

EASE THE RÉSISTANCE:
THE ROLE OF NARRATIVE AND OTHER-REFERENCING
IN ATTENUATING PSYCHOLOGICAL REACTANCE
TO PERSUASIVE DIABETES MESSAGES

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EASE THE RÉSISTANCE:
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This dissertation is dedicated to my mom, who always thinks of others,
and my dad, who always has the best stories.

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ABSTRACT

This study provides evidence illuminating pathways through resistance to enhance the persuasiveness of messages encouraging individuals to make smarter health decisions. Reactance theory (Brehm, 1966; Brehm & Brehm, 1981; Dillard & Shen, 2005) explains that persuasion may fail by inducing threats to individuals' perceived autonomy, but questions remain as to how message creators may avoid that failure.

A 2 (narrative) x 2 (other-referencing) x 2 (message) within-subjects experiment with a between-subjects order factor (4) was conducted with adult diabetics ($N = 58$) to test whether packaging overt recommendations as a story rather than a factual or informational argument (i.e. narrative structure) and highlighting the impact of health decisions on others, such as family and friends, rather than the individual (i.e., other-referencing) can effectively attenuate reactance. Findings indicate that, in the context of reactance-inducing print messages promoting healthy diet and physical activity for adult diabetics, narrative and other-referencing had both direct and indirect effects on attitudes and behavioral intentions related to the messages and their recommendations.

Specifically, both narrative and other-referencing led to lower perceived threat to choice, less state anger, less counter-arguing, less negative cognitive responses, more positive attitudes toward the ad, more positive attitudes towards the behaviors promoted, and greater likelihood of complying with the message's recommendation. Moreover, reactance mediated the influence of these message strategies, such that narrative and other-referencing attenuated reactance, which, in turn, enhanced persuasion.

Findings illustrate two strategies that message creators may use in order to benefit from clear, direct health messages while avoiding the resistance that such overt directiveness often provokes. Moreover, findings inform message design for diabetes self-care education, a pressing need given the rapidly increasing prevalence of this illness and the resistance that is disproportionately present among the most at-risk populations.

I. INTRODUCTION

It's easy for a persuasive message to fail.

Although illustrations of compelling persuasive messages resonate in our collective memory – WWII propaganda, cigarette advertising, and texting-while-driving viral videos, for instance – an arguably large majority of persuasive messages never fulfill their persuasive intent.

One could argue, in fact, that a message is more likely to fail than it is to succeed. In the process of reaching and influencing an audience, a message must overcome hurdles related to selective attention, biased perception, imperfect memory, inertia, scrutiny, and a general reluctance to change, among others. These hurdles combine to form a veritable obstacle course that message creators must chart in order to design and produce more effective strategic communication. This investigation attempts to do exactly that, albeit by tackling a small piece of the metaphorical puzzle. This study aims to chart pathways through resistance to enhance the persuasiveness of messages encouraging individuals to make smarter health decisions, guided by the goal of attenuating the resistance invoked when people feel their personal freedom jeopardized by an external source.

Resistance to persuasion may be conceptualized as an umbrella term, variably representing what Knowles and Linn (2004a) label as its “four faces”: generalized distrust of change, scrutiny of attempts to be persuaded, inertia to keep attitudes in balance, and psychological reactance in response to freedom-limiting threats. The experiment reported here focuses specifically on this final “face,” psychological

reactance, specifically examining strategies to counteract reactance to persuasive health messages.

Previous studies demonstrate the importance of clear, explicit directions in driving individuals toward positive health behavior change, but research based in reactance theory demonstrates that telling people what to do may very well be a good way to instead drive them toward an aversive response (i.e., the “boomerang effect”). Research to date exploring the process of psychological reactance has clarified somewhat the antecedents and output of reactance, but fewer studies have examined mechanisms to mitigate this detrimental force on message acceptance.

Researchers have demonstrated the usefulness of tactics such as inducing empathy (Shen, 2010) and establishing interpersonal similarity with the communicator (Silvia, 2006) to counter-act reactance. The current project is guided by a goal of exploring whether two specific message attributes, narrative structure and other-referencing, may attenuate the negative influence of reactance on message processing, thereby enhancing the persuasiveness of health messages. Given studies linking these message features to reduced counter-arguing, increased engagement with the message, and greater compliance with requests, they may possess unique abilities to circumvent or counteract reactance. To ground this theoretical investigation in an applied context, messages promoting diabetes self-management behaviors were tested among a group of adult diabetics.

Study overview

The current perspective on state psychological reactance is that it is best modeled as a motivational amalgam of negative cognitions and negative emotion (i.e., state anger), preceded by cognitive perception of a threat to personal freedom and followed by restoration of freedom (direct or indirect). Dillard and Shen (2005) found this “intertwined, process model” to be a better fit than models placing either cognition or emotion sequentially prior to the other, and additional scholars (e.g., Quick & Consideine, 2008; Rains & Turner, 2007) have replicated this finding. Subsequent studies, moreover, have examined message features that induce reactance, such as threat-to-choice language (Quick & Stephenson, 2007) or loss (versus gain) framing (Rains & Turner, 2007).

Despite advances in how and why psychological reactance occurs, less attention has been paid to tactics that may circumvent this form of resistance. In other words, reactance theory purports to explain why messages sometimes fail, but reactance research has not yet given much attention to ways to avoid that failure. This study addresses the latter charge, by exposing an audience to messages designed to induce reactance and testing whether including additional message attributes can diminish the negative impact of reactance on message outcomes. Specifically, I propose that packaging overt recommendations as a story rather than a factual or informational argument (i.e. narrative structure) will reduce or attenuate the negative influence of state reactance on attention to and acceptance of diabetes control messages. I further propose that other-referencing, or highlighting the impact of health decisions on others, such as family and friends, rather than the individual, will be an effective strategy to avert reactance.

Research from the communication and public health literatures supports these predictions. Engagement with a narrative not only consumes some of the limited cognitive resources that might otherwise be allocated to developing counter-arguments, but it also promotes liking for the message, thereby diminishing the drive to disagree with or feel angry toward the persuasive attempt. Although less is known about the potential of other-referencing to offset resistance to persuasion, messages that arouse anticipated guilt or state empathy for potentially negative consequences of a diabetic's choices on loved ones, such as children or a spouse, are predicted to similarly reduce both the motivation and ability to think and feel negatively toward a persuasive message.

Purpose: Diabetes prevalence and the need for smarter messages

This theoretical investigation is grounded in the applied context of messages promoting self-management of (primarily type 2) diabetes through health diet and exercise practices, tested among a sample of adult diabetics.

An estimated 23.6 million Americans currently live with diabetes, a family of chronic conditions that render the body unable to adequately produce and process insulin, the essential hormone for converting glucose to energy (Centers for Disease Control and Prevention, 2007). Various reports predict that this number will swell to 30 to 40 million by mid-century (Boyle, Honeycutt, Venkat Narayan, Hoerger, Geiss, Chen, et al., 2001; Saaddine, Cadwell, Gregg, Engelglau, Vinicor, Imperatore, et al., 2006). According to 2007 data, diabetes afflicts 11% of the U.S. adult population age 20 and above, and 23% of those age 60 or better (CDC, 2007). More than a million and a half new cases of diabetes were diagnosed among U.S. adults in 2007 (CDC, 2007), and diabetes was listed

as the seventh leading cause of death on U.S. death certificates from 2006, in the U.S., a figure considered conservative given the condition's close relationship with other mortal illnesses such as heart disease (CDC, 2007).

While intimidating, these numbers do not represent the full spectrum of diabetes affliction in the United States. An estimated 54 million additional individuals face pre-diabetes, a high-blood-sugar condition that increases one's risk for developing diabetes and other health complications (National Diabetes Information Clearinghouse, 2006), and the CDC has estimated that an alarming 6 million individuals remain undiagnosed (CDC, 2005). Type 2 diabetes, which accounts for 90 to 95% of all diabetic cases (CDC, 2005), is reaching virtually epidemic proportions as it continues to climb rapidly in prevalence (Boyle et al., 2001; Burke, Earley, Dixon, Wilke, & Puczynski, 2006). It is clear that the rapidly escalating need for sufficient diabetes self-care among the general public deserves attention through both individual and macro-level interventions and education.

Diabetes complications cost the United States an estimated \$174 billion each year, reflecting direct medical costs and indirect costs from reduced work productivity (American Diabetes Association, 2008; CDC, 2007). The true burden of diabetes, however, lies with the individual.

The hallmark of diabetes is abnormally high blood glucose, or blood sugar, due to deficient insulin production or use. Human bodies rely on the hormone insulin to convert glucose from food into energy, but chronically diabetic bodies are unable to either produce insulin (type 1 diabetes) or use it properly (type 2 diabetes). Over time, elevated

blood glucose levels contribute to complications including cardiovascular disease, nerve damage, renal failure, and retinal damage.

A diagnosis of diabetes entails often dramatic lifestyle changes for the diabetic to realign insulin and glucose levels, including diet, exercise, taking medications, smoking, blood glucose monitoring, doctor visits, foot care and other daily behaviors (American Diabetes Association, 2001). Maintaining glycemic control (keeping blood sugar, or glucose, at the correct level) effectively and perhaps uniquely prevents or delays the long-term complications of diabetes (ADA, 2001; Burke et al., 2006; CDC, 2005), yet achieving glycemic control requires disciplined adherence to a specific behavioral regimen that may actually reduce diabetics' quality of life. Perhaps unsurprisingly, many diabetics – some health providers estimate more than 50% – choose to not adhere to recommendations, particularly exercising regularly and maintaining a healthy diet (Drummond, 2005; Glasgow, Toobert, Riddle, Donnelly, Mitchell, & Calder, 1989; Kiuru, Poskiparta, Kettunen, Saltevo, & Liimatainen, 2004).

Another factor that may contribute to non-adherence rates involves the manner in which recommendations and guidelines are delivered to diabetics. Research on diabetic/health provider interactions support the efficacy of autonomy-supportive compared to autonomy-limiting communication with diabetics. Communication strategies that support patients' perceived self-autonomy facilitate improved diabetes self-care and increased glycemic control (Glasgow, Fisher, Anderson, LaGreca, Marrero, Johnson, et al., 1999; Williams, Freedman, & Deci, 1998), whereas overtly directive recommendations may do more harm than good. Williams and colleagues (1998)

determined, for example, that patient perceptions of autonomy support from health professionals pre-empted decreased glucose levels over time. Explicitly controlling advice given in diabetics' patient-provider interactions, conversely, fails to increase compliance with recommendations and, moreover, is associated with deficient metabolic control (Kiuru et al., 2004; Street, Piziak, Carpentier, Herzog, Hejl, Skinner, et al., 1993). This pattern of noncompliance in response to choice-limiting directives brings to mind the "boomerang effect" commonly found in state reactance.

