

## ABSTRACT

Title of Thesis: THE FOLLOWING MESSAGE MIGHT MAKE YOU MAD:  
FOREWARNING AND INOCULATION AGAINST  
REACTANCE

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If a persuasive attempt, be it a commercial advertisement, a Public Service Announcement, or a major public health campaign, threatens individuals' perceived freedom to make their own choices, psychological reactance can cause the attempt to be ineffective or even to backfire. Extant research points to two major ways of reducing reactance, the first being weakening the language of the persuasive message, and the second offering a freedom-restoring postscript. In the present research, a method to nip reactance in its bud by forewarning and inoculating individuals against their impending reactant state is proposed and experimentally tested. The data suggested that forewarning individuals against reactance made them more reactant, but inoculating them had no effect. In terms of boomerang effect, forewarning and inoculating seemed to work (marginally) for women, but backfire for men. Implications are discussed.

*Keywords: reactance, inoculation, boomerang effect, PSA, advertisement*

THE FOLLOWING MESSAGE MIGHT MAKE YOU MAD:  
FOREWARNING AND INOCULATION AGAINST REACTANCE

by

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## Research Questions The Following Message Might Make You Mad: Forewarning and Inoculation against Reactance

The US government spends hundreds of millions of dollars each year on prevention campaigns against unhealthy and risky behaviors (US Senate Committee on Appropriations, 2010). Despite the massive amounts of money spent on these pro-social appeals, meta-analyses of the effects of health campaigns on behavior have consistently shown small effect sizes ( $r < .1$ ; Salmon & Murray-Johnson, 2000; Snyder, 2000; Snyder, Hamilton, Mitchell, Kiwanuka-Tondo, Fleming-Milici, & Proctor, 2004). More importantly, some health campaigns are counterproductive: they can actually encourage *riskier* behaviors (Agrawal & Duhachek, 2010); Bushman 1998; Henriksen, Dauphinee, Wang & Fortmann, 2006; Giesbrecht & Greenfield, 2003; Ringold, 2002; Wolburg, 2006).

This adverse effect – that an attempt at attitude change backfires and receivers' attitudes change in the opposite direction than intended – has been termed the boomerang effect (Brehm, 1966; Brehm & Brehm, 1981). One explanation for this effect came from Brehm (1961; Brehm & Brehm, 1981), who developed the theory of Psychological Reactance. Psychological reactance is said to occur when there is a perception by message receivers that freedom of choice is threatened; as such, receivers act in the opposite way of the advocated behavior in order to reaffirm their freedom of choice.

Clearly, reactance on the part of message receivers can stand in the way of successful advertising and social campaigning. Finding ways to reduce or counteract reactance is thus of great import. To date, the two most successful methods of reducing reactance are avoiding the use of freedom threatening language in the message

(Bushman, 1998; Pfau et al., 1997; Grandpre, Alvaro, Burgoon, Miller, & Hall, 2003), and the use of a freedom-restoring postscript after the freedom-threatening message (Miller, Lane, Deatruck, Young, & Potts, 2007). Bushman (1998), for example, found that by toning down the warning language on a cream cheese warning label about fat content, participants wanted to eat it less. Grandpre et al. (2003) manipulated the explicitness of pro-smoking messages, and found that less explicit messages were more likely to elicit intentions to smoke in high school students. In the study by Miller et al. (2007), participants received a postscript after the threatening message, that informed them that the choice to perform the advocated behavior (i.e. exercise) was theirs, which significantly reduced the perception that freedom was threatened, and thus reactance. Their findings explained only one percent of the observed variance, however.

There are problems with both methods of reducing reactance, however. First, toning down the language can make the message more ambiguous, vague, and less easily understood (Miller et al. 2007). In addition, standpoint explicitness and justification explicitness have been shown to increase messages' persuasiveness (O'Keefe, 1997; 1998). Second, Miller et al.'s (2007) post-script method occurs after reactance has already been produced, and thus after reactance has already affected the cognitive processing of the message. In order to prevent reactance at its outset, a different strategy is needed, one that will anticipate and arrest reactance before someone is even exposed to the persuasive message. One demonstrated way of creating resistance in an audience is through forewarning and inoculation.

Inoculation theory (McGuire, 1961a; 1961b; McGuire & Papageorgis, 1962) has been an exceptionally active field of research in communication in recent years (see, for



the latest overview, Banas & Rains, 2010). The theory posits that by alerting the audience of an impending attack on their beliefs or attitudes, and refuting that attack, an audience can be made resistant to that subsequent persuasive message (McGuire & Papageorgis, 1962). The purpose of the present research is to test whether inoculation can be used as a method to reduce reactance. More specifically, I aim to test whether messages that are expressly designed to warn people that a persuasive message is likely to make them reactant and to ‘refute’ that reactance will reduce reactance.

## **Theoretical Framework**

### **Psychological Reactance Theory**

The theory of psychological reactance (Brehm, 1966) is based on the notion that people desire freedom, and posits that when people believe their freedom to perform certain behaviors is being eliminated or threatened, they will experience psychological reactance: an aversive motivational state aimed at restoring that freedom. Individuals can restore their threatened or eliminated freedom by expressing themselves in a manner opposite the threat and performing the threatened (or a related) behavior (Brehm & Brehm, 1981). For example, Pennebaker and Sander (1976) found that a bathroom wall where the experimenters had placed the sign, “do not write on these walls under any circumstance” was written on significantly more than the weaker, less freedom-threatening message, “Please do not write on these walls.”

The four essential elements of reactance theory are (perceived) freedom, (perceived) threat to freedom, reactance, and restoration of freedom (Brehm & Brehm, 1981; Dillard & Shen, 2005). In other words, for reactance to occur, individuals must first perceive having freedom (to behave or think in a certain way) and must subsequently perceive a threat to that freedom (someone telling him or her what to do or think). If these

conditions are met, said individuals are likely to feel reactance, ultimately resulting in the attempt to restore freedom by means of acting opposite to the advocated behavior. As one participant in Wolburg's (2006) study on antismoking messages put it:

All smokers hate anti-smoking ads, whether they're good or not. They hate them because they love to smoke and hate being told not to do something. Every smoker I know has a no-smoking sign in their house to make a mockery of anti-smoking messages. (p. 294)

Not only behavior is affected by reactance, however. Attitudes may change in the opposite direction of the advocated message as well. Worchel and Brehm (1970), for instance, created a freedom-threatening and a non-threatening version of a speech advocating that the communist party should be treated as any other political party in the United States, by inserting such phrases as "you cannot believe otherwise," or "you have no choice but to believe this" in the freedom-threatening condition (p. 19). Their results revealed that the greatest attitude change that occurred in any condition was the change away from the advocated position as a result of the freedom-threatening message.

In a more recent study, Silvia (2006) had students read a persuasive essay in favor of adding a major in advertising at their university. The first group read a non freedom threatening message, the second group read the same essay but with the freedom threatening line "when you think about it you are really forced to agree with me because this is a universal student issue" (p. 676). Agreement with the advocated position was significantly lower for people in the threat condition than in the no threat condition, even though a majority of the participants already were already in favor of adding a major in advertising before the actual experiment (Silvia, 2006).

Contrary to intuition, prior agreement with the communicator's position that threatens attitudinal freedom actually creates more reactance than prior disagreement (Brehm & Brehm, 1981). Studies have consistently shown that reduced or boomerang attitude change is strongest in (or even exclusive to) participants who showed prior agreement with the advocated position (Snyder & Wicklund, 1976; Worchel & Brehm, 1970; Wright, 1986). Worchel and Brehm (1970), who found a significant boomerang effect only in the initial agreement condition, explained their results:

[W]hen the communicator indicates to subjects that they "must" agree with his position, he is telling those who agree with him that they must do what they are already doing and that they are not free to do what they were not doing (i.e., hold the opposing position), while he is telling those who disagree that they "cannot" do what they are in fact doing, and they "must" do what they are in fact not doing. [...] [T]he subject who disagrees with the communicator is already exercising the freedom "threatened," while the subject who agrees with the communicator is not exercising the freedom threatened. Hence, the former may feel less threat to the freedom in question, [...while the latter...] may feel it necessary to demonstrate he can hold an opposing position. (p.21).

Miron and Brehm (2006) reiterated this view by explaining that difficulty of restoring freedom is responsible for the magnitude of reactance, such that reactance is highest when restoring one's freedom is moderately difficult. That is also why the Hong Reactance Scale includes items specifically based on prior agreement, like "It irritates me when someone points out things, which are obvious to me" (Hong & Page, 1989).

**Measuring Reactance.** In Brehm's original conception of reactance, reactance had the status of an "intervening, hypothetical variable" (Brehm & Brehm, 1981, p. 37) that could not be measured directly. Hypothesizing its existence, however, allowed researchers to predict a variety of behavioral effects (Brehm & Brehm, 1981). This lack of an operational definition in early reactance theory research is a likely reason that reactance has been 'measured' in a great variety of ways over the years. Miron and Brehm (2006) listed a number of ways in which reactance has been conceptualized. Their list of operationalizations of reactance included "awareness of feelings of discomfort as well as hostile and aggressive feelings," "anger or other emotion[s]," as well as indicators like "defiant, uncooperative, and angry," and even physiological arousal (p. 13-14). It appears that until recently, no study measured psychological reactance per se but rather measured outcomes believed to be associated with reactance (Quick & Stephenson, 2007).

To resolve this apparent problem, Dillard and Shen (2005) investigated the process that occurs between when people receive a freedom-threatening communication and when they exhibit reactance. They compared the explanative power of four different models that examined the role of, and relationship between, anger and negative cognitions in reactance. The model that fit their data the best was the intertwined model, which hypothesized that reactance has both cognitive and affective components that are "intertwined to such a degree that their effects on persuasion cannot be disentangled" (p. 147), thus pointing to one distinct underlying phenomenon. Using Likert-type scales to measure anger (irritated, angry, annoyed, and aggravated) and Cacioppo and Petty's (1981) thought listing task to record negative cognitions, they found that reactance was

best measured as a latent variable composed of anger and negative cognitions. The intertwined model has been empirically validated by Quick and Stephenson (2007) and Rains and Turner (2007), among others.

**Message features.** So what elements of a message arouse anger and negative cognitions? Research indicates that certain linguistic features in particular evoke a perceived threat of freedom, thus producing psychological reactance. Specifically, language that is controlling or dogmatic (Miller et al., 2007) or explicit (Grandpre et al., 2003) is likely to provoke reactance. Quick and Stephenson (2008) defined dogmatic language as “characterized by forceful language that explicitly pressures audiences to conform to a message,” (p. 450) and illustrated that dogmatic messages were perceived as more threatening, which in turn provoked reactance, anger, and unfavorable thoughts. Their dogmatic messages included imperatives, such as “must” or “need”, absolute allegations, such as “cannot deny that...,” and derision towards other perspectives, such as “[i]f you are a reasonable person, you have to agree that...” (Quick & Stephenson, 2008, p. 474). In addition, Bushman (1998) revealed that threats, in particular threatening warning labels on food, resulted in less willingness to comply than mere objective information did. Other studies that have also pointed to dogmatism as an antecedent to reactance included Worchel and Brehm (1970) and Quick (2008).

Given that dogmatism, explicitness, vividness, and other such message features are said to cause reactance, one obvious and oft-proposed solution is changing the language of persuasive messages to include allusions to choice, such as “[y]ou have a chance to...” or “we leave the choice to you...,” qualified propositions, such as “[t]here is pretty good evidence that...” or “[m]ost people would agree that...” (Quick and Stephenson, 2008, p.

474), and dry, impartial, objective information (Bushman, 1998), thus seemingly weakening the message in order to strengthen it. Miller and his colleagues opposed this strategy, however, calling it “flawed in its ambiguity, because autonomy-supportive suggestions may be perceived as vague, less tangible, and therefore less easily understood than clear, direct commands” (Miller et al. 2007, p. 233).

