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Reversing the Boomerang Effect in Persuasive Health Communication:
Reducing Psychological Reactance Using Inoculation and Restoration Treatments

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Reversing the Boomerang Effect In Persuasive Health Communication: Reducing Psychological Reactance to Self-Persuasion Using Inoculation and Restoration Treatments

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The elements of a persuasive message can have serious implications for its effect on recipients. Hornik and Yanovitzky (2003) addressed the ramifications of message effects in the construction of persuasive health campaigns and presented a general theory about the way in which these campaigns can have lasting and varying effects on receivers. Not all potential effects are positive. Designers of persuasive messages have often endorsed the use of messages that attempt to avoid eliciting reactance in recipients, or the elicitation of attitudes and behaviors that counter an advocated message. Psychological reactance occurs when individuals encounter what he or she perceives to be a threat to their freedoms. Because of the possibility of negative behavioral outcomes, it is important for message designers to take into account the possibility of psychological reactance, and explore the conditions that elicit and inhibit this phenomenon. The current research focuses on the latter.

The theory of psychological reactance (TPR) assumes that humans live in a constant state of observation of both their internal and external freedom to make choices (Brehm, 1966). Individuals take stock of ways in which they can accomplish their goals and how free they are in their ability to make pragmatic and conceivable choices along the way. These realistic and possible choices are identified as “free behaviors” (Brehm, 1966, p. 379). The perception of the ability to enact free behaviors is key to psychological reactance. Brehm (1966) posited that when individuals perceive that their freedom to make choices is threatened, a *boomerang effect* occurs whereby individuals endorse attitudes and behaviors counter to the advocated message (Backer, Rogers, & Sopory, 1992; Hornik, 2002). The arousal elicited by perceived threats to freedom motivates the restoration of threatened freedoms through varying avenues. Brehm (1966) gave an

example of this aroused state of reactance in research on health behavior, suggesting that a person whose freedom to choose their preferred brand of cigarette is threatened will tend to experience reactance and attempt to restore their freedom in purchasing their standard brand.

Brehm's (1966) introduction of TPR began what later became three consecutive waves of reactance research over the span of fifty years. First, social science research addressed the propositional logic of attitude change. During this time, reactance was framed as a psychological occurrence caused by threats to freedom (Wicklund, 1974; Wicklund & Brehm, 1968). Additionally, the relationship between threat and reactance was such that higher levels of threat resulted in higher levels of reactance (Brehm & Brehm, 1981). After this relationship was established and reaffirmed (Wright, 1986), the second wave of research situated psychological reactance as a compliance-gaining technique in health (Bensley & Wu, 1991), counseling (Cowan & Presbury, 2000; Dowd et al., 1988), freedom restoration (Schwarz, 1984), and threat (Wright, 1986) contexts. Psychological reactance has subsequently been explored in avenues of social relationships (Goldman, Pulcher, & Mendez, 1983), persuasive messages (Allen, Sprenkel, & Vitale, 1994), thought suppression (Kelly & Nauta, 1997), and patient compliance and therapy (Chamberlain, Patterson, Reid, Kavanagh, & Forgatch, 1984; Dowd et al., 1994; Fogarty, 1997; Karno & Longbaugh, 2005; Seibel & Dowd, 1999).

The third and final wave of psychological reactance research, which has occurred within the communication discipline, revisited models of reactance and explored the language features that elicit and inhibit reactance, predominantly in persuasive health communication contexts (Dillard & Shen, 2005; Rains & Turner, 2007; Richards & Banas, 2014). The current research contributes to the latter wave by investigating message features with the purpose of reducing reactance to a persuasive health message.

Message Characteristics that Elicit Reactance

Successfully reducing the experience of psychological reactance requires a comprehensive understanding of the factors that precipitate its occurrence. Brehm (1966) initially outlined several determinants of reactance, including the magnitude of the threat to freedom, the perceived importance of the threatened freedom, and the proportion of freedoms threatened (Burgoon et al., 2002, p. 217). Additional message-based determinants have been identified by contemporary research.

Perceived threat to freedom has been repeatedly cited as the causal mechanism for reactance, as was first implied by Brehm (1966). The original conceptualization of TPR postulated that reactance occurs as follows: a freedom exists, the freedom is threatened, reactance occurs, and the individual attempts to restore freedoms. Dillard and Shen (2005) proposed later that reactance "mediates the effects of threat to freedom on various outcomes such as attitudes a behavior" (p. 148). According to Brehm and Brehm (1981), these freedoms are perceived as "concrete behavioral realities" (p. 12). Threats to freedom motivate reactance if individuals are actively aware of the intent to persuade (Brehm, 1966). When individuals experience reactance, they experience a "motivational state, directed toward the re-establishment of the free behaviors which have been eliminated or threatened with elimination" (Brehm, 1966, p. 9).

Miller et al. (2007) identified language intensity as a key determinant of psychological reactance. Specifically, messages that exhibited controlling language were associated with more negative outcomes. According to Searle (1975), the more direct and explicit the language, the more forceful and controlling it is perceived. Miller et al. (2007) found that high-controlling and lexically concrete messages were positively associated with anger and negatively associated with

perceived fairness, attention, behavioral intention, source sociability, source expertise, and source trustworthiness (p. 233). The use of more forceful adverbs and more explicit wording, as opposed to more indirect and suggestive language, contributed to more negative attitudes towards an advocated message. Low-controlling messages were suggested to be the most effective in persuasive health appeals.

Freedom-threatening language has since been heralded as a powerful contributor to reactance as the cause of perceived threat to freedom (Dillard & Shen, 2005; Miller et al., 2007; Quick, 2012; Quick & Considine, 2008; Quick & Kim, 2009; Quick, Scott, & Ledbetter, 2011; Quick & Stephenson, 2007; Scott & Quick, 2012; Shen, 2011). The contemporary model of reactance purports that perceived threat to freedom causes reactance, which causes changes in attitudes and behavioral intentions (Dillard & Shen, 2005). Freedom-threatening language, then, affects reactance via individuals' perceptions that their freedom to make choices is limited (Dillard & Shen, 2005). Namely, TPR predicts that more explicit and controlling language will be perceived as more threatening, ultimately resulting in higher levels of reactance and negative behaviors (Miller et al., 2007).

Dillard and Shen (2005) asserted that the antecedents and outcomes of a perceived threat to freedom are meaningful to the experience of reactance; the "proximal" cause of reactance is a perceived threat, and reactance subsequently prompts restoration of freedoms. The strength of the threat and the level of trait reactance determine the intensity of reactance experienced (Brehm & Brehm, 1981; Dillard & Shen, 2005). Four proposed models represent reactance through emotion (Single Process Affective Model; Nabi, 2002), cognition (Single Process Cognitive Model; Petty & Cacioppo, 1986), cognitive and emotional (Dual Process Model; Dillard & Peck, 2000; Dillard, Plotnick, Godbold, Freimuth, & Edgar, 2006) and intertwined (Intertwined

Process Model; Dillard & Shen, 2005) avenues. A study on two health behaviors—flossing and intake of alcohol—supported Dillard and Shen's (2005) Intertwined Process Model, confirming Brehm's (1966) conceptualization of reactance as an entangled combination of affect and negative cognitions.

Contemporary reactance research has further supported the conceptualization of reactance as a combination of anger and negative cognitions (Quick & Stephenson, 2007; Rains & Turner, 2007). Quick and Stephenson (2007) validated this concept in a study on reproductive health advertisements by finding that, across seven persuasive ads for condoms, affect and negative cognition variables loaded equivalently. Kelly and Nauta (1997) also assessed reactance arousal and found that individuals with more dispositional reactance reported more negative cognitions. Rains and Turner (2007) found additional support for the intertwined process model as the best fit for the process of reactance.

Building upon the established relationship between threats to freedom and reactance, past research has also suggested that that freedom threats may mediate the relationship between message features and outcomes associated with reactance (Quick & Considine, 2008). Quick and Considine examined the role of message features, using varying degrees of forceful language in persuasive health messages, and found support for a two-step process of reactance: reactance-inducing message will motivate attempts to restore freedoms, and reactance will manifest in anger and negative cognitions. This study not only validated the role of anger and negative cognition in reactance, but exemplified the necessity of induction checks to ensure that message recipients also perceive a threat to freedom.

Reactance and restoration of freedoms has been evidenced in various persuasive contexts, including that of persuasive health communication. Studies on reactance have focused on

campaigns for organ donation (Quick, Scott, & Ledbetter, 2011), alcohol and binge drinking prevention (Allen, Sprenkel, & Vitale, 1994; Bensley & Wu, 1991; Rains & Turner, 2007; Richards & Banas, 2014), flossing (Dillard & Shen, 2005), tobacco use (Pfau, Van Bockern, & Kang, 1992), exercise (Quick & Considine, 2008), and reproductive health (Quick & Stephenson, 2007). Reactance research has expanded past messages advocating for simple health behaviors and has addressed interpersonal precursors to reactance, such as patient noncompliance (Fogarty, 1997). Additionally, Hornik and Yanovitzky (2003) addressed the design of messages for persuasive health communication, positing that message construction should be driven by a theory of effects and an awareness of the elicitation of resistance to advocated behaviors.

The application of theory to effective reduction of psychological reactance has meaningful implications for social influence attempts in general, and health communication campaigns in particular. Many types of persuasive messages have failed to elicit the desired effects, but isolating psychological reactance as a principal obstacle has given rise to pivotal questions regarding its alleviation. The tendency for individuals who experience reactance to endorse the *opposite* of an advocated message makes it an especially crucial phenomenon to explore. For message designers actively trying to instill healthy attitudes and behaviors, this boomerang effect is especially troublesome, due to the detrimental nature of an intervention designed to prevent unhealthy behaviors, not cause more of them. The overwhelming benefits that can arise from inspiring positive change in health-related contexts like alcohol abuse prevention, tobacco cessation, exercise, and safe sex gives significance to the pursuit of optimal reactance reduction strategies. With this understanding, significant effort has been made to identify means to mitigate reactance.

Reducing Reactance Via Restoration Postscripts

Several methods to reduce resistance to persuasion have been investigated in reactance research. Restoration postscripts, or brief statements recalling the free choice to comply after exposure to a persuasive message, are one notable avenue of reactance reduction (Bernard, 2014; Bessarabova, Fink, & Turner, 2013; Miller et al., 2007). Founded in TPR, restoration postscripts attempt to return the power of control to the individual after a threat to freedom has been perceived. Miller et al. (2007) proposed that postscripts presented at the end of a persuasive attempt would help to restore the target's autonomy and control by reminding them that they ultimately have the power to make their own choices in how to behave.

Bernard (2014) compared avenues of reducing reactance to persuasive health messages using restorative pre- and post-scripts. Results suggested that varying levels of freedom-threatening language resulted in different attitudes toward and intent to enact healthy behaviors. Specifically, higher levels of threat to freedom elicited more psychological reactance and more positive attitudes towards the advocated behaviors. Bernard used messages related to exercise and nutrition, but it is likely that the effect of varying levels of threat to freedom can be translated to investigation of other types of health behaviors, namely reproductive health, as evidenced by Quick and Stephenson's (2007) investigation of reactance to ads advocating for the use of condoms.

Prior to Bessarabova, Fink, and Turner (2013), restoration postscripts had been used to mitigate the effects of reactance (Miller et al., 2007), but the boundary conditions for the effectiveness of freedom restoration can be further explored. Their results suggested a boomerang effect occurred for persuasive messages with a high degree of threatening language, but this effect was reduced if participants read a restoration postscript immediately after the

freedom threat. In short, restoration postscripts work to buffer reactance. However, Bessarabova et al. (2013) also found that for low-threat messages, the inclusion of postscripts *increased* reactance. Bernard (2014) suggested that this may be because at such a low threat threshold, targets may not be aware of the intent to persuade until the postscript brings the attempt to their attention. Quick, Kam, Morgan, Liberona, and Smith (2015) also concluded that restorative postscripts were ineffective in reducing reactance. Their study, however, used radio ads rather than print messages, which raises the question of whether the message channel has an effect on the utility of restorative postscripts. Most importantly, Quick et al. did not use threatening language, one of the most important components of a reactance study, in their experiment, so their conclusions about restorative postscripts should be interpreted with caution.

In the present study, restoration postscripts are hypothesized as one strategy to reduce reactance to a persuasive appeal to communicate with a new intimate partner about his or her sexual history. The postscripts explicitly remind participants that it is within their control to make choices regarding sexual communication in their relationships. This should serve to restore freedoms threatened by the persuasive appeal, reducing the experience of psychological reactance.

