UNIVERSITY OF OKLAHOMA

GRADUATE COLLEGE

EXAMINING THE USE OF ALTERNATIVE RESTORATION SCRIPTS ON THE PSYCHOLOGICAL REACTANCE PROCESS

A DISSERTATION

SUBMITTED TO THE GRADUATE FACULTY

in partial fulfillment of the requirements for the

Degree of

DOCTOR OF PHILOSOPHY

By

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Norman, Oklahoma
2014

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EXAMINING THE USE OF ALTERNATIVE RESTORATION SCRIPTS ON THE PSYCHOLOGICAL REACTANCE PROCESS

A DISSERTATION APPROVED FOR THE
DEPARTMENT OF COMMUNICATION

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Acknowledgements

"First and foremost, I'd like to thank myself, because without me, none of this would be possible." Long ago, I jokingly thanked myself during a brief presentation during my M.A. convocation. Now that I have finished my Ph.D., I still find that quote funny, but I find a different quote more fitting for this process: "We are too much accustomed to attribute to a single cause that which is the product of several, and the majority of our controversies come from that" (Marcus Aurelius - *Meditations*). Although applicable to the scientific process, this quote speaks more to the gratitude I have for all those who deserve acknowledgment. Indeed, the success of this journey is a product of several great causes.

First, to my family, thank you so much for all of your love and support. To my parents, Joseph and Candace, for instilling in me the importance of education from an early age, for fostering my growth and development both inside and outside of academia, and for encouraging me to always pursue my interests. To my brother Jason Joseph and sister Heather MacErin, there is no Danny Rex without you. I am constantly in awe of your brilliance and never surprised by your successes. To family near or far, in person or spirit: Love, Loyalty, and Friendship.

To Rhiannon, you are one of the kindest people I have ever met, and that certainly makes you one of a kind. Memories shared with you shape my life today. You have constantly challenged me to become a better person simply by being yourself. Your compassion has shown me I can always do more and your humor has endured me when I have tried to do just that. Okay, thank you, okay!

Next, to my academic family, you have been so instrumental in the success of this project. To my Chair, Dr. John Banas, your passion and drive as a mentor, a scholar, and as a friend are challenging and rewarding. Thank you so much for your honesty. You have consistently shown me how to become a better theorist, a better researcher, and a better writer. I am so grateful to you for your constant encouragement and support. Without your persistence, the lines that follow would not be possible.

To the rest of my committee, to Dr. Elena Bessarabova, your advice and expertise is perhaps only slightly outweighed by your patience. Thank you for walking me through so much of this process and for your kind friendship. To Dr. Norah Dunbar, I have learned so much from you about so many facets of the academic life. Thank you for always giving me an opportunity to share in your knowledge and work with you on projects. A great joy of mine is discovering a new passion for something, I was lucky to find that passion in your research and in your support. To Dr. Glenn Hansen, thank you for taking the time to explain complicated processes to me and pushing me to fully understand them. I strive to meet your teaching capacity. To Dr. Matt Jensen, I admire your dedication to quality. Thank you for giving me an opportunity to work with you and to share in some of that quality.

To my extended academic family, thank you for providing both the academics and the family. To Dr. Scott Moore, a mentor, colleague, and above all friend, you are the definition of making someone better each and every day. Boomer! Sooner! To Drs. Dan and Mary John O'Hair, thank you for bringing me into your research and within your reach.

To my extended family, Dr. Bradley Adame, Dr. Nici Ploeger-Lyons, Mr. Jason Russell, Ms. Elissa Arterburn and Mr. Saffer, words cannot express how much I appreciate your friendship and company; which is probably a good thing because you are all likely very tired of hearing me talk anyway.

To Gaius Finnius Aurelius Caesar (and the great ones that have come before you), partial namesake to the quote at the beginning of these acknowledgements, I am reminded of the uncarved block. Every day you start different yet unchanged, and so learning begins anew each day for me as well; the process the same, yet the outcome slightly varied.

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Abstract

This study (N = 396) utilized a 3 (restoration: prescript vs. restoration postscript vs. control) × 2 (language: forceful vs. non-forceful) × 2 (topic: exercise vs. nutrition) mixed-model design to examine the effects of the reactance process over time with attitudes and behavioral intentions used as covariates. Results indicate that compared to non-forceful language, forceful language was perceived as a threat and elicited reactance (measured by anger and negative cognitions). Interestingly, forceful language elicited more positive attitudes than did non-forceful language. Although not a true boomerang effect, behavioral intentions were greater at Time 1 and Time 3 than at Time 2. There were no other significant effects for attitudes or behavioral intentions over time. Restoration prescripts and postscripts were equally successful at reducing negative cognitions but not anger. However, when topics were split and examined individually, restoration scripts were successful at reducing negative cognitions for the exercise topic but not for the nutrition topic. This raises important theoretical concerns for psychological reactance theory (TPR; J. W. Brehm, 1966). Mainly, boundary conditions of TPR may need to be revised if the reactance process varies for particular topics.

Chapter 1: Introduction

The theory of psychological reactance (TPR) was introduced by J. W. Brehm (1966) in an effort to understand why some individuals reject persuasive messages. TPR suggests persuasive messages may be viewed as threats to free behaviors and can provoke reactance, which is a motivational response to restore threatened freedoms (J. W. Brehm, 1966). Thus, a persuasive message designed to restrict a particular behavior (e.g., smoking, drunk driving, unsafe sex) may in fact create undesired effects, causing the target audience to derogate the source and possibly engage in the behavior opposite to the one advocated in the message as a means to restore the threatened freedom.

Forceful language increases perceptions of threats to freedom. Past TPR research has established that controlling, explicit, dogmatic, threat-to-choice, and forceful language features elicit reactance (Dillard & Shen, 2005; C. H. Miller, Lane, Deatrick, Young & Potts, 2007; Quick, 2012; Quick & Considine, 2008; Quick & Kim, 2009; Quick & Stephenson, 2007a; Quick & Stephenson, 2007b ; Quick & Stephenson, 2008; Quick, Scott, & Ledbetter, 2011; Scott & Quick, 2012; Shen, 2011). For the purposes of this study, this type of language will be referred to as forceful language[1]. A reason to include forceful language features in messages is because this type of language allows for less interpretation and is more likely to be received by the target audience as clear and directive (Andreasen, 1995). Although messages that include more forceful language are likely to be more readily understood by a target audience, they are also more likely to provoke reactance because forceful language limits freedom of choice. Thus, messages that are able to use explicit language features yet manage to avoid or mitigate reactance should be ideal for persuasive campaigns.

Recent research has examined the use of restoration postscripts as a means of reducing reactance generated by forceful or threatening messages (Bessarabova, Fink, & Turner, 2013; C. H. Miller et al., 2007). A restoration postscript is a brief message that reminds receivers that they have a choice whether or not to comply with the message. Of particular interest to the present study is the recommendation that restoration postscripts may be useful at overcoming "the detrimental effects of more controlling, though more readily understood, directive language" (C. H. Miller et al., 2007, p. 234). Recent applications of C. H. Miller et al.'s (2007) restoration postscript found that the inclusion of a restoration postscript reduced reactance and enhanced persuasion in high threat conditions (Bessarabova, 2010; Bessarabova et al., 2013). Interestingly, a meta-analysis examining the inclusion of "but you are free" (BYAF) language in face-to-face (FtF) requests found a similar verbal restoration postscript to increase compliance-gaining (Carpenter, 2013).

A simple, yet interesting, extension of the recommendation to provide restoration postscripts is to include the same language of the postscript prior to the delivery of the message; that is, provide language that reminds receivers it is their choice to comply with the instructions of a message prior to receiving the persuasive content. Although previous research suggests forewarning an individual that a message may attempt to shift their attitudes can negatively influence persuasion (Benoit, 1998), and in some cases generate reactance (Richards & Banas, 2011), no research to date has attempted to use the exact language of the restoration postscript in the form of a restoration prescript in an effort to reduce perceived threat and restore freedom. Thus, this study seeks to examine the effects of providing alternative message scripts on the

reactance process. Specifically, this study will provide two types of alternative message scripts: a prescript and a postscript to determine the degree to which a prescript and postscript message may mitigate reactance.

Despite the aforementioned research that examines language features and the restoration process, very little research has explored how reactance may influence attitudes and behavioral intentions over time. For example, J. W. Brehm and Mann (1975) examined how a time delay between the threat to conform to a group and later group processes increased positive attitudes and attractiveness of the group. R. L. Miller (1976) examined the influence of the mere exposure effect on reactance. Silvia (2006) examined the effects of altering the temporal position of a threat in a message.

More recently, research (Bessarabova, 2010) has investigated the effects of reactance over time, suggesting these effects may not be persistent. This raises important theoretical implications for TPR; namely, if the effects of reactance continue to decay over time then avoiding generating immediate reactance with explicit messages may not be necessary. Additionally, if a restoration script (either prescript or postscript) can help mitigate reactance generated immediately following a persuasive message, then devising messages that are both explicit and that contain a restoration script may facilitate comprehension for the target audience without the danger of reactance influencing future attitudes and behaviors. Thus, this study also seeks to examine the effects of reactance on attitudes and behavioral intentions over time.

Chapter 2: Theoretical Background

This chapter will first provide a description of the theory of psychological reactance (TPR; J.W. Brehm, 1996) as well as its major notions; including, freedom,

threat to freedom, reactance, and restoration of freedom (Dillard & Shen, 2005). Next, TPR research is discussed in terms of three specific waves of productivity including the recent operationalization of reactance as variable comprised of state anger and negative cognitions. This chapter then provides a rationale for the current study as well as relevant hypotheses.

Theory of Psychological Reactance (TPR)

The theory of psychological reactance (TPR; J.W. Brehm, 1996) attempts to explain why some individuals reject persuasive messages. TPR argues that persuasive messages can threaten free behaviors thereby eliciting reactance. Reactance is considered a motivational response to restore threatened freedoms (Dillard & Shen, 2005). The major notions that inform TPR include freedom, threat to freedom, reactance, and restoration of freedom.

Freedom. The conceptualization of freedom in TPR is not "abstract considerations, but concrete behavioral realities" (S.S. Brehm & Brehm, 1981, p. 12). Therefore, the notion of freedom in TPR is not understood in a general sense; instead, freedom is considered the ability to engage in particular behaviors. Although this distinction might seem limiting, the notion of freedom is defined to include behavioral actions, attitudes, and emotions (J.W. Brehm, 1966; Wicklund, 1974). In order for a behavior to be considered a freedom, individuals must be aware of, and feel as if they have the ability to, engage in a particular behavior. Thus, any attempt to restrict individuals from engaging in a specific freedom may be perceived as a threat (J. W. Brehm, 1966; S.S. Brehm & Brehm, 1981).

J. W. Brehm (1989) points to four reasons why the term freedom should be considered as specific behaviors. First, a freedom can be threatened or lost without it having any effect on other freedoms. J. W. Brehm (1989) offers the example of losing or misplacing a book; arguing that the freedom to read that book is threatened or perhaps lost, but other freedoms like driving a car or walking a dog are left intact. A second reason for thinking in terms of specific freedoms is that they will vary on importance to each individual. Thus, some freedoms will be more important to a particular individual than other freedoms and each individual will differ in which freedoms are the most important to them (J. W. Brehm, 1989). A third reason suggests that focusing on specific freedoms offers a way to examine any logical or psychological relationship between freedoms. Often times, having one freedom may imply having another freedom as well (J. W. Brehm, 1989). J. W. Brehm (1989) provides the example of the type of acceptable attire at a restaurant; suggesting that if a polo shirt is permissible at a specific restaurant, then presumably wearing a jacket and tie would also be acceptable. A fourth reason for framing freedom in specific terms is that the magnitude of reactance will coincide with both the number and amount of freedoms being threatened or eliminated (J. W. Brehm, 1989). Thus, reactance can be experienced along a continuum; where the importance of a threatened freedom, the proportion of freedoms threatened, and magnitude of the threat are all likely to increase reactance and attempts to restore freedoms (Burgoon, Alvaro, Grandpre, & Voulodakis, 2002).