Thus, Miller and colleagues (2007) offered a different solution aimed at reducing psychological reactance. They suggested that the freedom restoring tendency that is the result of reactance could be avoided by providing individuals with an easier way to restore their freedom. In their experiment, participants were presented with a freedom threatening persuasive text advocating exercise and physical activity. Participants in the experimental group received a freedom restoration postscript at the end of the message: “Of course, you don’t have to listen to any of these messages [...] The choice is yours” (p. 240), whereas the control group received a non-restorative filler. Participants in the restoration postscript condition reported significantly lower perceived threat, thus providing some support to their hypothesis.

It is important to note, however, that although Miller and colleagues (2007) found that the freedom-restoring postscript significantly reduced threat, it *did not* alter behavioral intent, nor did they report the effects of the restoration postscript on anger and negative cognitions, which constitute reactance (Dillard & Shen, 2005). In addition, a postscript can only restore perceived freedom *after* the threat has already impacted message processing (Silvia, 2006). In other words, a freedom-restoring postscript can only ameliorate the effect of reactance on behavior by suppressing the reactance that was already aroused during the message processing. Prevention is better than cure, however.

If the production of reactance can be prevented in the first place, then message processing will not be affected by it, and by extension, nor will behavior. Inoculation theory provides us with a method that indeed favors prevention over cure, and thus, in order to anticipate and prevent reactance before it occurs, I propose the use of inoculation to make an audience resistant against their tendency to feel reactance.

### **Inoculation Theory**

The theory of psychological reactance addresses why people resist certain persuasive messages, usually in order to minimize such resistance. In contrast, inoculation theory studies how to intentionally confer resistance. Given inoculation theory's early origins and the impressive amount of experimental data to back it up, Eagly and Chaiken (1993) termed it "the grandparent theory of resistance against attitude change" (p. 561).

Inoculation theory (McGuire, 1961; McGuire & Papageorgis, 1962) is based on the idea that people can be stimulated to build up resistance to attacks on attitudes by being exposed to weakened attitude-threatening messages (Szabo & Pfau, 2002). It grew out of research on message sidedness (e.g., Lumsdaine & Janis, 1953) that indicated that two-sided persuasive messages were more effective in countering attitude change than were one-sided messages when participants were exposed to counterpropaganda. One-sided arguments only consider one side of an argument (e.g., smoking is bad for your health), whereas two-sided arguments consider the validity of both sides (e.g., smoking is bad for your health, but it's also a stress reliever). Meta-analyses have pointed out that two-sided messages are more effective in conferring durable attitude change particularly when they

are refutational (that is, when the message *refuted* the other side of the argument; Allen, 1998; O’Keefe, 1999), as opposed to non-refutational.

**The inoculation metaphor.** McGuire’s (1961; McGuire & Papageorgis, 1962) original articulation of inoculation theory proposed that people can be ‘inoculated’ against persuasive attacks on their attitudes much in the same way they could be inoculated against viral attacks on their health. The idea of medical inoculation is that when one’s immune system is exposed to a weakened version of a virus, that virus stimulates the body’s defenses to build up resistance to it, so that the body is better able to defend itself against future attacks from the non-weakened version of the virus:

Just as we develop the disease resistance of a person raised in a germ-free environment by pre-exposing him to a weakened form of the virus so as to stimulate, without overcoming, his defenses, so also we would develop the resistance to persuasion of a person raised in an ideologically aseptic environment by pre-exposing him to weakened forms of the counterarguments, or to some other belief-threatening material strong enough to stimulate, but not so strong as to overcome, his belief defenses. (McGuire & Papageorgis, 1962, p. 25).

Evidently, McGuire limited his theory to cultural truisms, or “beliefs that are so widely shared within the person’s social milieu that he would not have heard them attacked, and indeed, would doubt that an attack were possible” (McGuire, 1964, p. 201). The reasoning for this was that cultural truisms were the attitudes that would have experienced the least doubt or attack, were therefore the most sterile, and, consistent with the biological analogy, most vulnerable to attacks. Freedman and Steinbruner’s (1964) study about inoculation and graduate school admissions was one of the first study to



successfully inoculate participants against attacks on more controversial attitudes. Other early studies that have inoculated against issues beyond cultural truisms have included, inter alia, McCroskey (1970), Adams and Beatty (1977), Burgoon et al. (1976), and Miller and Burgoon (1979) (see for an overview, Pfau & Szabo, 2004, p. 267).

**The inoculation mechanism.** Inoculation is a process in which individuals receive “weakened, *defense stimulating* forms of the counterarguments” (McGuire, 1961, p. 327, my emphasis). In order to be classified as an inoculation treatment, a message must at least contain a threat to one’s current attitude and a refutational preemption of that threat. These are the most important elements of the theory, as threat makes subjects aware of the vulnerability of their attitudes (Insko called this the “defense alerting element” [1967, p. 319]), and refutational preemption provides the subject with the specific content to defend his or her attitude (what Insko called the “defense producing element” [1967, p.319]). Later research has added delay (Petty & Cacioppo, 1979; Pfau, 1997, but see Banas & Rains, 2010), involvement (Pfau, 1992; Pfau, Tusing et al, 1997) and affect (Lee & Pfau 1998; Pfau, Szabo, Anderson, Morrill, et al., 2001) into the inoculation mechanism.

**Threat.** Threat is “the most distinguishing feature of inoculation” (Pfau, 1997, p. 137), and “inoculation is impossible without threat” (Compton & Pfau, 2005, p. 100-101). It is the degree to which one perceives that his or her belief is vulnerable, and as such is a necessary precursor to resistance, because a person must be made aware of the vulnerability of his or her attitude (McGuire, 1961). Thus, threat is the motivator of the resistance, without which inoculation cannot occur. McGuire (1964) argued that “any extrinsic threat [...] presented to the believer before the defense material [...] should

increase his motivation to assimilate the material and hence enhance its immunizing effectiveness” (p. 210). The motivational effect of threat in inoculation has been used to explain the finding that inoculation offers a “broad umbrella of protection, extending beyond the specific arguments raised in the opposing message” (Pfau & Szabo, 2004, p. 267). That is to say, inoculation increases resistance against unfamiliar arguments that were *not* mentioned in the inoculation message as well, because threat continues to motivate counterarguing during the interim between the pretreatment and the attack (McGuire, 1961; 1964; Pfau et al., 1997).

This motivational effect is best evidenced by the comparable effectiveness of refutational same and refutational different messages. A ‘refutational same’ message refutes exactly those counterarguments that will appear in the subsequent persuasive attack. ‘Refutational different’ treatments, in contrast, refute counterarguments that are different from the ones in the impending persuasive message. Pfau and Szabo (2004) recount a field study that showed the equal effectiveness of refutational same and refutational different inoculations:

[D]uring the 1988 presidential campaign, polling data indicated that Democrat Michael Dukakis was vulnerable to Republican attack for being soft on crime. Pfau and his colleagues (1990) prepared a refutational “same” inoculation message that raised this counterargument and preemptively refuted it. The message argued that Dukakis favored tough sentences, but that tough sentences alone did little to reduce crime. The message also argued that drugs are responsible for most crime and that Dukakis favored increased funding for drug education and enforcement. The researchers also prepared a refutational “different” message, arguing that in

contrast to his opponent, Michael Dukakis believed that it was time for a change; that America can, and must, do better to extend the economic expansion to those who have been left out, provide basic health insurance for all families, and stop the pollution of America's air and water. (Pfau & Szabo, 2004, p. 268)

Pfau and his colleagues found that Dukakis supporters who had been inoculated were less persuaded by a Bush message about Dukakis being soft on crime than their non-inoculated counterparts. Perhaps more importantly, however, the effectiveness of the "same" and "different" refutational messages was comparable. This lent credence to the hypothesis that threat is the most important component of inoculation, because it motivates people to actively counterargue both the arguments that they are warned about, and those that they are not.

This raises the question whether *only* a threat can make people resistant to subsequent persuasive attempts. It would permit the audience to arm *themselves* with counterarguments before the attack. Such a tactic was employed by Al Gore's campaign team in the 2000 presidential campaign. Gore warned voters that George W. Bush would try to scare them about issues such as Medicare. Gore may have lost the election, but a substantial body of research suggests that "*forewarning* an audience of a persuasive message can be an effective way of making the audience resistant to that message" (Gass & Seiter, 2011, p.196, original emphasis). Freedman and Sears' (1965) study sought to demonstrate the effectiveness of forewarning. The researchers reasoned that forewarning leads to (active) counterarguing, which is a cognitive process that takes time. They thus hypothesized that the amount of time between forewarning and the persuasive message should be positively correlated with resistance to persuasion. They warned high school

students that they were about to hear a message arguing that teenagers should not be allowed to drive, and given that message immediately, 2 minutes, or 10 minutes after the warning. Their results confirmed their hypothesis: an increase in time increased resistance. In a similar vein, Petty and Cacioppo (1977) used their classic thought listing task to confirm that people think of a greater number of counterarguments when they have more time.

More evidence for the forewarning hypothesis came from Romero, Agnew and Insko (1996). In line with Petty and Cacioppo's (1986) Elaboration Likelihood Model, they argued that in order to (preemptively) counterargue a message, people need the motivation and ability to do so. Thus, they forewarned their participants about an impending persuasive message about comprehensive exams in college, and manipulated motivation and ability. They manipulated motivation by telling some students that the message would argue for comprehensive exams after ten years, and other students that the comprehensive exams would actually apply to them. The second group was, of course, assumed to be more motivated to counterargue the message. Ability was manipulated by distracting some students with puzzles for three minutes, while letting the other students just wait three minutes before the persuasive message was presented to them. Romero et al.'s (1996) results confirmed the hypothesis: participants in the high motivation and high ability condition were more resistant to counter-persuasion.

In addition, Jacks and Devine (2000) found that forewarning, apart from the cognitive activity of counter-arguing, also heightened irritation. The irritation was directed at the source of the impending persuasive message, which led people to be more resistant to it. This, then, also helps explain how a forewarning can make people resistant

against an attack even when it only warns them about persuasive *intent* (and not the *content*) of the subsequent message (Fukada, 1986; Hass & Grady, 1975). In his study on the mediators of fear, Fukada (1986) told half of his participants that they would receive a message *intended* to arouse fear and to change their beliefs, and did not warn the other half. The warned participants experienced more psychological reactance, experienced less fear, and were less persuaded than the unwarned group.

One may even argue that forewarning alone can sometimes be expected to be more effective than inoculation per se, because leaving out the refutational preemption may be perceived as less patronizing (Wood & Quinn, 2003; Quinn & Wood, 2004) *and* because it has the potential to engage the audience more, as they more actively think about the arguments.

***Refutational preemption.*** Once people become aware of the vulnerability of, and the threat to, their attitude, the next step is to identify the best way to protect the attitude against the attack. Thus, a second important element of an inoculation treatment is refutational preemption, or replying to counterarguments before they occur. Refutational preemption consists of the (possible) content of the attack one should expect on one's currently held beliefs, and the refutation of that attack. As such it "provides specific content that receivers can employ to strengthen attitudes against subsequent change" (Pfau et al., 1997, p. 188). Thus, while threat provides motivation, refutational preemption provides scripts (Szabo & Pfau, 2002).

***Involvement.*** A moderator that has been identified is involvement. Pfau et al. (1997) suggested that involvement was a necessary precursor to perceived threat, and thus should exhibit a positive linear relation with threat and with inoculation

effectiveness (i.e., a negative relation with attitude change). The researchers indeed found a linear effect of both threat and involvement, but for high involvement the effects were actually independent of each other (Pfau et al., 1997). Banas and Rains (2010), on the other hand, argued that involvement should be related to threat in a curvilinear way, such that no involvement leads to no threat, and high involvement leads to no threat as well, because highly involved people were predicted to already have a well-defended attitude. Their meta-analysis found no such relationship, and even indicated “that there is no relationship between involvement and the resistance conferred by inoculation.” (p. 301).