High involvement with self-care is an effective strategy to control diabetes, but it depends in part on education, reinforcement, encouragement and other forms of support external to the individual (McGrew, 2005). Included in this ecosphere of support are the mediated messages that diabetic individuals receive from their health care providers, and increasingly through Web-based means. Media scholars may ease the transition to a diabetic lifestyle and contribute to the secondary prevention of diabetes complications by designing support messages to encourage, motivate, and reinforce healthy lifestyle behaviors.

This investigation is guided by a goal of illuminating pathways to attenuate psychological reactance in response to persuasive messages, specifically in the context of diabetes messages. The following chapter outlines literature on (1) psychological reactance theory and its application in health communication, and (2) the use of narratives and (3) other-referencing in persuasive messages, focusing on their potential influence on reactance-related processing and outcomes. Following this review of the

literature, an experiment is proposed to address the question: Can the use of narrative and other-referencing in a persuasive message counteract reactance, as well as its negative impact on message processing and outcomes? This question was examined in the context of messages promoting diabetes self-care behaviors related to healthy eating and physical activity, tested among a group of adult diabetics. Findings from the experiment and their implications for theory and message design conclude this report.

II. LITERATURE REVIEW

This literature review focuses on three broad areas: psychological reactance theory, the use of narratives in persuasive messages, and the potential of other-referencing as a message strategy. It begins by exploring ideas that underlie these conceptual areas, including motivations to approach and avoid external stimuli in one's environment and general resistance in the face of persuasion.

Motivations to approach and avoid environmental stimuli

The pursuit of pleasure and elusion of pain may be the most fundamental drives underlying human thought and action. Writing on the human desire to maximize pleasure and minimize pain stretches more than two millennia into history, when philosophers such as Socrates and Plato ruminated on peoples' ability and motivation to advance hedonistic tendencies (Elliot, 2008). Even the humble amoeba displays tendencies for approach and avoidance – advancing toward soft, muted light, but retracting from bright, intense light (Schneirla, 1959). The mechanisms to express appetitive and aversive reactions become more sophisticated as one ascends the metaphorical food chain, but their simple presence remains fairly consistent across living creatures (Elliot, 2008). Indeed, Zajonc (1998), among others, has argued that approach/avoidance is the fundamental, and initial, dimension on which decisions and actions are based.

As Lewin (1935) outlined, approach motivation stimulates movement toward a positively-evaluated environmental stimulus, while aversive motivation stimulates movement away from a negatively-evaluated environmental stimulus. Aversive motivation reminds us to run in the face of impending danger – literally, as in response to

a physical threat, or figuratively (and even maladaptively), as with smokers and anti-tobacco advertisements – and approach motivation pushes us to learn new information and form meaningful relationships.

Decisions regarding which stimuli to approach and which to avoid are built on a number of complex and dynamic sub-processes, including mental waffling between appetitive and aversive tendencies. For example, if someone were to offer a person with type 2 diabetes a slice of chocolate cake, she may initially experience strong approach tendencies (honestly, who could blame her?), which may just as quickly be countered by subsequent aversive tendencies, as she considers how the sugar rush may make her feel physically. To oversimplify, we want the things we like to be close to us, and we want the things we dislike to remain at a distance. Whether this distance is actual or metaphorical, it reflects a desire to increase positivity and decrease negativity. Following Lewin (1935) and others¹, scholars in the motivated cognition tradition advocate that emotion-based evaluations of positivity and negativity underlie motivations for approach and withdrawal, such that positive evaluations predict approach and negative evaluations predict aversion. Moreover, environmental stimuli often provide the cues that determine such evaluations; positive features such as similarity or attractiveness stimulate motivation to approach the stimulus, whereas negative features such as danger or offensiveness provoke aversion.

This study attempts to find a crossroads between approach and avoid tendencies. Within a context of avoidance, namely resistance to persuasion, are there certain

¹Elliot, 2008, p. 7, also provides a list of advocates of this perspective from the psychology literatures on emotion, motivation, and attitude

strategies that can induce approach motivations? As noted by Silvia (2005), “influence attempts create forces to comply and forces to react [non-compliantly]” (p. 277). Can communicators blend message features such that individuals feel compelled to over-ride their aversive tendencies toward overt persuasion, thereby maximizing forces to comply and minimizing forces to react? And ultimately, can this recipe apply to help individuals make smarter health decisions?

Resistance to persuasion

Resistance to persuasive communication is not a monolithic concept, but rather may wear one of several “faces,” such as distrust, scrutiny, and inertia (Knowles & Linn, 2004a). Whereas these forms of resistance represent a somewhat generalized bias against change or persuasion – indeed, one might argue that a healthy dose of skepticism actually benefits targets of persuasion – a fourth face, psychological reactance, reflects the human bias against external control, and our deep-rooted need for autonomy, whether real or perceived.

Whereas the majority of studies on resistance to persuasion focus on inducing resistant strategies that enable individuals to thwart persuasive attempts (Knowles & Linn, 2004b; e.g., inoculation theory: Pfau, Semmler, Deatruck, Mason, Nisbett, Lane, et al., 2009), research in the reactance paradigm – especially that found in the recent health communication literature – takes a somewhat different approach, focusing instead on the reasons we resist a message that may be proffering salient, positive, and/or useful recommendations. Knowles and Linn (2004c) distinguish these two approaches as alpha and omega strategies. Alpha strategies incentivize the adoption of a persuasive attempt –

essentially, encouraging targets to say “yes,” – while omega strategies counteract reasons not to adopt the persuasion – essentially, encouraging targets *not* to say “no.” Following the Health Belief Model (Janz & Becker, 1984), for instance, promoting benefits of behavior change exemplifies an alpha strategy, whereas demoting barriers to change illustrates an omega strategy.

The recent resurgence of reactance theory in health message design research, prompted by a chapter from Burgoon, Alvaro, Grandpre, and Voludakis (2002) in Dillard and Pfau’s *The persuasion handbook*, adopts the omega-strategy perspective, teasing out the reasons why people become reactant to persuasive health messages with the ultimate goal of avoiding these destructive triggers. These applications, as well as the general theory on which they are based, are explored in the following sections.

Psychological reactance theory

Communicators are faced with a range of psychological barriers that block persuasive attempts to change peoples’ opinions and behaviors. Simply becoming aware of a message’s persuasive intent, for instance, may provoke a person to feel threatened or restricted and subsequently trigger resistance to the message (Brock, 1967). An individual’s perceived sense of autonomy is of central importance in psychological reactance theory (Brehm, 1966; Brehm & Brehm, 1981). According to reactance theory, individuals perceive a set of free behaviors (Wicklund, 1974), such as whether or not they can smoke a cigarette or their ability to choose what they will eat for dinner. Challenges to these expectancies prompt an aversive motivational state, reactance. This state, in turn, directs the individual to restore her or his threatened freedom through thought or action.

In other words, “reduction in control arouses reactance, and reactance impels the individual to try to restore control” (Brehm & Brehm, 1981, p. 6).

Psychological reactance theory underscores the human need for autonomy and control over our own choices. Attempts to thwart that control, according to the theory, will be met with resistance, or even attitudes and behaviors opposite to the desired direction. For example, placing warning labels on violent entertainment has been shown to increase interest in the violent programming, compared to similar content without warning labels (Bushman & Stack, 1996). Similarly, unsolicited advice to purchase healthy snack food can increase a person’s intention to purchase *un*healthy options (Fitzsimons & Lehmann, 2004). As these studies demonstrate, reactance mediates message persuasiveness; more specifically, reactance mediates the influence of message content on message outcomes (Dillard & Shen, 2005, and Rains & Turner, 2007, for example, demonstrated mediation using structural equation modeling techniques).

The process model of state reactance. The entanglement of cognitions, affect, behavioral intent and behavior in the multi-stage process of reactance arousal, output and restoration complicates attempts to understand and model the true nature of reactance. This complexity led the creators of the theory to question whether the concept could be captured validly with empirical measures (Brehm, 1966; Brehm & Brehm, 1981). Recent applications of reactance theory in health communication, however, directly address this operational charge. Armed with more sophisticated measures, researchers have provided evidence for a structural model of state reactance as a process of reactance arousal and output followed by restoration (e.g., Quick & Stephenson, 2008) (see Figure 1, below).

The model proposes, basically, that when an individual feels their personal freedom threatened by an external source, this initiates a chain of negative thoughts and anger that the individual subsequently resolves by opposing the threat through thought and/or action.

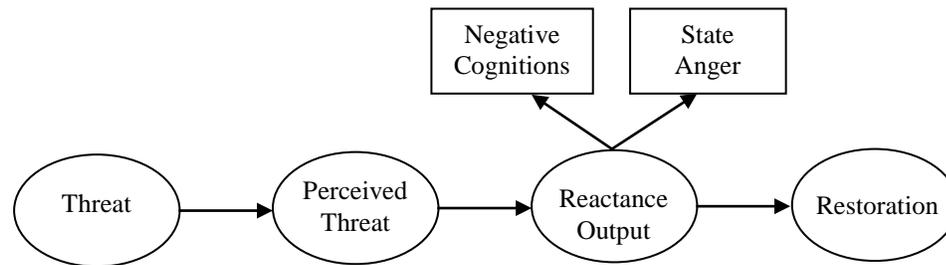


Figure 1. A Process Model of State Reactance

The model contains three key elements, discussed over the following paragraphs. First, reactance is initiated by a perceived threat to personal freedom. This perception induces a motivational amalgam of negative thoughts and anger. Restoration, the final stage in this model, allows the individual to resolve these negative sensations and regain a sense of autonomy.

Perceived threat to choice. For reactance to occur an individual must first perceive an attempt to limit a felt behavioral freedom, that is, a thought, feeling or action that the person believes is within the scope of her or his personal autonomy. Threats to freedom fundamentally attempt to eliminate or reduce a person's ability to exercise a free behavior. Individuals may perceive, for instance, that they are being manipulated, that a decision is being made for them, or that their ability to choose between alternatives is limited (Brehm & Brehm, 1981; Dillard & Shen, 2005; Quick & Stephenson, 2008;

Wicklund, 1974). Because health messages are often explicitly persuasive and directive in nature, they may easily appear to threaten a person's freedom and, in turn, elicit reactance rather than compliance (Dillard & Shen, 2005). Indeed, Brehm (1966) proposed that any persuasive message could potentially be perceived as a threat to personal freedom.

Perceived threats may vary widely in magnitude, determined by the importance of the threatened freedom and the degree of threat itself (e.g., limit versus restrict intake of sweets) (Brehm, 1966; Brehm & Brehm, 1981; Wicklund, 1974). The magnitude of reactance is positively related to both the importance of the threatened behavior to the individual and the magnitude of threat (Brehm & Brehm, 1981; Burgoon et al., 2002).