Threats to Freedom. Threats to freedom create reactance if individuals are aware of the intent to persuade (J. W. Brehm, 1966). An individual who is aware of the

persuasive intent of a message is more likely to perceive the message as a threat to freedom. As previously discussed, individuals must feel like they have the ability to perform the behavior being threatened in order for reactance to be triggered. In addition, individuals must feel they can engage in, either at that moment or in the future, a set of actions or behaviors for a threat to generate reactance. If an individual feels as if he or she cannot perform the behavior being restricted, there is little chance that he or she will experience reactance (J. W. Brehm, 1966; S.S. Brehm & Brehm, 1981).

Also mentioned previously, not all free behaviors are of equal importance to every individual. J. W. Brehm (1966) suggests the strength of reactance is affected by the positive relationship an individual has between the degree of threat and the importance of the behavior being threatened. Thus, free behavior varies in importance, significance, and consequence depending on the desire and ability an individual has to engage in the threatened behavior (C. H. Miller, Burgoon, Grandpre, & Alvaro, 2006).

Reactance. Psychological reactance is conceived as "a motivational state directed toward the re-establishment of the free behaviors which have been eliminated or threatened with elimination" (J. W. Brehm, 1966, p. 9). As J. W. Brehm continued to explicate the key components of TPR, he asserted that as a motivational state, reactance itself could not be measured. In fact, S.S. Brehm and Brehm (1981) argue that researchers "cannot measure reactance directly, but hypothesizing its existence allows [researchers] to predict a variety of behavioral effects" (p. 37). Thus, for several decades, researchers interested in TPR often relied on antecedents and outcomes

stemming from threats to free behaviors as a means to assess reactance (Dillard & Shen, 2005).

Attempting to measure reactance, Dillard and Shen (2005) posited four models of the reactance process that included cognition, anger, attitudes, and behavior. Specifically, they offered and tested four models of state reactance for use in communication research, including (a) only cognitions, (b) only anger, (c) both anger and cognitions but each defined separately, or (d) a construct defined by both anger and cognitions. They found support for the fourth model (d, labeled the intertwined process model) and other research has also found support for operationalizing reactance as a variable comprised of both state anger and negative cognitions (Quick, 2012; Quick & Considine, 2008; Quick & Kim, 2009; Quick & Stephenson, 2007a, 2007b; Quick & Stephenson, 2008; Rains, 2013; Rains & Turner, 2007; Scott & Quick, 2012).

Restoration of Freedom. When freedoms are threatened individuals are motivated to reestablish or restore the threatened freedoms (J. W. Brehm, 1966). Individuals are motivated by a need for autonomy and typically like to feel in control of their environment (Burgoon et al., 2002). When faced with treats to freedom, people may engage in the very behavior threatened. This behavior, termed *restoration*, restores or gratifies the desire to be in control and exhibit self-determination (Grandpre, Alvaro, Burgoon, Miller, & Hall, 2003). Early TPR research described this behavior as the *boomerang effect* (Worchel & Brehm, 1970), or a motivation to engage in behavior opposite of that advocated by the message (Burgoon et al., 2002). Another response generated by reactance involves making the behavior or freedom threatened

appear more attractive (J. W. Brehm, Stires, Sensenig, & Shaban, 1966). When freedoms are threatened, these very freedoms can appear more attractive as individuals seek to restore their autonomy in decision-making. In addition, individuals may seek more information as a means to measure or judge the attractiveness of the threatened freedom (Grandpre et al., 2003). Lastly, reactance may elicit anger, hostility, or aggression toward the source of the message or the message itself. Again, when faced with restrictions of freedom, individuals are likely to become angry and seek restoration of a threatened freedom and renewed sense of self-determination and autonomy.

Three Waves of TPR Research

There has been nearly 50 years of TPR research, and this voluminous literature can be best organized into three waves of TPR productivity. The first wave is described by Burgoon and colleagues (2002) as spanning from 1966 through 1981. This first wave of TPR research focused on fine tuning the propositional logic and components of TPR (J. W. Brehm, 1966; J. W. Brehm, 1972; S. S. Brehm & Brehm, 1981; Wicklund, 1974; Wicklund & Brehm, 1968), as well as examining various elements of persuasion and attitude change.

The second wave can loosely be described as ranging from 1981 to around 2001. During this period, reactance research examined a range of topics including compliance-gaining strategies (Bensley & Wu, 1991; Cowan & Presbury, 2000; Dowd, Hughs, Brockbank, & Halpain, 1988), freedom restoration (Schwarz, 1984), and threats (Wright, 1986). In addition, reactance research has examined social relationships (Goldman, Pulcher, & Mendez, 1983), persuasive messages (Allen,

Sprenkel, & Vitale, 1994), self-esteem (Hellman & McMillan, 1997), thought suppression (Kelly & Nauta, 1997), consumer behavior (J. W. Brehm, 1988), and therapy and patient compliance (Chamberlain, Patterson, Reid, Kavanagh, & Forgatch, 1984; Dowd, 1999; Dowd et al., 1994; Fogarty, 1997; Karno & Longbaugh, 2005; C. H. Miller, 2000; Seibel & Dowd, 1999).

The third wave of TPR research started with what other scholars (Quick & Stevenson, 2007b) have characterized as a spirited review of TPR by Burgoon and colleagues (2002) and continues into contemporary research. Since Burgoon et al.'s review, researchers have focused on several key elements of interest to the current study, including a refocus on persuasive health communication, testing models of the reactance process, and examining language features of persuasive messages.

Within the third wave of research, Dillard and Shen (2005) provided several key contributions to TPR research, two of which are of particular relevance to this study. First, Dillard and Shen (2005) tested several proposed models of the reactance process and found the best fit conceptualizes reactance as variable measured by negative cognitions and state anger. Negative cognitions (also sometimes referred to as unfavorable cognitions) are valenced thoughts that express an aversion to a particular message[2]. Second, Dillard and Shen (2005) created message vignettes to test the differences between high and low threatening messages. These messages used forceful language and non-forceful language to manipulate the threat-to-freedom between two topics, binge-drinking and flossing.

Seeking to test and extend Dillard and Shen's intertwined process model, Rains and Turner (2007) examined both the cognitive and affective processes associated with

reactance. The authors found support for the intertwined model. In addition to testing the intertwined model, Rains and Turner (2007) examined three variables to assess if they affected the reactance process; the variables included argument quality, severity of consequences associated with message topic, and the magnitude of the request. Confirming some of J. W. Brehm's (1966) earliest work, of the three variables examined, Rains and Turner (2007) found the only variable that affected reactance was the magnitude of request. More recently, Rains (2013) conducted a meta-analysis comparing competing conceptualizations of reactance and found support for the intertwined model.

Moving the newly developed intertwined model (Dillard & Shen, 2005) into another arena, Quick and Stevenson (2007a) examined the persuasiveness of seven existing television advertisements on the topic of condoms. The authors found evidence in support of the intertwined model; treating reactance as a latent variable comprised of state anger and negative cognitions. In addition, building from some of J. W. Brehm's (1956) earliest work examining the free choice paradigm, Quick and Stevenson (2007a) found that threat-to-choice perceptions to be positively associated with reactance, bolstering J. W. Brehm's (1966) assertion that threats to freedom would result in reactance.

Study Rationale and Hypotheses

Forceful Language. To date, several studies have utilized the same or a similar message format designed by Dillard and Shen (2005) to generate reactance. Specifically, research investigating the role language features have on generating reactance overwhelmingly demonstrate that controlling, explicit, threat-to-choice,

dogmatic, and forceful language features elicit reactance (Dillard & Shen, 2005; Quick, 2012; Quick & Considine, 2008; Quick & Kim, 2009; Quick & Stephenson, 2007a; Quick & Stephenson, 2007b ; Quick & Stephenson, 2008; Quick et al., 2011; C. H. Miller et al., 2007; Scott & Quick, 2012; Shen, 2011). Again, this type of language is referred to as forceful language in this study.

Forceful language is characterized by strong language that explicitly pressures audiences to conform to a message. For example, the forceful message includes imperatives such as ‘‘must’’ and ‘‘need’’ compared to the non-forceful message that includes less opinionated language such as ‘‘consider’’ and ‘‘chance’’ (Miller et al., 2007, p.223; Quick & Stephenson, 2008, p. 450). Following the design engineered by Dillard and Shen (2005), and later revised by Quick & Considine (2008), this study will use forceful and non-forceful language to further examine the effects of language on the reactance process (see Appendix A).

Although anger and negative cognitions may be elicited by a persuasive message, it may not necessarily be in response to a perceived threat to freedom. For example, a persuasive message that contains incongruent information, grammatical errors, or that is perceived as condescending may elicit anger and/or negative cognitions (Quick & Considine, 2008; Quick & Stephenson, 2008). Thus, recent research has proposed measuring reactance as a two-step process that includes both an induction check and a measure of state reactance. The first step involves an individual perceiving a threat to a freedom; and the second step is the response to this threat manifested by combination of anger and negative cognitions (Quick & Considine, 2008; Quick & Stephenson, 2008). Thus, the following hypothesis is proposed:

H1: Compared to non-forceful language, forceful language (a) elicits reactance as measured by anger and (b) negative cognitions.

When free behaviors are threatened, individuals may engage in the threatened freedom or embrace the threatened attitudes (J. W. Brehm, 1966). In fact, research specifically interested in TPR has demonstrated that threatening or forceful-type messages typically have an adverse effect, generating more negative attitudes (C. H. Miller, Ivanov, Sims, Compton, Harrison, Parker, et al.,2013; Shen, 2012; Silvia, 2006; Silvia, 2005) and lessening behavioral intentions (C. H. Miller & Quick, 2010; C. H. Miller et al., 2006; Scott & Quick, 2012) or both (Bessarabova et al. 2013; Dillard & Shen, 2005; Grandpre et al., 2003; C. H. Miller et al., 2007; Quick, 2012; Quick et al., 2011; Rains & Turner, 2007; Reinhart, 2007). Thus, the following hypothesis is proposed:

H2: Compared to non-forceful language, forceful language (a) generates negative attitudes and (b) lowers behavioral intentions.

Restoration Scripts. J. W. Brehm's (1966) original conception of restoration of freedom has recently been applied to message design. A way of reducing reactance suggested by C. H. Miller and colleagues (2007) is to include a restoration postscript at the end of a persuasive message as a way to restore autonomy and diminish the threat posed by a persuasive message. A restoration postscript is a brief message that reminds receivers it is their choice to comply with the message (see Appendix B). C. H. Miller and colleagues (2007) argued that this type of message could reduce the perception of freedoms being threatened. The authors recommend that future research examine the effect that alternative restoration scripts may have on the reactance process (C. H.

Miller et al., 2007). Although C. H. Miller and colleagues (2007) found that restoration postscripts helped reduce the perception of threat to freedom, they never clearly associate the use of a restoration postscript with attitude change or a reduction in reactance. Seeking to address these limitations, recent research has examined the use of restoration postscripts with persuasive messages (Bessarabova, 2010; Bessarabova et al., 2013). Specifically, Bessarabova and colleagues (2013) found restoration postscripts to be effective in reducing the effects of reactance for high-threat messages. They found high-threat messages that included a restoration message were as persuasive as low-threat messages for behavioral intentions and even more persuasive than low-threat messages for attitudes (Bessarabova et al., 2013). Thus, in an effort to further understand the effects restoration postscripts have on the reactance process; this study will include a restoration postscript as a way to restore autonomy and diminish the perceived threat of the persuasive message.

However, Bessarabova and colleagues (2013) found that low-threat messages that included a restoration postscript actually increased the effects of reactance. The authors suggest that in the high-threat condition, the restoration postscript may remind individuals it is still their decision to accept the recommendations of the message; but in the low threat condition, individuals may be unaware of the persuasive intent of the message until the restoration postscript brings attention to the fact that there was an attempt to influence their attitudes, thereby, increasing the effects of reactance (Bessarabova et al., 2013). Therefore, an interaction effect between forceful language and restoration postscript is predicted:

H3: There is an interaction between forceful language and restoration postscripts, such that forceful language paired with restoration postscripts (a) reduces reactance as measured by anger and (b) negative cognitions compared to restoration postscripts paired with non-forceful language.