### **Inoculating against reactance**

As noted above, McGuire originally focused his examination of inoculation only on “cultural truisms” (1964, p. 201). The reasoning for this was that cultural truisms were the attitudes that would have experienced the least doubt or attack, were therefore the most sterile, and, consistent with the biological analogy, most vulnerable to attacks. In early inoculation studies, therefore, only attitudes about cultural truisms like tooth brushing and the advantages of penicillin were to test its effectiveness (see for an overview, Banas & Rains (2010)).

Starting with Freedman and Steinbruner’s (1964) study about inoculation and graduate school admissions, however, researchers started expanding the topics of their research beyond cultural truisms and into topic areas that were of greater practical use for inoculation, such as political attacks (An & Pfau, 2006; Pfau & Burgoon, 1988; Pfau, Kenski, Nitz, & Sorenson, 1990), commercial marketing (Pfau, 1992; Sawyer, 1973; Swinyard, 1981), smoking prevention (Pfau et al., 1992; Pfau, Van Bockern & Kang, 1992; Szabo, 2000), and drinking prevention (Godbold & Pfau, 2000; Richards, 2010).

This opened the door to inoculating against constructs other than attitudes. Fukada (1986) successfully inoculated participants against fear, Williams (2004) inoculated African-American students against stereotype threat, and arguably, Schachter and Singer, in their classic 1962 study on arousal and misattribution, successfully inoculated participants against misattribution of their arousal. Although Fukada's (1986) study was the only one to inoculate participants against a feeling, it is interesting to examine whether if one forewarns individuals of the impending reactance that they are about to experience, and preemptively refutes that reactance by explaining that it is irrational and unhelpful, these individuals will be subsequently be inoculated against, and experience less, reactance.

To test this hypothesis, Richards (2010) had participants read a brochure about the health hazards of binge drinking, with a freedom threatening (i.e., reactance inducing) message presented at the end of the brochure. Half of his participants received an inoculation treatment before the brochure, and half did not. The inoculation treatment forewarned participants that they were about to experience "the reactance effect, where people react against the proposed advice, even if it hurts them, because they don't like being told what to do." The preemptive refutation only said that the advice was good advice. Richards found no significant effect of inoculation on reactance in terms of anger and unsupportive cognitions. His data did, however, show trends in the opposite direction than predicted: inoculated participants perceived greater threat to freedom, more anger, and greater behavioral intentions to binge drink after the message.

I argue that Richards ran into a number of methodological difficulties in his study which account for his findings. First, his inoculation message ends on "the facts about

binge drinking at [the University of Maryland] that are reported are pretty powerful when you think about them,” which is exactly the type of language Quick and Stephenson (2008) predicted to *cause* reactance. Second, the inoculation method implied that reactance happens to many people, which might have given participants the idea that feeling reactant is the normal thing to do (Cialdini & Trost, 1998). Third, meta-analyses by Wood and Quinn (2003; Quinn & Wood, 2004) have shown that forewarning sometimes moves people in the warned direction, because it threatens people’s self-concept by suggesting that they are gullible and vulnerable to influence (Gass & Seiter, 2010). If this was the cause of Richards’ findings, it suggests that his inoculation message may not have been subtle enough.

In addition, researchers have argued that forewarning alone leads to enough preemptive counterarguing in participants to make them more resistant to persuasion (Freedman & Sears, 1965; Romero, Agnew & Insko, 1996). Specifically, Romero and his colleagues conducted a study in which participants received forewarning that they were about to be exposed to a persuasive message advocating comprehensive exams at their university. Romero et al. (1996) manipulated participants’ involvement and motivation, as well as their ability, to counterargue, and found that, indeed, students in the high motivation, no distraction condition were more resistant to the subsequent persuasive message. Further, research has found that people produce more arguments if they have not received examples of arguments first (Sutton, 2001; Ward, Smith & Finke, 1999). All in all, if forewarning alone has the potential to inoculate participants against impending attacks, it is worth exploring further, because it is easier and more realistic for practitioners to use, and especially use subtly.



Thus, in the present research I aim to replicate and extend Richards' study, by eliminating some of the methodological issues and by adding forewarning as one hopefully potent condition. Forewarning, as discussed, has the threat component of inoculation, but not of preemptive refutation. Thus, people are put in a state of motivation to counter the threat, but they have to think of the reasons for countering it themselves. From all the foregoing, then, the following hypotheses and research questions may be distilled:

H1: Individuals who are forewarned against reactance will experience less reactance, measured in terms of anger and negative cognitions, than individuals in the control group.

H2: Individuals who are inoculated against reactance will experience less reactance, measured in terms of anger and negative cognitions, than individuals in the control group.

H3: Individuals who are forewarned against reactance will express more agreement with the subsequent persuasive message than individuals in the control group.

H4: Individuals who are inoculated against reactance will express more agreement with the subsequent persuasive message than individuals in the control group.

RQ1: Which will be more effective in reducing reactance: forewarning or inoculation?

RQ2: Which will be more effective in increasing agreement with a persuasive message: forewarning or inoculation?

## **Method**

### **Participants**

Undergraduate students ( $N = 226$ ) enrolled in communication courses at the University of Maryland participated in exchange for course credit. The mean age for participants was 19.7 years ( $SD = 1.6$ ) and ranged from 18 to 32 years. Sixty-five percent were female. Participants' self report data indicated that 66.1% of the participants were Caucasian, 11.9% were African American, 4.4% were Hispanic, 13.2% were Asian, and 4.4% reported their ethnicity as "other."

### **Design and Procedure**

This study employed a 3 (Pretreatment: forewarning, inoculation, control) x 2 (Freedom Threatening Language: low, high) between subjects experimental design. Participants were randomly assigned to one of the six experimental conditions, based on the first letter of their last name. The assignment logic was changed once a day. Participants then read and digitally "OK'd" a consent form, read a forewarning message, an inoculation message, or no message (Appendix A), followed by the high or low freedom threatening language (FTL) version of the advertisement (see Appendix B). After filling out a questionnaire (Appendix C), participants were debriefed and thanked.

### **Experimental Inductions: Development of the Messages**

In order to select a suitable reactance arousing advertisement and an appropriate version of the forewarning and inoculation messages, two separate pilot studies were conducted that assessed the reactance arousing nature of both.

**Pilot study 1.** In the first pilot, two versions of three different advertisements were assessed. Two of the advertisements pertained to binge drinking, and one to drinking soda. All three advertisements were professionally designed Public Service Announcements (PSAs). Freedom Threatening Language (FTL) was manipulated by

inserting phrases such as “You have to...,” “You can’t” and “We’re not asking you, we’re telling you” into the high FTL versions of the advertisements. The low FTL versions included such phrases as “you can,” “you could choose to,” and the word “please.” All pilot-tested PSAs can be found in Appendix D.

Participants in the first pilot study were students from six undergraduate classes ( $N = 51$ ; 55% female). Two versions of the three different advertisements were tested in a 2 (FTL: high, low) x 3 (PSA version: alcohol 1, alcohol 2, soda) mixed design. All participants saw all 3 PSAs, but only one version of the FTL embedded in each PSA. Participants were presented with booklets containing either two high FTL and one low FTL, or two low FTL and one high FTL version of the three messages. Order effects were controlled for by employing a counterbalanced design. After seeing each advertisement, participants filled out a post-test questionnaire about it, containing a six item reactance index that was taken from Dillard and Shen (2005). The scale included items like “The message threatened my freedom to choose,” and proved reliable with a Cronbach’s  $\alpha$  of .837 ( $M = 2.1$ ,  $SD = 0.82$ )

The data indicated a main effect for FTL condition, as expected (see Table 1). None of the ads scored significantly higher or lower on reactance than the others, and no significant interactions between advertisement and FTL condition or advertisement and sex was found. Based on the observed means, however, it seemed that the “drinking leads to fighting” advertisement had the potential of arousing more reactance in men ( $M = 2.97$ ,  $SD = 1.35$ ) than in women ( $M = 2.15$ ,  $SD = 1.03$ ). This interaction was not statistically significant, but might have become so with a larger sample. To avoid that risk, therefore, this ad was not used in the main study. Further, because the remaining two ads scored

similarly on the reactance scale in terms of sex and FTL condition, the final choice involved which advertisement had the greatest external validity. The soda advertisement was professionally designed for the New York City Department of Health and has actually been used on the New York City metro system, and was therefore deemed to have higher external validity than the binge drinking advertisement. Although the high FTL version elicited significantly higher scores on the reactance scale ( $M = 2.49$ ,  $SD = 1.25$ ) than the low reactance version ( $M = 1.25$ ,  $SD = 0.97$ ),  $F(1,54) = 7.40$ ,  $p < .01$ , a mean under the mid-point of the scale was too low. Based on these results, therefore, the text in the advertisement was further adapted to include even stronger FTL (e.g., “stop the denial” and “every reasonable person would agree”) for the main study (see appendix B).

**Pilot study 2.** The second pilot study examined the reactance arousing potential of the forewarning and inoculation pretreatments. Because advertisers have not, to my knowledge, used inoculation against reactance, the forewarning and inoculation messages were not be based on existent messages, but designed specifically for this study to include threat (in the case of forewarning), or threat and refutational preemption (in the case of inoculation). To ensure that the pretreatment messages themselves were not reactance arousing, two versions of each message were designed and tested in a four factor repeated measures design. Version 1 of the pretreatment messages warned participants about the freedom threatening language in an ensuing ad, whereas version 2 of the messages warned participants about the anger they might feel as a result of that language. All the piloted pretreatment messages are found in appendix D. Again, the order was counterbalanced.

Participants were students from six undergraduate classes ( $N = 58$ , 60% female, not the same participants as in pilot study 1). They received a booklet with each of the four messages, and, after signing a consent form, filled out a questionnaire similar to the one described under pilot study 1 after each message.

A repeated measures ANOVA indicated that version 1 of the pretreatment messages was less reactance arousing ( $M = 1.6$ ,  $SD = 1.04$  and  $M = 2.4$ ,  $SD = 1.12$  respectively) than the messages in version 2 ( $M = 2.5$ ,  $SD = 1.16$  and  $M = 2.9$ ,  $SD = 1.31$  respectively),  $F(1, 23) = 21.05$ ,  $p < .001$ ,  $\eta^2 = .48$ . Based on these data, version 1 of both messages was used in the main study. Upon closer inspection, however, it seemed that the messages contained somewhat vague or unfamiliar scientific language. To present participants with clearer and more accessible language in the actual experiment, the phrase “the ad you are about to see might contain strong language, that may sound freedom-threatening to some people” was thus replaced with “the ad you are about to see might contain forceful language. It may sound to some people as if it's trying to limit their freedom to choose.”

### **Measures (Main Experiment)**

#### **Reactance.**

**Anger.** Anger was measured by having participants respond to the question, “How do you feel after reading this article?” Four anger-related adjectives (i.e., angry, irritated, annoyed, aggravated [Dillard & Shen, 2005]) embedded in larger list of emotions (e.g., happy, sad, surprised) were measured on a Likert-type scale (1 = none of this feeling; 7 = a lot of this feeling) to form the anger index ( $M = 2.50$ ,  $SD = 1.46$ , Cronbach's  $\alpha = .882$ ).

**Cognitive responses.** Participants were asked to list all of the thoughts they had while reading the text (Cacioppo & Petty, 1981), and code those thoughts as relevant and irrelevant afterwards. Participants were instructed that responses were to be coded as relevant when they had to do with any message variables, including the content of the message, its source, its length, and the medium used, or the message effects, including agreement, disagreement, and behavioral intent. Further, participants coded all of their relevant thoughts as supportive, unsupportive, or neutral towards the message. The instructions for this task included examples, such as “a supportive thought could be ‘This ad is persuasive’ or ‘I’m going to drink less soda,’ an unsupportive thought could be ‘What a bad image,’ and a neutral thought does not evaluate the PSA, such as ‘interesting they would show this on a metro.’” The full instructions for this task are displayed in Appendix F.