A perceived threat to limit or eliminate a freedom that an individual values as highly important elicits greater reactance than a threat to a less important behavior (Brehm, 1966; Brehm & Brehm, 1981; Burgoon et al., 2002). The domain of behaviors an individual realistically perceives she or he has the capacity to perform freely is considered individual rather than universal (Brehm, 1966), and includes both potential future freedoms (e.g., deciding whether or not to have dessert after your next meal) and current behaviors the individual perceives as threatened (e.g., smoking). The relative values of free behaviors are neither stagnant nor homogenous. Rather, the importance and prominence of specific free behaviors varies for an individual (Burgoon et al., 2002). Seemann and colleagues suggested that these freedoms "fall on a continuum of importance" (2005, p. 89; see also Seemann et al., 2006), where threats to more important free behaviors elicit greater reactance than threats to less valued freedoms will. In a

follow-up study, Seemann and colleagues (2008) compared threats of similar magnitude but different type, including a “classic” reactance-inducing threat (limits decision-making freedom), a social influence threat (one person attempts to dominate another), and a barrier threat (limit or eliminate access to a free behavior). Across topically similar messages, social and barrier threats elicited higher state reactance than did the classic threat.

Threat magnitude does play a significant role in reactance arousal, however. Threats of large magnitude elicit greater reactance than threats of lesser magnitude (Brehm, 1966; Brehm & Brehm, 1981; Burgoon et al., 2002). One means of operationalizing threat magnitude involves manipulating the wording of a persuasive message, specifically altering the use of controlling versus autonomy-supportive language (Miller, Lane, Deatrick, Young, & Potts, 2007). Controlling language is more imperative than propositional, and thus poses stronger threats to behavioral freedom than autonomy-supportive language, which relies on suggestions rather than commands (McLaughlin, Shultz, & White, 1980; Miller et al., 2007). Highly threatening, or controlling, language is decidedly non-neutral in intent, characterized by intense, aggressive, directive, and opinionated syntax (Buller et al., 2000; Lanceley, 1985). The influence of controlling language on reactance and its role in the current investigation are examined in greater detail later in this chapter.

The magnitude of reactance, to summarize, is shaped by both the type and magnitude of the threat to a given free behavior. Threats to personal freedom are a particular type of threat that is distinguished from those commonly used in fear appeals,

such as health threats (e.g., Leshner, Bolls, Thomas, 2009) and social threats. Whereas a health or social threat intimidates by illustrating a negative consequence of non-compliance, such as lung cancer or bad breath caused by tobacco use, threats to personal freedom are relatively more immediate, in that they attempt to limit something absent an intervening action by the individual. Moreover, a health threat logically draws part of its power from the notion that it theoretically can be avoided through compliance (e.g., you won't get lung cancer if you stop smoking). The only way to avoid a reactance-inducing threat, conversely, is through non-compliance.

Although it has been suggested that reactance may operate nonconsciously (Chartrand, Dalton, & Fitzsimons, 2007), most findings hinge on a person's cognizance of the freedom-limiting threat; indeed, threat-to-choice perception is conceptualized as the induction of state reactance. For instance, conscious perception of a stereotype threat moderates the effects of gender stereotyping on stereotype-congruent behavior (Kray, Reb, Galinsky, & Thompson, 2004; Kray, Thompson and Galinsky, 2001), such that implicit activation results in stereotype-congruent behavior, whereas explicit activation of gender stereotypes triggers stereotype-incongruent behavior, or "stereotype reactance." According to Kray and colleagues, stereotype reactance does not occur without conscious perception of a stereotype threat.

Negative cognitive and affective output. Perceived threat-to-choice induces reactance, which is modeled as a latent variable comprising negatively-valent cognitive and affective output (Dillard & Shen, 2005; Quick & Stephenson, 2007a, 2008; Rains & Turner, 2007). The pattern of reactance arousal followed by reactance output mimics the

appraisal → response pattern found in other social psychological models of motivated stress response, such as the biopsychosocial model of challenge and threat (Blascovich & Mendes, 2000; Blascovich & Tomaka, 1996). The negative emotions that constitute the affective component fall within the general spectrum of angry feelings, such as irritation, hostility, frustration, aggression, and rage (Brehm, 1966; Dillard & Shen, 2005; Wicklund, 1974). Although anger is hallmark to reactance, this is not purely a theory of emotion. Rather, perception of and cognitive reactions to the threat initiate and reinforce the motivational drive toward restoration. Negative cognitions may manifest in several forms, namely counter-arguing (Silvia, 2006) and negative cognitive appraisals (Dillard, Kinney & Cruz, 1996; Miller et al., 2007).

Dillard and Shen (2005) empirically validated the structurally inseparable nature of cognitive and affective components in reactance output. They compared four process models using structural equation modeling techniques: a single process cognitive model (i.e., threat → cognition → attitude → behavior), a single process affective model substituting anger for cognition, a dual process cognitive model with cognition and anger occupying distinct paths between threat and attitude, and the intertwined model combining cognition and anger into a latent variable, reactance (Figure 1, above). Fit indices across two between-subjects experiments, one with pro-flossing messages, one with anti-binge-drinking messages, strongly supported the intertwined model over the other path models. These data, in conjunction with multiple replications (Quick & Stephenson, 2007a, 2008; Quick & Kim, 2009; Rains & Turner, 2007; Shen, 2010),

confirm that the cognitive and affective components of reactance co-occur, rather than manifest sequentially or uniquely.

Restoration of freedom. Once aroused, reactance drives the individual to restore or reclaim the threatened freedom, either directly (i.e., by performing the restricted action) or indirectly (Brehm, 1966; Burgoon et al., 2002; Quick & Stephenson, 2007b; Wicklund, 1974). Direct restoration is commonly referred to as the “boomerang effect” (e.g., Burgoon et al., 2002; Clee & Wicklund, 1980; Fishbein, Hall-Jamieson, Zimmer, von Haeften, & Nabi, 2002) and represents an exercise of freedom that is directly counter to the reactance-inducing demand. For example, a teenager who watches an ad demanding that he “just say no” to marijuana may feel pressured to use marijuana to prove to himself that he is in control of that decision. A classic boomerang effect would involve using the drug in an effort to regain control. With direct restoration (compared to indirect restoration), not only does the individual reject the recommendation, but they act in a manner to oppose it.

Indirect restoration may be more salient to communication scholars, however. Behavioral forms of indirect restoration may involve vicarious performance of the threatened behavior (e.g., associating with others who are using marijuana) or performance of a related behavior (e.g., using a different illegal drug such as methamphetamines) (Burgoon et al., 2002; Quick & Stephenson, 2007b; Worchel & Brehm, 1971). A form of indirect restoration that is of principal importance to message designers, however, is feeling or displaying aggression or hostility toward the source of the threat, such as a persuasive appeal (Wicklund, 1974). When a persuasive appeal is the

source of the freedom-limiting threat, individuals have been shown to react with negative message evaluations, reduced perceptions of the message's persuasiveness, source derogation, and outright message rejection (Burgoon et al., 2002; Grandpre, Alvaro, Burgoon, Miller, & Hall, 2003; Miller et al., 2007; Quick & Stephenson, 2007a; Silvia, 2006; Worchel & Brehm, 1970). Moreover, anger discourages message acceptance (Dillard, Plotnick, Godbold, Freimuth, & Edgar, 1996). Empirical findings related to message outcomes driven by reactance are explored further in the "Reactance and persuasive health communication" section later in this chapter.

It deserves notes that reactance and restoration are not dichotomous or purely quantitative concepts, but rather can be thought of as existing on a continuum, ranging from relatively extreme boomerang effect to more nuanced or subtle forms of resistance mixed with reluctant acquiescence – the image of a teenager griping and scowling while cleaning her room or doing other chores comes to mind. Ultimately, however, non-compliance, or at least increased preference for it, is hallmark to reactance. Whereas resistance is conceptually in diametric opposition to persuasion, reactance is more specifically in opposition to compliance.

Trait versus state reactance, and the influence of individual differences. One central difficulty in measuring reactance stems from its dual manifestations as a situation-dependent reaction and as a fixed personality attribute. While reactance may be conceptualized as a situation-specific state aroused by persuasive messages, as described above, it may also be operationalized as an individual trait that varies across and within audiences. Whereas state reactance functions as an outcome variable, generally itself a

precursor to message outcomes in its mediating role, trait reactance is conceptualized as an antecedent variable that guides message processing and reactions.

Researchers exploring trait reactance have linked reactance proneness to high-risk behaviors such as adolescent tobacco use (Miller, Burgoon, Grandpre, & Alvaro, 2006), underage alcohol consumption (Allen, Sprenkel, & Vitale, 1994), and resistance to physicians' advice (Graybar, Antonuccio, Boutilier, & Varble, 1989). Although Brehm's (1966) original explication of reactance theory conceived of reactance as more dependent on features of the threat than on features of the individual perceiving the threat, health scholars, in particular, also employ trait reactance as a predictor of adherence to clinical recommendations. There is also evidence that trait reactance influences the relationship between controlling language in a message and outcomes such as message acceptance. For example, Miller and colleagues (2007) reported that trait reactance, but neither gender nor age, was a significant covariate in the omnibus test of controlling language and lexical concreteness on multivariate measures of message persuasiveness.

Trait reactance is commonly operationalized as a four-factor model comprising emotional response toward restricted choice, reactance to compliance, resistance to influence from others, and reactance to advice and recommendations (Hong & Fraedda, 1996, p. 177). Trait reactance may further cleave along dimensions of age, gender and ethnicity (Hong, Giannakopoulos, Laing & Williams, 1994; Woller, Buboltz & Loveland, 2007), suggesting that these variables could potentially impact the reactance process as well. Although findings regarding individual differences and trait reactance are not

always consistent, there are indications that young adults and seniors, males, and some racial/ethnic minorities are prone to higher dispositional reactance.

Age may be a particularly relevant individual-difference variable, given its relationship with type 2 diabetes (i.e., onset generally occurs later in life). The originators of reactance theory proposed that individuals become less reactant over time, as they accumulate strategies for successfully establishing, prioritizing, and exercising freedoms (Brehm & Brehm, 1981). The few empirical studies specifically examining trait reactance across age have validated this notion. Hong, Giannakopoulos, Laing and Williams (1994) administered the Hong's trait reactance scale (Hong & Page, 1989) to 1,717 Australians ages 18 to 40. Mean levels of trait reactance were significantly higher for the younger group (ages 18-29) compared to the older group (ages 30-40). Woller, Buboltz and Loveland (2007) found similar results with the Therapeutic Reactance Scale (Dowd, Milne, & Wise, 1991) administered to 3,499 American students ages 18 to 64. Younger cohorts displayed higher trait reactance than most of the older cohorts, but these authors also documented a curvilinear effect, such that mean reactance scores for the oldest individuals in the sample (ages 55-64) mirrored the younger groups (ages 18-24, 25-34) more closely than the less-reactant middle age groups (ages 35-44, 45-54). While the decrease in reactance from early to middle adulthood fits with Brehm and Brehm's theoretical explication, Woller et al. (2007) suggest that the spike for the 55-64 age group may reflect the phenomenon of older individuals feeling less in control of their environment as they age. The authors base this proposition on literature indicating a decline in perceived control as age increases into late adulthood (e.g., Brandstädler, 1999;

Heckhausen & Schultz, 1995). It seems plausible that lifestyle restrictions necessary for diabetes self-management, such as diet regimens, may further thwart a person's sense of perceived control, compounding tendencies to be dispositionally reactant.