H4: There is an interaction between forceful language and restoration postscripts, such that forceful language paired with restoration postscripts (a) elicits positive attitudes and (b) increases behavioral intentions compared to restoration postscripts paired with non-forceful language.

Considering a great deal of reactance research has recommended that persuasive messages avoid generating reactance, providing a prescript as a form of alternative restoration may be a way to avoid eliciting reactance prior to the persuasive message. Thus, a simple, yet interesting, advancement of C. H. Miller et al.'s (2007) recommendation to investigate alternative restoration scripts is to provide a restoration prescript. A restoration prescript utilizes the same language as a restoration postscript; however, the brief message is placed at the beginning of persuasive messages (see Appendix B). S. S. Brehm and Brehm (1981) suggested that changing the position of threat within a message could be a useful way of assessing motivational and cognitive components of reactance. Silvia (2006) found differences between counter-arguing and altering the temporal position of a threat in a message.

Although adding a prescript to a persuasive message seems like a logical message design to avoid eliciting reactance, previous research suggests that forewarning may increase reactance by making a future threat to an individual's

freedom salient (Benoit, 1998; Chen, Reardon, Rea, & Moore, 1992). Specifically, Chen and colleagues (1992) found that forewarning and exposure to a weak message produced more negative thoughts than unwarned participants or participants who were warned and exposed to a strong message.

Given the connection between forewarning and message rejection, recent research has focused on the connection between inoculation theory (McGuire, 1964) and TPR. For example, Richards and Banas (2011) conducted two studies to inoculate against reactance; that is, they provided individuals with a message that warned them that they might experience reactance after being exposed to a persuasive message. In the first study, they found that individuals inoculated against reactance felt less threatened and angered, yet reported greater intentions to engage in drinking behavior. In the second study, the authors found that when individuals were inoculated with a more explicit forewarning threat of reactance, they reported increased intentions to drink and decreased efficacy to control drinking behavior (Richards & Banas, 2011). Although the authors suggest that inoculating against reactance may elicit more reactance, their findings are not all that surprising considering the more explicit the language that was used to warn the participants, the more likely the participants felt the need to restore their threatened freedom. In addition, the first study may indicate both that forewarning diminished an antecedent to reactance (i.e., perceived threat) and that a variable that comprises reactance was reduced (e.g., anger).

Another recent study to examine the connection between inoculation and reactance focused on generating reactance to increase resistance to persuasion (C. H. Miller et al., 2013). While the vast majority of TPR literature has focused on avoiding

generating reactance, C. H. Miller and colleagues (2013) deliberatively elicited reactance as a means to "*cultivate* resistance by exploiting reactant anger and negative cognitions" (p. 131). The authors found that reactance increased resistance outcomes associated with inoculation and resulted in less attitude change.

Although the aforementioned studies seem to support previous research suggesting forewarning may increase resistance, there is some evidence to suggest that not all forewarning increases resistance to persuasion. For example, a meta-analysis (Wood & Quinn, 2003) found that forewarning might shift attitudes closer to the ones advocated by a persuasive message. Other research suggests that when forewarned, individuals may shift their attitudes to avoid the impending resistance in an effort to lessen the impact of the persuasive message (Quinn & Wood, 2004). In addition, a recent meta-analysis of inoculation research conducted by Banas and Rains (2010) found that threat (as well as involvement and time delay) was not predictive in conferring resistance in the manner many past inoculation narratives had suggested[4].

Thus, despite some research suggesting that forewarning of an impending attack on an attitude may increase counter-arguing, a prescript designed to confer and bolster autonomy may minimize the perceived threat of the message. In fact, Benoit (1989) suggested persuaders consider compensating forewarning messages with additional information that emphasizes "the audience's best interests […] or simply ask the audience to keep an open mind" (pp. 147-148). It is possible that providing a restoration prescript will meet Benoit's (1989) recommendations. To date, no research has attempted to use the exact language of the restoration postscript in the form of a

restoration prescript in an effort to reduce perceived threat and restore freedom. Thus, an interaction effect between forceful language and restoration prescripts is predicted:

> H5: There is an interaction between forceful language and restoration prescripts, such that forceful language paired with restoration prescripts (a) reduces reactance as measured by anger and (b) negative cognitions compared to restoration prescripts paired with non-forceful language.

> H6: There is an interaction between forceful language and restoration prescripts, such that forceful language paired with restoration prescripts (a) elicits positive attitudes and (b) increases behavioral intentions compared to restoration prescripts paired with non-forceful language.

Although providing a restoration script should bolster autonomy and minimize the perceived forcefulness of a message, it is unclear whether a prescript or postscript will be better at reducing reactance; therefore, the following research question is proposed:

> RQ1: Which restoration script is more effective at reducing reactance, a restoration prescript or postscript?

Effects of Reactance over Time. Very little research has focused on how the effects of reactance may develop over time. For example, early research of group influence processes by J. W. Brehm and Mann (1975), found that group pressure to conform was removed by informing participants the group processes had ended. The time delay between the threat to conform to the group and being told the group

processes were over increased positive attitudes and attractiveness of the group (J. W. Brehm & Mann, 1975)

In a two-part experiment examining the temporal order of threats, Silvia (2006) found that agreement diverged from Time 1 and Time 2. Although the author did not find a difference between the order of threats and disagreement with the message at Time 1, in the second study, he did find that a threat positioned at the beginning of a message was more persistent over time and that agreement did not change over time. However, a threat positioned at the end of the message increased agreement after the participants believed the persuasive portion of the experiment had concluded.

More recently, Bessarabova (2010) measured reactance immediately after a message, at a one-minute delay, and at a two-minute delay. The author found that at the two-minute delay in the high-threat with restoration condition, attitudes and behavioral intentions were almost the same as the reports for attitudes and behavioral intentions recorded at the immediate time measurement. Thus, the effects of reactance may not be persistent over time (Bessarabova, 2010). In fact, C. H. Miller and colleagues (2013) suggest that "the immediate experience of psychological reactance is of relatively short duration […], people seek the immediate restoration of freedom, they do not wait hours, or days, much less weeks" (pp.148-149). This raises important theoretical implications for TPR; namely, if the effects of reactance continue to decay over time then avoiding generating immediate reactance with explicit messages may not be necessary. Additionally, if a restoration script (either prescript or postscript) can help mitigate reactance, then devising messages that are both explicit and that contain a restoration script may facilitate comprehension for the target audience without the

danger of reactance influencing future attitudes and behaviors. Bessarabova (2010) suggests that the effects of reactance should be measured over longer periods of time. Thus, this study also seeks to examine how reactance may develop over a week:

RQ2: Measuring immediately after the message, after 3 days, and after 7 days, will there be any differences in reports (a) attitudes and (b) behavioral intentions?

Topic. Although some TPR research has focused on one topic in the message design (Grandpre et al., 2003; C. H. Miller et al., 2006; C. H. Miller et al., 2007; Quick, 2012; Quick & Kim, 2009; Quick et al., 2011; Quick & Stephenson, 2008; Rains & Turner, 2007; Reinhart, 2007; Scott & Quick, 2012; Shen, 2012; Silvia, 2005; Silvia, 2006) other research has utilized two topics in their message design (Dillard & Shen, 2005; C. H. Miller et al., 2013; Quick & Considine, 2008; Quick & Stephenson 2007a; Quick & Stephenson 2007b) In an effort to use a more "dependable, efficient, and practical means for gathering the requisite evidence for dependable generalizations" (Jackson, O'Keefe, & Jacobs, 1988, p.127), this study uses two topics. The messages crafted by Quick and Considine (2008) were specifically targeted for individuals using a gym. However, the topics of weightlifting and group exercise are not likely to be behaviors that many people readily participate in outside of the gym environment. Recall that in order for individuals to have a freedom threatened, they must feel as if they can engage in a particular behavior. Thus, in an effort to increase the likelihood that individuals will feel like they can engage in the behaviors being threatened by the messages of the current study, the topics have been changed to

exercise and nutrition, two behaviors that individuals can engage in regardless of their affiliation with a gym.

Chapter 3: Method

The purpose of this study is twofold; first to examine the effects of forceful and non-forceful language and the use of prescript and postscript messages on the reactance process. Second, to investigate the role time may play on the effects of reactance. Thus, this study is a 3 (restoration: prescript vs. restoration postscript vs. control) × 2 (language: forceful vs. non-forceful language) ×2 (topic: exercise vs. nutrition) mixed-model design. Prior to conducting the main study, a Pilot Study was conducted to test the effects of the message design.

Pilot Study

Participants. Participants were recruited from the Department of Communication at the University of Oklahoma. The Pilot Study was posted on the departmental research website. The department uses SONA, an online experiment management system. Participants were able to sign up for this Pilot Study using a unique 4 digit identification number that is not associated with any other identifying information. Participants that signed up for the study received a reminder email containing the location, time, and date of their appointment. Data was collected via computer using Qualtrics in a computer lab. Qualtrics is an online survey platform. Participants completing this Pilot Study received extra credit to be applied to a communication course.

A total of $N = 49$ participants were recruited from the communication research opportunities pool. Fifty-five percent were female ($n = 27$) and forty-four percent were male ($n = 22$). Ages ranged from 18 to 23 with a mean 19.68 ($Mdn = 19$; $SD = 1.35$).

Sixty-seven percent (*n* = 26) identified as White/Caucasian, 10% (*n* = 4) identified as Asian, 8% (*n* = 3) identified as African American, 8% (*n* = 3) identified as Native American, 5% (*n* = 2) identified as Hispanic, and 3% (*n* = 1) identified as other. Thirty-six percent (*n* = 14) were Freshman, 28% (*n* = 11) were Sophomores, 18% (*n* = 7) were Juniors, 15% (*n* = 6) were Seniors, and 3% (*n* = 1) identified as a Graduate Student.

Procedures. Participants completed this Pilot Study in person at a computer lab using Qualtrics. After consenting to the study, participants were randomly assigned to one of 12 conditions (see Appendix C). As predicted by TPR, forceful language generated more perceived threat (*M* = 4.66, *SD* = 1.30) than non-forceful language (*M* = 2.92, *SD* = 1.19), more anger (*M* = 2.04, *SD* = 1.23) than non-forceful language (*M* = 1.51, *SD* = 1.09), and more negative cognitions (n = 19, *M* = 1.89, *SD* = .658) than non-forceful language (n = 8, *M* = 1.38, *SD* = .518). However, forceful language produced slightly higher attitudes (*M* = 6.6, *SD* = .477) than did non-forceful language (*M* = 6.5, *SD* = .498) and slightly higher behavioral intentions (*M* = 74.21, *SD* = 22.12) than did non-forceful language (*M* = 64.15, *SD* = 29.14). Thus, it was determined that the modified forceful messages were successful at eliciting perceived threat and reactance.

Main Study

Data Screening and Transformation. Prior to analysis, data was screened for missing data and outliers. After screening, data was transformed to meet the assumption of normality necessary for general linear modeling (Fink, 2009).

Missing data was accessed by examining the univariate descriptive statistics in SPSS (Tabachnick & Fidell, 2007) as well as the missing values analyses. These

analyses determined the data was missing completely at random. For Time 1, there was a total of 13 missing data points. These missing items were not replaced with a value.

The data was inspected for outliers. An outlier is a value so extreme or strange that it distorts statistics (Tabachnick & Fidell, 2007). Outliers were determined by examining the descriptive statistics as well as histograms with normality plots tests. Examination of these analyses determined there were no outliers for this data.

Normality of data is a key assumption of any multivariate analysis, particularly when the objective is inference (Tabachnick & Fidell, 2007). Normality is the assumption that a dependent variable is normally distributed, for multivariate normality; this includes all dependent variables and all linear combinations of the variables (Tabachnick & Fidell, 2007). Normality was determined by examining the skewness and kurtosis of each dependent variable (Tabachink & Fidell, 2007). Again, histograms with normality plots tests were used and it was determined that many of the continuous dependent variables were non-normal.

Continuous dependent variables that were determined to be non-normal were transformed in an effort to meet the assumption of normality (Fink, 2009). A trial and error method (Fox, 1997) was used to determine the best possible equation for each transformation. Although all of the transformations reduced skewness, not all of the transformations were successful in achieving normality. The transformations of dependent variables are discussed below. Transformations did not result in any differences in significant findings.