In total, 615 relevant thoughts were listed and coded, of which 353 supportive, and 262 unsupportive thoughts. The average number of supportive thoughts was 1.56 ( $SD = 1.80$ ), of unsupportive thoughts 1.15 ( $SD = 1.55$ ), and of total thoughts 2.71 ( $SD = 2.09$ ). The low number of unsupportive thoughts suggested a floor effect, and thus an additional variable was calculated, namely the ratio between unsupportive and total thoughts ( $M = .44$ ,  $SD = .41$ ). Some participants ( $N = 48$ ) did not code all of their thoughts, leaving a total of 171 thoughts uncoded.

**Attitudes.** All participants responded to six attitude questions after the freedom-threatening message. Measured along 7-point Likert-type scales, the attitude index included questions such as “drinking soda and sugary beverages makes me feel good” and “my meal is better with soda or sugary beverages.” Based on low item-total

correlation, two items had to be dropped from the index. These items were “the government should increase taxes on soda and sugary drinks” (item-total  $r = .15$ ) and “Soda is bad for you” (item-total  $r = .14$ ). The final attitude index had a mean of 3.16 ( $SD = 1.36$ ), and a Cronbach’s  $\alpha$  of .835.

***Behavioral intentions.*** Attitudes have predicted behavior with varying degrees of precision, so if persuasive texts are ultimately aimed at changing behavior, behavioral intent is a measure that deserves attention (Ajzen & Fishbein, 2005). In addition, Brehm & Brehm (1981) pointed out that reactance does not work “as elegantly simple and cut-and-dry” with attitudes and persuasion as it does with behavior (p. 121). Thus, behavioral intentions were assessed through six items, including “I plan to reduce my soda consumption” and “I plan to check out nutrition labels on soda bottles.” Based on low item-total correlation, three items had to be dropped from this index. These items were “I plan to drink soda with my next lunch or dinner” (item-total  $r = .08$ ), “I plan to only drink diet versions of soda from now on” (item-total  $r = .20$ ) and “In the next week, I’ll have this many ounces of soda per day (on average)” (item-total  $r = .21$ ). After dropping these items, the mean of the behavioral intentions scale was 4.45 ( $SD = 1.42$ ; Cronbach’s  $\alpha = .710$ ).

### **Covariates.**

***Trait reactance.*** Trait reactance was measured using Hong’s Reactance Scale (Hong & Faedda, 1996; Shen & Dillard, 2005). The scale was used as a single measure of trait reactance, and included items as “I consider advice from others to be an intrusion”, “I become frustrated when I am unable to make free and independent choices,” and “advice and recommendations usually induce me to do just the opposite,” measured along

seven point Likert-type scales. The mean score on the Reactance Scale was 3.93 ( $SD = .98$ ), and the scale had a Cronbach's  $\alpha$  of .886 in this study.

***Involvement.*** Issue involvement was assessed using an abbreviated version of Zaichkowsky's Personal Involvement Inventory (P.I.I.; Zaichkowsky, 1985; Pfau et al., 2005). Items of the P.I.I. which participants rated on a 7-point scale included: "insignificant / significant," "of no concern / of much concern," and "doesn't / does matter to me." The mean for the PII was 4.05 ( $SD = 1.65$ ), and the inventory had a Cronbach's  $\alpha$  of .943.

## **Results**

All directional hypotheses presented in the current study were assessed with one-tailed tests, and are reported accordingly. All post hoc analyses were conducted with SAS Statistical Software, using adjusted means according to the Tukey-Kramer method. Table 2 contains the means and standard deviations of all outcome variables as a function of the experimental manipulations. All bivariate correlations among outcomes are found in Table 3.

### **Hypothesis testing**

**Hypothesis 1 and 2.** The first two hypotheses predicted that participants in the forewarning and inoculation condition would experience less reactance in terms of anger and negative cognitions in response to the FTL in an advertisement. To test this hypothesis, one two-way Analysis of Covariance (ANCOVA) was conducted with anger as the dependent variable, and one with unsupportive thoughts as the dependent variable. The FTL and pretreatment conditions served as the independent variables, and trait reactance and personal involvement were entered as covariates.



With regard to anger, the ANCOVA revealed a statistically significant main effect both for FTL,  $F(1, 211) = 4.183, p < .05, \eta^2 = .02$ , and for pretreatment,  $F(2, 211) = 2.764, p < .05, \eta^2 = .02$ . As predicted, participants in the high FTL condition experienced more anger ( $M = 2.7, SD = 1.54$ ) than participants in the low FTL condition ( $M = 2.3, SD = 1.35$ ). Surprisingly, post hoc tests examining the differences among the three pretreatment conditions showed a statistically significant difference between conditions, such that participants in the forewarning condition were significantly angrier ( $M = 2.8, SD = 1.39$ ) than those in the inoculation condition ( $M = 2.2, SD = 1.41, p < .01$ ), and those in the control condition ( $M = 2.5, SD = 1.5, p < .05$ ). There was no statistically significant difference between the inoculation and control condition (Table 3).

Further, the expected interaction between reactance and pretreatment was not statistically significant,  $F(2, 211) = 1.07, p = .346$ . However, because it is possible that the topic, the fattening nature of soda, may have elicited different reactions from women than it did from men, sex was included as an independent variable in the analysis. When sex was entered into the model, a significant 3-way interaction emerged between pretreatment, reactance, and sex,  $F(2, 204) = 2.39, p < .05, \eta^2 = .02$ . Post hoc comparisons revealed that men in the forewarning, low FTL condition reported more anger ( $M = 3.8, SD = 1.15$ ) than men in the inoculation, low FTL condition ( $M = 1.55, SD = .94, p < .05$ ), and than women in the inoculation, low FTL condition ( $M = 2.00, SD = 1.03, p < .05$ , see Figure 1).

The second part of hypotheses 1 and 2 pertains to the effect of FTL and the pretreatment condition on unsupportive thoughts. Because participants generally reported few thoughts ( $M = 1.15, SD = 1.55$ ), a floor effect was expected. Therefore, the ratio of

unsupportive to total reported thoughts ( $M = .44$ ,  $SD = .41$ ) was employed as the outcome variable of interest.

Main effects for FTL and pretreatment were found, such that participants in the high FTL condition reported a significantly higher ratio of unsupportive to total thoughts ( $M = .54$ ,  $SD = .41$ ) than did participants in the low FTL condition ( $M = .34$ ,  $SD = .40$ ),  $F(1, 159) = 9.17$ ,  $p < .01$ ,  $\eta^2 = .06$ . Participants in the forewarning condition had a higher ratio of unsupportive thoughts ( $M = .52$ ,  $SD = .43$ ) than those in the inoculation ( $M = .39$ ,  $SD = .38$ ,  $p < .01$ ) and control conditions ( $M = .43$ ,  $SD = .43$ ,  $p < .05$ ),  $F(2, 159) = 3.82$ ,  $p < .05$ ,  $\eta^2 = .05$ . There was no significant difference between the inoculation and control condition.

Further, a two-way interaction was present between FTL and pretreatment,  $F(2, 159) = 2.98$ ,  $p < .05$ ,  $\eta^2 = .04$ , such that the aforementioned effect of pretreatment was only present in the low FTL condition (see Figure 2). Two more two-way interactions were found, namely between sex and FTL,  $F(1, 159) = 2.77$ ,  $p < .05$ ,  $\eta^2 = .02$  and between sex and pretreatment,  $F(2, 159) = 2.59$ ,  $p < .05$ ,  $\eta^2 = .03$ . In both cases, the aforementioned main effects of FTL and pretreatment were more pronounced for men than they were for women (see Table 1; Figures 3 and 4).

Thus, support was found neither for hypothesis 1, nor for hypothesis 2.

**Hypotheses 3 and 4.** These hypothesis dealt with reactance in terms of the oft-noted boomerang effect in attitude (Brehm, 1966; Wolburg, 2006). No main effects were found for reactance or pretreatment on attitudes, but a significant main effect for sex indicated that men felt somewhat more positively towards soda ( $M = 3.4$ ,  $SD = 1.24$ ) than did women ( $M = 3.0$ ,  $SD = 1.42$ ) after seeing the advertisement,  $F(1, 199) = 4.10$ ,  $p <$

.05,  $\eta^2 = .02$ . Further, a significant effect was found for personal involvement,  $F(1, 212) = 2.59, p < .05, \eta^2 = .03$ . It seems that the more someone reported the ad to be interesting and relevant to them, the more positive their attitude toward soda was ( $\beta = .19$ ).

In addition, the ANCOVA showed a three-way interaction between sex, reactance, and pretreatment condition on attitudes,  $F(2, 199) = 2.56, p < .05, \eta^2 = .03$ . The corresponding graph (see Figure 5) suggests that in the high FTL condition, men experienced a greater and women a smaller boomerang effect as a result of the pretreatment messages. However, a post hoc examination of pairwise comparisons revealed no statistically significant differences between any of the groups. In light of this, a post hoc power analysis using the procedures recommended by Cohen (1988) was performed to determine the power achieved by this analysis. The effect size of the omnibus ANCOVA was  $f = .16$ , which is considered a moderately small effect size (Cohen, 1988). The parameters for the post hoc power analysis were the defined level of significance ( $\alpha = .05$ ), the reported effect size (Cohen's  $f = .16$ ) and the sample size ( $N = 219$ ). The results show that the power of the ANCOVA to detect an effect size of .16 was only .53 with a noncentrality parameter of 5.54. In other words, there is a 47% chance that a type II error occurred. Therefore, it appears that this study may have been underpowered, which would explain the significant omnibus test, but insignificant post hoc comparisons.

An additional analysis was conducted to determine the sample size that would have been needed to find a significant effect with the obtained effect size. Results of this a priori power analysis determined that in order to achieve power of .80, a minimum sample size of 379 participants would have been needed. The parameters for the a priori

power analysis were the specified level of power (power = .80), the defined significance level ( $\alpha = .05$ ), and observed effect size (Cohen's  $f = .16$ ).

Thus, neither hypothesis 3 nor hypothesis 4 was supported by the present data.

Finally, behavioral intentions were assessed as a variable of interest, because the advertisement that was used in the experimental manipulation was ultimately designed to change behavior, not just attitudes. No main or interaction effects of the independent variables on behavioral intentions were found, however.

### **Research Questions**

The research questions raised at the end of the introduction asked which tactic, forewarning or inoculation, would better at reducing reactance, both in terms of anger and negative cognitions (Dillard & Shen, 2005) as well as in terms of a boomerang effect in attitude (Brehm & Brehm, 1981). As the foregoing analyses have pointed out, however, the significant effects of pretreatment condition on anger and unsupportive cognitions all concerned the *heightened* anger and unsupportive responses in the forewarning condition as compared to the inoculation and control conditions. The answer to research question 1 must thus be that neither tactic works better than the other in reducing reactance.

Further, as seen in the ANCOVA results corresponding to hypotheses 3 and 4, forewarning and inoculation had no significant impact on attitude when compared in a pairwise fashion. That said, a trend was visible, such that for high FTL, the boomerang effect seemed to increase for men in the forewarning and inoculation conditions, and decrease for women in those conditions. This analysis was underpowered, however, so in

the framework of the present study the answer to research question 2 is that neither tactic works better in reducing the boomerang effect in attitude.

### **Discussion**

Psychological reactance has the potential to thwart persuaders' attempts at changing their audiences' attitudes and behaviors by motivating the audience members to restore a threatened freedom and thus countering the advocated message. To date, the two most successful methods of reducing reactance are toning down the language in the message on the one hand, and the use of a freedom-restoring postscript after the freedom-threatening message on the other. In the introduction to this study, I have discussed the problems that exist in practice with both of these methods. I have therefore proposed, and sought to experimentally validate, a new method aimed at reducing reactance and the associated boomerang effects in attitudes and behavior here. Consequently, in this study I proposed four hypotheses, together predicting that forewarning and inoculation would reduce reactance, both in terms of anger and unsupportive thoughts as well as in terms of the associated boomerang effect.