While there is evidence that trait reactance may vary with age, extensive research has documented state reactance in response to controlling health directives across young and older adult age groups, as well as adolescents (see Quick & Kim, 2009, for a recent review). This reactance generally occurs in a context that has relevance for the participants, however. The magnitude of state reactance varies as a function of the degree of threat, such as the intensity of controlling language, but it also varies positively with the importance of the threatened freedom to an individual (Brehm, 1966; Brehm & Brehm, 1981; Burgoon, Alvaro, Grandpre, & Voludakis, 2002). For this reason, scholars have tested messages that threaten relevant freedoms among their selected populations, such as adolescents and anti-tobacco (Grandpre et al., 2003) and anti-drug (Burgoon et al., 2002) advertising, undergraduate college students and condom ads (Quick & Stephenson, 2007a), and adult members of a fitness center and exercise ads (Quick & Considine, 2008). This study continues this tradition of bolstering the external validity of experimental research by testing type 2 diabetes control messages with the individuals they were designed to persuade, type 2 diabetics.

While the trait-reactance perspective provides valuable insight into audience characteristics (suggesting how a single message elicits a myriad of audience responses, for example), the present study focuses on state reactance rather than trait reactance. Although individual differences, including trait reactance, are not the primary focus of

this study, they represent an area for future inquiry, as explored further in the discussion section. The focal question for this research is how reactance drives cognitive and emotional responses, or, from a different perspective, what cognitive and emotional processes signal a reactance response.

Reactance and persuasive health communication. Reactance theory has been applied to explain resistance to choice-limiting messages in a variety of persuasive health communication contexts, including adolescent smoking (Grandpre et al., 2003) binge drinking (Dillard & Shen, 2005; Shen, 2010), illegal drug use (Shen, 2010), exercise promotion (Miller et al., 2007; Quick & Consideine, 2008), sun protection (Buller, Burgoon, Hall, Levine, Taylor, Beach, et al., 2000), dental flossing (Dillard & Shen, 2005), and condom use (Quick & Stephenson, 2007a), among others. Reactance impacts message persuasiveness by mediating the influence of a freedom-limiting threat contained in the message on the recipient's subsequent attitudes and behavioral intentions, particularly intended compliance with the recommendation (Bensley & Wu, 1991; Buller, et al., 2000; Dillard & Shen, 2005).

Empirically, reactance has been shown to both completely (e.g., Rains & Turner, 2007) and partially (e.g., Quick & Consideine, 2008) mediate the effects of message features on message outcomes. An experiment from Reinhart and colleagues (2007) demonstrated that reactance mediated the influence of gain and loss framing in organ and tissue donation messages, such that loss-framed messages aroused greater reactance, which, in turn, negatively impacted attitudes towards donation and thoughts in reaction to the messages. Although not all gain/loss framing may induce reactance, threats to

personal freedom almost certainly do; reactance thus mediates path from threat-to-choice language in a message to attitudes and behavioral intentions related to the message and its health topic. This mediated chain of influence has been demonstrated in adult, adolescent, and college student samples. For example, Quick and Considine (2008) asked adult health club members to read invitations to group exercise and weightlifting programs that varied only in how forcefully-worded the messages were. Language strength was causally and significantly linked to message rejection through the mediated path in Figure 2, below (which updates the process model from before to more directly reflect a persuasive communication context).

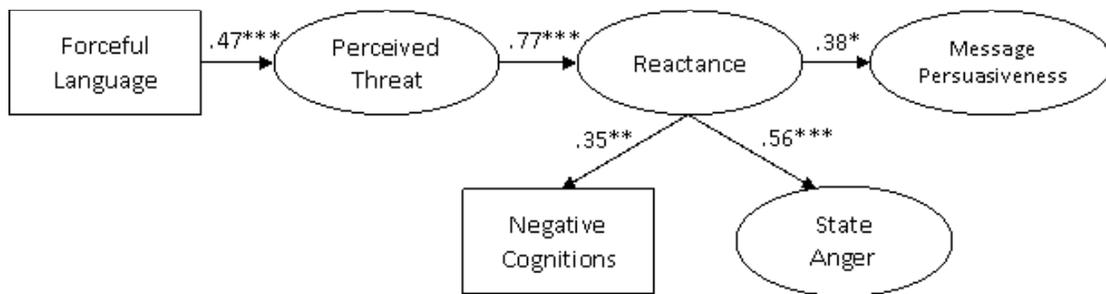


Figure 2. A Process Model of Reactance in Communication, Quick and Considine (2008)

The risks and benefits of using overtly directive language in persuasive appeals complicate message design efforts. For example, in a study by Miller and colleagues (2007), controlling messages promoting regular exercise were perceived as threatening, induced reactance, and were associated with negative feelings toward the message – but these messages were also rated as less difficult to understand than non-controlling messages. Leshner and colleagues (2008) found that explicit advice-giving messages

promoting breast cancer detection practices outperformed relatively implicit story-based messages in terms of self-efficacy, response efficacy and intended information seeking behaviors. Messages with high linguistic intensity are more likely to arouse individuals than low intensity messages, although this arousal may be positive (compliance) or negative (reactance) (Buller, Borland, & Burgoon, 1998; Mendes, Major, McCoy, & Blascovich, 2008). Controlling language is often associated with rejection of the persuasive attempt, however, as demonstrated through “boomerang effects,” negative message evaluations, reduced intentions to comply with the message advocacy, and increased counter-arguing with the message, as outlined in the following paragraphs.

Controlling language has been described variably as dogmatic (Quick & Considine, 2008), forceful (Quick & Kim, 2009; Quick & Stephenson, 2008), freedom-threatening (Doob & Zabrack, 1971), imperative, commanding (Miller et al., 2007), opinionated (Buller et al., 1998), strong (versus weak) language (Cody et al., 1980), and threat-to-choice language (Burgoon, Alvaro, Broneck, et al., 2002; Dillard & Shen, 2005). Terms such as “ought,” “must,” and “need” signal controlling persuasive attempts (Lanceley, 1985). The underlying idea is that this style of message delivery explicitly threatens or restricts the recipient’s range of attitudinal or behavioral choices, often through overt coercion, verbal aggression and strongly-opinionated demands for compliance (Buller et al., 2000; Dillard & Shen, 2005).

Whereas controlling language dictates freedom-limiting requests, non-controlling language, or autonomy-supportive language (Vansteenkiste, Lens, & Deci, 2006), promotes the individual’s role in decision-making and pushes the individual only to

choose the best option for her or him. Autonomy-supportive language encourages rational consideration of the message's recommendations with intentionally temperate wording (Dillard & Shen, 2005; Miller et al., 2007; Vansteenkiste et al., 2006) and reminders that the individual is ultimately in control of her or his choices and actions (McLaughlin, Shultz, & White, 1980; Miller et al., 2007). Tactics that promote autonomy, rather than try to limit it, demonstrate empathy with the decider, call attention to opportunities for choice, give rationale if choice is limited, and avoid using pressure or coercion (Deci, Eghrari, Patrick, & Leone, 1994; Vansteenkiste et al. 2006). Theoretically, autonomy-supportive messages generally are not perceived as threats to one's ability to access or exercise a freedom and therefore do not initiate the arousal and expression of reactance.

The distinction between controlling and autonomy-supportive language may be subtle, as in two examples from Dillard and Shen (2005): a high controlling message states that "there is a problem and you have to be part of the solution," whereas a low controlling message declares that "there is a problem and you have *a chance* to be part of the solution" (emphasis added). Longer scripts allow for more clear distinctions between these two types of language, demonstrated in the following excerpts from Miller et al.'s (2007) exercise promotion messages (emphasis added):

High-Controlling Message: ...you really must exercise to both burn calories and reduce your risk of breaking bones during falls. Additionally, you must exercise to develop greater lung capacity and increase oxygen intake. There are other ways to increase physical activity. For instance, you should join team sports such as basketball or softball, and you ought to start walking whenever you can, rather than always driving. You also ought to try taking the stairs more often instead of the elevator.

Low-Controlling Message: ...why not exercise to both burn calories and reduce your risk of breaking bones during falls? You can also exercise to develop greater lung capacity and increase oxygen intake. Joining in team sports, such as basketball or softball, is a good way to increase physical activity. Besides exercising, you might want to start walking whenever you can, rather than always driving. You might also think about taking the stairs more often instead of the elevator. (Miller et al., 2007, Appendix A)

Among message features that elicit state reactance, controlling language is most consistently linked to successful inductions of this motivational state (Dillard & Shen, 2005; Grandpre et al., 2003; Henriksen, Dauphinese, Wang, & Fortmann, 2004; Miller et al., 2007; Quick & Considine, 2008; Quick & Kim, 2009; Quick & Stephenson, 2008; Rains & Turner, 2007). Controlling language is associated positively with perceived threat to freedom and reactance output (e.g. Dillard and Shen, 2005; Miller et al., 2007; Quick & Considine, 2008) and negatively with various indicators of message persuasiveness, including negative evaluations of the message (Dillard & Shen, 2005; Rains & Turner, 2007) and its source (Grandpre et al., 2003; Miller et al., 2007), as well as increased liking for and intentions to exercise the proscribed action (Quick & Kim, 2009; Quick & Stephenson, 2007a). Dillard and Shen (2005), for example, mapped mediated but significant paths from threat-to-choice language to negative attitudes and reduced behavioral intentions to comply with message directions in anti-binge-drinking and pro-flossing message reactions among a sample of college students.

In this sense, both perceived threat-to-choice and reactance mediate the impact of controlling language on message outcomes. Buller and colleagues (1998) found no significant effects of language strength on reactance, but this finding may be traced to

arguably weak manipulations of language intensity. Specifically, high and low intensity messages about the importance of sunscreen use labeled skin cancer as “grotesque” versus “unusual,” respectively, described skin cancer treatment as “cutting or burning” versus “removing” tumors, and noted that either “tragically” or “sadly” a number of people would die from skin cancer. These insignificant findings demonstrate that reactance is a response to an explicit threat to an individual’s freedom, not simply increasingly vivid language.