Participants. Participants were recruited from the Department of Communication undergraduate research pool at the University of Oklahoma. Using G*Power 3.1 (Faul,

Erdfelder, Buchner, & Lang, 2007), a power analysis was calculated to determine the appropriate sample size. With alpha set at .05 and power set a .95, using an effect size of .10, G*Power analysis estimated a sample size of $N = 264$. Participants for the Main Study were collected using the same procedures as the Pilot Study.

A total of $N = 396$ participants were recruited from the communication research opportunities pool. Fifty-three percent were female ($n = 212$) and forty-six percent were male ($n = 184$). Ages ranged from 18 to 43 with a mean 19.80 ($Mdn = 19$; $SD = 1.931$). Seventy-six percent ($n = 302$) identified as White/Caucasian, 7% ($n = 27$) identified as African American, 6% ($n = 25$) identified as Asian, 6% ($n = 23$) identified as Hispanic, 3% ($n = 13$) identified as Native American, 5% ($n = 5$) identified as other, and 1 person identified as Pacific Islander. Twenty-eight percent ($n = 110$) were Freshman, 39% ($n = 154$) were Sophomores, 21% ($n = 84$) were Juniors, and 12% ($n = 48$) were Seniors.

Procedures. Participants completed the Main Study in person at a computer lab using Qualtrics. After consenting to the study, participants were randomly assigned to one of 12 conditions (see Appendix C). After reading the message, participants completed several questionnaires. This portion of the Main Study will be referred to as Time 1. Participants were reminded they needed to complete another set of questionnaires in three days (Time 2) and another set of questionnaires in seven days (Time 3) online. E-mail notifications were automatically generated and sent from the online experiment management system (SONA) reminding participants to complete the second and third set of questionnaires.

Measures.

Perceived threat. Perceived threat to freedom was measured to ensure that messages with forceful language were perceived as a threat (Dillard & Shen, 2005). On a 7 point scale (1 = strongly disagree to 7= strongly agree), perceived threat was measured with a 4-item scale. The items included ‘‘The message tried to manipulate me,” “The message tried to pressure me,’’ “The message threatened my freedom to choose,” and “The message tried to make a decision for me” (α = .87 for exercise topic; α = .88 for nutrition topic). Items for this measure were transformed (see Table 1) using the following formula: item transformed = (original item+1)$^{1.9}$.

Reactance. Recall that reactance is comprised of anger and negative cognitions. The following items were used to measure these components of reactance.

Anger. Anger arousal was assessed using a 4-item index (irritated, angry, annoyed, and aggravated; α =.92; Dillard & Shen, 2005) measured on a 7-point scale (where 1 = none of this feeling and 7 = a great deal of this feeling). Items for this measure were transformed (see Table 2) using the following formula: item transformed = ln(original item+.01).

Negative cognitions. For cognitive responses, participants were given 90 seconds to write down the thoughts they had while reading the message (Quick & Considine, 2008; Quick & Stephenson, 2007b; Quick & Stephenson, 2008; Rains & Turner, 2007). The participant-as-coder method was employed in which participants identify 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; see Petty, Ostrom, & Brock, 1981; Quick & Considine, 2008; Quick &

Stephenson, 2007b; Quick & Stephenson, 2008; Rains & Turner, 2007)[2]. To avoid confounding the measures of cognition and affect, thoughts indicating affect were identified using the list of affective terms compiled by Shaver, Schwartz, Kirson, and O'Connor (1987) and removed from the data set. Cognitions labeled as unfavorable were considered negative cognitions. The total number of negative cognitions was used as the cognitive component of state reactance.

Attitudes. Attitudes were measured using the 7-point semantic differential scale used by Dillard and Shen (2005). Attitudes were measured both before and after participants read the promotional message so that they could be co-varied. Participants were asked how bad/good, foolish/wise, unfavorable/favorable, negative/positive, undesirable/desirable, unnecessary/necessary, and detrimental/beneficial is exercise or nutrition ($\alpha = .88$ for exercise topic; $\alpha = .84$ for nutrition topic). Attitudes were also measured at three days (Time 2: $\alpha = .84$ for exercise topic; $\alpha = .85$ for nutrition topic) and seven days (Time 3: $\alpha = .84$ for exercise topic; $\alpha = .88$ for nutrition topic) after participation in Time 1. Items for this measure were transformed (see Table 3, Table 4, and Table 5) for all Times using the following formula: item transformed = (original item+1)[3].

Behavioral Intentions. Using the same technique as Dillard and Shen (2005), behavioral intentions were measured using a 100-point, single-item estimate of the likelihood that participants will exercise or be nutritious in the following week or limit their exercise or nutritious behavior the following week. Behavioral intentions were measured both before and after participants read the promotional message so that they could be co-varied. In addition, behavioral intentions were measured three days (Time

2) and seven days (Time 3) after initial participation (Time 1). This item was transformed (see Table 6) for all Times using the following formula: transformed item = (original item+1)^3. This transformation resulted in the means for behavioral intentions being in the ten thousands. Thus, the transformed item was divided by ten thousand in an effort to adjust the means to a value more comparable with the values of other variables.

Chapter 4: Results

Induction Check

A univariate analysis of variance was performed to examine if forceful language was perceived as a threat to freedom (see Table 7). The results indicated a significant effect of forceful language on perceived threat, $F(1,392) = 158.702$, $p < .001$, $\eta^2 = .288$. Forceful language was perceived as more of a threat ($M_{.} = 28.78$; $SD = 12.33$, $n = 199$) compared to non-forceful language ($M = 14.91$; $SD = 9.26$, $n = 195$). Univariate analyses were also performed by topic, indicating that regardless of topic, forceful language was perceived as a threat (see Table 18 & Table 27).

Analysis

Results from a multivariate analysis indicated that there were no significant differences between participants who completed all 3 Times of the Main Study and participants that failed to complete all 3 Times of the Main Study (see Table 8).

A mixed-model design was used to test the hypotheses in this study, predicting the effects of forceful language, restoration scripts, and topic on reactance, attitudes, and behavioral intentions at Time 1 (see Table 9). Results indicated significant multivariate effects for forceful language, Wilks' $\lambda = .819$, $F(4, 130) = 7.19$, $p < .001$,

and for topic, Wilks' $\lambda = .840$, $F(4, 130) = 6.17$, $p < .001$. No other multivariate main effects or interactions were significant. Since multivariate analysis revealed a significant main effect for topic, the data set was split by topic and separate analyses were performed by topic[3]. Below, results from the analysis prior to splitting the data by topic are presented with differences between topics discussed. Tables for each analysis are provided.

Attitudes and Behavioral Intentions over Time (RQ2)

A mixed-model MANCOVA was performed with forceful language, restoration scripts, and topic used as between-subjects factors, time measured immediately after reading the message (Time 1), 3 days later (Time 2), and 7 days later (Time 3) used as the within-subjects factors, attitudes and behavioral intentions used as the dependent variables, and preliminary attitudes and behavioral intentions used as covariates (see Table 10 and Table 11). RQ2 asked if there would be any differences in attitudes and behavioral intentions over time. For within-subjects effects on attitudes and behavioral intentions, Mauchly's Test revealed violations in the sphericity assumption (for attitudes: Mauchly's $W = .971$, χ^2 (2) = 7.28, $p = .026$, and for behavioral intentions: Mauchly's $W = .822$, χ^2 (2) = 46.30, $p < .001$). Thus, results are reported with a Huynh-Feldt correction. There were no significant results for attitudes over time. For behavioral intentions, a Huynh-Feldt correction ($\varepsilon = .898$) was applied and the effect of the covariate was significant $F(1.79, 425.44) = 4.38$, $p = .016$ (see Figure 1) indicating that behavioral intentions were greater at Time 1 ($M_{Adj.} = 58.66$; $SE = .765$) and at Time 3 ($M_{Adj.} = 58.20$; $SE = 1.31$) than they were at Time 2 ($M_{Adj.} = 55.75$; $SE = 1.02$).

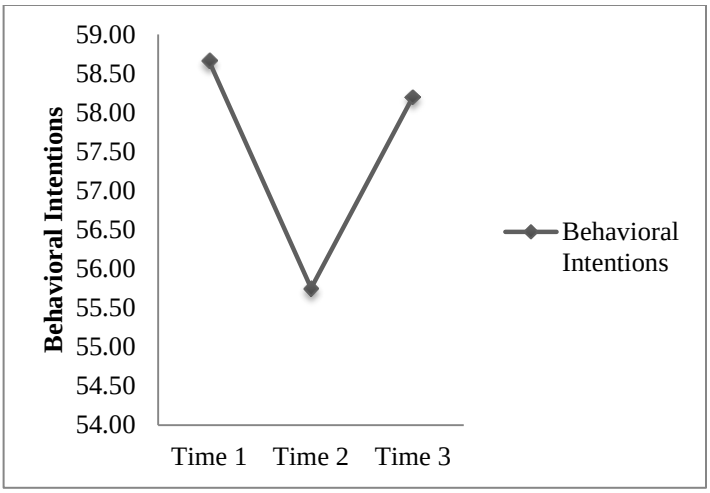


Figure 1. Behavioral Intentions over Time.

Examination of the univariate results $F(2, 237) = 4.08$, $p = .018$, $\eta^2 = .025$ (see Figure 2), indicated a significant script by time interaction. A polynomial contrast revealed that restoration prescripts elicited greater behavioral intentions ($M_{Adj.} = 60.28$; $SE = 1.41$) than did restoration postscripts ($M_{Adj.} = 58.04$; $SE = 1.43$) or messages without either restoration script ($M_{Adj.} = 54.30$; $SE = 1.55$).

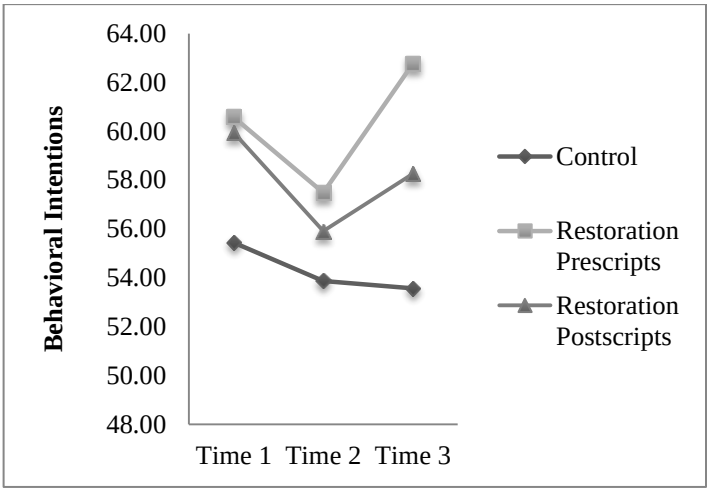


Figure 2. Script by Time Interaction.

When examined by topic (for exercise: see Table 20 and Table 21; for nutrition: see Table 29 and Table 30) there were no significant results for attitudes or behavioral intentions over time for either topic.

Hypothesis Testing

A post-hoc analysis of the MANOVA with a Bonferroni correction was used to test the hypotheses. H1 predicted that compared to non-forceful language, forceful language (a) elicits reactance as measured by anger and (b) negative cognitions (see Table 12). Examination of the univariate effects revealed a significant effect of forceful language on anger, $F(1, 133) = 14.40$, $p < .000$, $\eta^2 = .097$, indicating that forceful language elicited more anger ($M_{Adj.} = .955$; $SE = .054$) than non-forceful language ($M_{Adj} = .554$; $SE = .091$). A significant univariate effect of forceful language on negative cognitions was also found, $F(1, 133) = 12.21$, $p = .001$, $\eta^2 = .084$, indicating that forceful language elicited more negative cognitions ($M_{Adj} = 1.69$; $SE = .082$) than did non-forceful language ($M_{Adj} = 1.12$; $SE = .139$). Thus, H1 was supported.

When split by topic, univariate analysis revealed an effect of forceful language on anger and negative cognitions for the topic of exercise (see Table 22) and for the topic of nutrition (see Table 31), indicating that forceful language elicited more anger and negative cognitions than did non-forceful language for both topics.