Restoration postscripts are not the only strategy used to reduce reactance, however. As an alternative, Benoit (1998) proposed that persuaders should use forewarning messages to emphasize the best interests of the targets. This concept echoes a second method of reducing reactance: inoculation treatments.

Inoculation Theory

Inoculation theory was born out of investigations involving the “selective exposure” postulate, or the idea that individuals will tend to avoid statements that run contrary to their

beliefs (McGuire & Papageorgis, 1962). Long-term avoidance of counter-attitudinal information is posited to leave individuals unmotivated to develop supportive arguments, resulting in weakened defenses. A powerful analogy for this concept would be a person who was raised in an environment completely devoid of germs, and who, when suddenly introduced to harmful bacteria, was vulnerable to illness without a well-developed immune system.

McGuire's (1961) original conceptualization of inoculation theory was modeled after medical vaccinations designed to defend against such illnesses. Simply, subjects who were previously exposed to weakened versions of counter-attitudinal statements would confer greater resistance to subsequent attacks on their beliefs, much like medical patients who received small doses of a disease in the form of an immunization would later be more resistant to contracting the full-fledged version of the ailment. These weakened attacks will stimulate a defense system by motivating individuals to advance support for their beliefs. According to McGuire, exposure to counter-arguments and refutation will act as a cognitive immune system, protecting an individual from subsequent strong counterarguments.

Inoculation strategies have been used successfully in health communication research. Godbold and Pfau (2000) inoculated adolescents against persuasive appeals to use alcohol. Pfau, Van Bockern, and Kang (1992) used inoculation to promote adolescents' resistance to tobacco use. These studies represent the utility of reactance reduction strategies in health communication contexts.

The body of research on inoculation treatments has shown it to be a superior way to confer resistance to counterarguments, as compared to supportive or no-treatment control groups (Banas & Rains, 2010). Supportive treatments provide pro-attitudinal messages to bolster an individual's beliefs, therefore fostering resistance, and have been suggested to do so more

effectively than no-treatment control groups. Inoculation treatments, however, are still the most effective way to motivate resistance to persuasion, as evidenced by a 2010 meta-analysis conducted by Banas and Rains.

Several additions to the original inoculation model have further elucidated a previous understanding of the process and outcomes of inoculation. Four amendments to the preliminary theory, in particular, were identified in Banas and Rains's (2010) meta-analysis of inoculation research: threat, refutational preemptions, delays between inoculation and attack, and issue involvement.

Threat has been identified as key to understanding the process of resistance to persuasion, and is particularly relevant to the present study, in which threat is manipulated by exposing participants to persuasive appeals with varying levels of freedom threatening language. Defined as the acknowledgment of receiver susceptibility to counter-attitudinal attacks, threats are identified as a stimulus for resistance (McGuire & Papageorgis, 1962; Pfau, 1996). Without perception of threat, an individual will likely be unmotivated to summon pro-attitudinal defenses (McGuire & Papageorgis, 1962, p. 25). In early conceptualizations of inoculation, threat was left an unmeasured construct, inherent in the use of refutational preemptions and never explicitly identified or measured (McGuire, 1961; McGuire & Papageorgis, 1961). Ultimately, however, threat became an overtly recognized part of contemporary inoculation research, which has addressed ways in which to increase its effect and its potency (Banas & Rains, 2010; Miller et al., 2013).

Issue involvement, another addition to McGuire's (1961) original inoculation model, has been addressed broadly in social influence literature. Petty and Cacioppo (1979) describe high levels of issue involvement as occurring when an issue is intrinsically important or has a great

deal of personal meaning to an individual (p. 1916). The level of issue involvement is a key element of study design in contemporary inoculation research. For instance, Godbold and Pfau (2000) chose to study attitudes towards alcohol in young adolescents, as they perceived drinking to be a particularly salient issue for teenagers. Issue involvement and its association with inoculation has also been explored in marketing and influence research. Pfau (1992) reported that individuals who received an inoculation treatment before exposure to comparative ads would confer resistance to attitude change most effectively for ads for products with which individuals were highly involved. Relatedly, Kamins and Asseal (1987) found that high levels of issue involvement bear a positive relationship to potential for inoculation. Petty and Cacioppo (1979) forwarded high levels of issue involvement as essential to counter-arguing, making it a possible prerequisite for attitude change. Pfau et al. (1997) supported this claim, positing that inoculation and issue involvement function in a parallel, yet distinct fashion in conferring resistance. Thus, for inoculation to function, message targets must care about the issue at hand.

Because the present study was conducted on a college campus, reproductive health was chosen as the focus of the advocated persuasive message. The danger of sexually-transmitted diseases (STDs) on college campuses is an issue that is highly relevant to college students; the campus where the present study was conducted ranked 121st out of 141 universities on the Centers for Disease Control's and Trojan Brand Condom's (2010) joint sexual health report. As is expressed in the experimental manipulations in the present study, one out of every four college students has an STD, making this issue intrinsically important to individuals in the sample population.

Threat and issue involvement — two elements of the contemporary inoculation model — contribute to an advantageous method of persuasive message design through isolation and

identification of each step of the reactance process (Banas & Rains, 2010). The updated inoculation model is employed in the present study to address psychological reactance to persuasive attempts.

While traditional research using TPR has been focused on ways to prevent or reduce psychological reactance (i.e. Dillard & Shen; Miller, Burgoon, Grandpre, & Alvaro, 2006; Miller et al., 2007), Miller et al. (2013) explored TPR in a novel way and advanced strategies to enhance resistance to attitude change through the use of anger and negative cognitions inherent to psychological reactance. Specifically, reactance was used to bolster the effectiveness of threat and refutational preemptions in inoculation treatment. Reactance was suggested to magnify outcomes of threat, anger, negative cognitions, affect, and restoration of freedoms through derogation of threat and counter-arguing.

Despite its heuristic value, inoculation against reactance has only just begun to be addressed. Richards and Banas (2014) inoculated against reactance to a health message, hypothesizing that the inoculation treatment would decrease negative reactions to messages advocating for reduced binge drinking. Results suggested that inoculation was successful in reducing reactance, and those who received the inoculation treatment were less likely to display harmful health behaviors. This line of research introduces how psychological reactance is elicited by self-generated appeals. This is especially pertinent to the current study, which harnesses TPR to investigate the use of inoculation against *self-persuasion.*

Self-persuasion transpires when people experience the internal motivation to alter their attitudes and behaviors to avoid the inconsistency of deviating from associated attitudes (Aronson, 1999). Building upon previous use of forewarning of an impending threat to freedoms, Richards and Banas (2014) illustrated the mitigating effect of inoculation on reactance. Findings

suggested that inoculation resulted in less perceived threat to the freedom to drink alcohol and less resulting reactance and intentions to abuse alcohol, opening the door for further examination of the effectiveness of inoculation on reducing resistance to self-generated forces (Richards & Banas, 2014).

Inoculation against psychological reactance involves exposing individuals to an inoculation message (with forewarning and refutational preemption components) before they are confronted with a persuasive appeal. The persuasive appeal, because it contains a level of freedom-threatening language, will likely elicit reactance and prompt participants to restore their freedoms. Psychological reactance is situated here as self-persuasion, because it is an internally-generated motivation to enact the opposite of the advocated message (which is, in this experiment, an appeal to communicate with new intimate partners about sexual relationships). Taken together, the inoculation message in the present study contains a warning of an impending freedom-threatening persuasive message, and a refutation of the impending self-persuasion implicit to reactance. In the present research, the refutational preemption reminds participants of their agency to make their own choices. Because the inoculation message warns the recipient of an impending threat and reminds them they are free to choose their own behaviors, it should serve to reduce the experience of reactance.

Inoculation treatments and restoration postscripts have both been used as distinct ways to reduce reactance to persuasive attempts both inside and outside of health communication research. Both methods incorporate ways of bolstering existing attitudes, but feature separate message components. Restoration postscripts attempt to reduce reactance by restoring the control of the subject of persuasive appeals over their choices (Miller et al., 2007). Inoculation messages, made up of threat and refutational preemption, focus on the effectiveness of a forewarning of

impending threat. These two message strategies have been shown to successfully reduce reactance. Thus, consider the following predictions:

H1: An inoculation treatment will be more effective in reducing reactance than no inoculation treatment.

H2: A restorative postscript treatment will be more effective in reducing reactance than no restoration postscript treatment.

The present experiment employs the use of both inoculation and restorative treatments in an attempt to assess their efficacy in reactance reduction both *alone* and *in combination*. When individuals experience psychological reactance, warning them of an impending threat and bolstering their counterarguments (inoculation) *before* they feeling reactance, and reminding them that they are free to make their own choices (restoration) *after* a threat should both be viable ways to reduce the level of reactance. Because these treatments are both effective in singularity (Miller et al., 2007; Richards & Banas, 2014), they should be *more effective* in *combination*.

H3: Exposure to both inoculation and restoration treatments will be more effective in reducing reactance than either treatment in isolation.

Banas and Rains (2010) revealed inoculation messages to be more effective in fostering resistance to attitude change than supportive messages, and supportive messages to be more effective than no treatment, suggesting that inoculation may also be more efficacious than restorative messages in reducing reactance to self-persuasion. A relevant question is whether this changes at varying levels of threat.

The amount of threat used in a persuasive appeal has considerable implications for the amount of reactance elicited, and for the message strategy that would be most effective in

reducing it. Persuasive attempts may elicit reactance for all threatened individuals, but the effectiveness of treatments will differ dependent upon the amount of freedom-threatening language present in the message. More lexically-concrete and forceful freedom-threatening language will trigger more reactance in message recipients (Miller et al., 2007). It is reasonable to assume, then, that it will be easier to temper individuals' reactance *before* they become highly stimulated than trying to reduce it retroactively. Thus, while both inoculation and restoration treatments have been suggested to be effective in reducing reactance, this thesis posits that *inoculation* against self-generated persuasive appeals will be more effective for reactance reduction than will restoration of freedoms.

H4: When threat to freedom is low, exposure to inoculation treatments will be more effective in reducing reactance than will restorative postscripts, and the difference in strength of inoculation over that of restorative postscripts will be greater than in the high threat condition.

At higher levels of threat, individuals will still experience reactance, and inoculation treatments will still be more effective at reducing reactance. Banas, Richards, and Magid (2015) found that inoculation was only significantly effective in the presence of a weak threat and not in the presence of highly threatening language, suggesting that highly freedom-threatening language may elicit reactance so intense that reduction treatments are less effective. Thus, the difference in reactance reduction between inoculation and restoration treatments will be less significant in the high threat condition. Individuals who experience high levels of threat, and therefore, high levels of reactance, will be so aroused that the message strategy will make less of a difference in the amount of reactance elicited.

H5: When threat to freedom is high, exposure to inoculation treatments will be more effective in reducing reactance than will restorative postscripts

Another important consideration when choosing the most effective type of reactance reduction strategy is existing levels of *trait* reactance. According to theories of cognitive behavior, reactance is meant to protect the core identity of an individual. Assessment of an individual's level of trait reactance is relevant to attempts to buffer their reactance to persuasion, as accounting for an individual's innate level of reactance is useful in determining how to best approach them with pro-social messages and potentially threatening messages. While reactance was originally posited as context-specific (Brehm, 1966), contemporary research has highlighted individual differences in level of reactance (Brehm & Brehm, 1981; Dillard & Shen, 2005). Reactance has been evidenced as being trait-based, with trait reactance being situated as a precursor to reactance (Brehm & Brehm, 1981). Thus, it is logical to predict that individuals who rate higher in trait reactance will experience more reactance when confronted with threats to freedom than will individuals who rate lower in trait reactance.

H6: For people high in trait reactance, exposure to freedom threatening language will increase the experience of reactance more than for people low in trait reactance.

For people who have a low baseline level of trait reactance, inoculation treatments will be more effective in reducing reactance than will restorative postscripts. As previously stated, providing individuals with a forewarning of an impending threat and a way to bolster their argument (inoculation) will be more effective in reducing reactance than simply trying to retroactively reduce their reactance after arousal. It is more difficult to calm aroused individuals down than it is to preemptively reduce their experience of reactance.

H7: For people low in trait reactance, exposure to inoculation treatments will be more effective in reducing reactance than will be restorative postscripts.