In reactance studies, messages with autonomy-supportive (i.e., “low-controlling” (e.g., Miller et al., 2007) or “less controlling” (e.g., Quick & Kim, 2009)) language consistently elicit less anger and more positive message appraisals than controlling messages do (see also Dillard & Shen, 2005; Henriksen et al., 2004; Rains & Turner, 2007). Moreover, research from the health sciences suggests that the use of autonomy-supportive language and similar patient empowerment tactics by health care providers can facilitate better diabetes self-care (Glasgow et al., 1999; Williams et al, 1999). Williams and colleagues (1999), for instance, determined that patient perceptions of autonomy support from health care workers were causally linked to a subsequent decrease in blood sugar levels over a 12-month period. Controlling tactics such as option-limiting demands, conversely, have been shown to predict decreased patient participation in diabetes self-care and increased indicators of poor health, such as poor metabolic control (Drummond, 2005; Kiuru et al., 2004; Street et al. 1993; Weiss & Hutchinson, 2000; Williams et al., 1998).

Language strength is an important component of threat magnitude in reactance theory. Controlling directives rely on imperatives rather than rational propositions (McLaughlin et al., 1980; Miller et al., 2007), and this form of language intensity is characterized by powerful, forceful, dominating, and freedom-limiting demands. Alternate conceptualizations of language intensity include aspects such as explicitness versus implicitness (Burgoon, Alvaro, Broneck et al., 2002; Dillard, Kinney, & Cruz, 1996; Grandpre et al., 2003) and lexical concreteness (Miller et al., 2007). The distinction between these concepts and controlling language is not arbitrary. For example, Miller and colleagues (2007) found controlling language to negatively predict self-reported attention to and acceptance of a message, while lexical concreteness positively predicted attention and positive message ratings. The researchers concluded that “an increase in one form of language intensity – concrete descriptiveness – tends to enhance persuasiveness, whereas an increase in another form of language intensity – explicit directiveness – tends to diminish persuasiveness” (Miller et al. 2007, p. 235). This study relies on the consistently-demonstrated link from this “explicit directiveness” in persuasive messages (i.e., controlling language) to perceived threats to choice, in order to induce reactance and measure the cognitive and emotional processes it entails.

To summarize the preceding sections, messages featuring controlling language are predicted to elicit state reactance, modeled as (1) perceived threat-to-choice followed by (2) negative cognitions and state anger and culminating in (3) restoration of freedom. Given the focus of this study on reducing and/or attenuating reactance, this state must first be induced in order to compare relative reductions; controlling language is the

mechanism by which this is accomplished. The findings reviewed over the preceding pages confirm that controlling language can be considered a reliable message feature in empirical tests designed to induce reactance, such as the current study. The present study exposes adult type 2 diabetics to messages proffering recommendations for effective diabetes self-care, delivered through coercive/controlling wording. These controlling messages, which explicitly demand compliance with the recommendations through forcefully directive and restrictive language, are expected to induce state reactance and lead to negative evaluations of the message.

It remains uncertain, however, if messages can be constructed in a way as to benefit from the advantages of clear, direct advice, while avoiding the pitfalls of being perceived as a threat to freedom. The question then becomes: what strategies (i.e., message features) can attenuate reactance in opposition to the message's recommendations?

Processes versus effects orientation to attenuating reactance. Reactance impacts not only how an individual reacts following a persuasive message (or conversation, etc.), but also how the individual processes that message during reception of it. More specifically, reactance arousal is likely to trigger negatively-valenced and biased message processing. In a pair of experiments, Silvia (2006) found that threats-to-choice placed at the beginning or end of a persuasive message provoked similar levels of disagreement with the directive, but fostered either biased or objective processing, respectively. Negative cognitive responses (critical thinking, counter-arguing) fully mediated the influence of threats at the start of a message on disagreement, indicating

biased message processing, whereas no mediation occurred in the threat-at-end condition, suggesting relatively objective processing and a more direct effect of threat on disagreement. Moreover, there was a sleeper effect such that dissent dissipated for the objective processing/threat-at-end group after a distraction task, but was sustained for the biased processing/threat-at-start group. Threats-to-choice, accordingly, can drive disagreement with a coercive attempt both indirectly and directly, and biased processing of these persuasive attempts can produce more permanent boomerang effects.

The growing movement to study media processes rather than simple effects is predicated on exploring how features of mediated content interface with human information processing systems to produce an array of systematic, if complex, responses and eventual outcomes, thus giving us a look inside the “black box” and providing an ultimately richer portrait of how media and the mind interact. Research examining both the processing and effects of media messages (e.g., Bolls, Lang & Potter, 2001; Leshner, Bolls, & Thomas, 2009) avoids making assumptions about the “how” of media influence by focusing on steps that predate behavioral or attitudinal outcomes, namely how message and individual factors interact with a motivated information processing system to drive and shape processing of mediated content.

Although examining real-time processing of reactance-inducing and reactance-attenuating messages lies outside the scope of the current investigation (see the “Future extensions” section in the Discussion chapter for an overview of extensions into the area of psychological processing), several key considerations from the “processes” orientation will be taken into account for this study. In this view, the “message” is not central, but

rather, its “features” and how they interact with a person’s motivationally-driven processing system are paramount. Given that the most useful communication theory not only explains but predicts complex social phenomena (Chaffee & Berger, 1987), such as resistance to persuasion, a deeper empirical understanding of the processes leading to media-related “effects” is necessary to advance our field in terms of original theory. For these reasons, specific message features (narrative, other-referencing) are explored both individually and in conjunction with each other. Moreover, mediating states, including those that are theoretically specific to narrative and other-referencing (i.e., narrative engagement, guilt arousal, state empathy), are measured, rather than simply capturing outcome variables such as behavioral intentions. The following sections explore these potential mediators – that is, predicted mitigators – between reactance-inducing messages and negative reactions.

Counteracting and attenuating reactance

Although people are generally wary of attempts to restrict their range of choices and actions, they do not monolithically or inevitably oppose directives. The classic Milgram experiments (e.g., Milgram, 1974) illustrate tendencies toward obedience with authority figures, for instance. In Milgram’s studies and across multiple replications, approximately 65% of people fully complied with persuasive directives, despite highly negative consequences to others (Blass, 1999). In more recent examples, studies from the infectious disease literature examining people’s responses to directives following the outbreak of a disease such as H1N1 or diagnosis of a condition such as HIV indicate that people adhere to directives if they comprehend an imminent risk (Murphy, Rotheram-

Borus, & Joshi, 2000; Tobin & Whiteford, 2002), understand the directive and its rationale (Moore, Gamage, Bryce, Copes, Yassi, et al, 2005; Ruef, 2004), anticipate that compliance with the request will protect or aid them (Adam, Maticka-Tyndale, & Cohen, 2003; Joseph, 2004), and believe that peers are complying with the request (Moore et al., 2005).

Leshner and colleagues (2008) compared didactic, or advice-giving, messages with narrative messages promoting breast cancer detection behaviors among African-American women. The advice-giving messages, which included explicit requests for compliance, outperformed their relatively implicit story-based counterparts in promoting self-efficacy, perceived response efficacy, and information-seeking behaviors. Message structure also interacted with emotional tone of the messages such that emotionally-mixed didactic messages (i.e., both pleasant and unpleasant emotion; coercive) elicited more attention over the course of the message than all other message types except for unpleasant narratives (which were not significantly different in terms of cognitive resource allocation from didactic mixed messages). These findings imply that communicators may benefit from including clear, direct advice in their strategic messages, and moreover, that reactance does not unfailingly occur in the face of overt persuasion, at least not always to a detrimental degree.

A handful of studies specifically examining reactance have proffered strategies to avoid its negative influence on message processing and outcomes. Experimental research indicates that certain message or context features may impede reactance expression or restoration. For example, adding a control-restoring message to the end of a controlling

message can avert direct restoration (Miller et al., 2007), in a sense by priming perceptions of self-autonomy. In the context of messages promoting exercise and physical activity, Miller and colleagues found that highly-intense messages directly followed by a “restoration postscript” (e.g., “...you don’t have to listen to any of these messages. You know what is best for yourself...The choice is yours. You’re free to decide for yourself.”) predicted lower degrees of perceived threat to freedom than messages followed by a filler postscript. One might argue, however that these messages were perceived as autonomy-supportive rather than controlling, or at least as a combination of both. As such, reactance may have been prevented rather than attenuated or mitigated.

Other strategies, such as interpersonal similarity with the source of the directive or distraction during message reception, may reduce reactance in the presence of overt, highly directive persuasion. Perceived interpersonal similarity to a coercive communicator can diminish reactance, thus reducing the motivation to counter-argue with the directive (Silvia, 2005). Across a pair of experiments, similarity interacted with degree of threat to freedom, such that high-threat messages were met with disagreement only when perceived similarity was low. For highly-similar communicators, agreement did not differ for high versus low threat messages, indicating that interpersonal similarity attenuated reactance. Moreover, similarity directly increased liking for the communicator and reduced perceived threat. Distracting individuals during message reception can also reduce counter-arguing, particularly among low-involvement audiences (Festinger & Maccoby, 1964). These researchers showed overtly persuasive films either with or

without distraction to low-, high- and no-involvement groups. Distraction directly and negatively influenced disagreement and counter-attitudinal responses (though they do not clarify whether motivation or ability was central), and the effect was especially pronounced for less involved audiences.

The current study proposes two message features – narrative structure and other-referencing – that may attenuate reactance, and more importantly, its negative influence on message outcomes. The following sections review literature on these content features and explore avenues by which they may circumvent reactance.

Narrative strategies in persuasion

The rich complexity of mediated messages, coupled with the diverse audiences they reach, theoretically leads to a virtually unlimited combination of potential message outcomes. In terms of message attributes, both structural and content features can influence cognitive and emotional processes during and following media consumption. For instance, attention to a message may be increased by introducing camera changes (Lang, 2000) or by incorporating emotional content into the message (Bolls, Lang & Potter, 2001; Leshner et al., 2009) The style of information delivery can also influence message processing and reactions. For example, episodically-framed news stories direct readers' or listeners' focus to the individual case rather than its broad implications, whereas thematically-framed articles provide the context that enables audiences to think more abstractly about the issue (Iyengar, 1991).

Narrative delivery style in persuasive messages. One particular delivery style, narrative, has received substantial attention in health communication research (see

Kreuter, Green, Cappella, Slater, Wise, Storey, et al., 2007 for a recent review). Kreuter and colleagues (2007) define narrative as "a representation of connected events and characters that has an identifiable structure, is bounded in space and time, and contains implicit or explicit messages about the topic being addressed" (p. 222). This description includes the key components found across varying definitions of narrative, namely cause-and-effect, sequential unfolding of events, connectivity among story elements, and the presence of one or more characters.