Unfortunately, I found no support for any one of the four hypotheses. First, whereas I predicted that forewarning would reduce anger and negative cognitions, the opposite pattern emerged. Particularly in the low FTL condition, participants in the forewarning condition were actually *angrier* and reported a *higher* ratio of unsupportive to total relevant thoughts than their counterparts in the inoculation and control conditions. Inoculation and control were not significantly different from each other on either of these two dependent variables. In addition, the aforementioned effect of forewarning versus control and inoculation was not present in the high FTL condition.

One potential explanation for the observed effect would seem to be that the forewarning message in itself made people more reactant than the inoculation message. The pilot study for this experiment showed, however, that the forewarning message led to significantly less reactance than did the inoculation message. It appears, therefore, that the observed levels of anger and unsupportive cognitions in the forewarning condition were not intrinsic to the forewarning message as such. An alternative, and more suitable, explanation for the observed effect, then, might be that the forewarning message called participants' attention to possible "forceful language" in the ensuing advertisement, even if it was not there (i.e., the effect occurred only in the low FTL condition). This focus of attention may have caused the higher levels of anger and unsupportive cognitions.

Second, gender turned out to play an unexpected role in moderating the effects of FTL and pretreatment on all of the outcome variables in this study. The inclusion of sex as a between subjects independent variable in the analysis caused the design to contain twelve instead of six cells. This led to an inevitable reduction in statistical power: whereas a three-way interaction effect was observed in the omnibus ANCOVA on attitude, the ensuing post hoc comparisons did not identify any significant differences between group means. A post hoc power analysis pointed to the 47% probability of a Type II error, and suggested that a sample size of 379 participants would have been necessary to reach sufficient power.

Despite the lack of power in this analysis, an interesting trend can be observed by looking at the graphical representation of the three-way interaction of sex, FTL and pretreatment (see Figure 5). It appears that in the high FTL condition, inoculation and forewarning increased the boomerang effect for men as compared to the control group,

whereas for women, those pretreatments decreased the boomerang effect. This trend is consistent with a different trend in my data that men reported more anger than women ( $p = .09$ ). With a large enough sample, the pairwise comparisons corresponding to this interaction may have turned out statistically significant, and thus an explanation is warranted.

Extant research is unclear about the effect of gender on inoculation. Pfau and Burgoon (1990) found in their study on inoculation against political attack messages that men were more susceptible to inoculation than women. Burgoon, Pfau and Birk (1995), however, found that “women are particularly sensitive to source appeals in inoculation messages” (p. 502). Other inoculation studies that have included sex or gender into their analyses have reported no main or interaction effects of receiver gender (e.g., Hass & Linder, 1972; Kamins & Asseal, 1987; Pfau, 1992). Why, then, does gender seem to play a role in the current study? Why would the pretreatment work (albeit marginally) for women, but backfire for men? One might try to find an answer in the topic of the reactance arousing text that was used in this study. Although sex was not related to involvement ( $p = .13$ ,  $\eta^2 < .01$ ), women did have a slightly less positive attitude towards soda than men. Perhaps this could explain why women did less to restore their freedom to drink soda than men: that freedom was less important to them. This explanation is not adequate, however, because men and women did not differ on attitude in the high FTL, no pretreatment condition.

One alternative may be that, by warning participants of impending threatening language, the pretreatment messages primed threat, thus eliciting a behavioral response. Research has pointed out that whereas threat usually elicits a fight or flight response in

men, it is more likely to elicit a “tend and befriend” response in women (Taylor et al, 2000; Turton & Campbell 2005). Thus, men may have been primed to fight the threatening message more than women, and therefore have experienced and exhibited more reactance.

### **Implications**

The present study was similar in its rationale to Richards’ study examining the possibility of inoculating against reactance (Richards, 2010), but employed a different experimental design (i.e., the addition of the forewarning condition and the covariates) and more subtle inoculation manipulations. In his study, Richards found that, in the low FTL condition, inoculation led to an increase in perceived threat and a slight (statistically insignificant) increase in anger. These findings are similar to my findings about forewarning, but *not* those about inoculation.

This discrepancy may be attributed to the difference in the wording of Richards’ inoculation message and the pretreatment messages in this study. The messages in this study were only one sixth to one third of the length of Richards’ message, and contained no scientific language. Further, whereas Richards’ inoculation treatment warned participants that an ensuing message may threaten their *actual* freedom to choose how they consume alcohol, the message in the present study only warned people of forceful language and that may sound to some people *as if it's trying* to limit their freedom to choose.” Finally, Richards’ message concluded that the facts in the ensuing message were “powerful when you think about them,” which is similar to the reactance arousing phrase “[i]f you are a reasonable person, you have to agree that...” (Quick & Stephenson, 2008, p. 474). Such phrases were avoided in the present study. Thus, it appears that whereas my



forewarning message may have directed participants' attention to forceful or freedom threatening language, the preemptive refutation in the inoculation message undid that effect.

### **Limitations and Suggestions for Future Research**

As was discussed in the results section, arguably the biggest limitation of the present study was its lack of power. This lack of power was caused by a combination of two factors: first, the inclusion of sex as factor in the ANCOVA's increased the number of groups, thus decreasing the number of participants per group; second, the effect size of the findings required a larger sample. The current sample was large enough to detect significant differences with  $.05 < \eta^2 < .06$ , such as the main effects, but not the more subtle pairwise comparisons corresponding to the three-way interaction effect found in the omnibus ANCOVA on attitudes ( $\eta^2 = .02$ ).

The implications of the small effect sizes in this study are two-fold. First, in order to be able to articulate more conclusively the effects of pretreatment on reactance and on boomerang effects, a larger sample size is needed. Thus, I will aim to replicate this study with a larger sample. I will likely omit the forewarning condition, however, as it only lead to higher levels of anger and unsupportive cognitions, and focus my analysis on the inoculation condition. Second, the noted effect sizes have quite a different implication as well: they suggest that the most interesting effects examined in this paper, the two- and three-way interactions, only explain between two and three percent of the variance in participants' reactions. On the one hand, one might argue that two percent is substantial: three percent can win or lose an election, and two percent could theoretically amount to 8,800 fewer smoking related deaths per year in the United States alone (CDC, 2008). On

the other hand, a two percent effect size means that 98% of the variance is not explained by the independent variables of interest in this paper. This would suggest that inoculation against reactance might not be an avenue worth exploring further.

That is not to say that inoculating against any emotion is not possible, and this may indeed still be fruitfully examined in future research. Inoculation has been shown to work against fear (Fukada, 1986), and it is not hard to imagine that it might work with other emotions, such as surprise, either. The difference between these approaches and the one taken in this paper, is that fear and surprise are often used purposely by practitioners, whereas reactance is not. Thus, an inoculation against the former emotions could read “the advertisement *is trying* to scare you into buying something,” thus warning the audience members against others’ manipulative intent. Reactance, however, is not intended by a crafter of a message, but rather motivated by the reader, and is thus harder to inoculate against.

All in all, the findings in this study partly corroborate those of Richards (2010) in terms of forewarning, but seem to contradict them in terms of inoculation. Following the trends in the current data, a replication of this study with a larger sample may point eventually to the usefulness of subtle inoculation in reducing reactance in female audience members. The current data, however, do not provide sufficient evidence for such a claim, but suggest that practitioners should not try to forewarn or inoculate their audiences against reactance. Rather, they should follow the established method of preventing reactance: avoiding freedom threatening language when crafting a persuasive message altogether.

**Table 1.**

*Means and standard deviations of the Dillard and Shen's (2005) reactance scale as a function of advertisement and FTL condition.*

Advertisement	FTL Condition	
	High	Low
Alcohol 1	2.55 <sup>a</sup> 1.27	1.67 <sup>b</sup> 0.93
Alcohol 2	2.48 <sup>a</sup> 1.23	1.72 <sup>b</sup> 1.09
Soda	2.49 <sup>a</sup> 1.25	1.65 <sup>b</sup> 0.97

*Note.* Means that do not share a superscript are different at the  $p < .05$  level, based on 95% confidence intervals.

**Table 2***Means and Standard Deviations of the Dependent Variables as a function of Independent Variables.*

	Low FTL						High FTL					
	Forewarning		Inoculation		Control		Forewarning		Inoculation		Control	
	M	F	M	F	M	F	M	F	M	F	M	F
<i>N</i>	9	23	15	22	15	27	11	24	15	28	15	22
Anger	3.81 <sup>a</sup> <i>1.15</i>	2.30 <sup>ab</sup> <i>1.22</i>	1.55 <sup>b</sup> <i>0.94</i>	2.00 <sup>b</sup> <i>1.03</i>	2.37 <sup>ab</sup> <i>1.32</i>	2.49 <sup>ab</sup> <i>1.61</i>	2.41 <sup>ab</sup> <i>1.41</i>	2.28 <sup>ab</sup> <i>1.32</i>	3.03 <sup>ab</sup> <i>1.41</i>	2.89 <sup>ab</sup> <i>1.47</i>	2.93 <sup>ab</sup> <i>1.55</i>	2.40 <sup>ab</sup> <i>1.64</i>
Ratio <sup>1</sup>	0.54 <sup>a</sup> <i>0.43</i>	0.45 <sup>a</sup> <i>0.43</i>	0.08 <sup>b</sup> <i>0.13</i>	0.29 <sup>ab</sup> <i>0.38</i>	0.13 <sup>ab</sup> <i>0.25</i>	0.43 <sup>ab</sup> <i>0.44</i>	0.67 <sup>a</sup> <i>0.47</i>	0.50 <sup>a</sup> <i>0.44</i>	0.64 <sup>a</sup> <i>0.43</i>	0.48 <sup>a</sup> <i>0.33</i>	0.52 <sup>ab</sup> <i>0.45</i>	0.54 <sup>a</sup> <i>0.41</i>
Attitude	3.50 <sup>a</sup> <i>1.53</i>	3.01 <sup>a</sup> <i>1.24</i>	2.92 <sup>a</sup> <i>1.35</i>	3.49 <sup>a</sup> <i>1.54</i>	3.52 <sup>a</sup> <i>1.52</i>	2.70 <sup>a</sup> <i>1.50</i>	3.31 <sup>a</sup> <i>1.45</i>	3.04 <sup>a</sup> <i>1.44</i>	3.55 <sup>a</sup> <i>0.98</i>	2.89 <sup>a</sup> <i>1.52</i>	3.67 <sup>a</sup> <i>0.98</i>	2.85 <sup>a</sup> <i>1.20</i>
Behavioral intentions	4.63 <i>1.20</i>	4.20 <i>1.34</i>	4.44 <i>1.65</i>	5.17 <i>1.26</i>	4.60 <i>1.85</i>	4.47 <i>0.93</i>	3.61 <i>1.37</i>	4.38 <i>1.63</i>	3.89 <i>1.40</i>	4.67 <i>1.51</i>	4.36 <i>1.57</i>	4.30 <i>1.26</i>

*Note.* Means that do not share a superscript are different at the  $p < .05$  level, based on 95% confidence intervals.

<sup>1</sup> The dependent variable “Ratio” is the ratio of unsupportive to total relevant thoughts.