HEALTH MESSAGES

An individual's level of trait reactance is important to consider when choosing a reactance reduction strategy. Trait reactance has been identified as a significant contributor to the experience of psychological reactance to persuasive messages (Quick & Stephenson, 2008), such that individuals high in trait reactance will tend to rebel against control and forcefulness more than those who rate lower in the trait (Seibel & Dowd, 2001). The present experiment predicts a four-way interaction effect between the two experimental manipulations, freedom-threatening language, and trait conditions: The comparative effectiveness of inoculation and restoration treatments changes with the presence of trait reactance. Individuals who are highly reactant can become extremely aroused by threats to their personal freedoms, marked by very negative cognitions and high levels of anger. Because naturally highly-reactant individuals tend to be more sensitive to threats, while both inoculation and restoration messages have been suggested to be effective in reducing reactance, this thesis posits that there will be no significant difference in the effectiveness of inoculation against self-generated persuasive appeals and restoration of freedoms after a perceived threat. Highly trait reactant individuals are *so aroused* by a threat to their freedoms that using a forewarning and refutational preemption will not be significantly more effective in reducing reactance than trying to restore their freedoms after the threat. Studies using trait reactance have indicated that the presence of high levels of this trait have a powerful affect on the way that individuals respond to threats (Dillard & Shen, 2005, Quick & Stephenson, 2008). The trait is not only a precursor for reactance (Brehm & Brehm, 1981), but even more strongly affects reactance reduction than freedom-threatening language.

H8: For individuals high in trait reactance, there will be no difference in the effectiveness of inoculation and restorative postscripts in reducing reactance.

Method

Participants

Participants for this experiment were undergraduate students from entry-level communication courses at Texas Christian University (*N* = 334), 226 of whom were female and 108 of whom were male. The group was largely of Caucasian descent. The average age for participants was 19.1. Participants received a small amount of course credit for their participation in the study.

Design, Procedure, and Materials

This study used a 2 (*inoculation* vs. *control*) x 2 (*low* vs. *high* FTL) x 2 (*restoration post-script* vs. *control*) between-subjects experimental design. Participants completed an online survey hosted on the Qualtrics survey website. They were told they would be assessing a public service announcement (PSA) purportedly issued by the TCU Public Health Initiative. After giving their informed consent to participate in the study, participants were randomly assigned to experimental conditions.

Participants in experimental groups either read an inoculation message or a control message of equal word length before exposure to the sexual health PSA. The pilot study was conducted to determine the most effective inoculation message is detailed below. The inoculation condition message read:

> The information you are about to read might contain forceful language. It may sound to some people as if it is trying to limit their freedom to choose. Try not to let it cloud your judgment; the message's recommendation may still be a good one, even if the ad's language makes you a little mad.

The inoculation control condition message read:

> We can trace sushi's origin back to the 4th century BCE. Cleaned fish were kept in rice so that the natural fermentation of the rice helped preserve the fish. This sushi was taken out of storage after a couple of months of fermentation. Over time, sushi spread throughout China, and later, it was introduced in Japan.

Participants were then randomly assigned to either the high- or low- freedom-threatening message conditions of the reproductive health PSA, and were instructed to carefully read the entire message in order to answer subsequent questions about it. The PSA featured an image of a couple kissing and either a high- or low- freedom threatening message advocating for having conversations with a sexual partner. Both versions of the PSA included statistics about sexually transmitted diseases. The low FTL condition message read:

> Are you putting yourself at sexual RISK? 1/4 of college students have an STD. 85% of schools rank better than TCU in sexual health. Only 1/3 of adults with STDs tell their partners. CONSIDER HAVING THE CONVERSATION. You could choose to reduce your risk of sexually transmitted diseases by asking your intimate partner about their sexual history before having sex. Studies show that the risk of contracting infections like HIV or chlamydia is significantly lowered by communicating about past sexual relationships. It's a healthy and safe way to protect yourself from infection. Why not give it a try? Think about your partner and think sexual history.

The high FTL condition message read:

> You are putting yourself at sexual RISK! 1/4 of college students have an STD. 85% of schools rank better than TCU in sexual health. Only 1/3 of adults with STDs tell their partners. YOU MUST HAVE THE CONVERSATION. You have no choice but to ask your new intimate partner about their sexual history before having sex to reduce your risk

> of contracting a sexually transmitted disease. Studies show that the risk of contracting infections like HIV or chlamydia is significantly lowered by communicating about past sexual relationships. It's the only healthy and safe way to protect yourself from infection. We're not asking you, we're telling you. ASK YOUR PARTNER ABOUT THEIR SEXUAL HISTORY.

After reading either condition of the PSA, participants were then randomly assigned to receive either a restoration postscript message or a non-restorative postscript message. The restoration postscript message modeled after one used by Miller et al. (2007) read:

> You've probably heard a lot of message telling you to discuss sexual history and past partners in your intimate relationships with a new partner. You've probably even heard messages similar to this one telling you how important sexual communication is. Of course, you don't have to list not any of these messages. You know what is best for yourself. Some people decide to talk to their new intimate partners about their sexual history, and some decide not to. Everyone 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.

The non-restorative postscript control message read:

> You've probably heard a lot of messages telling you to have open communication in your relationships. You've probably even heard messages similar to this one telling you how important communication is. Of course, a message is a means to communicate. Communication occurs every day. These messages are designed to be able to communicate with all different types of people. All different types of people will read what you've read today.

Participants then immediately completed a thought-listing task in which they were instructed to record thoughts, questions, and emotions they had while they read the PSA about sexual health. Cacioppo and Petty (1981) determined that this cognition-based method is the best means to record relevant thoughts. The thoughts appeared for coding later in the survey. Participants then completed a series of questions about reactance, anger, negative cognitions, anger control, and perceived threat to freedom, followed by demographic questions. Finally, participants were provided with a debrief statement explaining the purpose of the experiment.

Measures

Inoculation. The effectiveness of the inoculation manipulation was initially assessed using a six-item, seven-point semantic differential scale (*"I find this idea:* 1 = *Non-threatening,* 7 = *Threatening"*) (M = 2. 71, SD = 1.30) (This scale resulted in low reliability (α = .39) (McGuire, 1961). The scale was then adjusted to include only three items that exhibited strong internal reliability (α = .88); "this message made me feel safe," "this message made me feel threatened," "this message made me feel like I was taking a risk" (M = 2.64, SD = 1.30).

Perceived threat to freedom. The perceived threat to freedom was evaluated using a four-item, seven-point Likert-type scale (1 = *Strongly disagree,* 7 = *Strongly agree*) (M = 3.14, SD = 1.48), and exhibited a strong internal reliability (α = .86) (Burgoon, Cohen, Miller, & Montgomery, 1978).

Anger. State anger was assessed using a four-item, seven-point semantic differential anger arousal scale that asks participants to indicate their level of the following feelings: *irritated, angry, annoyed, aggravated,* (M = 2.51, SD = 1.49) (Spielberger, 1988) . A variety of emotions were included to disguise the true intent of the measure, but did not factor into state

anger arousal, one of two markers of reactance (Dillard & Shen, 2005). A test of reliability using Cronbach's alpha indicated that the reliability of this four-item scale was high (α = .89)

Negative cognitions. For the thought-listing tasks, participants were asked to record thoughts they had while reading the PSA. During the coding stage, participants were instructed to code the relevance and valence of these thoughts. Cognitions were considered negative if they are coded as both negative and relevant to the advocated message (*M* = .45*, SD* = .93).

Behavioral intention. Seven items were used to assess behavioral intention to ask a new intimate partner about their sexual history (e.g. "I plan to have a conversation with my next new intimate partner about his/her sexual history before engaging in sexual relations.") on seven-point Likert-type scales (1 = *Strongly disagree,* 7 = *Strongly agree*), *M* = 5.89, *SD* = 1.37 (Fishbein & Ajzen, 2010). An alpha reliability test indicated that the scale reliability was good, α = .95.

Trait reactance. Trait reactance was measured using a thirteen-item seven-point Likert-type scale (1 = *Strongly disagree,* 7 = *Strongly agree*) (e.g. "Regulations (rules) trigger a sense of resistance in me"), *M* = 3.69, *SD* = .94 (Hong & Faedda, 1996). Cronbach's alpha reliability score indicated that the reliability for the scale was high, α = .89.

Pilot Studies

Pilot Study I

Two pilot studies were conducted in order to determine the effectiveness of experimental manipulations on separate groups of subjects before the main experiment was conducted. For Pilot Study I, the sample was made up of largely white college students (*N* = 45), 26 of whom were females and 19 of whom were males. An independent-samples t-test was conducted to

compare perceived threat to freedom as elicited by high- and low-freedom threatening language version of a health message PSA reportedly from the TCU Public Health Initiative. Participants were randomly assigned to either receive a high- or low- freedom-threatening language version of the PSA, and the attached four-item perceived threat to freedom scale (Burgoon et al., 1978; *This message threatened my freedom to choose; This message tried to make a decision for me; This message tried to pressure me; This message tried to manipulate me*). There was a significant difference in the scores for high freedom threatening language (M = 3.71, SD = 1.46) and low freedom threatening language (M = 2.83, SD = .93) conditions, $t(43) = -2.44$, $p < .05$. Results of Pilot Study I indicated that the reliability of the scale was good (α = .76). The version of the PSA with high freedom-threatening language elicited more perceived threat than did the low freedom-threatening language version (See Appendix C for full manipulations).

Pilot Study II

For Pilot Study II, a sample of largely white college students was used to test the effectiveness of different inoculation messages, N = 57, 32 of whom were female and 26 of whom were male. A one-way between subjects analysis of variance (ANOVA) was conducted to compare the effects of two different inoculation messages on perceived threat in comparison to a control group. There was a significant effect of the type of inoculation message on level of perceived threat, $F(2, 43) = 6.89$, $p < .01$. Post hoc comparisons using the LSD test indicated that the mean difference for Inoculation message 1 (M = 4.21, SD = .56) was significantly different than Inoculation message 2 (M = 3.3, SD = .5) and the control message (M = 2.6, SD = 1.08) ($p < .01$). However, Inoculation message 2 did not significantly differ from the control message ($p > .05$). Inoculation message 1 was significantly more effective in signaling an impending threat than either Inoculation message 2 or the control message (see Appendix A for

complete manipulation), and was thus selected for use in the present research. After Pilot Study I and II were conducted, the main experiment was run on a separate group of subjects with similar demographics.

Results

Analytical Procedures

An independent samples t-test, factorial analyses of variance (ANOVAs), and one-way ANOVAs were used to evaluate the results of the present experiment. A t-test was used only for a manipulation check for the inoculation treatment. This type of test was used because it compares whether two groups have different average values; in this case, participants who received either the inoculation message or the control message. Factorial ANOVA tests are used to assess whether there are significant differences between a continuous-level dependent variable and two or more categorical independent variables. For this experiment, factorial ANOVA was used to test for differences between various combinations of inoculation, freedom-threatening language, and restoration postscript experimental conditions. Finally, one-way ANOVA tests were used to assess significant differences between two or more independent groups, in this case, an "all conditions" composite variable of inoculation, freedom-threatening language, and restoration postscripts, and assorted dependent variables.

Manipulation checks.

Inoculation manipulation. To check whether the inoculation manipulation was successful, an independent-samples t-test was conducted. This test compared perceived threat to freedom as elicited by both treatment and control conditions. Initially, the manipulation between inoculation ($M = 2.76$, $SD = 1.21$) and control ($M = 2.65$, $SD = 1.39$) seemed to be unsuccessful; $t(5) = .75$, $p = .46$. However, three items that exhibited strong internal reliability ($\boldsymbol{\alpha} = .88$) "this

message made me feel safe," "this message made me feel threatened," "this message made me feel like I was taking a risk") resulted in a significant manipulation check. There was a significant different in the scores for inoculation (M = 2.76, SD = 1.21) and control (M = 2.65, SD = 1.39) groups; $t(332) = .75$, $p = .005$. Thus, depending on the items with which the manipulation was assessed, the inoculation manipulation was considered successful. Despite the lack of unequivocal evidence of a successful manipulation, the inoculation manipulation was previously successfully pilot-tested in isolation of other message features, which affords some confidence in its validity.

Freedom-threatening language (FTL) manipulation. Freedom-threatening language scores were subjected to a two-way factorial ANOVA with two levels of threat (high, low) and two levels of inoculation (treatment, control) on perceived threat to freedom (PTF). For this test, participants who received the restorative postscript treatment were removed from analysis, as receipt of the reactance reduction treatment could have created meaningful differences in the assessment of threat independent of FTL. A more appropriate test of the FTL manipulation was therefore performed by isolating the people who did not receive the restorative postscript treatment. Therefore, only participants in the restorative postscript control group were used for this test. The main effect of FTL on PTF was significant while controlling for the effect of the inoculation manipulation, $F(3,1) = 18.78$, $p < .000$, indicating that the FTL manipulation was successful, or that the two different levels of threat used for the high- and low-threat PSAs did, in fact, result in different levels of perception of threat.