H2 predicted that compared to non-forceful language, forceful language (a) generates more negative attitudes and (b) lowers behavioral intentions (see Table 12). A significant univariate effect for attitudes was found in the opposite direction of that predicted, $F(1, 133) = 5.19$, $p = .024$, $\eta^2 = .037$, indicating that forceful language generated more positive attitudes ($M_{Adj.} = 431.52$; $SE = 8.52$) than did non-forceful

language ($M_{Adj.}$ = 393.28; *SE* = 14.44). In addition, there was no support for H2b, $F(1, 133) = .070$, $p = .792$. Thus, H2 was not supported.

When split by topic, forceful language also generated more positive attitudes for the topic of exercise (see Table 22) but not for the topic of nutrition (see Table 31). There were no significant effects of forceful language on behavioral intentions for either topic.

Hypotheses 3 & 5. H3 predicted an interaction between forceful language and restoration postscripts, such that forceful language paired with restoration postscripts (a) reduces reactance as measured by anger and (b) negative cognitions compared to restoration postscripts paired with non-forceful language and H5 predicted an interaction between forceful language and restoration prescripts, such that forceful language paired with restoration prescripts (a) reduces reactance as measured by anger and (b) negative cognitions compared to restoration prescripts paired with non-forceful language (see Table 9). An examination of the multivariate effects revealed a non-significant effect for forceful language that included a restoration script on anger Wilks' $\lambda = .947$, $F(2, 133) = .963$, $p = .384$ or on negative cognitions, $F(2, 133) = .578$, $p = .562$. Thus, H3 and H 5 were not supported.

However, a univariate analysis revealed a significant effect for restoration scripts on negative cognitions, $F(2, 133) = 5.76$, $p = .004$, $\eta^2 = .079$ (see Figure 3), indicating that messages with restoration scripts produced fewer negative cognitions (for prescripts, $M_{Adj.}$ = 1.29; *SE* = .137; for postscripts, $M_{Adj.}$ = 1.16; *SE* = .166) than did messages without restoration scripts ($M_{Adj.}$ = 1.75; *SE* = .111).

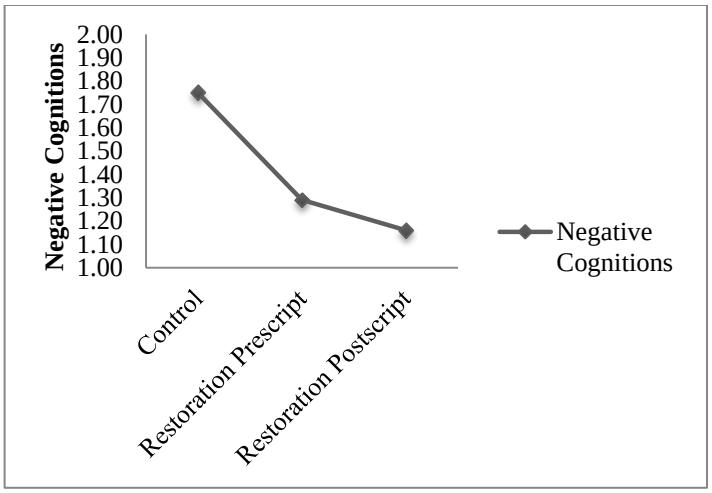


Figure 3. Effect of Restoration Scripts on Negative Cognitions.

RQ 1 asked which restoration script is more effective at reducing reactance, a restoration prescript or postscript (see Table 14). Although restoration scripts did not reduce anger, a post hoc analysis with a Bonferroni correction was used to determine if prescripts or postscripts were better at reducing negative cognitions. Since the comparisons were nonorthogonal, the significance level was divided for the analysis (.05/3 = .017). Results of the *t*-tests indicated that prescripts (M = 1.41; SD = .693) and postscripts (M = 1.25; SD = .508), both significantly reduced negative cognitions compared to messages without restoration scripts (M = 1.96; SD = 1.077) (prescripts: $t(111) = 2.99$, $p = .003$; postscripts: $t(99) = 3.52$, $p = .001$; see Table 15, Table 16, and Table 17). However, there was no significant difference between restoration prescripts (M = 1.41; SD = .693) and restoration postscripts (M = 1.25; SD = .508; $t(74) = 1.10$, $p = .275$.).

When split by topic, restoration prescripts and postscripts did not reduce anger for either topic (see Table 19 and Table 28). A univariate analysis revealed a significant effect of restoration scripts on negative cognitions for the topic of exercise

(see Table 23). Both restoration prescripts and postscripts reduced negative cognitions; however, there were no significant differences (see Table 24, Table 25, and Table 26) between restoration prescripts and postscripts for the topic of exercise. For the topic of nutrition, neither restoration prescripts nor postscripts (see Table 32) reduced anger or negative cognitions.

Further examination of the univariate effects (see table 13) revealed a significant effect for topic on anger, $F(1, 133) = 5.619$, $p = .019$, $\eta^2 = .040$, indicating that the topic of nutrition elicited more anger ($M_{Adj.} = .880$; $SE = .065$) than did the topic of exercise ($M_{Adj.} = .629$; $SE = .083$).

Hypotheses 4 & 6. H4 predicted an interaction between forceful language and restoration postscripts, such that forceful language paired with restoration postscripts (a) elicits positive attitudes and (b) increases behavioral intentions compared to restoration postscripts paired with non-forceful language and H6 predicted an interaction between forceful language and restoration prescripts, such that forceful language paired with restoration prescripts (a) elicits positive attitudes and (b) increases behavioral intentions compared to restoration prescripts paired with non-forceful language. A univariate analysis found no significant interaction of language type and restoration script on attitudes, $F(2, 133) = 1.06$, $p = .384$ or on behavioral intentions, $F(2, 133) = .201$, $p = .818$. Thus, H4 and H6 were not supported. There were no significant differences for either topic.

Chapter 5: Discussion

H1 and H2 tested the effects of forceful language on anger and negative cognitions. Similar to other reactance research, the results of this study indicate that

forceful language elicits anger and negative cognitions. However, the results of this study did not replicate past research that has linked forceful language to more negative attitudes and decreases in behavioral intentions. A possible explanation for this finding is that the framing of these messages affected the reactance process. A gain-framed message emphasizes the advantages of compliance with a message while a loss-framed message emphasizes the disadvantages of noncompliance with a message (O'Keefe & Jensen, 2007). A meta-analysis on gain-framed messages and loss-framed messages found while both approaches are equally effective for disease detection messages, gain-framed messages are better at disease prevention messages compared to loss-framed messages (O'Keefe & Jensen, 2006). Similarly, a different meta-analysis of gain-framed and loss-framed messages found gain-framed messages to be more persuasive for a particular topic (dental hygiene); however, this meta-analysis found no significant differences in persuasiveness between gain-framed and loss-framed messages concerning certain topics (e.g., safe-sex, skin cancer prevention, diet and nutrition behaviors; O'Keefe & Jensen, 2007).

Past reactance studies have often utilized loss-framed messages as a way of threatening free behaviors. The current study utilized gain-framed messages for both topics. Thus, despite forceful language generating reactance (anger and negative cognitions), it is possible that the gain-framed messages reduced the effects of reactance on attitudes and behavioral intentions. In conjunction with restoration scripts, perhaps gain-framed messages help to minimize the effects of reactance on attitudes and behavioral intentions.

H3 and H5 tested the interaction of language type (forceful vs. non-forceful) and restoration scripts (prescript vs. postscript) on anger and negative cognitions. Restorations scripts were unsuccessful at reducing anger. In fact, the topic of nutrition elicited more anger than the topic of exercise. A possible explanation for these differences is included in the discussion below.

Although H3 and H5 were not fully supported, results indicate that the inclusion of restoration scripts reduced negative cognitions. Specifically, both restoration prescripts and restoration postscripts successfully reduced negative cognitions compared to the control group; however, there were no differences between the restoration scripts. Seemingly, one component of reactance can be mitigated (negative cognitions) while the other one (anger) is unaffected. Thus, despite feelings of anger after having a freedom threatened, restoration scripts managed to reduce negative cognizing about the threatened freedom. As pervious research has suggested, individuals seek immediate restoration of freedom (C. H. Miller et al., 2013). Restoration scripts may provide that immediate restoration for the cognitive component of reactance.

H 4 and H 6 tested the interaction of language type (forceful vs. non-forceful) and restoration scripts (prescript vs postscript) on attitudes and behavioral intentions and did not find any significant results in the direction predicted. In fact, forceful language was associated with an increase in positive attitudes. Perhaps non-forceful messages were considered less credible compared to forceful messages. Although neither forceful nor non-forceful messages contained any evidence to support the beneficial claims of conforming to the message, it is possible that forceful messages

were perceived as more credible because of they also contained an amount of lexical concreteness. Lexical concreteness refers to language that provides specific details and descriptive-action verbs (Miller et al., 2007). Miller and colleagues (2007) found the use of concrete language was more demanding of attention and resulted in the message source being perceived as more expert and more trustworthy compared to abstract language. The messages of this study specifically name risk factors reduced by complying with the message (i.e., diabetes, obesity, respiratory diseases, and cardiovascular diseases). The inclusion of these specific illnesses may have been enough to provide the messages of this study with a level of lexical concreteness. Lexical concreteness, when combined with forceful language, may increase perceptions of credibility, trustworthiness, and expertise of the message source regardless of evidence; thereby increasing reports of positive attitude toward the topic of the message.

There are likely very few individuals who disagree with the overall messages of this study: that exercise and nutrition are beneficial. Thus, it is possible that normative social influence (Asch, 1956) impacted the results with regard to attitudes and behavioral intentions. Recent research investigating normative social influence has found that communicating a descriptive norm via written text is sufficient to induce conformity (Parks, Sanna, & Berel, 2001). Participants may have felt pressured to respond to the topics with the social norm (i.e., positively) on the attitudes and behavioral intentions metrics. In fact, it is possible that the messages themselves reminded participants what the social norms are regarding exercise and nutrition. Thus, despite forceful language generating reactance, attitudes and behavioral intentions

were not negatively affected because of the social norms associated with the topics of exercise and nutrition. Additionally, anger may have persisted for those receiving forceful messages and restoration scripts because they felt socially compelled to agree with the message, thereby limiting their freedoms and reintroducing reactance.

There was also an interaction effect between restoration scripts and behavioral intentions indicating that restoration scripts elicited greater behavioral intentions at Time 1 and Time 2 compared to Time 3. Although not a true boomerang effect, the quadratic relationship between restoration scripts and behavioral intentions follows a similar pattern. Additionally, past research has demonstrated a connection between reactance and a *sleeper effect*. A sleeper effect is the notion that messages lacking credibility may become more persuasive over a time delay (Hovland & Weiss, 1951). An argument to explain this phenomenon suggests that over time, individuals tend to disassociate the content and the source of the message (Hovland & Weiss, 1951). As mentioned previously, the messages from this study did not include any evidence to support the claims. Although lexical concreteness and forceful language may have increased initial attitudes, it is likely that increases in behavioral intentions at Time 3 are associated with a sleeper effect. Recall that restoration scripts reduced negative cognitions. If negative cognitions were reduced then participants may have spent less time thinking about the messages once the study was over, increasing the likelihood that they would disassociate the content and the source of the message over time.

The data was split by topic (exercise vs. nutrition) and all of the hypotheses were retested. Support for H1 was found for both topics: forceful language elicited anger and negative cognitions. Results for the exercise condition mirrored many of the

results of the Main Study before splitting the data. Specifically, restorations scripts reduced negative cognitions compared to the control group. No differences were found between restoration prescripts and postscripts; they were equally successful at reducing negative cognitions compared to the control group. In addition, forceful messages were associated with more positive attitudes. As mentioned previously, participants may have felt socially compelled to respond with favorable attitudes towards these topics.

For the nutrition condition, there were no other significant results. As mentioned previously, prior to splitting the data by topic, the nutrition condition elicited more anger compared to the exercise condition. In addition, neither restoration prescripts nor restoration postscripts were successful at mitigating reactance. Perhaps these differences are due in part to the conceptualization of each topic. Typically, the concept of exercise is concrete and well understood. There are likely few differences between what an individual perceives to be exercising. Although there are various ways to exercise, there are probably few disagreements on what constitutes exercise. For example, one individual may walk 20 minutes a day and another individual may be training for a marathon; however, they are both likely to consider their activities exercise compared to more sedentary behavior.