**Table 3***Pearson correlations between covariates and outcome variables.*

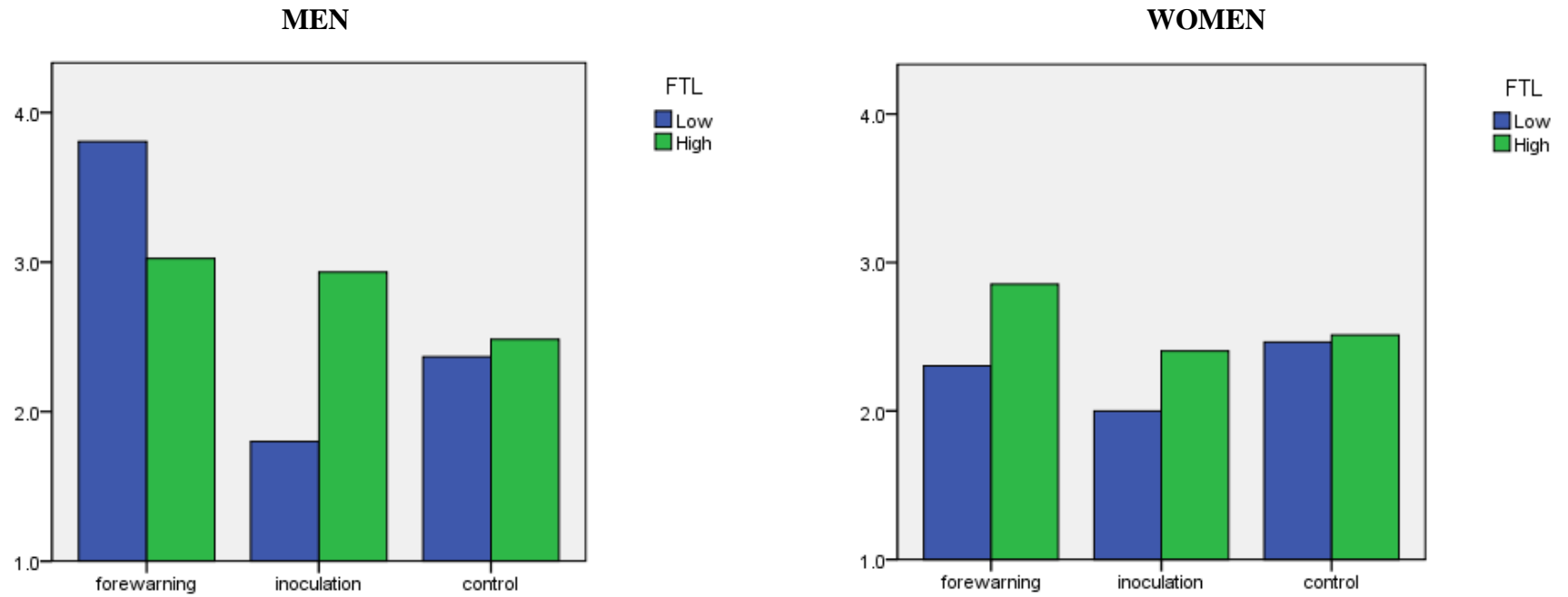
	Trait Reactance	Anger	Attitude	Behavior	Ratio Unsupportive: Total
Personal Involvement	.084	.059	.194**	.385**	-.378**
Trait Reactance		.233**	.029	.028	-.030
Anger			.164*	-.023	.199**
Attitude				.016	.112
Behavior					-.314**

\*. Correlation is significant at the 0.05 level (2-tailed).

\*\* . Correlation is significant at the 0.01 level (2-tailed).

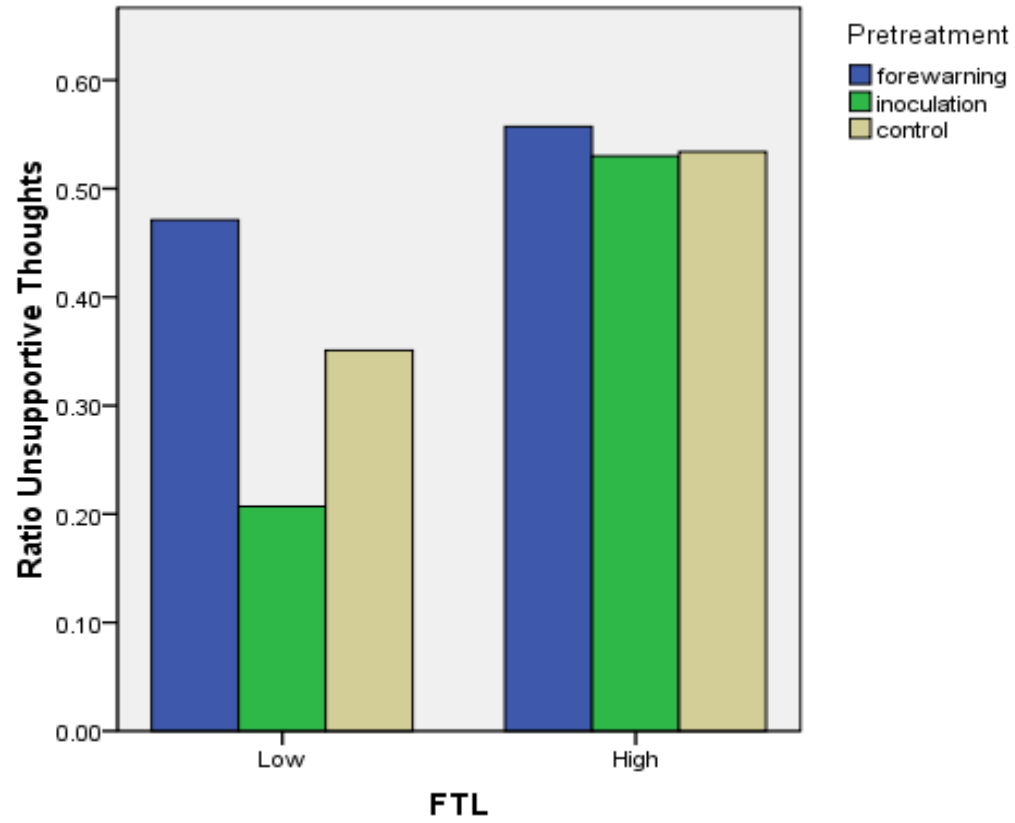
**Figure 1.**

*Means of anger as a function of FTL, sex, and pretreatment condition.*



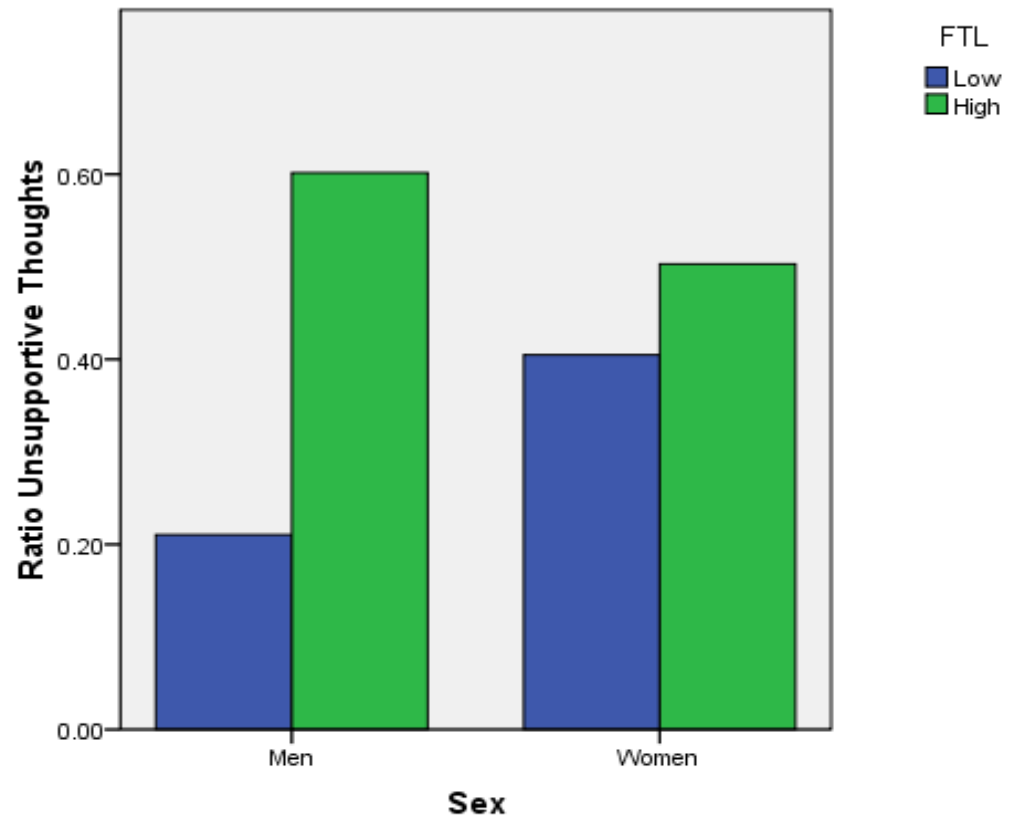
**Figure 2**

*Means of the ratio of unsupportive thoughts as a function of FTL and pretreatment*