Restorative postscript manipulation. A three-way factorial ANOVA was used to assess significant differences between inoculation (treatment, control), FTL (high, low), and restorative postscript (RPS) (treatment, control) groups. This test included all RPS conditions. Results of the

ANOVA indicated that the RPS manipulation was not successful, $F(7,1) = 4.44$, $p > .05$. This was somewhat surprising because the identical manipulation was previously shown to reduce reactance (Miller et al., 2007) (see Table 1).

Fidelity check for trait reactance. To test whether the trait reactance measure was a valid assessment of the construct, a three-way factorial ANOVA was conducted to assess whether reports to this measure were dependent on experimental variables. Non-significant results would indicate that the measure was independent of message conditions to which participants were exposed. Results of ANOVA tests on the interaction between inoculation, freedom-threatening language, restorative postscripts, and trait reactance indicated that the interaction between the three experimental variables had a significant effect on the way that participants answered questions about their trait reactance, $F(7, 326) = 2.17$ (see Table 1). Therefore the measure was not a valid assessment of trait reactance.

Trait reactance has been characterized in past literature as a stable, inborn characteristic, and therefore should not have been affected by inoculation, language, and restoration treatments (Dillard & Shen, 2005). For stable trait variables like trait reactance, the timing of testing also should not affect measurement. Reactance studies commonly measure this variable after exposure to experimental manipulations (Dillard & Shen, 2005; Quick, 2012; Quick & Considine, 2008; Quick & Kim, 2009). Because trait reactance is stable, the need to assess it before experimental exposure was not necessitated for this experiment, especially because the use of the post-test only design eliminates potential testing-treatment interaction threats to internal validity (Campbell & Stanley, 1963). Thus, the assessment of trait reactance after exposure to experimental conditions was appropriate. But, because trait reactance was affected

by an interaction between experimental variables, it could not be used in this study to evaluate predictions about reactance. Thus, Hypotheses 7 and 8 could not be tested.

Decomposition of the three-way interaction on trait reactance indicated that at high levels of freedom-threatening language, exposure to *both* inoculation and restoration treatments was successful at reducing reactance while the use of *only* inoculation was comparatively ineffective. In other words, when people are confronted with a highly threatening persuasive attempt, both inoculating them against the threat *and* retroactively restoring their freedoms reduced reactance better than simply inoculating them.

A main effect resulted for restorative postscripts, indicating that this treatment reduced reports of trait reactance, as evidenced in Table 1. One-way ANOVA tests were used to assess the differences between levels of freedom-threatening language (high, low), inoculation (treatment, control), and restorative postscripts (treatment, control). An analysis of variance (ANOVA) showed that the effect of the interaction between experimental variables was a significant predictor of trait reactance, $F(7, 326) = 2.17$, $p = .04$. Results of a PROCESS simple slopes test further suggested that the three-way interaction between inoculation, FTL, and restorative postscripts on trait reactance was significant, $t(7) = 2.69$, $p = .008$, meaning that at high levels of threat, the use of both inoculation and restorative postscripts will reduce the level of reactance participants experience. Inoculation, meanwhile, did not have a significant effect on trait reactance alone, $F(7, 326) = 2.17$, $p = .09$.

Post hoc analysis indicated that there was a significant difference between groups, as evidenced in Table 2. At high levels of FTL, groups who received only restorative postscripts ($t(7) = 1.26$, $\beta = .64$, $p = .03$) differed significantly from those who did not receive either condition. Simply, when people receive persuasive messages with high levels of threatening

language, restoring their freedoms with restorative postscripts is significantly more effective than using no treatment at all (see Figure 2).

These results suggest that high levels of threat were requisite for the effectiveness of pre- and post-exposure reactance reduction treatments. In the context of reducing the extent to which participants report being trait reactant, the use of *one* reactance reduction treatment is no more effective than *no treatment.*

Hypothesis Testing

Hypothesis 1 predicted that inoculation treatments would be more effective in reducing reactance than no treatment. Factorial ANOVA tests were used to assess the validity of this prediction. No significant main effect was identified for inoculation treatments on dependent variables, including perceived threat to freedom, trait reactance, attitudes, negative cognitions, behavioral intentions, and state anger arousal, which are all markers of psychological reactance (see Table 1). This indicates that inoculation treatments did not have an overarching effect on reactance reduction. Thus, Hypothesis 1 was not supported.

Hypothesis 2 predicted whether restorative postscripts would be more effective in reducing reactance than no restoration postscript. Like for inoculation treatments, a factorial ANOVA test was run to assess the validity of this prediction. No significant main effects were identified for restorative postscripts on the dependent variables, with the exception of trait reactance, indicating that restorative postscripts do not have an overarching effect in reducing reactance (see Table 1). Thus, Hypothesis 2 was not supported.

Hypothesis 3 predicted that the use of two treatments (inoculation and restorative postscripts) would be more effective than using either of them in isolation. A factorial ANOVA was conducted to assess whether there was an overall effect for using both treatments in

combination as compared to only one. Particular attention was paid to whether a two-way interaction between inoculation and restorative postscript treatments was significant. No significant effects were indicated for this interaction, indicating that the use of two treatments rather than one was not more effective, overall (see Table 1). Thus, Hypothesis 3 was not supported.

Hypothesis 4 predicted that in the low freedom-threatening language condition, inoculation treatments would be more effective than restorative postscripts in reducing reactance, and that the difference in strength of inoculation over that of restorative postscripts would be greater than in the low threat condition. A factorial ANOVA test was used to compare reports of reactance at varying levels of freedom-threatening language (low, high), inoculation (treatment, control), and restorative postscripts (treatment, control). The results of this test did not elicit any significant differences (see Table 1). Thus, Hypothesis 4 was not supported.

Hypothesis 5 predicted that the same would be true for individuals in the high freedom-threatening language condition, but to a lesser degree. A factorial ANOVA was used to assess the same groups, and, like for Hypothesis 4, there were no significant differences in the level of reactance elicited after exposure to inoculation and restorative postscript treatments (see Table 1). Thus, Hypothesis 5 was not supported.

Hypothesis 6 proposed that higher levels of threat would result in higher levels of reactance. The results of a factorial ANOVA test indicated that there was no main effect for freedom threatening language on the experience of reactance. Thus, Hypothesis 6 was not supported.

As stated above, because the trait reactance measure used in this experiment did not seem to measure the true trait and instead measured *reports* of trait reactance, H7 and H8 were not assessed.

Supplemental Analyses

In order to evaluate the effect of the experimental variables on psychological reactance, analysis was performed on several dependent variables that serve as markers of reactance. First, perceived threat to freedom (PTF) was subjected to a factorial ANOVA. Perceived threat is a prerequisite for the experience of reactance (Brehm, 1966). Results indicated that freedom-threatening language was a significant predictor, $F(1, 7) = 28.21$, $p = .000$. Participants exposed to the low FTL conditions ($M = 2.69$, $SD = 1.39$) reported significantly less PTF compared to participants exposed to the high FTL conditions ($M = 3.61$, $SD = 1.37$). This result replicated the significant FTL manipulation check on all participants in both restorative postscript conditions. No other main or interaction effects were found (see Table 1).

For state anger, or anger arousal (one of the two markers of psychological reactance highlighted by Dillard and Shen's (2005) Intertwined Process Model), results of a factorial ANOVA indicated that the interaction between inoculation, freedom-threatening language, and restorative postscripts was nonsignificant, $F(1, 7) = 1.29$, $p = .25$.

The second marker of psychological reactance, negative cognitions (Dillard & Shen, 2005), was also analyzed using a factorial ANOVA to identify whether exposure to varying levels of inoculation, freedom-threatening language, and restorative postscripts made a significant difference in cognitions. As Table 1 indicates, no significant results were found for this test, suggesting that the experimental variables did not have a significant effect on negative cognitions and reactance reduction, $F(1, 7) = .87$, $p = .53$.

Attitude change is an important element of persuasion studies. The attitudes subjects held towards asking an intimate partner his or her sexual history before engaging in sexual activity was subject to a factorial ANOVA to evaluate the effect of varying levels of inoculation, threat, and restorative postscripts. As Table 1 indicates, no significant effects were yielded, suggesting that attitude change was not achieved using reaction reduction strategies before and after exposure to freedom-threatening language, $F(1,7) = .79$, $p = .59$.

Finally, behavioral intentions to ask an intimate partner about their sexual history before engaging in sexual intercourse were analyzed using a factorial ANOVA test. Although the interaction between inoculation and restorative postscripts was found to be significant $F(1) = 1.82$, $p = .03$, the overall omnibus results of a PROCESS simple slopes analysis revealed that the results in fact were not significant, $F(7, 326) = 1.4$, $p = .20$). This suggests that the strength of the interaction was not strong enough to truly make a contribution to the overall model. In other words, inoculation and restorative postscript messages do not have an overall significant effect on the behavioral intentions of participants.

Discussion

This experiment examined the efficacy of two different strategies of reducing psychological reactance by manipulating the experience of inoculation treatments, the level of threat in a persuasive appeal, and restorative treatments. Though the goal of this experiment was to identify the best way to reduce reactance using either inoculation treatments, restorative postscript treatments, or both, no main effects for either treatment were found to be significant on substantive markers of reactance. That no message variables had their intended effects on anger, negative cognitions indicates that, to a large extent, the messages in this study did not exhibit the effects that were predicted.

However, further analysis indicated that the level of freedom-threatening language to which a message recipient is exposed may be a significant consideration for the selection of reactance reduction strategies. Specifically, results of this experiment identified that at high levels of freedom-threatening language, the use of both inoculation and restorative postscript treatments served as an effective way to reduce reports of trait reactance in comparison to either message strategy alone or no message exposure at all. Overall, most results of this experiment were non-significant, but this finding may be a starting place for future explorations of reactance reduction at varying levels of threat. Since there weren't many significant conclusions made with the experimental manipulations used in the present study, future research can rule out the particular manipulation of threat used here, and try alternative ways of using freedom-threatening language to induce reactance.

The main finding of this experiment was that *at high levels of freedom-threatening language*, the use of inoculation and restorative postscript messages is most effective at reducing reactance. This is a meaningful finding because for health campaign designers, it is evidence that the level of threat included in persuasive messages is a very important consideration.

The second part of this finding is that inoculation and restoration treatments work best *in combination* in high-threat conditions. Restorative postscripts, or short statements recalling the choice to comply with a persuasive attempt, had been used as an avenue of reactance reduction in previous research (Bernard, 2014; Bessarabova, Fink, & Turner, 2013; Miller et al., 2007). These statements return the power of agency to the message recipient, reducing the experience of reactance. The present study used restoration treatments alone and in combination with inoculation messages. Results suggested that under high levels of threat, message recipients

report less trait reactance if they are exposed to both inoculation and restoration treatments than if they were only exposed to the latter.

Research on psychological reactance and the use of both inoculation and restorative postscript messages provided a backdrop for this study, which offers new information about persuasive attempts at high levels of threat. This study also built on past persuasion research by exploring the boundary conditions of inoculating against self-persuasion. Richards and Banas (2014) illustrated the utility of inoculation in reducing reactance to self-persuasion. Past research has also examined the use of restorative postscripts to reduce reactance (Bernard, 2014; Bessarabova, Fink, & Turner, 2013; Miller, et al., 2007). The present experiment advanced knowledge about reactance reduction strategies by combining these two efforts to see which strategy, alone or in combination, was most effective. The results of this study may serve as a jumping-off point for future research on freedom-threatening language and reactance reduction. The results of this study may not be directly meaningful to purveyors of health communication, as it did not produce any clear-cut indications for a right or wrong way to reduce reactance, and because predictions regarding trait reactance could not be assessed. However, it may inform later research on comparisons between pre- and post-persuasive message exposure, as it provides information about the best way to affect change in reports of trait reactance under high-threat conditions, and the best way to increase participants' intentions to engage in pro-social health behaviors using inoculating and restoration messages.

The theory of psychological reactance (TPR) posits that all individuals constantly take stock of their personal freedoms, internal and external (Brehm, 1966). Humans always want to know what their ability is to accomplish their goals, or what their "free behaviors" are (Brehm, 1966, p. 379). When people feel as though they are being limited in some way, they will often

experience psychological reactance, a state in which they will embrace the opposite of an advocated message in order to restore their personal freedom to make their own choices (Backer, Rogers, & Sopory, 1992; Hornik, 2002). The boomerang effect can be dangerous from the perspective of persuasive message designers. This present experiment was designed to elicit information about the best way to reverse the boomerang effect and incite persuasion. Specifically, results informed our understanding of how high levels of freedom-threatening language can change the way message designers should pad their persuasive attempts. To the extent that reductions in reports of trait reactance serve as evidence that reactance was reduced, the best way to do that is to use both inoculation and restorative postscripts.

