implications of influence goals: A revised analysis of face-threatening acts and application to seeking compliance with same-sex friends. *Human Communication Research, 25*, 64-96.
- Wilson, S. R., & Kunkel, A. W. (2000). Identity implications of influence goals: Similarities in perceived face threats and facework across sex and close relationships. *Journal of Language and Social Psychology, 19*, 195-221.
- Witte, K. (1992). Putting the fear back into fear appeals: The extended parallel process model. *Communication Monographs, 59*, 329-349.
- Witte, K. (1994). Fear control and danger control: A test of the extended parallel process model (EPPM). *Communication Monographs, 61*, 113-134.
- Wolpe, J. (1958). *Psychotherapy by reciprocal inhibition*. Stanford: Stanford University Press.
- Worchel, S., Andreoli, V. A., & Archer, R. (1976). When is a favor a threat to freedom: The effects of attribution and importance of freedom on reciprocity. *Journal of Personality, 44*, 294-310.
- Worchel, S., & Brehm, J. W. (1970). Effect of threats to attitudinal freedom as a function of agreement with the communicator. *Journal of Personality and Social Psychology, 14*, 18-22.
- Worth, L. T., & Mackie, D. M. (1987). Cognitive mediation of positive affect in persuasion. *Social Cognition, 5*, 76-94.

Appendix A. Curiosity Induction



Exercise Clip



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Meditation clip

Appendix B. Message Manipulations

[Threat Manipulation]
Exercise (High Threat to Positive Identity)

“EXERCISE: REASONABLE PERSON DOES NOT DENY”

There is pretty compelling evidence that exercise saves you from dying of a massive heart attack, cancer, morbid obesity, and being stressed out of your mind. In fact, there is evidence right here on this campus of stressed out, overweight Gophers. Most people would agree that these are serious issues for students at the University of Minnesota that *need to be addressed soon. Stop the denial! Any reasonable person would not deny all the evidence that there is a problem. So if you are not already participating in a weekly exercising routine, be smart and reasonable. Only a lazy person wouldn't even try to live a much healthier life!*

Exercise (Low Threat to Positive Identity)

“EXERCISE: BE INITIATIVE”

There is pretty compelling evidence that exercise saves you from dying of a massive heart attack, cancer, morbid obesity, and being stressed out of your mind. In fact, there is evidence right here on this campus of stressed out, overweight Gophers. Most people would agree that these are serious issues for students at the University of Minnesota that *need to be addressed soon. Look closely! This is not a problem of only one university and you have a chance to be a part of the solution if you choose. If you are not already participating in a weekly exercise routine, you are not alone. Even a reasonable person could not be in it, due to many reasons. But by choosing to participate in a weekly exercise routine you are more likely to live a much healthier life for you and others too!*

Exercise (High Threat to Freedom)

“EXERCISE: YOU HAVE TO DO IT”

There is pretty compelling evidence that exercise saves you from dying of a massive heart attack, cancer, morbid obesity, and being stressed out of your mind. In fact, there is evidence right here on this campus of stressed out, overweight Gophers. Most people would agree that these are serious issues for students at the University of Minnesota that *demand your immediate attention. No other conclusion makes any sense. There is a problem and you must be a part of the solution. If you are not already participating in an exercise program, the choice is crystal clear: You simply must participate in a weekly exercising routine to live a much healthier life. You must start right now.*

Exercise (Low Threat to Freedom)

“CONSIDER EXERCISING ROUTINE”

There is pretty compelling evidence that exercise saves you from dying of a massive heart attack, cancer, morbid obesity, and being stressed out of your mind. In fact, there is evidence right here on this campus of stressed out, overweight Gophers. Most people would agree that these are serious issues for students at the University of Minnesota that *need to be addressed soon. It's a sensible conclusion. There is a problem and you have a chance to be a part of the solution if you choose. So if you are not already participating in a weekly exercising routine, why not consider it? By choosing to participate in a weekly exercise routine you are more likely to live a much healthier life!*

Meditation: Curiosity Condition.