Conversely, the concept of nutrition is much more abstract and not necessarily well defined for most individuals. Despite individuals perceiving they are being nutritious, they may not fully understand what constitutes this concept. For example, one individual could have a salad for lunch and another individual could have a burger for lunch. In fact, these individuals could have lunch together and have entirely different perceptions about whose lunch was more nutritious. Also, it should be noted

that depending on the contents of each item ordered, it is possible that the salad was more nutritious but less healthy or that the burger was less nutritious and more healthy. In short, being healthy and being nutritious are likely confounded to some degree. For many, the concept of being healthy may resonate more with lifestyle choices, while being nutritious may simply refer to the types of foods eaten.

In addition, it is likely difficult to feel self-efficacious if the concept of the persuasive message is too abstract. Self-efficacy (Bandura, 1977) is a term used to describe "one's perceived power over, or confidence in, dealing with an environmental obstacle" (Szabo & Pfau, 2002, p. 241). Thus, if individuals do not feel the ability to follow the recommendations of the persuasive message; they may become angry or frustrated. In addition, not feeling in control, or not feeling autonomous of one's decision-making is a treat to freedom. Thus, one reason the topic of nutrition elicited more anger is because not feeling in control of decision-making elicits reactance. Similarly, restoration scripts may have been unsuccessful because participants did not feel self-efficacious to comply with the recommendations of the message, so anger and negative cognitions could not be reduced.

Limitations

There are a few limitations to this study. First, this study suffered from attrition at Time 2 and Time 3 for both attitudes and behavioral intentions. However, a multivariate analysis indicated there were no significant differences between participants that completed all 3 Times and participants that failed to complete all 3 Times. Second, there was a ceiling effect for several variables. Many of the items in this study were skewed; suggesting many of the variables reached a ceiling effect. A

ceiling effect is a term used to describe when responses are compressed toward the upper limit of a measure (Reinard, 2006). Although data transformations helped some of these items, others were still severely skewed regardless of data transformation. Perhaps the utilization of different metrics would be helpful in obtaining more variance in the data. Last, it is possible that the topics themselves did not lend themselves to adverse attitudes and behavioral intentions regardless of whether the message generated reactance.

Implications and Future Directions

There are some important implications for future research. The results of this study indicate that restoration scripts can influence behavioral intentions over time. Specifically, restoration prescripts may increase behavioral intentions several days after individuals are given a persuasive message. Reducing negative cognitions after exposure to a persuasive message may help to facilitate message acceptance and promote future behavioral intentions. However, why prescripts rather than postscripts were successful at influencing behavioral intentions remains unclear.

Recall that past research has suggested restoration postscripts may remind individuals they have a choice of message acceptance for high-threat messages and for low-threat messages restoration postscripts may increase their awareness of the persuasive intent of the message (Bessarabova et al., 2013). In mitigating negative cognitions, perhaps restoration prescripts avoid generating the persuasive awareness associated with restoration postscripts. If negative cognitions are minimized, individuals may feel more inclined to comply with the persuasive message after the initial effects of reactance have had time to decay. More research is needed to elucidate

the effects that restoration scripts and reactance may have on attitudes and behavioral intentions over time.

Restoration scripts were also successful at reducing negative cognitions, a key component of reactance. Although past research has demonstrated some success utilizing restoration postscripts, this was the first attempt at using the same language as a postscript in the form of a prescript to mitigate reactance. This study demonstrates that restoration prescripts are as effective as restoration postscripts in reducing negative cognitions. Thus, it may be possible to utilize forceful language with restoration scripts as a means of clearly conveying the persuasive request, while reducing negative cognitions and diminishing some of the other associated negative effects of reactance.

Although negative cognitions were reduced, anger was not affected by restoration scripts. Considering reactance is comprised of both anger and negative cognitions, future research should continue to examine if restoration scripts are successful at reducing both anger and negative cognitions. In addition, future research may want to examine if it is necessary to reduce both anger and negative cognitions in order to minimize the effects of reactance and increase persuasion. Anger is likely to diminish without repeated exposure to the stimulus that elicited anger, so focusing on reducing negative cognitions may be important for future persuasive research. Conversely, if anger is not diminished but negative cognitions are reduced, anger may not be internalized and could possibly be focused away from the message.

Further examination is needed to examine if other message designs or other combinations of restoration scripts are successful at mitigating reactance. For example, combining both restoration prescripts and postscripts was not examined; it is possible

that this combination could reduce reactance and increase persuasion. Restoration scripts could also be intertwined in the persuasive message rather than simply appear before or after a persuasive message. For example, a persuasive message could insert a restoration line immediately following each forceful sentence or persuasive claim. Breaking up the content of a persuasive message with the content of a restoration script may even reduce perceived threat for forceful messages.

Another interesting finding of this study was the differences between topics. Specifically, the topic of nutrition elicited more anger and restoration scripts failed to reduce anger or negative cognitions for the nutrition topic. Although past research has been successful at inducing reactance with multiple topics (Dillard & Shen, 2005; C. H. Miller et al., 2013; Quick & Considine, 2008; Rains & Turner, 2007), future research may wish to investigate the effects of restoration scripts on various topics. In particular, research should investigate if there are differences between concrete and abstract topics. As mentioned previously, the topic of exercise may be more concrete, understandable, or even salient compared to the topic of nutrition.

Of particular concern to reactance scholars is the generalizable and scope of TPR given the findings of this study. Although finding differences in topic may be unique to this study, it warrants further examination. If there are differences of reactance effects by other topics, then boundary conditions of TPR may need to be revised. In addition to replicating the findings of this study, future research should examine if topic alone or topic in conjunction with other variables affect the reactance process.

For example, future exploration could investigate the effects that language type and topic have on the reactance process. Despite past research warning against the use of forceful language, it is possible that forceful language combined with lexically concrete language is perceived as more credible or is more persuasive than passive language for particular topics. There may also be differences between topics that advocate behaviors and messages that are opposed to particular behaviors.

For example, forceful messages that promote a particular behavior may differ from forceful messages that restrict a particular behavior. Perhaps forceful messages that advocate behavior (as opposed to restrict behavior) still generate reactance but avoid the associated effects of reactance, minimizing the impact of reactance on attitudes and behavioral intentions. Combined with restoration scripts, forceful messages that advocate behavior may be more persuasive than forceful restricting messages. Research interested in mitigating reactance may have several options available to reduce the effects of messages that generate reactance.

Last, although TPR and recent reactance research postulates rather straightforward paths for threats to freedom and reactance, the reactance process is likely much more intricate. Indeed, as researchers become increasingly more interested in mitigating reactance with restoration messages, studies indicate there are nuances for the effects of reactance and the restoration process. TPR has continued to grow and develop through each of the waves of research aforementioned, and areas of the theory are still being developed.

Conclusion

This study examined the effects of forceful language, restoration scripts, and topic on attitudes and behavioral intentions over time. The results of this study replicated previous research by using forceful language to generate a perceived threat and elicit reactance, as measured by state anger and negative cognitions. Interestingly, forceful language generated more positive attitudes for the exercise topic than for the nutrition topic. This study further examined the notion of providing restoration scripts as a means of mitigating reactance; finding that both restoration prescripts and postscripts were successful at reducing negative cognitions but not anger. However, when each topic of this study was examined separately, results indicate that neither restoration prescripts nor postscripts were successful at reducing anger or negative cognitions for the nutrition topic. In fact, prior to examining each topic separately, results indicate that the topic of nutrition generated more anger than did the topic of exercise. Additionally, restoration prescripts were associated with an increase in behavioral intentions over time, suggesting that the effects of reactance may not persistent over time. Results of this study suggest that for certain topics, the inclusion of restoration scripts are useful at diminishing negative cognitions, a key component of reactance.

Endnotes

[1] The term forceful language is used rather than threatening language to distinguish between language that attempts to force or control the decision-making process and language that threatens or alludes to punishment for noncompliance.

[2] Participants marked their own thoughts as neutral, favorable, or unfavorable. Unfavorable cognitions are considered negative cognitions.

[3] Analysis was conducted with both topics together, and then separate analyses were conducted for each topic.

[4] Threat in inoculation studies refers to a message warning participants of an impending attack on their attitudes.

Tables

Table 1. Means, Standard Deviations, Skewness, and Kurtosis for Perceived Threat.

Item	Untransformed				Transformed			
	M	*SD*	Skew-ness[a]	Kurt-osis[b]	*M*	*SD*	Skew-ness	Kurt-osis
The message tried to manipulate me.	3.99	1.88	-.164	-1.22	23.78	14.88	.236	-1.06
The message tried to pressure me.	4.32	1.88	-.285	-1.17	26.52	15.50	.093	-1.19
The message threatened my freedom to choose.	2.94	1.88	.706	-.793	16.14	14.26	1.10	.087
The message tried to make a decision for me.	3.61	2.02	.177	-1.38	21.22	15.81	.515	-1.06

Note. $N = 394$

[a] Standard error of skewness = .123

[b] Standard error of kurtosis = .245

Table 2 Means, Standard Deviations, Skewness, and Kurtosis for Anger.

Item	Untransformed				Transformed			
	M	*SD*	Skew-ness[a]	Kurto-sis[b]	*M*	*SD*	Skew-ness	Kurto-sis
Irritated	2.06	1.45	1.35	.994	.525	.610	.680	-.986
Angry	1.52	1.01	2.19	4.39	.620	.671	.514	-1.279
Annoyed	2.35	1.71	1.05	-.165	.400	.560	1.04	-.404
Agg-ravted	1.78	1.26	1.60	1.66	.285	.476	1.48	.934

Note. $N = 393$

[a] Standard error of skewness = .123

[b]Standard error of kurtosis ranged from .245 to .246

Table 3. Means, Standard Deviations, Skewness, and Kurtosis for Attitudes Time 1.

Item	Untransformed				Transformed			
	M	*SD*	Skew-ness[a]	Kurt-osis[b]	*M*	*SD*	Skew-ness	Kurt-osis
Bad/ Good	6.80	.545	-3.03	9.31	481.36	80.89	-2.64	6.17
Foolish/ Wise	6.69	.722	-2.62	7.16	464.93	101.44	-2.08	3.35
Unfavorable/ Favorable	6.31	1.03	-1.50	1.70	412.93	138.57	-1.01	-.389
Negative/ Positive	6.67	.648	-2.31	6.08	460.24	95.52	-1.73	2.27
Undesirable/ Desirable	5.84	1.33	-1.05	.493	354.47	161.63	-.419	-1.25
Unnecessary/ Necessary	6.21	1.05	-1.33	1.36	396.50	139.54	-.779	-.690
Detrimental/ Beneficial	6.75	.651	-2.97	9.11	473.81	92.20	-2.45	5.27

Note. $N = 394$
[a] Standard error of skewness = .123
[b]Standard error of kurtosis = .245

Table 4. Means, Standard Deviations, Skewness, and Kurtosis for Attitudes Time 2.

Item	Untransformed				Transformed			
	M	*SD*	Skew-ness[a]	Kurt-osis[b]	*M*	*SD*	Skew-ness	Kurt-osis
Bad/ Good	6.71	.713	-4.61	32.56	468.64	90.81	-2.19	4.93
Foolish/ Wise	6.67	.780	-3.64	19.00	462.85	100.94	-2.04	3.65
Unfavorable/ Favorable	6.28	1.05	-1.77	3.83	407.26	136.24	-.938	-.324
Negative/ Positive	6.67	.646	-2.05	3.85	460.25	96.88	-1.68	1.76
Undesirable/ Desirable	5.97	1.25	-1.31	1.81	369.29	153.82	-.547	-1.06
Unnecessary/ Necessary	6.36	.898	-1.39	1.73	415.46	126.13	-.903	-.484
Detrimental/ Beneficial	6.76	.562	-2.75	8.23	474.91	4.05	-2.25	4.50

Note. *N* = 297 to 298

[a] Standard error of skewness = .141

[b]Standard error of kurtosis ranged from .281to .282

Table 5. Means, Standard Deviations, Skewness, and Kurtosis for Attitudes Time 3.