In the present experiment, inoculation treatments were used alone and in combination with restorative postscripts. The crux of this study, again, was the comparative effectiveness of these two treatments in singularity and together at varying levels of threat on reports of trait reactance.

This research did not replicate previous findings that inoculation reduces reactance. Instead, it was initially designed to evaluate how subjects would experience psychological reactance after exposure to reactance reduction treatments at varying levels of threat, while factoring in their level of trait reactance. Inoculation and restoration treatments were used to reduce this experience. Though trait reactance was found to be an inaccurate measure of the true stable characteristic it was designed to assess, this experiment still yielded the interesting finding that an interaction between treatments and threat changes the way subjects report their trait reactance.

This study, like all others, had limitations. Results indicated that trait reactance was significantly affected by the interaction between inoculation, freedom-threatening language, and

restorative postscripts. Because trait reactance is a stable, inborn characteristic, this interaction between testing and treatment indicates that the measures used in this study may have uncovered a marker related to trait reactance, but not trait reactance itself. This is a limitation in the present experiment because it did not allow for evaluation of many of the hypotheses, which required a valid assessment of trait reactance to function as an independent variable. Because true trait reactance is stable, it should not matter when it is measured, but future research should perhaps assess it using a different measure than the scale used in the present study.

A second limitation is that this study was conducted on a sample of college students. This is commonly known to be an over-sampled population, largely because of its convenience. This is a limitation because it is difficult to generalize the results of this experiment beyond the young, highly-educated, largely Caucasian population surveyed. Issue involvement was identified as a receiver characteristic key to studying reactance (McGuire, 1961). The topic of this experiment — sexual health — was chosen because of its relevance to the population being studied. If this same experiment were performed on a different population, the results may be significantly different. Using issues less salient to a population would elicit less reactance after persuasive attempts.

A third limitation may relate to this experiment being conducted online. Because of the nature of the data collection, it was most feasible to conduct an online survey with experimental manipulations. Online data collection does not allow for the type of control that would be afforded if the experiment were performed with paper and pencil in a laboratory setting. The clinical nature of a lab setting would increase the certainty that outside influences did not have an effect on the way that participants answered survey questions. The freedom-threatening language manipulation was displayed in the context of a public service announcement brochure in the

form of an image on the participants' computer screens, so depending upon the device on which subjects were viewing it, the message may have had a slightly different appearance. If the experimental manipulations appeared differently depending the device, then meaningful differences would exist between groups. The two freedom-threatening language manipulations, presented as public service announcements only different in the lexical concreteness and intensity of language used, were designed to appear as identical as possible, in order to maintain experimental control. Experimental control is important to the integrity of the results, as any meaningful differences between groups should ideally be attributable to the manipulations and nothing else.

Despite its limitations, this experiment yielded results important to persuasion research. Information about the best ways to reduce the boomerang effect gives real, applicable solutions to the problems that designers of prosocial health campaigns face as they try to change the face of public health. Understanding better the role of freedom-threatening language in reducing reactance is key to creating the most effective messages to encourage people to endorse healthy habits. Particularly for the area of health communication, the stakes of this endeavor are high. The experiment reported here provided evidence that using pre- and post-script messages in persuasive attempts are the best way to change the attitudes of message recipients.

References

Allen, D. N., Sprenkel, D. G., & Vitale, P. A. (1994). Reactance theory and alcohol consumption laws: Further confirmation among collegiate alcohol consumers. *Journal of Studies on Alcohol and Drugs, 55,* 34-40.

Aronson, E. (1999). The power of self-persuasion. *American Psychologist, 54,* 875-884. doi: 10.1037/h0088188

Backer, T. E., Rogers, E. M., & Sopory, P. (1992). *Designing health communication campaigns: What works?.* Thousand Oaks, CA: Sage Publications

Banas, J. A., & Rains, S. A. (2010). A meta-analysis of research on inoculation theory. *Communication Monographs, 77,* 281-311. doi: 10.1080/03637751003758193

Benoit, W. L. (1998). Forewarning and persuasion. In M. Allen & R. Preiss (Eds.), *Persuasion: Advances through meta-analysis* (pp. 139-154). Cresskill, NJ: Hampton Press.

Bensley, L. S., & Wu, R. (1991). The role of psychological reactance in drinking following alcohol prevention messages. *Journal of Applied Social Psychology, 21,* 1111-1124. doi: 10.1111/j.1559-1816.1991.tb00461.x

Bernard, D. (2014). *Examining the use of alternative restoration scripts on the psychological reactance process* (Unpublished doctoral dissertation). University of Oklahoma, Norman.

Bessarabova, E., Fink, E. L., & Turner, M. (2013). Reactance, restoration, and cognitive structure: Comparative statics. *Human Communication Research, 39,* 339-364. doi: 10.1111/hcre.12007

Brehm, J. W. (1966) *A theory of psychological reactance.* New York, NY: Academic Press.

Brehm, S. S., & Brehm, J. W. (1981). *Psychological reactance: A theory of freedom and control.* San Diego, CA: Academic.

Burgoon, M., Alvaro, E., Grandpre, J., & Voulodakis, M. (2002). Revisiting the theory of psychological reactance: Communicating threats to attitudinal freedom. In J. P. Dillard & M. Pfau (Eds.), *The persuasion handbook: Developments in theory and practice* (pp. 213-232). Thousand Oaks, CA: Sage.

Burgoon, M., Cohen, M., Miller, M. D., & Montgomery, C. L. (1978). An empirical test of a model of resistance to persuasion. *Human Communication Research, 5,* 27-39. doi: 10.1111/j1468-2958.1978.tb00620.x

Cacioppo, J. T., & Petty, R. E. (1981). Social psychological procedures for cognitive response assessment: The thought-listing technique. In T. V. Merluzzi, C. R. Glass, & M. Genest (Eds.), *Cognitive Assessment* (pp. 309-342). New York, NY: Guilford Press.

Centers for Disease Control. (2010). *STD 101: Sex on campus.* [Data file]. Retrieved from http://dailyinfographic.com/schools-out-but-the-doctors-in-infographic

Chamberlain, P., Patterson, G., Reid, J., Kavanagh, K., & Forgatch, M. (1984). Observation of client resistance. *Behavior Therapy*, *15*, 144-155. doi: 10.1016/S0005-7894(84)80016-7

Cowan, E. W., & Presbury, J. H. (2000). Meeting client resistance and reactance with reverence. *Journal of Counseling and Development, 78,* 411-419.

Dillard, J. P., & Peck, E. (2000). Affect and persuasion: Emotional responses to public service announcements. *Communication Research, 27,* 461-495. doi: 10.1177/009365000027004003

Dillard, J. P., & Shen, L. (2005). On the nature of reactance and its role in persuasive health communication. *Communication Monographs, 72,* 144-168. doi: 10.1080/03637750500111815

Dillard, J. P., Plotnick, C. A., Godbold, L. C., Freimuth, V. S., & Edgar, T. (1996). The multiple affective outcomes of AIDS PSAs: Fear appeals do more than scare people. *Communication Research, 23,* 44-72. doi: 10.1177/009365096023001002

Dowd, E. T., Hughes, S. L., Brockbank, L., Halpain, D., Seibel, C., & Seibel, P. (1988). Compliance-based and defiance-based intervention strategies and psychological reactance in the treatment of free and unfree behavior. *Journal of Counseling Psychology, 35,* 370-376. doi: 10.1037/0022-0167.35.4.370

Fishbein, M., & Ajzen, I. (2010). *Predicting and changing behavior : The reasoned action approach.* New York : Psychology Press.

Fogarty, J. S. (1997). Reactance theory and patient noncompliance. *Social Science & Medicine, 45,* 1277-1288. doi: 0277-9536/97.

Godbold, L. & Pfau, M. (2000). Conferring resistance to peer pressure among adolescents: Using inoculation theory to discourage alcohol use. *Communication Research, 27,* 411-437. doi: 10.1177/009365000027004001

Goldman, M., Pulcher, D., & Mendez, T. (1983). Appeals for help, prosocial behavior, and psychological reactance. *Journal of Psychology, 113*, 265-269. doi: 10.1080/00223980.1983.9923585

Hong, S., & Faedda, S. F. (1996). Refinement of the Hong psychological reactance scale. *Educational and Psychological Measurement, 56,* 173-182.

Hornik, R. C. (2002). *Public health communication: Making sense of contradictory evidence.* Mahwah, NJ: Lawrence Erlbaum.

Hornik, R. C., & Yanovitzky, I. (2003). Using theory to design evaluations of communication campaigns: The case of the National Youth Anti-Drug Media Campaign. *Communication Theory, 13,* 204-224. doi: 10.1111/j.1468-2885.2003.tb00289.x

Kamins, M. A., & Asseal, H. (1987). Cognitive perspective on argumentation, source derogation, and the effect of disconfirming trial on belief change. *Journal of Marketing Research, 24,* 29-39. doi: 10.2307/3151751

Karno, M. P., & Longabaugh, R. (2005). Less directiveness by therapists improves drinking outcomes of reactant clients in alcoholism treatment. *Journal of Consulting and Clinical Psychology, 73*, 262. doi: 10.1037/0022-006X.73.2.262

Kelly, A. E., & Nauta, M. M. (1997). Reactance and thought suppression. *Personality and Social Psychology Bulletin, 23,* 1123-1132. doi: 10.1177/041461672972311001

McGuire, W. J. (1961). Resistance to persuasion conferred by active and passive prior refutation of the same and alternative counterarguments. *Journal of Abnormal and Social Psychology, 63,* 326-332. doi: 10.1037/h0048344

McGuire, W. J., & Papageorgis, D. (1961). The relative efficacy of various types of prior belief-defense in producing immunity against persuasion. *Journal of Abnormal and Social Psychology, 62,* 327-337. doi: 10.1037/h0042026

Miller, C. H., Burgoon, A., Grandpre, J. R., & Alvaro. (2006). Identifying principal risk factors for the initiation of adolescent smoking behaviors: The significance of psychological reactance. *Health Communication, 19,* 241-252. doi: 10.1207/s15327027hc1903_6

Miller, C. H., Ivanov, B., Sims, J., Compton, J., Harrison, K. J., Parker, K. A., Parker, J. L., & Averbeck, J. M. (2013). Boosting the potency of resistance: Combining the motivational forces of inoculation and psychological reactance. *Human Communication Research, 39,* 127-155. doi: 10.1111/j.1468-2958.2012.01438.x

Miller, C. H., Lane, L. T., Deatrick, L. M., Young, A. M., & Potts, K. A. (2007). Psychological reactance and promotional health messages: The effects of controlling language, lexical concreteness, and the restoration of freedom. *Human Communication Research, 33*, 219-240. doi: 10.1111/j.1468-2958.2007.00291.x

Nabi, R. L. (2002). Discrete emotions and persuasion. In J. P. Dillard & M. Pfau (Eds.), *The persuasion handbook* (pp. 289-308). Thousand Oaks, CA: Sage.

Papageorgis, D., & McGuire, W. J. (1961). The generality of immunity to persuasion produced by pre-exposure to weakened counterarguments. *Journal of Abnormal and Social Psychology, 62,* 475-481. doi: 10.1037/h0048430

Petty, R. E. & Cacioppo, J. T. (1979). Issue involvement can increase or decrease persuasion by enhancing message-relevant cognitive responses. *Journal of Personality and Social Psychology, 37,* 1915-1926. doi: 10.1037/0022-3514.37.10.1915

Petty, R. E. & Cacioppo, J. T. (1986). *Communication and persuasion: Central and peripheral routes to attitude change.* New York, NY: Springer-Verlag.

Pfau, M. (1992). The potential of inoculation in promoting resistance to the effectiveness of comparative advertising messages. *Communication Quarterly, 40,* 26-44. doi: 10.1080/01463379209369818.

Pfau, M. W. (1988). *Inoculation in political campaigns.* (Doctoral dissertation). Wiley Online Library. University of Arizona, Tucson.