Narratives appear in a variety of formats, both nonfictional, as with narrative journalism or case histories, and fictional, such as literature or entertainment education. A common narrative format in advertising and strategic communication is the testimonial, which provides a vivid exemplar through the form of a personal reflection, possibly accompanied by personal opinions (Braverman, 2008). Entertainment education (Slater & Rouner, 2002) incorporates pro-social and pro-health messages into story-based dramatic, comedic or musical formats. Whether in the form of soap operas (e.g., Dutta-Bergman, 2006), dramas, skits, songs, or cartoons, entertainment education is an increasingly popular means of delivering persuasive messages to audiences, particularly at-risk audiences who may not engage with traditional informational messages. In Nigeria, for example, a campaign based on pro-social messages fused into music videos and skits had a substantial and positive influence on contraceptive use and family planning for both male and female audiences (Bankoke, Rodriguez, & Westoff, 1996).

Narratives, whether brief anecdotes or lengthy epics, rely on the human information processing bias toward stories and the organic nature of story processing

(Green, Brock, & Strange, 2002) to deliver persuasive and educational content. This inherent property of narratives enhances our ability to understand them, as well as our preference for this more easily understood format of information presentation (Kreuter et al., 2007). There is evidence that humans “think narratively,” building mental representations and memories as connected scripts and schemas (Wyer, Jr., 2007), suggesting that messages that do the same seem more natural to the human brain. Narratives may therefore enhance information processing and foster closer understanding of the message (Kreuter et al., 2007).

Enhancing persuasion through narrative engagement. The presence of narrative structure in a persuasive message does not automatically ensure that the story will have an impact on message processing and outcomes, however. As Petraglia noted, “Meaning does not inhere in words or actions – it resides in the meaning that individuals apply to words and actions” (2007, p. 499). Much as freedom-limiting threats do not induce reactance unless the individual perceives a threat, narratives are unlikely to have an impact without arousing a “mediating state” of engagement with the narrative (O’Keefe, 2003). The influence of narrative on message reactions is mediated by this engagement, variably conceptualized as absorption (Graesser, 1981), transportation into the story world (Green & Brock, 2000), “being hooked” by the story (Escalas, Moore, & Britton, 2004), experiential immersion (Chang, 2008), and involvement with the narrative (Slater & Rouner, 2002; Slater, 2002).

These concepts differ primarily in terms of depth of engagement; for example, transportation generally occurs for longer narratives such as feature films or novels,

whereas experiential immersion was shown to occur for much shorter narratives, such as public service announcements. Despite different labels and technical differences, the distinctions are, to some degree, semantic. Though proposed and tested in different mediated message contexts, each type of engagement involves some form of identification with the character(s), a certain understanding of the/their situation, and an element of enjoyment from vicariously experiencing the story action. Moreover, engagement involves both cognitive and affective processes, namely increased attention and heightened emotional response.

Stories engage individuals cognitively (Escalas et al., 2004; Limon & Kazoleas, 2004) and emotionally (Escalas, 2004) as they entice the viewer, listener, or reader to become engrossed in the story action (Chang, 2009; Green & Brock, 2005). It is this engagement that gives narratives their persuasive power. For example, Chang (2008) compared narrative and argument forms of advertising promoting mental health literacy and compassion for individuals with mental health. His experiments showed that experiential immersion in a narrative message where a depressed person describes her symptoms increased sympathy for depressed individuals, but exposure to a non-narrative message did not induce immersion and greater sympathy. Research drawn from psychology, communication and public health literatures highlights the potential influence of narrative (and, more appropriately, narrative processing) on cognitive, affective, and behavioral aspects of message reception and response. Although studies often examine narrative engagement in the context of longer messages, such as novels (Green & Brock, 2000) or TV sitcoms (Busselle & Bilandzic, 2009), transportation can

occur with shorter messages, including health promotion advertisements (Dunlop, Wakefield, & Kashmina, 2008).

Direct and indirect pathways from narrative to persuasion. Cognitively, stories seem able to circumvent critical evaluation of the message and its arguments (Green & Brock, 2005; Limon & Kazoleas, 2004), therefore pre-empting counter-arguing or critical thoughts in response to the message (Durkin, Biener, & Wakefield, 2009; Green & Brock, 2002). The potential for narrative formats to mitigate counter-arguing in response to a persuasive message is of principal importance for the current study, which explores avenues to attenuate reactance. In a test of public service announcements concerning the risks of tanning bed use, for example, the use of exemplar rather than statistical supporting evidence in persuasive messages led to reduced counter-arguing and critical thinking (Limon & Kazoleas, 2004).

This first key to narrative influence breaking the chain of state reactance happens, in part, because the use of storytelling renders the communicator's persuasive intent less obvious or explicit to the audience (Hinyard & Kreuter, 2007; Kreuter et al., 2007). Perceiving less persuasive intent may be synonymous with perceiving less threat-to-choice. Narrative processing also demands cognitive resources (Chang, 2009); given humans' limited store of these resources (Lang, 2009), narrative may therefore reduce reactance, in part, by consuming the cognitive resources required for counter-arguing and critical thinking.

In addition to reducing the ability to counter-argue, narrative also reduces a person's motivation to counter-argue. Absorption into a narrative is generally a positive

emotional experience that produces feelings of enjoyment (Busselle & Bilandzic, 2009; Green, Brock & Kaufman, 2004), also referred to as a sense of “flow” (Csikszentmihalyi, 1997; Limon & Kazoleas, 2004). Escalas and colleagues (2004) also found that narrative ads of fictitious consumer brands not only increased positive emotion, but also reduced apathy toward the product. Slater and Rouner (2002) found the negative influence of narrative on counter-arguing to be most pronounced for counter-attitudinal messages, indicating that advantages of narrative are enhanced in situations where the message is met with resistance. It seems logical that coercive messages demanding compliance with a directive would present a similar counter-attitudinal threat to choice.

Narrative forms of persuasion may attenuate resistance not only to the messages themselves, but to the attitudes and actions that they promote. Kreuter and colleagues (2007) proposed that health-focused narratives may mitigate fear and resistance toward health- and disease-related behaviors, such as cancer screening or contraceptive use, by enhancing self-efficacy and response efficacy through behavioral modeling. Anderson (2006) found that narratives increased self-efficacy regarding breast self exams among female audiences by enabling women to vicariously engage in the practice. Both male and female audiences can benefit from this phenomenon, however. Pro-social narratives in music videos or soap operas may “teach” young adults, for example, useful strategies, and even specific language, to insist that their sexual partners use contraceptives (Dutta-Bergman, 2006; Basten, 2009).

In addition to enhancing persuasion indirectly, by attenuating resistance, narratives are likely to have a direct, positive impact on persuasion. Narrative advertising,

compared to argument or advocacy advertising, can elicit more positive cognitive appraisals of the message (Feeley, Marshall, & Reinhart, 2006) and the product advertised (Chang, 2008; Dunlop et al., 2008), more positive attitudes toward the brand (Chang, 2009; Polyorat, Alden, & Kim, 2007) and the ad itself (Chang, 2009; Feeley et al., 2006), as well as greater adoption of beliefs and attitudes that are consistent with the story (Green & Brock, 2000). This openness to story-consistent ideas and arguments is perhaps the most important mechanism underlying narrative influence, as it is a key initial step in the adoption of new (and more adaptive) behaviors. Presenting a narrative of ideal behavior enables the recipient to draw comparisons between his world and the world created by the story, which may help him better understand his own experience and learn new information or behaviors to guide safe health practices. Moreover, narratives provide a context for emotionality and emotional content that may not exist in non-narrative formats, thus giving voice to more abstract emotional and existential issues (Kreuter et al., 2007) that allow vicarious reflection by the message recipient on her or his situation, such as living with and managing diabetes.

Narrative persuasion and health interventions. The use of narrative testimonials in public health interventions has been shown to elicit positive health behavior and attitude change. The *telenovela*, a Spanish-language television or radio soap opera, has proven to be a particularly effective vehicle for delivering pro-health messages to the Spanish-speaking community, for example. *Telenovela*-based interventions have induced attitude and behavior change for health practices such as condom use and cancer screening (Elder, Ayala, Parra-Medina, & Talavera, 2009). In the context of colorectal

cancer prevention and detection among Latinos, an intervention based on storytelling led to significantly more servings of vegetables consumed and minutes exercised daily than an intervention based on a numeric risk tool (Larkey & Gonzalez, 2007). Narrative influence appears to permeate diverse cultures, however; longitudinal analyses of a general-audience statewide anti-smoking campaign in Massachusetts indicated that exposure to testimonial and emotional, but not comparison, campaign ads predicted tobacco cessation by recipients at follow-up (Durkin et al., 2009). This quitting effect was most pronounced among low- and medium-socioeconomic status (SES) groups, arguably those most in need of more effective interventions.

Narratives and non-narrative messages may carry the same information (e.g., reduce sugar in your diet), while presenting it in different ways. Non-narrative messages adopt a variety of formats, including informational (Braverman, 2008), argumentative (Chang, 2008, 2009), expository (Smith, 1995), advocacy-oriented (Dunlop et al, 2008 – included stats and steps), didactic (Kreuter et al., 2007), statistical (Limon & Kazoleas, 2004), factual (Polyorat et al., 2007; Reinard, 1988), and rhetorical (Green & Brock, 2005). These styles all provide information relevant to the topic and context, but do not feature a particular story tied to the information. These counterparts to testimonial-based messages often adopt an impersonal, even professional, tone, and rely on context such as statistics, reason-based arguments, expert opinions, and factual descriptions of the product, issue, or topic as evidentiary support (Deighton, Romer, & McQueen, 1989; Durkin et al., 2009; Reinard, 1988). For example, a non-narrative health PSA might

enumerate the potential consequences of a health risk or describe symptoms of an illness in a clinical, rather than personal or reflective, fashion.

From a rational, quantitative perspective, a message built on information drawn from aggregated cases should be more persuasive than a message featuring only a single case (Baesler & Burgoon, 1994). In reality, however, vivid exemplars often outperform statistical evidence or professional opinions (Brosius & Bathelt, 1994; Strange & Leung, 1999), particularly in political communication and health policymaking (McDonough, 2001). People who hear or read a story may identify with the character even in the face of her or his singularity and potential unreliability as an information source, although this may be less likely for highly-involved audience members, who are more likely to elaborate on the message arguments and scrutinize weaker arguments (Braverman, 2008).

Communicators targeting highly-involved audiences may find success using non-narrative messages, however. Leshner and colleagues (2008) found that emotion moderated the influence of narrative on attention in breast cancer survivor messages, such that didactic messages with mixed emotional tone garnered as much attention as testimonials with unpleasant emotional tone, and received more attention than pleasant or mixed emotional narratives. Moreover, the advice-giving messages surpassed testimonials in eliciting perceived self-efficacy, response efficacy and information-seeking intentions. Involvement and value congruency are also known to impact narrative processing.