Item	Untransformed				Transformed			
.	*M*	*SD*	Skew-ness[a]	Kurt-osis[b]	*M*	*SD*	Skew-ness	Kurt-osis
Bad/ Good	6.78	.521	-3.08	13.13	476.60	78.39	-2.22	4.81
Foolish/ Wise	6.74	.578	-2.42	6.03	470.55	87.42	-2.01	3.18
Unfavorable /Favorable	6.37	.967	-2.03	5.61	418.61	126.7	-1.07	.121
Negative/ Positive	6.71	.642	-2.21	4.17	4666.5	95.71	-1.93	2.46
Undesirable/ Desirable	6.15	1.16	-1.55	2.49	391.41	145.57	-.788	-.653
Unnecessary /Necessary	6.40	.945	-1.65	2.44	423.37	128.9	-1.13	-.003
Detrimental/ Beneficial	6.74	.708	-4.72	30.80	473.85	88.55	-2.54	6.95

Note. N = 285 to 286

[a] Standard error of skewness = .144

[b] Standard error of kurtosis = .287

Table 6. Means, Standard Deviations, Skewness, and Kurtosis for Behavioral Intentions (B.I.) at Time 1, Time 2 and Time 3.

Dependent Variable	Untransformed				Transformed			
	M	*SD*	Skew-ness[a]	Kurt-osis[b]	*M*	*SD*	Skew-ness	Kurt-osis
B.I. Time 1	75.42	24.64	-1.17	.915	56.77	35.16	-.062	-1.32
B.I. Time 2	74.05	24.95	-1.11	.626	54.52	34.69	.018	-1.23
B.I. Time 3	76.04	24.88	-1.21	1.01	58.12	35.63	-.109	-1.36

Note. B.I. 1 *N* = 392; B.I. 2 *N* = 295; B.I. 3 *N* = 279

[a] Standard error of skewness B.I. 1 = .123; B.I. 2 = .142; B.I. 3 = .146

[b]Standard error of kurtosis B.I. 1 = .246; B.I. 2 = .283; B.I. 3 = .291

Table 7. Univariate Analysis of Variance Forceful Language on Perceived Threat.

Dependent Variable	*df*	Error *df*	Mean Squared	*F*	Sig.	Eta Squared
Perceived Threat	1	392	18934.52	158.70	< .001	.288

Table 8. Analysis of Participant Attrition.

Variables	*df*	Error *df*	Wilks' Lamba	*F*	Sig.	Partial Eta Squared
Complete[a]	4	271	.468	76.965	.305	.018

[a]Complete is nominal variable comprised of participants who completed all 3 Times of the study and participants who failed to complete all 3 Times of the study.

Table 9. Multivariate Effects (H3-H6).

Independent Variables	*df*	Error *df*	Wilks' Lamba	*F*	Sig.	Partial Eta Squared
Topic	4	130	.840	6.17	< .001	.160
Forceful Language	4	130	.819	7.19	< .001	.181
Restoration Scripts	8	260	.892	1.91	.059	.056
Topic x Forceful Language	4	130	.994	.212	.931	.006
Topic x Restoration Scripts	8	260	.943	.962	.466	.029
Forceful Language x Scripts	8	260	.947	.900	.517	.027
Topic x Forceful Language X Restoration Scripts	8	260	.920	1.37	.207	.041

Table 10. Multivariate Effects of Attitudes over Time[a] (RQ2).

Variables	*df*	Error *df*	Wilks' Lamba	*F*	Sig.	Partial Eta Squared
Attitudes	2	245	.993	.872	.419	.007
Attitudes x ATT Covary[b]	2	245	.999	.103	.902	.001
Attitudes x Forceful Language	2	245	.996	.515	.598	.004
Attitudes x Restoration Scripts	4	490	.975	1.58	.178	.013
Attitudes x Topic	2	245	.989	1.36	.258	.011
Attitudes x Forceful Language x Restoration Scripts	4	490	.975	1.57	.179	.013
Attitudes x Forceful Language x Topic	2	245	.994	.769	.464	.006
Attitudes x Restoration Scripts x Topic	4	490	.967	2.08	.081	.017
Attitudes x Forceful Language x Restoration Script x Topic	4	490	.991	.569	.685	.005

[a] Mauchly's Test revealed violations in assumption of sphericity (Mauchly's $W = .971$, χ^2 (2) = 7.285, $p = .026$). A, Huynh-Feldt correction did not reveal any significance.
[b] ATT Covary stands for Attitudes as a covariate.

Table 11. Multivariate Effects of Behavioral Intentions (B.I.) over Time for (RQ2)[a].

Variables	*df*	Error *df*	Wilks' Lamba	*F*	Sig.	Partial Eta Squared
B.I.	2	236	.974	3.09	.047	.026
B.I. x BI Covary[b]	2	236	.974	3.15	.044	.026
B.I. x Forceful Language	2	236	.995	.59	.553	.005
B.I. x Restoration Scripts	4	472	.976\5	1.47	.208	.012
B.I. x Topic	2	236	.997	.308	.735	.003
B.I. x Forceful Language x Restoration Scripts	4	472	.993	.404	.806	.003
B.I. x Forceful Language x Topic	2	236	.984	1.89	.152	.016
B.I. x Restoration Scripts X Topic	4	472	.990	.609	.656	.005
B.I. x Forceful Language x Restoration Scripts x Topic	4	472	.997	.205	.935	.002

[a]Mauchly's Test revealed violations in assumption of sphericity (Mauchly's $W = .822$, χ^2 (2) = 46.30, $p < .001$). A, Huynh-Feldt correction was applied ($\varepsilon = .898$).
[b] BI Covary stands for Behavioral Intentions as a covariate.

Table 12. Univariate Effects of Language (H1 & H2).

Dependent Variables	*df*	Language	*M*	95% Confidence Level	
				Lower Bound	Upper Bound
Anger[a]	1,133	Forceful Language	.955	.849	1.06
		Non-forceful Language	.554	.375	.734
Negative Cognitions[b]	1,133	Forceful Language	1.69	1.52	1.85
		Non-forceful Language	1.12	.850	1.40
Attitudes (Time 1)[c]	1,133	Forceful Language	431.52	414.66	448.37
		Non-forceful Language	393.28	364.70	421.86
Behavioral Intentions (Time 1)	1,133	Forceful Language	50.77	43.76	57.79
		Non-forceful Language	48.93	37.04	60.82

[a] $p < .001$
[b] $p = .001$
[c] $p = .024$

Table 13. Univariate Effects of Topic.

Dependent Variables	*df*	Topic	*M*	95% Confidence Level	
				Lower Bound	Upper Bound
Anger[a]	1,133	Exercise	.629	.465	.793
		Nutrition	.880	.751	1.00
Negative Cognitions	1,133	Exercise	1.47	1.22	1.72
		Nutrition	1.34	1.14	1.54
Attitudes (Time 1)	1,133	Exercise	401.64	375.56	427.71
		Nutrition	423.16	402.64	443.68
Behavioral Intentions (Time 1)[b]	1,133	Exercise	61.87	51.03	72.72
		Nutrition	37.83	29.29	46.37

[a] $p = .019$
[b] $p = .001$

Table 14. Univariate Effects of Restoration Scripts (RQ1).

Dependent Variables	*df*	Restoration Scripts	*M*	95% Confidence Level	
				Lower Bound	Upper Bound
Anger	1,133	Control	.760	.617	.904
		Prescript	.740	.617	.904
		Postscript	.763	.617	.904
Neg Cogs[ab]	1,133	Control	1.75	1.53	1.97
		Prescript	1.29	1.02	1.57
		Postscript	1.16	.839	1.49
Attitudes (Time 1)	1,133	Control	422.02	399.24	444.81
		Prescript	413.35	385.12	441.57
		Postscript	401.83	367.75	435.90
BI[c] (Time 1)	1,133	Control	50.12	40.64	59.60
		Prescript	54.07	42.33	65.82
		Postscript	45.36	31.19	59.54

[a]Neg Cogs stands for Negative Cognitions.
[b] $p = .004$
[c] BI stands for Behavioral Intentions

Table 15. *t*-Test (RQ1) Control vs. Prescript.

Dependent Variable	Means Compared: Control vs. Prescript	*t*	*df*	*p*[a]
Neg. Cogs[b]	1.96 (*SD* = 1.077, *n* = 69) vs. 1.41 (*SD* = .693, *n* = 44)	2.99	111	.003

[a] A Bonferroni correction was used to adjust the significance level for each comparison being made. There were three planned comparisons for RQ1 (control vs. prescript; control vs. postscript; and, prescript vs. postscript), so the significance level for these analyses was set at (.05/3) to .017.

[b] Neg. Cogs stands for Negative Cognitions.

Table 16. *t*-Test (RQ1) Control vs. Postscript.

Dependent Variable	Means Compared: Control vs. Postscript	*t*	*df*	*p*[a]
Neg. Cogs[b]	1.96 (*SD* = 1.077, *n* = 69) vs. 1.25(*SD* = .508, *n* = 32)	3.527	99	.001

[a] A Bonferroni correction was used to adjust the significance level for each comparison being made. There were three planned comparisons for RQ1 (control vs. prescript; control vs. postscript; and, prescript vs. postscript), so the significance level for these analyses was set at (.05/3) to .017.

[b] Neg. Cogs stands for Negative Cognitions.

Table 17. *t*-Test (RQ 1) Prescript vs. Postscript.

Dependent Variable	Means Compared: prescript vs. postscript	*t*	*df*	*p*[a]
Neg. Cogs[b]	1.41 (*SD* = .693, *n* = 44) vs. 1.25 (*SD* = .508, *n* = 32)	1.101	74	.275

[a] A Bonferroni correction was used to adjust the significance level for each comparison being made. There were three planned comparisons for RQ1 (control vs. prescript; control vs. postscript; and, prescript vs. postscript), so the significance level for these analyses was set at (.05/3) to .017.

[b] Neg. Cogs stands for Negative Cognitions.

Table 18. Univariate Analysis of Variance Forceful Language on Perceived Threat for Exercise Topic.

Dependent Variable	*df*	Error *df*	Mean Squared	*F*	Sig.	Partial Eta Squared
Perceived Threat	1	195	9147.18	75.50	< .001	.279

Table 19. Multivariate Effects for Exercise Topic (H3-H6).

Independent Variables	*df*	Error *df*	Wilks' Lamba	*F*	Sig.	Partial Eta Squared
Forceful Language	4	58	.827	3.04	.024	.173
Restoration Scripts	8	116	.795	1.75	.092	.108
Forceful Language x Scripts	8	116	.861	1.12	.353	.072

Table 20. Multivariate Effects of Attitudes over Time for Exercise Topic (RQ2).

Variables	*df*	Error *df*	Wilks' Lamba	*F*	Sig.	Partial Eta Squared
Attitudes	2	111	.952	2.82	.064	.048
Attitudes x Covary ATT[a]	2	111	.974	.974	.233	.026
Attitudes x Forceful	2	111	.988	.988	.519	.012
Attitudes x Restoration Scripts	4	222	.953	.953	.255	.024
Attitudes x Forceful Language x Restoration Scripts	4	222	.974	.974	.570	.013

[a]Covary ATT stands for Attitudes used as a covariate.

Table 21. Multivariate Effects of Behavioral Intentions (B.I) over Time for Exercise Topic (RQ2)[a].

Variables	*df*	Error *df*	Wilks' Lamba	*F*	Sig.	Partial Eta Squared
B.I.	2	109	.958	2.33	.102	.042
B.I. x B.I. Covary[b]	2	109	.966	1.88	.157	.034
B.I. x Forceful Language			.986	.758	.471	.014
B.I. x Restoration Scripts	4	218	.978	.593	.668	.011
B.I. x Forceful Language x Restoration Scripts	4	218	.988	.315	.867	.006

[a] Mauchly's Test revealed violations in assumption of sphericity (Mauchly's $W = .603$, χ^2 (2) = 54.061, $p < .000$). A Huynh-Feldt correction did not reveal any significance.