Pfau, M., Van Bockern, S., & Kang, J. G. (1992). Use of inoculation to promote resistance to smoking initiation among adolescents. *Communication Monographs, 59,* 213-230. doi: 10.1080/03637759209376266

Pfau, M., Tusing, K, J.,Koerner, A. F., Lee, W. Godbold, L. C., Yang, V. S., & Hong, Y. (1997). Enriching the inoculation construct: The role of critical components in the process of resistance. *Human Communication Research, 24,* 187-215. doi: 10.1111/j.1468-2958.1997.tb00413.x

Quick, B. L. (2012). What is the best measure of psychological reactance? An empirical test of two measures. *Health Communication, 27,* 1-9. doi:10.1080/10410236.2011.567446

Quick, B. L., & Considine, J. R. (2008). Examining the use of forceful language when designing exercise persuasive messages for adults: A test of conceptualizing reactance arousal as a two-step process. *Health Communication, 23,* 483-491. doi: 10.1080/10410230802342150

Quick, B. L., Kam, J. A., Morgan, S. E. , Liberona, C. A. M., & Smith, R. A. (2015). Prospect theory, discrete emotions, and freedom threats : An extension of psychological reactance theory. *Journal of Communication, 65,* 40-61. doi : 10/1111/jcom. 12134.

Quick, B. L., & Kim, D. K. (2009). Examining reactance and reactance restoration with South Korean adolescents: A test of psychological reactance within a collectivist culture. *Communication Research, 36,* 765-782. doi: 10.1177/009365020346797

Quick, B. L., Scott, A. M., & Ledbetter, A. M. (2011). A close examination of trait reactance and issue involvement as moderators of psychological reactance theory. *Journal of Health Communication, 16,* 660-679. doi: 10.1080/10810730.2011.551989

Quick, B. L., & Stephenson, M. T. (2007). Further evidence that psychological reactance can be modeled as a combination of anger and negative cognitions. *Communication Research, 34,* 255-276. doi: 101177/0093650207300427

Rains, S. A., & Turner, M. M. (2007). Psychological reactance and persuasive health communication: A test and extension of the intertwined model. *Human Communication Research, 33,* 241-269. doi: 10.1111/j.1468-2958.2007.00298.x.

Richards, A. S., & Banas, J. A. (2014). Inoculating against reactance to persuasive health messages. *Health Communication, 29,* 1-10. doi: 10.1080/10410236.2013.867005.

Richards, A. S., Banas, J. A., & Magid, Y. (2015, May). The paradoxical role of threat in inoculation against reactance to health interventions. Paper presented at the annual conference of the International Communication Association, San Juan, Puerto Rico.

Schwarz, N. (1984). When reactance effects persist despite restoration of freedom: Investigations of time delay and vicarious control. *European Journal of Social Psychology, 14,* 405-419. doi: 0046-2772/84/040405

Scott, A. M., & Quick, B. L. (2012). Family communication patterns moderate the relationship between psychological reactance and willingness to talk about organ donation. *Health Communication, 27,* 702-711. doi: 10.1080/10410236.2011.635135

Searle, J. R. (1975) Indirect speech acts. *Syntax and semantics, 3,* 59-82.

Seibel, C. A., & Dowd, E. T. (2001). Personality characteristics associated with psychological reactance. *Journal of Clinical Psychology, 57,* 963-969. doi: 10.1002/jclp.1062

Shen, L. (2010). Mitigating psychological reactance: The role of message-induced empathy in persuasion. *Human Communication Research, 36,* 397-422. doi: 10.1111/j.1468-2958.2010.01381.x

Spielberger, C. D. (1988). *Professional Manual for the State-Trait Anger Expression Inventory (STAXI).* Odessa, FL: Psychological Assessment Resources.

Wicklund, R. A. (1974). *Freedom and reactance.* Oxford, England: Lawrence Erlbaum.

Wicklund, R. A., & Brehm, J. W. (1968). Attitude change as a function of felt competence and threat to attitudinal freedom. *Journal of Experimental Social Psychology, 4,* 64-75. doi: 10.1016/0022-1031(68)90050-4

Worchel, S., & Brehm, J. W. (1971). Direct and implied social restoration of freedom. Journal of Personality and Social Psychology, 18(3), 294. doi: 10.1037/h0031000

Wright, R. A. (1986). Attitude change as a function of threat to attitudinal freedom and extent of agreement with a communicator. *European Journal of Social Psychology, 16,* 43-50. doi: 0046-2772/86/010043-08$05.00

Table 1 ANOVA results

Dependent variable	R^2	F	η^2	Inoculation F	Inoculation η^2	FTL F	FTL η^2	RPS F	RPS η^2	INOC x FTL F	INOC x FTL η^2	INOC x RPS F	INOC x RPS η^2	FTL x RPS F	FTL x RPS η^2	INOC x FTL x RPS F	INOC x FTL x RPS η^2
Perceived threat	.09	4.44***	.09	.90	.00	28.12***	.08	.73	.002	.92	.003	1.06	.003	.53	.002	.06	.000
Anger arousal	.03	1.29	.03	.40	.002	.71	.002	1.87	.006	.04	.000	.46	.001	.46	.001	3.67*	.01
Negative cognitions	.02	.86	.95	2.76	.002	.73	.01	.30	.001	1.20	.004	.24	.001	1.45	.004	.01	.000
Behavioral intention	.03	1.41	.03	.90	.000	1.12	.003	.09	.000	1.74	.005	4.54	.01	1.82*	.006	.583	.002
Trait reactance	.04	2.18*	.02	2.74	.008	1.20	.004	5.11*	.02	4.12	.003	1.05	.003	.74	.002	4.48*	.014
Attitude	.02	.76	.02	.29	.003	.53	.002	1.04	.003	.41	.001	2.21	.007	.25	.001	.50	.002

*p < .05, **p < .01, ***p < .001, two-tailed.

Table 2 Means, standard deviations, and estimated marginal mean differences between levels of freedom-threatening language for inoculation treatments and restorative postscript treatments.

		Low FTL				High FTL			
		Inoculation		Control		Inoculation		Control	
	F	RPS	Control	RPS	Control	RPS	Control	RPS	Control
Perceived Threat	4.44***	2.69_a	2.59_a	2.74_b	2.89_b	3.61_c	3.66_c	3.28_d	3.14_d
		(1.39)	(1.34)	(1.46)	(1.35)	(1.37)	(1.51)	(1.50)	(1.48)
Anger arousal	1.29	2.19	.28	2.72	2.59	2.63	2.65	2.65	2.62
		(.86)	(1.25)	(1.03)	(1.07)	(1.07)	(1.22)	(.96)	(1.09)
Negative cognitions	.86	.45	.57	.54	.15	.53	.39	.38	.15
		(.94)	(.89)	(1.07)	(.36)	(1.11)	(.71)	(.67)	(.36)
Behavioral intent	1.38	5.71	5.96	6.35	5.78	5.66	6.11	5.69	5.72
		(1.29)	(1.35)	(1.09)	(1.38)	(1.41)	(1.32)	(1.27)	(1.59)
Trait reactance	2.18*	3.56_a	3.59_a	3.55_a	3.81_b	3.29_c	3.94_d	3.86_b	3.86_b
		(.97)	(1.01)	(.81)	(.76)	(.85)	(1.13)	(.93)	(.85)
Attitudes	.72	2.01	2.02	1.97	2.38	2.04	1.97	1.99	2.38
		(1.16)	(.89)	(.84)	(1.25)	(.96)	(.92)	(.79)	(.79)

*p < .05, **p < .01, ***p < .001, two-tailed. Numbers with different subscripts are significantly different.

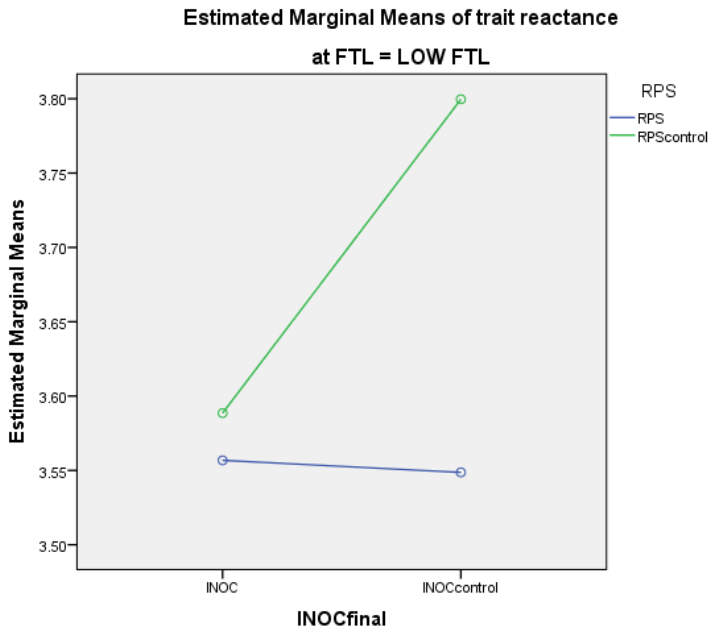

Figure 1. Estimated marginal means of trait reactance in restorative postscript (treatment, control), and inoculation (treatment, control) conditions at low levels of freedom-threatening language.

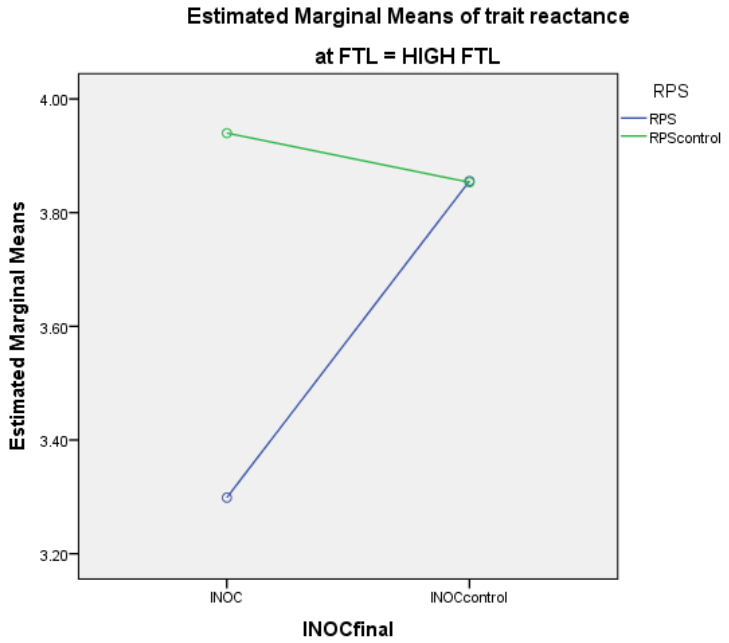

Figure 2. Estimated marginal mean differences of levels of trait reactance in restorative postscript (treatment, control), and inoculation (treatment, control) conditions, at high levels of freedom-threatening language.

Appendix A

Inoculation treatment message

"The information you are about to read might contain forceful language. It may sound to some people as if it is trying to limit their freedom to choose. Try not to let it cloud your judgment; the message's recommendation may still be a good one, even if the ad's language makes you a little mad" (Richards, Banas, & Magid, 2015).

Inoculation control message.

"We can trace sushi's origin back to the 4th century BCE. Cleaned fish were kept in rice so that the natural fermentation of the rice helped preserve the fish. This sushi was taken out of storage after a couple of months of fermentation. Over time, sushi spread throughout China, and later, it was introduced in Japan" (Richards & Banas, 2014).

Appendix B

Restorative Postscript Message

You've probably heard a lot of messages telling you to discuss sexual history and past partners in your intimate relationships with a new partner. You've probably even heard messages similar to this one telling you how important sexual communication 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 talk to their new intimate partners about their sexual history, and some decide not to. Everyone 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 (Miller et al., 2007).

Restorative Postscript Control Message.

You've probably heard a lot of messages telling you to have open communication in your relationships. You've probably even heard messages similar to this one telling you how important communication is. Of course, a message is a means to communicate. Communication occurs every day. These messages are designed to be able to communicate with all different types of people. All different types of people will read what you've read today (Miller et al., 2007)

Appendix C

Survey: Health Messages About Reproductive Health Conversations

Consent to participate in research

Title of Research: Health Messages About Reproductive Health Conversations

Funding Agency/Sponsor: N/A

Study Investigators: Dr. Adam Richards and Micah Dawes Haynes
What is the purpose of the research?
The purpose of this study is to gain a better understanding of the effectiveness of persuasive health messages.

How many people will participate in this study?
Approximately 500 participants will be recruited to complete the questionnaire.

What is my involvement for participating in this study?
You must be 18 years of age to participate in this study. After providing consent to participate in this study, you will read a health message about reproductive health and complete an online questionnaire about your opinions of what you read. Your responses to the questionnaire will remain completely anonymous: At no time will your answers be associated with your identity. With your consent, we will use your responses as part of the data collection for this study. You participation is completely voluntary, and you may withdraw from the study at any time without penalty.

How long am I expected to be in this study for and how much of my time is required?
The online questionnaire should take approximately 30 minutes to complete.