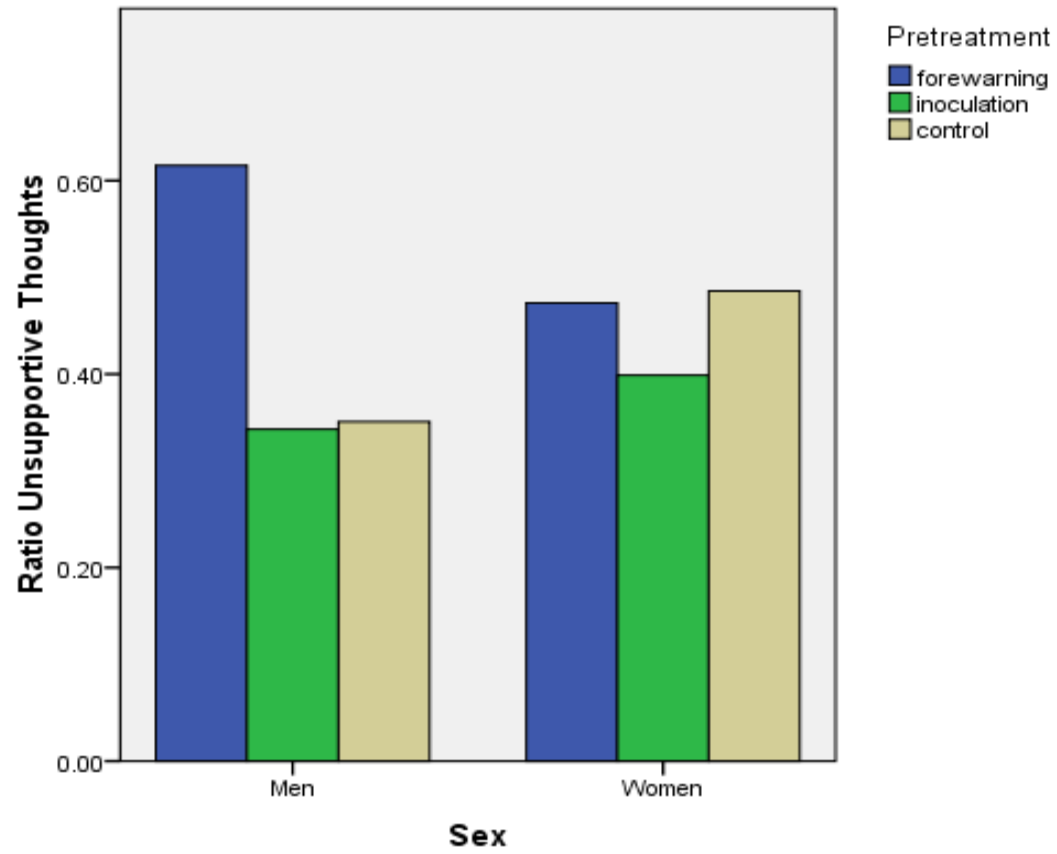


**Figure 3**

*Means of the ratio of unsupportive thoughts as a function of sex and FTL*

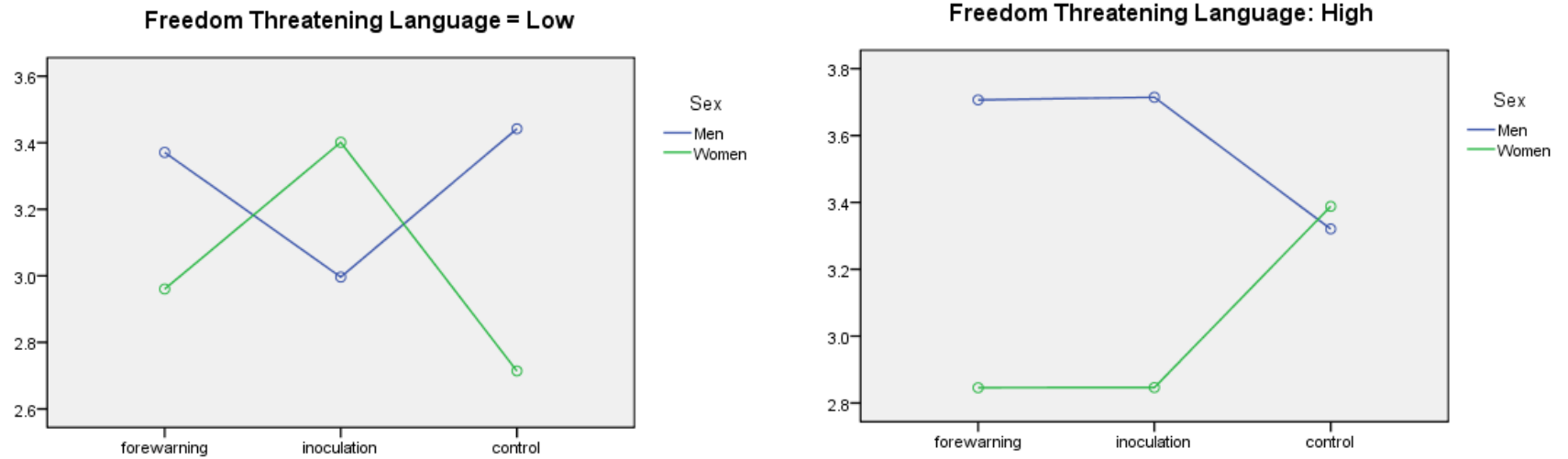




**Figure 4****Means of the ratio of unsupportive thoughts as a function of sex and pretreatment**

**Figure 5**

*Estimated marginal means of attitude in the three-way interaction of sex, inoculation and FTL.*



*Note.* The omnibus ANCOVA was significant at the  $p < .05$  level, but none of the post hoc pairwise comparisons were statistically significant. Covariates appearing in the model are evaluated at the following values: Personal Involvement = 4.05, Trait Reactance = 3.927

## Appendix A

### Forewarning and Inoculation Messages Used in the Final Study

#### **Forewarning**

The ad you are about to see might contain forceful language. It may sound to some people as if it's trying to limit their freedom to choose.

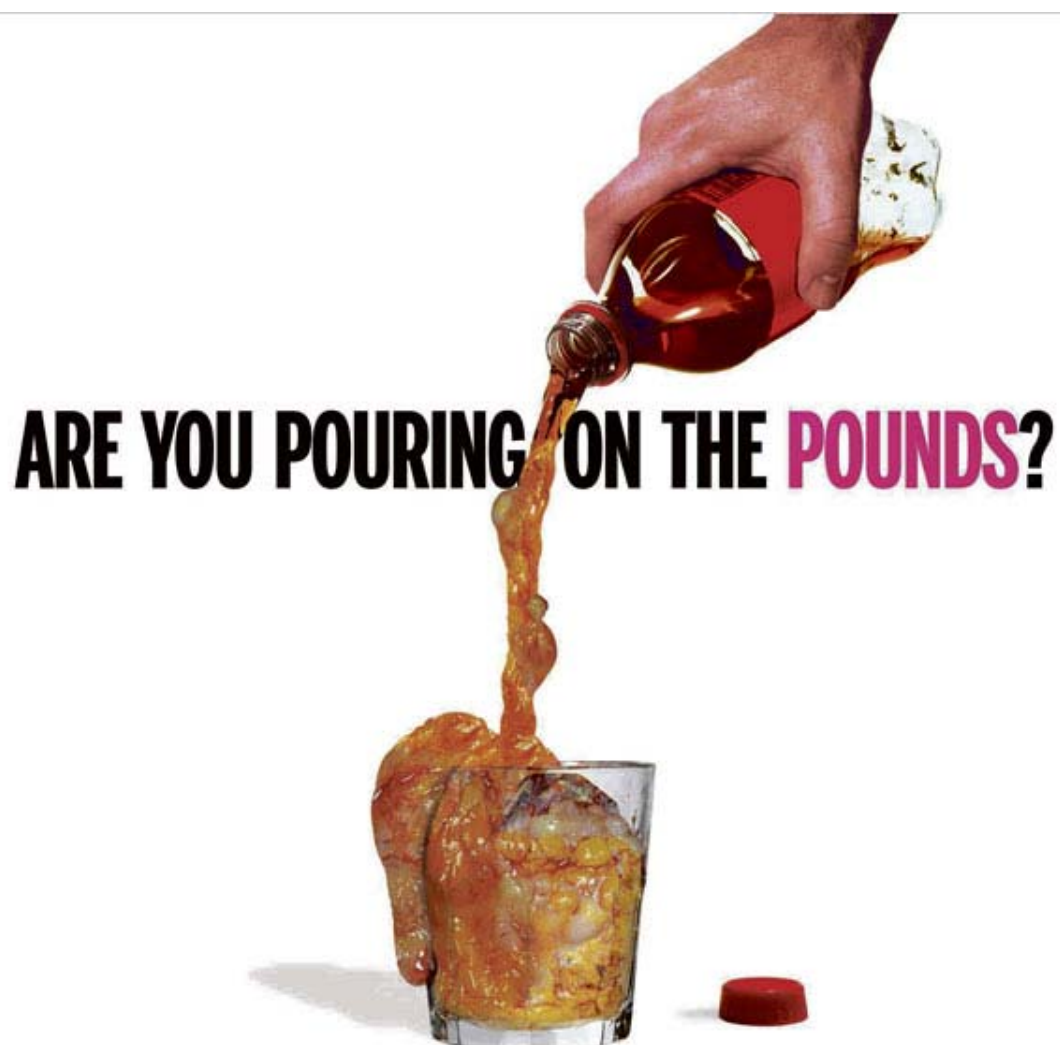
#### **Inoculation**

The ad you are about to see might contain forceful language. It may sound to some people as if it's 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.

## Appendix B

High and Low Threat to Freedom Advertisements Used in the Final Study

Version 1: Low Threat to Freedom



**You may be drinking yourself fat.**  
You could cut back on soda and other sugary beverages. You could choose water, seltzer or low-fat milk instead. It's healthy and it's safe.

**NYC**  
Michael R. Bloomberg  
Mayor

Department of  
Health & Mental  
Hygiene  
Thomas Farley, M.D., MPH,  
Commissioner

## Appendix B, Cont'd

High and Low Threat to Freedom Advertisements Used in the Final Study

Version 2: High Threat to Freedom

**DON'T DRINK YOURSELF FAT!**

**Stop the denial, any reasonable person would agree:  
You have to stop drinking soda and other sugary beverages.  
You need to drink water, seltzer or low-fat milk instead.  
Be healthy, be safe. We're not asking you, we're telling you!**

**NYC**  
Michael R. Bloomberg  
Mayor

Department of  
Health & Mental  
Hygiene  
Thomas Farley, M.D., MPH,  
Commissioner

## Appendix C

### Measures

#### **Abbreviated version of Zaichkowsky's (1985) Personal Involvement Inventory (P.I.I.).**

Participant indicated whether the advertisement was Insignificant / significant, of no concern / of much concern, doesn't matter to me / does matter to me, unimportant / important, irrelevant / relevant, means nothing / means a lot to them on 7 point Likert-type scales.

#### **Attitude scale**

Participants indicated to what extent they agree with the following statements on 7 point Likert-type scales:

- Drinking soda and sugary beverages makes me feel good
- Dinner is better with soda or sugary beverages.
- The government should tax soda and sugary drinks
- I like soda and sugary beverages
- Soda is bad for you
- This is the amount of soda I find acceptable (for me) on an average day (where 1 = 0 ounces, 7 = more than 60 ounces, in increments of 12 ounces).

**Behavioral intentions scale**

Participants indicated to what extent they agree with the following statements on 7 point

Likert-type scales:

- I plan to reduce my soda consumption
- I plan to drink (selzer) water or milk more.
- I plan to drink soda with my next lunch or dinner
- I plan to only drink 'diet' versions of soda from now on
- I plan to check out nutrition labels on soda bottles.
- In the next week, I'll have this many ounces of soda per day (on average, where (where 1 = 0 ounces, 7 = more than 60 ounces, in increments of 12 ounces).

**Thought listing task**

Participants were given the following instructions:

Please write down all the thoughts that came to your mind as you looked at the PSA you just saw. They can be about the PSA or not. List each thought separately using a new box for each thought. If you have more thoughts than there are boxes, please feel free to add the additional comments in the last box. You may also have fewer thoughts than boxes, and that's fine too. Don't worry about grammar and punctuation.

You will see two drop-down boxes to the right of each text box. For now, please ignore these drop-down boxes, as you will not have to deal with this part until later.

Before you proceed, make sure that you have written all of the thoughts.

### **Hong Psychological Reactance Scale**

Participants indicated to what extent they agree with the following statements along 7 point Likert-type scales:

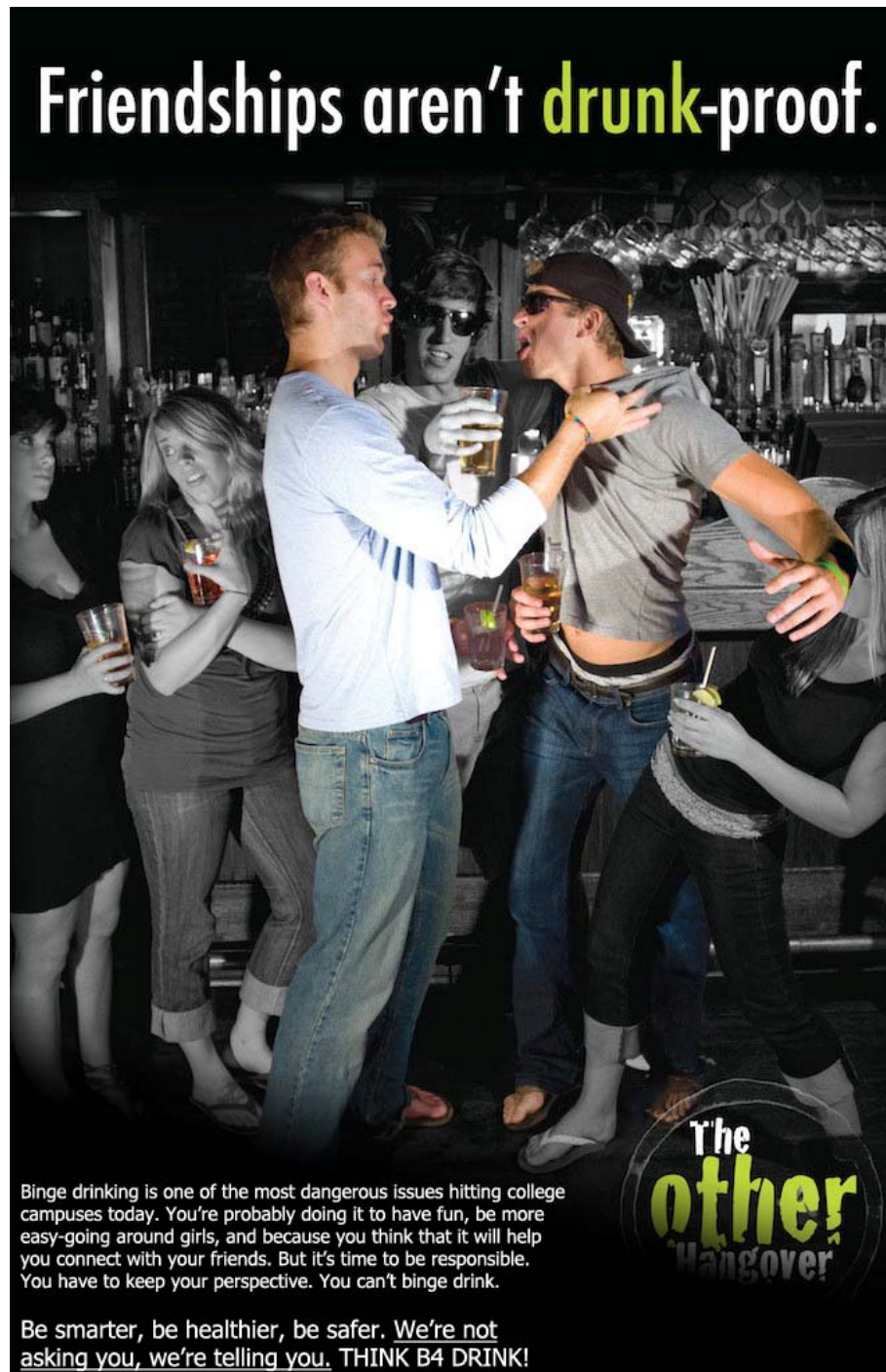
- Regulations trigger a sense of resistance in me.
- I find contradicting others stimulating.
- When something is prohibited, I usually think, “That’s exactly what I am going to do”.
- The thought of being dependent on others aggravates me.
- I consider advice from others to be an intrusion.
- I become frustrated when I am unable to make free and independent decisions.
- It irritates me when someone points out things which are obvious to me.
- I become angry when my freedom of choice is restricted.
- Advice and recommendations usually induce me to do just the opposite.
- I am content only when I am acting of my own free will.
- I resist the attempts of others to influence me.
- It makes me angry when another person is held up as a role model for me to follow.
- When someone forces me to do something, I feel like doing the opposite.
- It disappoints me to see others submitting to standards and rules