Braverman (2008) found that involvement moderated the influence of delivery style of weight loss promotion messages. While there was no main effect of testimonial

versus informational delivery style on a composite persuasiveness variable (message evaluation, agreement, behavioral intentions), informational messages were more persuasive for the high-involvement group, whereas testimonials were more effective with the low-involvement group. Recipient support for the advocated position or behavior also moderates the impact of evidence type (Slater & Rouner, 1996). Supporters responded most strongly to statistical evidence in alcohol education messages, but opponents of the message position were more persuaded by anecdotal evidence.

Taken together, these findings suggest, as Kreuter and colleagues (2007) and Slater and Rouner (2002) also argue, that narratives work best in the face of resistance to a message or the behavior change it prescribes. This pattern of results has not been tested specifically among reactance-inducing messages, however, nor has it been established with a sample of adult diabetic participants. The distinctive ability of narrative or testimonial evidence to attenuate resistance to persuasion suggests that this form of delivery may reduce state reactance to explicitly controlling messages, a hypothesis tested in the current study.

Other-referencing strategies in persuasive messages

There is evidence that human connections may provide an avenue to circumvent reactance and foster compliance. Silvia (2005) found that perceived interpersonal similarity with a communicator reduced reactance by reducing the level of perceived threat from a controlling message. Similarity also increased liking, which further enhanced message persuasiveness. Taking a related but different approach, this study explores whether emphasizing familial others may similarly diminish the threatening

nature of the health directive, albeit by arousing thoughts and emotions about one's family rather than oneself.

Other-referencing strategies emphasize the potential influence of an individual's choices and actions on others, whether known or unknown, rather than focusing on personal outcomes related to one's choices. McGuire (2001) suggested that although communicators generally appeal to individuals' more obvious motives, such as freedom from death and disease, they may find more success, particularly among at-risk audiences, by appealing to less common drives, including altruism (p. 27). Other-referencing may reduce the negative influence of reactance on message processing by motivating individuals to attend to and accept the message's recommendations, despite feeling initially reactant toward the controlling nature of the persuasive attempt.

Examples of other-referencing from the public sphere. Several examples from public health campaigns exemplify the other-referencing approach. A 2009 New York anti-smoking campaign included a televised public service announcement that depicted a little boy stranded in a busy train station by his mother, in a metaphor for deceased smokers leaving their children behind to suffer the consequences of their choices. While images of the terrified, sobbing child fill the screen, a voiceover asks parents to “imagine if *they* lost you for life” (emphasis added; <http://www.youtube.com/watch?v=oiikpiRYq1Q>).

A similar anti-tobacco PSA from the Michigan Department of Community Health (<http://www.youtube.com/watch?v=ta3cKT5BXmo>) focuses on guilt appeals related to secondhand smoke. Cherubic young children fill the PSA with lines such as, “I smoke

during my nap,” “We smoke in the car,” and “I’m down to about a pack a day” to highlight their incidental intake of secondhand smoke from their parents. A 1999 pamphlet from the Michigan Department of Community Health emphasized the family-related benefits of reducing cigarette use: “The *greatest benefit* of a smoke-free home is that you will remove all the health risks associated with secondhand smoke.... Even your pets will be happier.” (Murray-Johnson & Witte, 2003, p. 484). National campaigns have also incorporated other-referencing to appeal to audiences. A classic anti-drug PSA (<http://www.youtube.com/watch?v=Y-Elr5K2Vuo>) features a parental-guilt-based appeal: when a father implores his son to admit where he learned to use marijuana, the teenager exclaims, “I learned it by watching you!”

These messages all emphasize a specific type of negative outcome of unhealthy living – the impact on significant others. This approach targets behavior change indirectly rather than directly. These messages are designed not necessarily to make target audiences feel negatively about the behavior itself, but to induce feelings of guilt for the potential influence of that behavior on people who are important to the smoker, drug user, or, in the current study, diabetic².

Theoretical foundations for the use of other-referencing in persuasion.

Although other-referencing as a message strategy has received scant scholarly attention in the specific context of this study (i.e., self-helping behaviors) among a general audience general populations, there are indications of the potential of other-referencing to

² It deserves noting that I do *not* intend to equate diabetics with those who partake in legal or illegal drug use. The connecting thread between PSAs such as these and the messages tested in this study is not the individuals they target, but rather, the use of message strategies to induce guilt for the continuation of *voluntary* health-detrimental behaviors (which include unhealthy eating and exercise refusal, as well as tobacco or drug use).

elicit positive attitude and behavior change from research on guilt appeals and persuasion, as well as public health interventions targeting Latino communities. This research is reviewed below.

A meta-analysis of message framing tactics in health communication reported that referencing the self versus others was negatively correlated ($r = -.13$) with positive behavioral intentions (Keller & Lehmann, 2008). The authors explain this finding by noting that people generally believe that negative outcomes are more likely for others than for themselves (Menon, Block, & Ramanathan 2002). In addition to such logical considerations, other-referencing may also induce emotional and motivational desires to change, namely by arousing feelings of anticipated guilt or regret for not avoiding potentially-harmful consequences to loved ones. Felt guilt is often reactive, generally tinged with regret for one's actions or inactions, but feelings of guilt may also be anticipatory, that is, in response to the foreseeing rather than the occurrence of an adverse outcome (Lazarus, 1991; Lindsey, 2005). A content analysis of guilt-appeal advertisements in 24 leading magazines in the U.S. concluded that guilt was as prevalent an appeal tactic as humor, sex, or product comparisons (Huhmann & Botherton, 1997). Moreover, most guilt appeals were anticipatory, rather than reactive or existential, and the majority focused on health-related products or charities.

Guilt appeals and guilt arousal. Feelings of anticipated guilt and regret may influence decision-making processes, including those in response to freedom-limiting directives (Crawford, McConnell, Lewis, & Sherman, 2002). For example, purchase decisions are driven, in part, by feelings of guilt, including social responsibility guilt

related to familial obligations (Burnett & Lunsford, 1994; Coulter & Pinto, 1995). In the Coulter and Pinto study, for example, working mothers experienced greater felt guilt in response to moderate (compared to low or high) guilt appeals, which positively influenced intentions related to family food purchases. Charitable giving intentions are also positively related to guilt arousal (Hibbert, Smith, Davies, & Ireland, 2007; Lindsey, 2005). In a health context, feelings of anticipatory regret have been shown to positively predict intentions to have a mammogram among participants in a breast cancer screening program (Lechner, de Vries, & Offermans, 1997).

Crawford and colleagues (2002) found that simply priming anticipated regret – without designating a target, such as a person’s spouse or children, of this regret – led to greater compliance following an influence attempt. The researchers gave a sample of college students the option to bet on one of two hypothetical football teams, while subjecting them to an external directive that told the individual they “definitely have to pick” a particular team. Half of the participants were also asked, before making a decision, to estimate the amount of anticipated regret they would feel if they chose a team and lost. In the anticipated regret condition, 74% of participants complied with the external directive. Among those who were *not* primed with anticipated regret, however, the compliance rate was only 23%. Not only does this study show that priming feelings of anticipatory regret may subsequently influence message reactions, it also demonstrates that perceptions of potential regret do not arise spontaneously. Translated to the current context, diabetic individuals may not impulsively anticipate harmful consequences for loved ones, or the guilt associated with these consequences, but if primed to reflect on

these possibilities, they may be more accepting of health directives that purport to appease this potential regret.

At some threshold of guilt arousal, individuals feel a need to reduce their guilty feelings (Ghingold, 1981), although this point varies according to the individual as well as the context. A persuasive guilt appeal, therefore, must provide guilt-inducing *and* guilt-resolving content. In other words, much as the most effective fear-based appeals incorporate threat as well as efficacy information (Witte, 1992; 1994), successful guilt-based appeals must both arouse feelings of guilt and introduce a channel to resolve those feelings (O’Keefe, 2002). As Lindsey (2005), referencing Lazarus (1991), explained: “If people perceive that they have control over the situation, believe that they can expiate guilt through an action, and feel assured that engaging in these behaviors will attenuate the feelings of guilt, they are likely to engage in guilt-reducing behaviors (p. 454).” Indeed, people may be more motivated to minimize regret than to minimize risk (Zeelenberg, Beattie, van der Pligt, & de Vries, 1996).

Highly-intensive guilt appeals, however, may incite anger, negatively impact attitudes toward the ad, and reduce intentions to adopt its recommendations (O’Keefe, 2002). For example, Coulter and Pinto (1995) found that when inducing guilt related to familial nutrition and flossing among working mothers, moderate-guilt messages positively affected purchase intentions related to the health topics, but low- and high-guilt appeal conditions did not exhibit similarly positive outcomes. Anger mediated the relationship between degree of guilt appeal and message outcomes. Perceptions of manipulative intent by the persuasive message also inhibit arousal of anticipated guilt

(Hibbert et al., 2007). High-guilt messages that arouse feelings of shame may similarly undermine compliance. Findings from Bennett (1998), for example, illustrate the importance of targeting guilt rather than shame. In this study of reactions to non-profit and public sector advertisements, high-guilt messages were positively and significantly associated with attitude toward the ad and prosocial behavioral intentions, whereas shame-inducing messages negatively predicted these message outcomes. It appears that highly-intensive guilt appeals can be perceived as threats to attitudinal or behavioral choice – that is, inducing strong feelings of guilt in a person may be interpreted by the target as an attempt to limit what they can and cannot do, thus initiating state reactance.

Message-induced empathy. Although there is some indication that guilt may be the mechanism connecting other-referencing to persuasion, other forces may link this message feature to message outcomes as well as, or even instead of, feelings of anticipated regret. Shen (2010) recently demonstrated that state empathy aroused by pro-social messages can effectively enhance persuasion, both directly and by mitigating psychological reactance to these health directives.

The majority of the current research on the role of empathy in communication explores its function as an individual difference (i.e., trait empathy) rather than a situation-specific state (i.e., state empathy) (Shen, 2010), but some studies have focused on message-induced empathy in response to persuasive messages. In this context, state empathy is conceptualized as a multi-faceted process involving cognitive, affective and associative components. At a cognitive level, state empathy involves “recognizing, comprehending, and adopting another person’s point of view” (Shen, 2010, p. 399). The

affective component of state empathy may be more obvious; shared feelings, even something as basic as shared emotional valence, underscores the experience of empathy (Mehrabian & Epstein, 1972; Zillmann, 2006). Both cognitive and affective processes are essential for empathy to occur; as Shen explains: “Shared affect without shared cognition would mean little more than mimicry. Similarly, shared cognition without shared affect would be sympathy, instead of empathy” (p. 399). Message-induced empathy also includes an associative component, similar to the associative element inherent to narrative engagement. Indeed, Campell and Babrow (2004), as well as Shen (2010), conceptualize this associative component as identification with the message and argue that the vicarious experience that accompanies identification is essential to connect felt empathy to action-oriented empathy.