What are the risks of participating in this study and how will they be minimized?
The potential risks of this study are minimal. As an example of a potential risk, some participants might become upset when filling out the questionnaire, because some elements of the questionnaire might remind them of having uncomfortable conversations with their intimate or sexual partners. Your participation is completely voluntary and anonymous. If you feel the need to withdraw from the study, you may do so at any time without penalty. If you are taking the study for course credit, results will in no way affect your grade in this course.

What are the benefits for participating in this study? Even though there may be no direct benefit to you from the results of the online questionnaire, the current study will contribute to the growing knowledge body of research on health communication, and will result in findings that

extend our understanding of how to use persuasive health messages to encourage positive change in sexual health behaviors.

Will I be compensated for participating in this study?
Your instructor may choose to award course credit or extra credit for participating in this study.

What is an alternate procedure(s) that I can choose instead of participating in this study?
If you do not wish to participate, your instructor will provide you with an alternative assignment option so as to give you the opportunity to earn the same amount of credit.

How will my confidentiality be protected?
Your responses from the online questionnaire will be anonymous. This consent form and the data you provide will be kept in a locked cabinet or password-protected electronic file. The researchers will be the only individuals with the ability to access this information.

Is my participation voluntary?
Your participation in this study is completely voluntary.

Can I stop taking part in this research?
You may withdraw from this research at any time without penalty.

What are the procedures for withdrawal?
If you wish to withdraw, you may exit the online survey at any time. Then, if completing the survey for course or extra credit, you may consult your instructor for an alternative option.

Will I be given a copy of the consent document to keep?
Yes--if you wish to retain this form, please print or save a copy of it now.

Who should I contact if I have questions regarding the study?
Dr. Adam Richards, Assistant Professor of Communication, Texas Christian University, adam.richards@tcu.edu

Who should I contact if I have concerns regarding my rights as a study participant?

Dr. Sally Fortenberry, Chair, TCU Institutional Review Board, Telephone 817-257-6752. Dr. Bonnie Melhart, Director, Sponsored Research, Telephone 817-257-7104.

By clicking YES below and proceeding to the first page of the survey, you indicate that you have read or been read the information provided above, you have received answers to all of your questions and have been told who to call if you have any more questions, you have freely decided to participate in this research, and you understand that you are not giving up any of your legal rights.

- ❍ Yes (1)
- ❍ No (2)

PLEASE ENTER YOUR NAME, so that you can receive class credit for your participation in the study.

SECTION
Please enter your course instructor's name, so that you can receive class credit for your participation in the study.
Note that if you are a student enrolled in COMM 10123, Dr. Finn is the course director, and you should insert the correct name of your lab instructor.

TCU ID
Please enter the last four digits of your TCU student ID number.

You are about to begin taking a survey about health messages and reproductive health conversations. Regardless of your current sexual activity, we are interested in your opinion about a reproductive health message produced by the TCU Public Health Initiative. Be sure to read and follow instructions completely. Please answer all applicable questions.

Thank you for participating in this survey.

Demographic information

What is your biological sex?
- ❍ Male (1)
- ❍ Female (2)

What is your age? Please answer in numerical digits (i.e. 22).

What is your ethnicity?
- ❍ White/Caucasian (1)
- ❍ African American (2)
- ❍ Asian/Island Pacific (3)
- ❍ Native American (4)
- ❍ Hispanic (5)
- ❍ Other (6) _____

What is your grade level?
- ❍ Freshman (1)
- ❍ Sophomore (2)
- ❍ Junior (3)
- ❍ Senior (4)
- ❍ Nontraditional (5)
- ❍ Other (6) _____

Freedom-threatening language manipulation (see Appendix D for manipulations).

Please read the following message before continuing:

The information you are about to read might contain forceful language. It may sound to some people as if it is trying to limit their freedom to choose. Try not to let it cloud your judgment; the message's recommendation may still be a good one, even if the ad's language makes you a little mad.

I have finished reading this entire message and would like to continue with the survey.
- ❍ Yes (1)
- ❍ No (2)

Please read the following message before continuing:

We can trace sushi's origin back to the 4th century BCE. Cleaned fish were kept in rice so that the natural fermentation of the rice helped preserve the fish. This sushi was taken out of storage after a couple of months of fermentation. Over time, sushi spread throughout China, and later, it was introduced in Japan. I have finished reading this entire message and would like to continue with the survey.
- ❍ Yes (1)
- ❍ No (2)

Inoculation manipulation check.

This set of items is designed to help us understand how you feel about the main idea expressed in the message you just read. How do you feel about the possibility of this idea? I find this idea:

	Safe (1)	(2)	(3)	(4)	(5)	(6)	Unsafe (7)
(1)							

	Nonthreatening (1)	(2)	(3)	(4)	Threatening (5)
(1)					

	Calm (1)	(2)	(3)	(4)	(5)	(6)	Anxious (7)
(1)							

	Unintimidating (1)	(2)	(3)	(4)	(5)	(6)	Intimidating (7)
(1)							

	Harmful (1)	(2)	(3)	(4)	(5)	(6)	Not harmful (7)
(1)							

	Not risky (1)	(2)	(3)	(4)	(5)	(6)	Risky (7)
(1)							

Once you have finished reading the health message, click NEXT to continue with the survey. PLEASE NOTE that you should pay close attention to the contents of this message, as you will be asked to answer questions about it. I have read the entire health message and would like to continue with the survey

- ❍ Yes (1)
- ❍ No (2)

Perceived threat to freedom

Recall the advertisement from the TCU Public Health Initiative you read earlier, and please indicate the extent to which you agree with the following statements:

	Strongly Disagree (1)	Disagree (2)	Moderately Disagree (3)	Neither Agree Nor Disagree (4)	Moderately Agree (5)	Agree (6)	Strongly Agree (7)

This message threatened my freedom to choose. (1) This message tried to make a decision for me. (2) This message tried to manipulate me. (3) This message tried to pressure me. (4)							

Negative cognitions

Please write down all the thoughts that came to mind as you read the message. List each thought separately using a different line for each thought. Don't worry about your use of grammar and punctuation. You only need to list as many thoughts as you had. Don't worry about filling every line.

Thought 1: (1)
Thought 2: (2)
Thought 3: (3)
Thought 4: (4)
Thought 5: (5)
Thought 6: (6)
Thought 7: (7)
Thought 8: (8)
Thought 9: (9)
Thought 10: (10)
Thought 11: (11)
Thought 12: (12)
Thought 13: (13)
Thought 14: (14)
Thought 15: (15)

For each thought you just listed on the previous page, please choose whether it is:
"Favorable" if you consider the thought you recorded to be in agreement with, or in support of the health message
"Unfavorable" if you consider the thought to be in opposition to, or countering the health message "Neutral" if neither.

ALSO, for each thought, please choose whether it is:
"Relevant" if you consider the thought you recorded to have something to do with the health message. (ie) "I am worried about my sexual health," would be a relevant thought.
"Irrelevant" if you consider the thought you recorded to have nothing to do with the health message. (ie) "I'm hungry," would be an irrelevant thought.

DO NOT code lines for which you did not have a thought. Just leave them blank and continue with the survey.

HEALTH MESSAGES

Response 1: "${q://QID80/ChoiceTextEntryValue/1}"

- ❍ Favorable (1)
- ❍ Unfavorable (2)
- ❍ Neutral (3)

- ❍ Relevant (1)
- ❍ Irrelevant (2)

Response 2: "${q://QID80/ChoiceTextEntryValue/2}"

- ❍ Favorable (1)
- ❍ Unfavorable (2)
- ❍ Neutral (3)

- ❍ Relevant (1)
- ❍ Irrelevant (2)

Response 3: "${q://QID80/ChoiceTextEntryValue/3}"

- ❍ Favorable (1)
- ❍ Unfavorable (2)
- ❍ Neutral (3)

- ❍ Relevant (1)
- ❍ Irrelevant (2)

Response 4: "${q://QID80/ChoiceTextEntryValue/4}"

- ❍ Favorable (1)
- ❍ Unfavorable (2)
- ❍ Neutral (3)

- ❍ Relevant (1)
- ❍ Irrelevant (2)

Response 5: "${q://QID80/ChoiceTextEntryValue/5}"

- ❍ Favorable (1)
- ❍ Unfavorable (2)
- ❍ Neutral (3)

- ❍ Relevant (1)
- ❍ Irrelevant (2)

Response 6: "${q://QID80/ChoiceTextEntryValue/6}"

- ❍ Favorable (1)
- ❍ Unfavorable (2)
- ❍ Neutral (3)

- ❍ Relevant (1)
- ❍ Irrelevant (2)

Response 7: "${q://QID80/ChoiceTextEntryValue/7}"

- ❍ Favorable (1)
- ❍ Unfavorable (2)
- ❍ Neutral (3)

- ❍ Relevant (1)
- ❍ Irrelevant (2)

Response 8: "${q://QID80/ChoiceTextEntryValue/8}"

- ❍ Favorable (1)
- ❍ Unfavorable (2)
- ❍ Neutral (3)

- ❍ Relevant (1)
- ❍ Irrelevant (2)

Response 9: "${q://QID80/ChoiceTextEntryValue/9}"

- ❍ Favorable (1)
- ❍ Unfavorable (2)
- ❍ Neutral (3)

- ❍ Relevant (1)
- ❍ Irrelevant (2)

Response 10: "${q://QID80/ChoiceTextEntryValue/10}"

- ❍ Favorable (1)
- ❍ Unfavorable (2)
- ❍ Neutral (3)

- ❍ Relevant (1)
- ❍ Irrelevant (2)

Response 11: "${q://QID80/ChoiceTextEntryValue/11}"

❍ Favorable (1)
❍ Unfavorable (2)
❍ Neutral (3)

❍ Relevant (1)
❍ Irrelevant (2)

Response 12: "${q://QID80/ChoiceTextEntryValue/12}"

❍ Favorable (1)
❍ Unfavorable (2)
❍ Neutral (3)

❍ Relevant (1)
❍ Irrelevant (2)

Response 13: "${q://QID80/ChoiceTextEntryValue/13}"

❍ Favorable (1)
❍ Unfavorable (2)
❍ Neutral (3)

❍ Relevant (1)
❍ Irrelevant (2)

Response 14: "${q://QID80/ChoiceTextEntryValue/14}"

❍ Favorable (1)
❍ Unfavorable (2)
❍ Neutral (3)

❍ Relevant (1)
❍ Irrelevant (2)

Response 15: "${q://QID80/ChoiceTextEntryValue/15}"

❍ Favorable (1)
❍ Unfavorable (2)
❍ Neutral (3)

❍ Relevant (1)
❍ Irrelevant (2)

State anger arousal.

How do you feel right now? For each of the terms below, indicate the degree of emotion that best represents your feelings after reading the advocated health message.

	None of this feeling (1)	(2)	(3)	(4)	(5)	(6)	A great deal of this feeling (7)

Surprised (1)							
Irritated (2)							
Fearful (3)							
Startled (4)							
Sad (5)							
Happy (6)							
Angry (7)							
Astonished (8)							
Sickened (9)							
Content (10)							
Annoyed (11)							
Afraid (12)							
Revolted (13)							
Dreary (14)							
Guilty (15)							
Scared (16)							
Aggravated (17)							
Ashamed (18)							
Cheerful (19)							
Dismal							

(20)							
Disgusted (21)							

Hypothetical attitudes.

For the following questions, we are interested in your opinions about sexual health and communication, regardless of your current sexual activity.

For someone to ask his/her new intimate partner about their sexual history before they engage in sexual relations is:

	Good (1)	(2)	(3)	(4)	(5)	(6)	Bad (7)
(1)							

	Foolish (1)	(2)	(3)	(4)	(5)	(6)	Wise (7)
(1)							

	Favorable (1)	(2)	(3)	(4)	(5)	(6)	Unfavorable (7)
(1)							

	Positive (1)	(2)	(3)	(4)	(5)	(6)	Negative (7)
(1)							

	Desirable (1)	(2)	(3)	(4)	(5)	(6)	Undesirable (7)

(1)							

	Unnecessary (1)	(2)	(3)	(4)	(5)	(6)	Necessary (7)
(1)							

	Beneficial (1)	(2)	(3)	(4)	(5)	(6)	Detrimental (7)
(1)							

Personal attitudes.

Now, we are interested in knowing more about your thoughts about your own sexual health communication.