How to be a happy person? Are you tired of waiting around for happiness to find you? Despite what fairy tales depict, happiness doesn't appear by magic. It's not even something that may happen to you. But it's something you can cultivate. The following messages will equip you with some ideas and tools to cultivate your happiness.

Meditation (High Threat to Positive Identity)

“MEDITATE: REASONABLE PERSON DOES NOT DENY”

Recent research shows that meditation brings about dramatic effects in as little as a 10-minute session. Studies done by Harvard Medical School have demonstrated that people who mediated for a short time showed more relaxed brain waves, had a less anxious and depressed nervous system and were less likely to have a heart attack or stroke.

There is pretty compelling evidence that meditation saves you from dying of heart disease, depression, morbid obesity, and being stressed out of your mind. In fact, there is evidence right here on this campus of stressed out, anxious Gophers. Most people would agree that these are serious issues for students at the University of Minnesota that *need to be addressed soon. Stop the denial! Any reasonable person would not deny all the evidence that there is a problem. So if you are not already engaging in a daily meditation routine, be smart and reasonable. Only a lazy person wouldn't even try!*

Meditation (Low Threat to Positive Identity)

“MEDITATE: BE INITIATIVE”

Recent research shows that meditation brings about dramatic effects in as little as a 10-minute session. Studies done by Harvard Medical School have demonstrated that people who mediated for a short time showed more relaxed brain waves, had a less anxious and depressed nervous system and were less likely to have a heart attack or stroke.

There is pretty compelling evidence that meditation saves you from dying of heart disease, depression, morbid obesity, and being stressed out of your mind. In fact, there is

evidence right here on this campus of stressed out, anxious Gophers. Most people would agree that these are serious issues for students at the University of Minnesota that *needs to be addressed soon. Look closely! This is not a problem of only one university and you have a chance to be a part of the solution if you choose. If you are not already engaging in a daily meditation routine, you are not alone. Even a reasonable person could not be in it, due to many reasons. But by choosing to engage in a daily meditation routine you are more likely to live a much healthier life for you and others too!*

Meditation (High Threat to Freedom)

“MEDITATE: YOU HAVE TO DO IT”

Recent research shows that meditation brings about dramatic effects in as little as a 10-minute session. Studies done by Harvard Medical School have demonstrated that people who mediated for a short time showed more relaxed brain waves, had a less anxious and depressed nervous system and were less likely to have a heart attack or stroke.

There is pretty compelling evidence that meditation saves you from dying of heart disease, depression, morbid obesity, and being stressed out of your mind. In fact, there is evidence right here on this campus of stressed out, anxious Gophers. Most people would agree that these are serious issues for students at the University of Minnesota that *demand your immediate attention. No other conclusion makes any sense. There is a problem and you must be a part of the solution. If you are not already engaging in a daily meditation routine, the choice is crystal clear: You simply must engage in a daily meditation routine to live a much healthier life. You must start right now.*

Meditation (Low Threat to Freedom)

“CONSIDER MEDITATION ROUTINE”

Recent research shows that meditation brings about dramatic effects in as little as a 10-minute session. Studies done by Harvard Medical School have demonstrated that people who mediated for a short time showed more relaxed brain waves, had a less anxious and depressed nervous system and were less likely to have a heart attack or stroke.

There is pretty compelling evidence that meditation saves you from dying of heart disease, depression, morbid obesity, and being stressed out of your mind. In fact, there is evidence right here on this campus of stressed out, anxious Gophers. Most people would agree that these are serious issues for students at the University of Minnesota that *needs to be addressed soon. It's a sensible conclusion. There is a problem and you have a chance to be a part of the solution if you choose. So if you are not already engage in a daily meditation routine, why not consider it? By choosing to engage in a daily meditation routine you are more likely to live a much healthier life!*

[Hope condition]

“DREAM TO BE HAPPY: Meditate”

So if you have not practiced meditation regularly, you can start from this moment. Bring your attention to your breath – in and out. When you breathe in, focus on air coming in through your nose. When you breathe out, focus on air going out through your mouth. Now you’ve just done mindfulness meditation - just be open-minded toward different types of meditation and find the one right for you.