Table 22. Univariate Effects of Language for Exercise Topic (H1 & H2).

Dependent Variables	*df*	Language	*M*	95% Confidence Level	
				Lower Bound	Upper Bound
Anger[a]	1,61	Forceful Language	.857	.689	1.02
		Non-forceful Language	.402	.078	.725
Negative Cognitions[b]	1,61	Forceful Language	1.75	1.50	1.99
		Non-forceful Language	1.19	.717	1.66
Attitudes (Time 1)[c]	1,61	Forceful Language	426.91	404.61	449.22
		Non-forceful Language	376.63	333.43	419.30
Behavioral Intentions (Time 1)	1,61	Forceful Language	63.75	51.38	76.11
		Non-forceful Language	60.00	36.20	83.80

[a] $p = .015$
[b] $p = .040$
[c] $p = .041$

Table 23. Univariate Effects of Restoration Scripts for Exercise Topic (RQ1).

Dependent Variables	*df*	Restoration Scripts	*M*	99.9% Confidence Level	
				Lower Bound	Upper Bound
Anger	2,61	Control	.674	.433	.904
		Prescript	.598	.272	.904
		Postscript	.617	.250	.904
Neg Cogs[ab]	2,61	Control	2.05	1.70	1.97
		Prescript	1.19	.716	1.57
		Postscript	1.16	.628	1.49
Attitudes (Time 1)	2,61	Control	409.90	377.26	444.81
		Prescript	412.79	369.57	441.57
		Postscript	382.93	334.14	435.90
BI[c] (Time 1)	2,61	Control	57.25	39.54	74.95
		Prescript	72.72	48.76	96.67
		Postscript	55.65	28.61	82.70

[a]Neg Cogs stands for Negative Cognitions.
[b] $p = .004$
[c] BI stands for Behavioral Intentions.

Table 24. *t*-Test for Exercise Topic (RQ1) Control vs. Prescript.

Dependent Variable	Means Compared: control vs. prescript	*t*	*df*	*p*[a]
Neg. Cogs[b]	2.34 (*SD* = 1.110, *n* = 35) vs. 1.29 (*SD* = .470, *n* = 17)	3.72	50	.001

[a] A Bonferroni correction was used to adjust the significance level for each comparison being made. There were three planned comparisons for RQ1 (control vs. prescript; control vs. postscript; and, prescript vs. postscript), so the significance level for these analyses was set at (.05/3) to .017.

[b] Neg. Cogs stands for Negative Cognitions.

Table 25. *t*-Test for Exercise Topic (RQ1) Control vs. Postscript.

Dependent Variable	Means Compared: control vs. postscript	*t*	*df*	*p*[a]
Neg. Cogs[b]	2.34 (*SD* = 1.110, *n* = 35) vs. 1.27 (*SD* = .458, *n* =15)	3.60	48	.001

[a] A Bonferroni correction was used to adjust the significance level for each comparison being made. There were three planned comparisons for RQ1 (control vs. prescript; control vs. postscript; and, prescript vs. postscript), so the significance level for these analyses was set at (.05/3) to .017.

[b] Neg. Cogs stands for Negative Cognitions.

Table 26. *t* -Tests for Exercise Topic (RQ1) Prescript vs. Postscript.

Dependent Variable	Means Compared: prescript vs. postscript	*t*	*df*	*p*[a]
Neg. Cogs[b]	1.29 (*SD* = .470, *n* =17) vs. 1.27 (*SD* = .458, *n* =15)	.167	30	.869

[a] A Bonferroni correction was used to adjust the significance level for each comparison being made. There were three planned comparisons for RQ1 (control vs. prescript; control vs. postscript; and, prescript vs. postscript), so the significance level for these analyses was set at (.05/3) to .017.

[b] Neg. Cogs stands for Negative Cognitions.

Table 27. Univariate Analysis of Variance Forceful Language on Perceived Threat for Nutrition Topic.

Dependent Variable	*df*	Error *df*	Mean Squared	*F*	Sig.	Partial Eta Squared
Perceived Threat	1	195	9770.52	83.18	< .001	.299

Table 28. Multivariate Effects for Nutrition Topic (H3-H6).

Independent Variables	*df*	Error *df*	Wilks' Lamba	*F*	Sig.	Partial Eta Squared
Forceful Language	4	69	.791	4.56	.003	.209
Restoration Scripts	8	138	.932	.614	.765	.034
Forceful Language x Scripts	8	138	.861	1.34	.228	.072

Table 29. Multivariate Effects of Attitudes over Time (RQ2) for Nutrition Topic[a].

Variables	*df*	Error *df*	Wilks' Lamba	*F*	Sig.	Partial Eta Squared
Attitudes	2	132	.991	.629	.535	.009
Attitudes x ATT Covary[b]	2	132	.982	1.19	.305	.018
Attitudes x Forceful Language	2	132	.982	1.17	.312	.018
Attitudes x Restoration Scripts	4	264	.936	2.22	.067	.033
Attitudes x Forceful Language x Restoration Scripts	4	264	.956	1.50	.202	.022

[a] Mauchly's Test revealed violations in assumption of sphericity ($W = .894$, χ^2 (2) = 14.725, $p = .001$). A Huynh-Feldt correction did not reveal any significance.
[b] ATT. Covary stands for Attitudes as a covariate.

Table 30. Multivariate Effects of Behavioral Intentions (BI) over Time for Nutrition Topic[a].

Variables	*df*	Error *df*	Wilks' Lamba	*F*	Sig.	Partial Eta Squared
B.I.	2	127	.979	1.34	.264	.021
B.I. x B.I. Covary[b]	2	127	.968	2.09	.128	.032
B.I. x Forceful Language	2	127	.970	1.97	.143	.030
B.I. x Restoration Scripts	4	254	.947	1.75	.139	.027
B.I. x Forceful Language x Restoration Scripts	4	254	.985	.493	.741	.008

[a] Mauchly's Test revealed violations in assumption of sphericity ($W = .920$, χ^2 (2) = 10.534, p =.005). A Huynh-Feldt correction did not reveal any significance.
[b] B.I. Covary stands for behavioral intentions as a covariate.

Table 31. Univariate Effects of Language for Nutrition Topic (H1 & H2).

Dependent Variables	*df*	Language	*M*	95% Confidence Level	
				Lower Bound	Upper Bound
Anger[a]	1,72	Forceful Language	1.05	.916	1.18
		Non-forceful Language	.707	.514	.900
Negative Cognitions[b]	1,72	Forceful Language	1.62	1.410	1.84
		Non-forceful Language	1.06	.750	1.37
Attitudes (Time 1)	1,72	Forceful Language	436.12	410.77	461.47
		Non-forceful Language	410.20	374.20	446.21
Behavioral Intentions (Time 1)	1,72	Forceful Language	37.80	30.25	45.35
		Non-forceful Language	37.86	27.15	48.58

[a] $p = .005$
[b] $p = .004$

Table 32. Univariate Effects of Restoration Scripts for Nutrition Topic (RQ1).

Dependent Variables	*df*	Restoration Scripts	*M*	95% Confidence Level	
				Lower Bound	Upper Bound
Anger	2,72	Control	.847	.676	1.01
		Prescript	.882	.698	1.06
		Postscript	.910	.660	1.15
Neg Cogs[a]	2,72	Control	1.46	1.18	1.73
		Prescript	1.40	1.11	1.70
		Postscript	1.16	.765	1.56
Attitudes (Time 1)	2,72	Control	434.85	402.81	466.89
		Prescript	413.91	379.68	448.14
		Postscript	420.72	374.20	467.24
BI [b] (Time 1)	2,72	Control	43.00	33.46	52.54
		Prescript	35.42	25.24	45.61
		Postscript	35.07	21.22	48.92

[a]Neg Cog stands for Negative Cognitions.
[b] BI stands for Behavioral Intentions.

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Appendix A: Forceful and Non-forceful Messages

Forceful and Non-forceful Messages

Forceful and non-forceful language adopted from Quick & Considine (2008, p. 491)

Forceful Message: "EXCERSISE: YOU HAVE TO DO IT"

It is impossible to deny all the evidence that an individual exercise program leads to improvements in your mental and physical health. Exercise also reduces the risk factors for non-communicable conditions such as diabetes, obesity, respiratory diseases, and cardiovascular diseases. In fact, any reasonable person absolutely has to agree that these conditions are a serious societal problem that demands your immediate attention. No other conclusion makes any sense. Stop the denial. There is a problem and you must be a part of the solution. So if you are not already participating in an individual exercise program, you must start right now. You simply have to do it.

Non-Forceful Message: "CONSIDER EXERCISE"

There is pretty good evidence that exercise leads to improvements in your mental and physical health as well as reducing the risk factors for non-communicable conditions such as diabetes, obesity, respiratory diseases, and cardiovascular diseases. In fact, most people agree that these conditions are a serious societal problem 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. So if you are not already participating in an individual exercise program, why not give it a try?

Forceful Message: “NUTRITION: YOU HAVE TO DO IT”

It is impossible to deny all the evidence that nutrition leads to improvements in your mental and physical health. Nutrition also reduces the risk factors for non-communicable conditions such as diabetes, obesity, respiratory diseases, and cardiovascular diseases. In fact, any reasonable person absolutely has to agree that these conditions are a serious societal problem that demands your immediate attention. No other conclusion makes any sense. Stop the denial. There is a problem and you must be a part of the solution. So if you are not already participating in a nutrition program, you must start right now. You simply have to do it.

Non-Forceful Message: “CONSIDER NUTRITION”

There is pretty good evidence that a nutrition leads to improvements in your mental and physical health as well as reducing the risk factors for non-communicable conditions such as diabetes, obesity, respiratory diseases, and cardiovascular diseases. In fact, most people agree that these conditions are a serious societal problem 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. So if you are not already participating in a nutrition program, why not give it a try?

Appendix B: Restoration Scripts

Restoration postscript designed by C. H. Miller et al. (2007, p. 240).

Restoration Exercise Postscript

You've probably heard a lot of messages telling you to exercise for good health. You've probably even heard messages similar to this one telling you how important physical activity is. Of course, you don't have to listen to any of these messages. You know what is best for yourself. Some people decide to exercise. Some people decide not to exercise. Everybody is different. We all make our own decisions and act as we choose to act. Obviously, you make your own decisions too. The choice is yours. You're free to decide for yourself.

Restoration Exercise Prescript

You've probably heard a lot of messages telling you to exercise for good health. You've probably even heard messages similar to the one you are about to read telling you how important physical activity is. Of course, you don't have to listen to any of these messages. You know what is best for yourself. Some people decide to exercise. Some people decide not to exercise. Everybody is different. We all make our own decisions and act as we choose to act. Obviously, you make your own decisions too. The choice is yours. You're free to decide for yourself.

Restoration Nutrition Postscript

You've probably heard a lot of messages telling you to nutrition is good for health. You've probably even heard messages similar to this one telling you how important nutrition is. Of course, you don't have to listen to any of these messages. You know what is best for yourself. Some people decide to be nutritious. Some people decide not to be nutritious. Everybody is different. We all make our own decisions and act as we choose to act. Obviously, you make your own decisions too. The choice is yours. You're free to decide for yourself.

Restoration Nutrition Prescript

You've probably heard a lot of messages telling you nutrition is good for health. You've probably even heard messages similar to the one you are about to read telling you how important nutrition is. Of course, you don't have to listen to any of these messages. You know what is best for yourself. Some people decide to be nutritious. Some people decide not to be nutritious. Everybody is different. We all make our own decisions and act as we choose to act. Obviously, you make your own decisions too. The choice is yours. You're free to decide for yourself.

Appendix C: Experimental Conditions

1. Exercise x Forceful
2. Exercise x Non-forceful
3. Exercise x Forceful x Prescript
4. Exercise x Forceful x Postscript
5. Exercise x Non-forceful x Prescript
6. Exercise x Non-forceful x Postscript
7. Nutrition x Forceful
8. Nutrition x Non-forceful
9. Nutrition x Forceful x Prescript
10. Nutrition x Forceful x Postscript
11. Nutrition x Non-forceful x Prescript
12. Nutrition x Non-forceful x Postscript