For me to ask about my new intimate partner's sexual history is:

	Good (1)	(2)	(3)	(4)	(5)	Bad (6)
(1)						

	Foolish (1)	(2)	(3)	(4)	(5)	Wise (6)
(1)						

	Favorable (1)	(2)	(3)	(4)	(5)	Unfavorable (6)
(1)						

	Positive (1)	(2)	(3)	(4)	(5)	Negative (6)
(1)						

	Desirable (1)	(2)	(3)	(4)	(5)	Undesirable (6)
(1)						

	Unnecessary (1)	(2)	(3)	(4)	(5)	Necessary (6)

(1)						

	Beneficial (1)	(2)	(3)	(4)	(5)	Detrimental (6)
(1)						

For me to ask my new intimate partner about his/her sexual history before we engage in vaginal intercourse is:

	Good (1)	(2)	(3)	(4)	(5)	(6)	Bad (7)
(1)							

	Foolish (1)	(2)	(3)	(4)	(5)	(6)	Wise (7)
(1)							

	Favorable (1)	(2)	(3)	(4)	(5)	(6)	Unfavorable (7)
(1)							

	Positive (1)	(2)	(3)	(4)	(5)	(6)	Negative (7)
(1)							

	Desirable (1)	(2)	(3)	(4)	(5)	(6)	Undesirable (7)

(1)							

	Unnecessary (1)	(2)	(3)	(4)	(5)	(6)	Necessary (7)
(1)							

	Beneficial (1)	(2)	(3)	(4)	(5)	(6)	Detrimental (7)
(1)							

For me to ask my new intimate partner about his/her sexual history before we engage in oral sex is:

	Good (1)	(2)	(3)	(4)	(5)	(6)	Bad (7)
(1)							

	Foolish (1)	(2)	(3)	(4)	(5)	(6)	Wise (7)
(1)							

	Favorable (1)	(2)	(3)	(4)	(5)	(6)	Unfavorable (7)
(1)							

	Positive (1)	(2)	(3)	(4)	(5)	(6)	Negative (7)

(1)							

	Desirable (1)	(2)	(3)	(4)	(5)	(6)	Undesirable (7)
(1)							

	Unnecessary (1)	(2)	(3)	(4)	(5)	(6)	Necessary (7)
(1)							

	Beneficial (1)	(2)	(3)	(4)	(5)	(6)	Detrimental (7)
(1)							

For me to ask my new intimate partner about his/her sexual history before we engage in anal sex is:

	Good (1)	(2)	(3)	(4)	(5)	(6)	Bad (7)
(1)							

	Foolish (1)	(2)	(3)	(4)	(5)	(6)	Wise (7)
(1)							

	Favorable (1)	(2)	(3)	(4)	(5)	(6)	Unfavorable (7)

(1)							

	Positive (1)	(2)	(3)	(4)	(5)	(6)	Negative (7)
(1)							

	Desirable (1)	(2)	(3)	(4)	(5)	Undesirable (6)
(1)						

	Unnecessary (1)	(2)	(3)	(4)	(5)	Necessary (6)
(1)						

	Beneficial (1)	(2)	(3)	(4)	(5)	Detrimental (6)
(1)						

Behavioral intent.

Please indicate the likelihood with which you would exhibit the following behaviors:

I plan to have a conversation with my next new intimate partner about his/her sexual history before we engage in sexual relations.

	Extremely Unlikely (1)	Unlikely (2)	Moderately Unlikely (3)	Neither Likely Nor Unlikely (4)	Moderately Likely (5)	Likely (6)	Extremely Likely (7)	Not Applicable (8)
(1)								

I will make an effort to ask a new intimate partner about his/her sexual history before we engage in sexual relations.

	I definitely will not. (1)	I will not. (2)	I probably will not. (3)	I am undecided. (4)	I probably will. (5)	I will. (6)	I definitely will. (7)	Not Applicable (8)

(1)								

I intend to ask a new intimate partner about his/her sexual history before we engage in sexual relations.

	Strongly Disagree (1)	Disagree (2)	Moderately Disagree (3)	Neither Agree Nor Disagree (4)	Moderately Agree (5)	Agree (6)	Strongly Agree (7)	Not Applicable (8)
(1)								

I intend to ask my next intimate partner about his/her sexual history before we engage in sexual relations.

	I definitely will not. (1)	I will not. (2)	I probably will not. (3)	I am undecided. (4)	I probably will. (5)	I will. (6)	I definitely will. (7)	Not Applicable. (8)
(1)								

I intend to ask my next intimate partner about his/her sexual history before we engage in vaginal intercourse.

	I definitely will not. (1)	I will not. (2)	I probably will not. (3)	I am undecided. (4)	I probably will. (5)	I will. (6)	I definitely will. (7)	Not Applicable (8)
(1)								

I intend to ask my next intimate partner about his/her sexual history before we engage in oral sex.

	I definitely will not. (1)	I will not. (2)	I probably will not. (3)	I am undecided. (4)	I probably will. (5)	I will. (6)	I definitely will. (7)	Not Applicable (8)
(1)								

I intend to ask my next intimate partner about his/her sexual history before we engage in anal sex.

	I definitely will not. (1)	I will not. (2)	I probably will not. (3)	I am undecided. (4)	I probably will. (5)	I will. (6)	I definitely will. (7)	Not Applicable (8)
(1)								

Trait reactance.

Please indicate the degree to which you agree or disagree which the following statements:

	Strongly Disagree (1)	Disagree (2)	Moderately Disagree (3)	Neither Agree Nor Disagree (4)	Moderately Agree (5)	Agree (6)	Strongly Agree (7)

Regulations (rules) trigger a sense of resistance in me. (1)								
I find contradicting others stimulating. (2)								
When something is prohibited, I usually think "That's exactly what I am going to do." (3)								
The thought of being dependent on others aggravates me. (4)								
I consider advice from others to be an intrusion. (5)								
I become frustrated when I am unable to make free and independent decisions. (6)								
It irritates me when someone points out things which are obvious to me. (7)								

I become angry when my freedom of choice is restricted. (8)							
Advice and recommendations usually induce me to do just the opposite. (9)							
I am contented only when I am acting of my own free will. (10)							
I resist the attempts of others to influence me. (11)							
It makes me angry when another person is held up as a role model for me to follow. (12)							
When someone forces me to do something, I feel like doing the opposite. (13)							

Anger control.

Please indicate the degree to which you agree or disagree with the following statements:

	Strongly Disagree (1)	Disagree (2)	Moderately Disagree (3)	Neither Agree Nor Disagree (4)	Moderately Agree (5)	Agree (6)	Strongly Agree (7)

I often feel furious. (1)								
When angry, I keep my cool. (2)								
I often feel irritated. (3)								
When angry, I tend to say nasty things. (4)								
When angry, I keep my anger in. (5)								
When angry, I feel I am boiling inside. (6)								
I often feel angry. (7)								
When angry, I control my behavior. (8)								
I often feel like yelling. (9)								
When angry, I am still tolerant. (10)								
I am often angrier than I will admit. (11)								
When angry, I will withdraw from others. (12)								

When angry, I tend to be sarcastic. (13)							
When angry, I tend to argue with others. (14)							
I tend to hold grudges. (15)							
I often feel like breaking things. (16)							
When angry, I can control my temper. (17)							
I often feel mad. (18)							
When angry, I tend to do demonstrative things like slam doors. (19)							
I often feel like banging on something. (20)							
I often feel like hitting something. (21)							
When angry, I can calm myself down. (22)							

I am secretly critical of others. (23)							
When I am angry, I express my anger. (24)							
When I am angry, I am patient with others. (25)							
When angry, I tend to pout or sulk. (26)							
When I am angry, I will tell others. (27)							
When angry, I can control my anger. (28)							

Sexual health behaviors,

For how many years have you been sexual active?
Please enter a numerical answer. If you have not been sexually active, please enter 0.

In your lifetime, with how many people have you engaged in vaginal intercourse?
Please enter a numerical answer.

Over the past year (12 months), with how many people have you engaged in vaginal intercourse?
Please enter a numerical answer.

In your lifetime, with how many people have you engaged in oral sex?
Please enter a numerical answer.

HEALTH MESSAGES

Over the past year (12 months), with how many people have you engaged in oral sex?
Please enter a numerical answer.

In your lifetime, with how many people have you engaged in anal sex?
Please enter a numerical answer.

Over the past year (12 months), with how many people have you engaged in anal sex?
Please enter a numerical answer.

Indicate the extent to which you agree with the following statements:
When I engage in vaginal intercourse, I typically use a condom or another form of contraception ____% of the time.
_____ (1)

When I engage in oral sex, I typically use a condom or another form of contraception ____% of the time.
_____ (1)

When I engage in anal sex, I typically use a condom or another form of contraception ____% of the time.
_____ (1)

Sexual health communication.

Indicate the extent to which you agree with the following statements:

	Strongly Disagree (1)	Disagree (2)	Moderately Disagree (3)	Neither Agree Nor Disagree (4)	Moderately Agree (5)	Agree (6)	Strongly Agree (7)
I have had open communicatio n about sexual health with one or both of my parents. (1)							
I feel comfortable discussing sexual health with my mother (or female guardian). (2)							
I feel comfortable discussing sexual health with my father (or male guardian). (3)							
Sexual health was part of my educational curriculum in the past. (4)							

Religiosity.

How often do you attend religious services?

- ❍ Never (1)
- ❍ Less than Once a Month (2)
- ❍ Once a Month (3)
- ❍ 2-3 Times a Month (4)
- ❍ Once a Week (5)
- ❍ 2-3 Times a Week (6)
- ❍ Daily (7)

Besides attending religious services, how often do you take part in other activities at a place of worship?

- ❍ Never (1)
- ❍ Less than Once a Month (2)
- ❍ Once a Month (3)
- ❍ 2-3 Times a Month (4)
- ❍ Once a Week (5)
- ❍ 2-3 Times a Week (6)
- ❍ Daily (7)

How important are your religious or spiritual beliefs as a source of meaning in your life?

	Extremely Unimportant (1)	Unimportant (2)	Moderately Unimportant (3)	Neither Important Nor Unimportant (4)	Moderately Important (5)	Important (6)	Extremely Important (7)
(1)							

How important are your religious or spiritual beliefs to what you do every day?

	Extremely Unimportant (1)	Unimportant (2)	Moderately Unimportant (3)	Neither Important Nor Unimportant (4)	Moderately Important (5)	Important (6)	Extremely Important (7)

(1)							

How often do you pray, if at all?
- ❍ Never (1)
- ❍ Less than Once a Month (2)
- ❍ Once a Month (3)
- ❍ 2-3 Times a Month (4)
- ❍ Once a Week (5)
- ❍ 2-3 Times a Week (6)
- ❍ Daily (7)

Demographic information.

Are you a member of a fraternity or sorority?
- ❍ Yes (1)
- ❍ No (2)

With which sexual orientation do you most closely identify?
- ❍ Heterosexual (1)
- ❍ Homosexual (2)
- ❍ Bisexual (3)
- ❍ Asexual (4)
- ❍ Other (5) _____

Please indicate your current relationship status:
- ❍ Single (1)
- ❍ Casually dating (2)
- ❍ Seriously dating (3)
- ❍ Engaged (4)
- ❍ Married (5)
- ❍ In a long-term domestic partnership (6)
- ❍ Separated (7)
- ❍ Other (8) _____

Thank you for your participation in this study! Please continue on for a debrief statement.

Debrief statement.

We are Dr. Adam Richards, Assistant Professor, and Micah Haynes, Master's candidate, both researchers with Texas Christian University's Department of Communication.

The purpose of this study was to determine how people react to messages that may be perceived as limiting their freedom.

Past research asserted that people react negatively to messages that they consider threatening to their ability to make choices. Research has also been conducted that shows if people are forewarned about an impending persuasive appeal, they are less persuaded by it.

In this study, we were interested in determining whether it was possible to decrease negative reactions to freedom-threatening messages if people were forewarned against the possibility of reacting negatively. To do this, we created freedom-threatening messages and forewarning messages.

You've just read information about sexual communication among college students at TCU purportedly produced by the TCU Public Health Initiative. In fact, though the information about sexual health and sexually transmitted disease was factually correct, this was not real information produced by TCU, and the TCU Public Health Initiative does not exist.

You were asked to participate in this study because you are in a communication undergraduate course. You are one of approximately 300 people in this study. We are sorry that we had to be mildly deceptive in order to gain this understanding. We did not mean to harm you in any way at all, but rather want to understand communication and persuasion. Please don't tell your fellow students about the content of this study, because they might participate in the study later on in the semester.

Sincerely, Dr. Adam Richards Micah Dawes Haynes

Contact Dr. Richards at adam.richards@tcu.edu with any questions or concerns. If you are disturbed by any content in this survey, contact the TCU Counseling Center at (817) 257-7863.

Exit

I have finished reading the debrief statement and would like to complete the survey

- ❍ Yes (1)
- ❍ No (2)

Appendix D

Experimental Manipulations

Low freedom-threatening language.

High freedom-threatening language.