## Appendix D

## High and Low Threat to Freedom Advertisements Used in the Pilot Study

## Low Reactance Message # 1



**Friendships aren't drunk-proof.**

Binge drinking is one of the most dangerous issues hitting college campuses today. You're probably doing it to have fun, be more easy-going around girls, and because you think that it will help you connect with your friends. But it's time to be responsible. You have to keep your perspective. You can't binge drink.

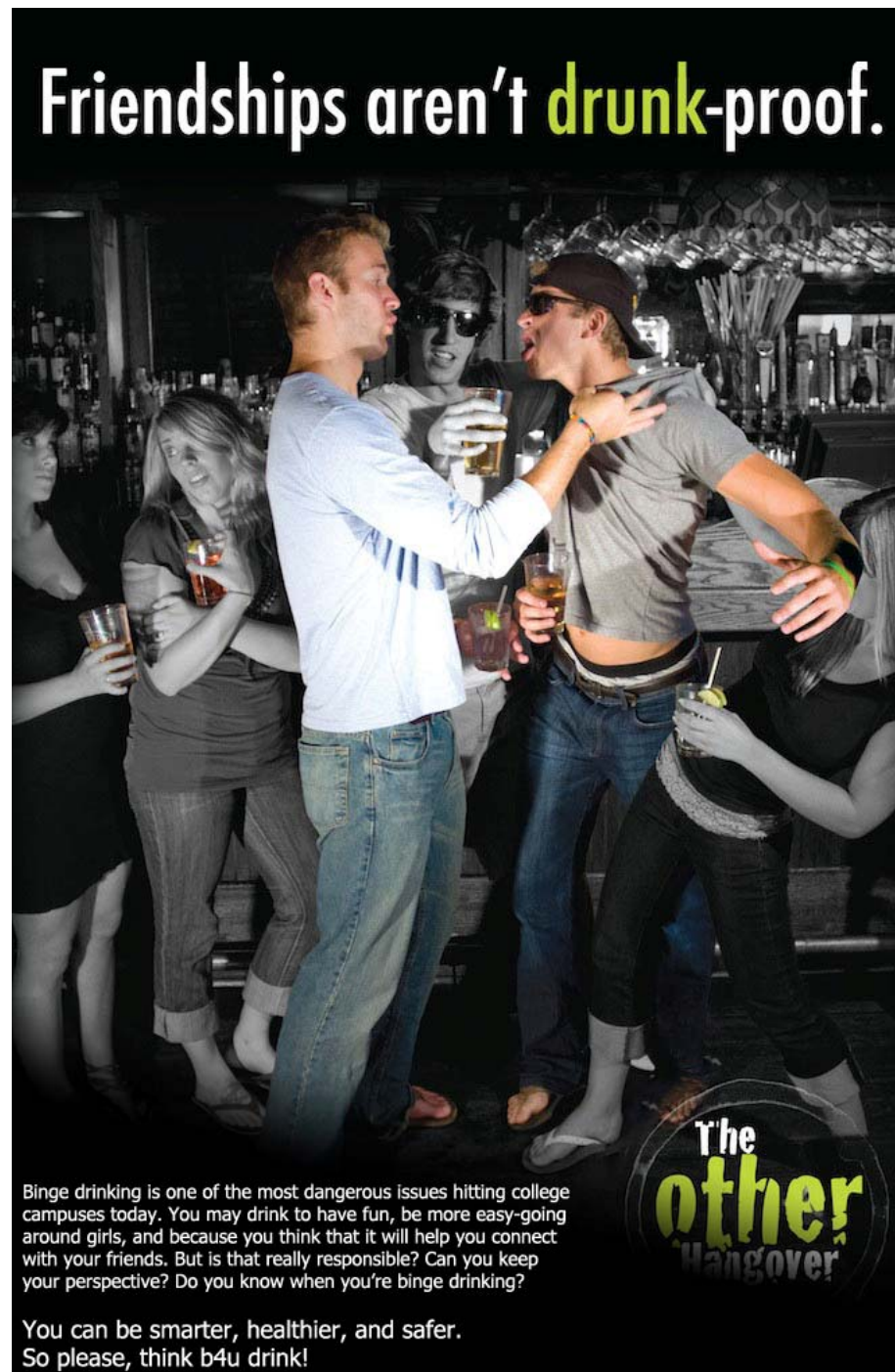
Be smarter, be healthier, be safer. We're not asking you, we're telling you. THINK B4 DRINK!

**The other Hangover!**

## Appendix D, Con'd

## High and Low Threat to Freedom Advertisements Used in the Pilot Study

## High Reactance Message # 1



**Friendships aren't drunk-proof.**

Binge drinking is one of the most dangerous issues hitting college campuses today. You may drink to have fun, be more easy-going around girls, and because you think that it will help you connect with your friends. But is that really responsible? Can you keep your perspective? Do you know when you're binge drinking?

You can be smarter, healthier, and safer.  
So please, think b4u drink!

**The other  
hangover**

Appendix D, Con'd

High and Low Threat to Freedom Advertisements Used in the Pilot Study

Low Reactance Message # 2

**think b4 drink**  
KEEP YOUR PERSPECTIVE

Binge drinking is one of the most dangerous issues hitting college campuses today. When you're in college, you drink to have fun, be more easy-going around the opposite sex, and because you think that it will help you connect with your friends. But is that really responsible? Can you keep your perspective?

Do you know when you're binge drinking?

You can be smarter, healthier, and safer. So please, think b4 drink!

**800-555-2121**  
[www.tb4d.com](http://www.tb4d.com)

Contact us to speak to a professional

**WHY DO YOU DO IT?**

**think b4 drink**  
KEEP YOUR PERSPECTIVE  
[www.tb4d.com](http://www.tb4d.com)

Appendix D, Con'd

High and Low Threat to Freedom Advertisements Used in the Pilot Study

High Reactance Message # 2

 **think b4 drink**  
KEEP YOUR PERSPECTIVE

Binge drinking is one of the most dangerous issues hitting college campuses today. You're probably doing it to have fun, be more easy-going around the opposite sex, and because you think that it will help you connect with your friends. But it's time to be responsible.

You have to keep your perspective. You can't binge drink.

Be smarter, be healthier, be safer.

**We're not asking you we're telling you.**

800-555-2121  
www.tb4d.com

Contact us to speak to a professional

**DON'T  
BINGE  
drink**

 **think b4 drink**  
KEEP YOUR PERSPECTIVE  
www.tb4d.com



## Appendix D, Con'd

## High and Low Threat to Freedom Advertisements Used in the Pilot Study

## Low Reactance Message # 3



**You may be drinking yourself fat.**  
You could cut back on soda and other sugary beverages. You could choose water, seltzer or low-fat milk instead. It's healthy and it's safe.

**NYC**  
Michael R. Bloomberg,  
Mayor

Department of  
Health & Mental  
Hygiene  
Thomas Farkas, M.D., M.P.H.,  
Commissioner

## Appendix D, Con'd

High and Low Threat to Freedom Advertisements Used in the Pilot Study

## High Reactance Message # 3

**DON'T DRINK YOURSELF FAT.**

You have to stop drinking soda and other sugary beverages.  
You need to drink water, seltzer or low-fat milk instead.  
Be healthy, be safe. We're not asking you, we're telling you.

**NYC**  
Michael R. Bloomberg  
Mayor

Department of  
Health & Mental  
Hygiene  
Thomas Farley, M.D., MPH,  
Commissioner

## Appendix E

### Forewarning and Inoculation Messages Used in the Pilot Study

#### **Forewarning 1**

The ad you are about to see might contain strong language, that may sound freedom-threatening to some people.

#### **Forewarning 2**

The ad you are about to see might make some people a little mad, and might make them want to do the opposite of what it says, just because people often don't like being told what to do. This is called psychological reactance.

#### **Inoculation 1**

The ad you are about to see might contain strong language, that may sound freedom-threatening to some people. 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.

#### **Inoculation 2**

The ad you are about to see might make some people a little mad, and might make them want to do the opposite of what it says, just because people often don't like being told what to do. This is called psychological reactance, but try not to let it cloud your judgment: the message's recommendation may still be a good one, even if the ad itself makes you mad.

## Appendix F

### Coding instructions for participants

Now that you have completed writing down your thoughts, we would like you to code them. In a moment, you will return to the previous page and use the drop-down boxes to the right of each text box to code each thought. Please do not change the actual content of the thoughts you wrote down. We would like you to code each thought in the following way:

1. First, we'd like you to code each thought on whether it is **relevant or irrelevant** to the PSA you saw. Does the thought have to do with the PSA? If the thought relates to the PSA, please mark "Relevant" in the drop-down box next to that thought. If the thought does not relate to the PSA you saw (ex: "I'm hungry"), please mark "Irrelevant" in the drop-down box next to that thought.

2. For thoughts that you code as "Relevant," we'd like you to code each thought on whether it is supportive, neutral, or unsupportive towards the PSA you saw. Please see descriptions of the codes below.

**Supportive:** The thought is supportive, such as "This ad is persuasive," or "I'm going to drink less soda."

**Unsupportive:** The thought is unsupportive, such as "What a bad image."



**Neutral:** The thought does not evaluate the PSA, such as “Interesting they would show this on the metro.”

You may indicate whether each relevant thought was "Supportive," "Neutral," or "Unsupportive" in the right-hand drop-down box next to each thought.

For the thoughts that you had coded as "Irrelevant," you can leave the right-hand drop-down box empty.

You may now return to the previous page by clicking the “**Back**” button at the bottom of this page. Please use the drop-down menus to code each thought you originally wrote. After you have coded each thought, you may proceed to the next page.

**It might be a good idea to copy-paste these instructions into a word document, so you can look them over while you're coding on the previous page.**

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