Anyone can practice meditation. It’s simple and inexpensive, and it doesn’t require any special equipment. And you can practice meditation wherever you are and whatever you do – whether you’re out for a walk, riding the bus, or waiting at the doctor’s office. Why not enjoying it! Just imagine yourself happy and stress-free! And share this with your friends and loved ones if possible. DREAM to be one of the happiest in every moment!

Appendix C. Threat-to-health Messages

Exercise

Fact: Obesity rates will reach 42 percent, reported by Reuters on Nov. 04, 2010.

Americans will keep growing overweight until 42 percent of the nation is considered obese, and having overweight friends is part of the problem, researchers at Harvard University said.

Fact: Sedentary lifestyle causes more deaths than smoking, says study.

Following a sedentary lifestyle is more dangerous for your health than smoking, says a new study. The results are fascinating: 20% of all deaths of people 35 and older were attributed to a lack of physical activity. That's more [deaths](#) than can be attributed to [smoking](#).

Looking at specific diseases, the risk of dying from [cancer](#) increased 45% for men and 28% for women due to lack of [physical activity](#). The risk of dying from respiratory ailments was 92% higher for men and 75% higher for [women](#). The risk of dying from heart [disease](#) was 52% higher for men and 28% higher for women, all due to a lack of physical activity.

It turns out that being a couch potato can kill you, literally.

Mediation

Fact: 50 % of students who attend college drop out or fail, 33% within their first year. Educational burnout tops the list of reasons why students drop out of college. Stress is the biggest life issue that students say affects their studies.

Fact: According to a spring 2009 poll of more than 2,200 students across 40 colleges and universities:

- 85 percent of students reported feeling stressed on a daily basis.
- Academic concerns like school work and grades, with 77 percent and 74 percent respectively, maintain their positions as the top drivers of student stress, even over financial woes in today's economy.
- Six out of 10 students report having felt so stressed they couldn't get their work done on one or more occasions.
- Since starting college, over 70 percent of students have not considered talking to a counselor to help them deal with stress or other emotional issues.

Constant stress not only hurts your academic achievement but also puts your health at risk. The long-term activation of the stress-response system can disrupt almost all your body's processes with numerous health problems, including: heart disease, sleep problems, digestive problems, depression, obesity, memory impairment, and worsening of skin conditions.

It turns out that being in constant stress can kill you, literally. That's why it's so important to learn healthy ways to cope with the stressors in your life.

Appendix D. Items deleted

*Deleted Items

[Trait Curiosity]

I would describe myself as someone who actively seeks as much information as I can in a new situation.

I frequently find myself looking for new opportunities to grow as a person (e.g., information, people, resources)

*I am *not* the type of person who probes deeply into new situations or things (reversed)

Everywhere I go, I am out looking for new things or experiences.

When I am participating in an activity, I tend to get so involved that I lose track of time.

When I am actively interested in something, it takes a great deal to interrupt me.

My friends would describe me as someone who is “extremely intense” when in the middle of doing something.

[Trait Hope]

I can think of many ways to get out of a jam.

I energetically pursue my goals.

*I feel tired most of the time.

There are lots of ways around any problem.

*I am easily downed in an argument.

I can think of many ways to get the things in life that are important to me.

*I worry about my health.

Even when others get discouraged, I know I can find a way to solve the problem.

My past experiences have prepared me well for my future.

I've been pretty successful in life.

*I usually find myself worrying about something.

I meet the goals that I set for myself.

Appendix E. A Summary Table of Manipulation Checks

Message Manipulation	Exercise		Meditation	
	Main Effect	Interaction E.	Main Effect	Interaction
Threat to Identity	n.s.	-	n.s.	-
Curiosity	n.s.	-	n.s.	-
	-	F(1, 103)=4.04*	-	n.s.
Threat to Freedom	F(1,98)=4.56*	-	F(1,102)=19.59***	-
Curiosity	n.s.	-	n.s.	-
	-	n.s.	-	n.s.
Curiosity	n.s.	-	n.s.	-
Hope after thF	F(1,98)=8.09**	-	F(1,102)=4.07*	-
Hope after thI	n.s.	-	n.s.	-