State empathy, as conceptualized by these studies, may function in a manner similar to narrative engagement, by reducing both the ability and motivation to resist persuasion. Identification/engagement diminishes the ability to counter-argue with a counter-attitudinal message, in part via increased internalization and understanding of the target’s point of view (Shen, 2010; Steensma & Erkel, 1999). Affective empathy may additionally reduce the ability to feel anger in response to a persuasive message by inducing empathic emotions, which become more salient than message-induced anger.

Although Shen’s study focused on high versus low empathy messages rather than self-referencing versus other-referencing messages, the negative influence of state empathy on state reactance was significant and substantial. Moreover, state empathy had a positive direct effect on attitudes toward the message advocacy and perceived

effectiveness of anti-substance abuse PSAs above and beyond its indirect effect through reactance. While Shen's study focused on the mitigating role of state empathy on message reception, she noted in her conclusion that additional research is needed to determine what message features arouse empathy. The current investigation examines whether other-referencing induces state empathy, or, from a different angle, whether state empathy is a mechanism by which other-referencing impacts persuasion.

Other-referencing in culturally-targeted health interventions: Focus on family. While the guilt appeals studies discussed earlier examined anticipated guilt for primarily unknown others (e.g., a child affected by one's decision whether or not to donate bone marrow; Lindsey, 2005), the current study focuses specifically on referencing known others, namely family and loved ones. Although other-referencing in the context of self-care (such as diabetes self-management) remains relatively unexplored among general populations, there is evidence of its effectiveness as message strategy for collectivist cultures such as Chinese (Turner, Xie, Southard, & Lamm, 2005), demonstrated in the context of messages promoting mammography, and Latinos (Wilkin & Ball-Rokeach, 2006) across a range of health contexts. Latino individuals, incidentally, are twice as likely to develop type 2 diabetes compared to non-Hispanic whites (Centers for Disease Control and Prevention, 2004), due to both genetic and socio-cultural factors, such as stigmatization and access to quality preventive health care (Durant, Bartman, Person, Collins, & Austin, 2009; Millan-Ferro & Caballero, 2007).

In a nutrition promotion campaign targeting a multi-ethnic population, messages that focused on family diet practices were particularly effective at increasing interest and

knowledge among Latino participants (Albright, Bruce, Howard-Pitney, Winkleby, & Fortmann, 1997). Interventions such as the *La Diabetes y La Unión Familiar* diabetes education program by the University of Arizona (Teufel-Shone, Drummond, & Rawiel, 2005) have found success at increasing knowledge and efficacy related to diabetes self-care through family-oriented strategies, such as emphasizing family diet planning and potential negative outcomes of the individual's disease on spouses and children. In their exploration of cultural orientations and AIDS-related fear appeal tactics, Sampson and colleagues (2001) found that messages emphasizing potential family shame and suffering were more influential among Mexican-American teens than messages that emphasized personal shame and suffering. The individual-harm messages were more effective than familiar-harm messages among the African-American teens in the study, who represented a more "individualistic" culture, according to the researchers.

Taken together, these findings suggest that other-referencing strategies that induce feelings of guilt or empathy may indeed have an impact on audiences' likelihood of compliance, but that factors related to cultural identity (e.g., collectivistic vs. individualistic orientation) may mediate this influence.

III. HYPOTHESES AND RESEARCH QUESTIONS

The primary question guiding this research is whether particular message features, narrative and other-referencing, can attenuate psychological reactance to persuasive messages, as well as its negative impact on message processing and outcomes, specifically in the context of diabetes messages. Based on the preceding review of the literature examining psychological reactance theory, the use of narratives in persuasive messages, and the potential of other-referencing as a message strategy, a series of hypotheses and research questions were proposed.

Reactance and threats-to-choice

Research in the vein of psychological reactance theory explores the reasons why people become reactant to persuasive attempts by examining components of the process of state reactance, including perceived threats to personal freedom (e.g., Seemann et al., 2008; Vick et al., 2008), the intertwined nature of negative cognitive and affective output following this perception (e.g., Dillard & Shen, 2005; Rains & Turner, 2007), and attempts to restore one's threatened sense of autonomy (e.g., Miller et al., 2007; Quick & Stephenson, 2007a). As Brehm and Brehm (1981) summarized, "reduction in control arouses reactance, and reactance impels the individual to try to restore control" (p. 6).

Over the past five years, scholars have attempted to clarify the process model of state reactance, untangling the mix of cognitions, affect, behavioral intent and behavior in the stages of reactance arousal, output and restoration. Although much work remains in terms of explicating the cognitive and emotional processes underlying and connecting

each link in this metaphorical chain, current research is guided by a process model initiated by a freedom-limiting threat and culminating in restoration of the limited freedom. When an individual feels their personal freedom threatened by an external source, this initiates a motivational amalgam of negative thoughts, counter-arguing and state anger that the individual subsequently resolves by opposing the threat through thought and/or action (e.g., Dillard & Shen, 2005; Quick & Stephenson, 2008; Rains & Turner, 2007).

Reactance impacts message persuasiveness by mediating the influence of a freedom-limiting threat contained in the message on the recipient's subsequent attitudes and behavioral intentions, particularly intended compliance with the recommendation (Bensley & Wu, 1991; Buller et al., 2000; Dillard & Shen, 2005). Threats of large magnitude elicit greater reactance than threats of lesser magnitude (Brehm, 1966; Brehm & Brehm, 1981; Burgoon et al., 2002). One means of amplifying threat magnitude involves manipulating the wording of a persuasive message, specifically delivering recommendations as commands (i.e., using controlling rather than autonomy-supportive language).

Controlling language is the message feature that is most consistently linked to successful inductions of state reactance (Dillard & Shen, 2005; Grandpre et al., 2003; Henriksen, Dauphinese, Wang, & Fortmann, 2004; Miller et al., 2007; Quick & Considine, 2008; Quick & Kim, 2009; Quick & Stephenson, 2008; Rains & Turner, 2007). Controlling (i.e., threat-to-choice) language was therefore chosen as the

mechanism to induce reactance, thereby allowing subsequent examination of attempts to reduce it.

Controlling language explicitly threatens the recipient's range of attitudinal or behavioral choices through overt coercion, verbal aggression and strongly-opinionated demands for compliance (Buller et al., 2000; Dillard & Shen, 2005). This message feature is associated positively with perceived threat to freedom and reactance output (e.g. Dillard and Shen, 2005; Miller et al., 2007; Quick & Considine, 2008). Therefore, controlling messages are expected to elicit perceived threat, negative cognitions, and anger when a reactance-attenuating message feature is not present.

Furthermore, controlling language is associated negatively with various indicators of message persuasiveness, including evaluations of the message (Dillard & Shen, 2005; Rains & Turner, 2007) and its source (Grandpre et al., 2003; Miller et al., 2007), as well as increased liking for and intentions to exercise the proscribed action (Quick & Kim, 2009; Quick & Stephenson, 2007a). Accordingly, controlling messages are expected to garner negative message reactions, as well, when a reactance-attenuating message feature is not present.

Predicting the attenuation of state reactance

Although people are generally wary of attempts to restrict their range of choices and actions, they do not monolithically or inevitably oppose directives. Moreover, resistance and its potentially negative influence on message processing and outcomes can be diminished through certain strategic choices in message design. Focusing specifically on reactance, strategies such as appending a coercive message with an autonomy-

supportive postscript (Miller et al., 2007), and fostering empathy (Shen, 2010) or cultivating perceptions of interpersonal similarity with the source of a counter-attitudinal message (Silvia, 2005), can diminish or prevent perceived threat, reactance output, and attempts at restoration. Narrative and other-referencing present two additional pathways that may enhance persuasion by reducing reactance.

Narrative. Narratives, which range in format and length from long-form journalism to educational soap operas to testimonials in PSAs, facilitate persuasion through a variety of means: they enhance information processing, foster closer understanding of the message, provide para-social support for disease prevention and control, give voice to abstract concepts such as emotions that may be overlooked by purely information messages, and reduce resistance to overt persuasion (Kreuter et al., 2007). This final capability is of central importance for this study.

The use of narrative is predicted to reduce both the ability and motivation to respond negatively to a persuasive message. Narrative structure cloaks, somewhat, the persuasive intent of a message (Hinyard & Kreuter, 2007; Kreuter et al., 2007). If persuasive intent is less obvious, persuasive attempts such as threats to freedom should be less obvious, as well. Narratives have also been shown to reduce critical thoughts, including counter-arguments, specifically, in response to a persuasive message (Durkin et al., 2009; Green & Brock, 2002; Limon & Kazoleas, 2004). Narrative processing also demands cognitive resources (Chang, 2009), thus reducing the store of resources that are allocated to counter-arguing and critical thinking. Engaging with a narrative is generally a positive emotional experience that generates pleasant feelings (Busselle & Bilandzic,

2009; Csikszentmihalyi, 1997; Escalas et al., 2004; Green, Brock & Kaufman, 2004; Limon & Kazoleas, 2004). These positive feelings should, to some degree, replace and/or counter-act the anger associated with reactance. Accordingly, the following set of hypotheses was proposed:

H1: Controlling messages that incorporate narrative delivery style, compared to non-narrative controlling messages, will elicit reduced state reactance, including (a) lower perceived threat to choice, (b) less counter-arguing, (c) less negative cognitive appraisals, and (d) less state anger.

Other-referencing. Other-referencing strategies emphasize the potential influence of an individual's choices and actions on others, whether known or unknown, rather than focusing on personal outcomes related to one's choices. This study focuses specifically on referencing known others, specifically loved ones such as family and friends, to reduce resistance to pro-health messages.

The literature supporting the use of other-referencing in persuasion is quite limited compared to that for narrative, and it largely focuses on outcomes such as charitable giving rather than self-helping behaviors. There is evidence, however, that human connections may provide an avenue to circumvent reactance and foster compliance. In particular, cultivating a sense of interpersonal similarity with the source of a coercive message diminishes the threat perceived by that coercion (Silvia, 2005), demonstrating the influence of interpersonal connections in the chain from message to resistance.

Theory involving the influence of empathy-based and guilt-based appeals inducing empathy and guilt, respectively, would suggest that other-referencing operates

similarly to narrative in reducing both the motivation and ability to think or feel negatively toward a persuasive message. Shen (2010) found that high-empathy public service announcements induced state empathy and reduced state reactance in response to anti-drug messages, for example. Priming anticipated regret for one's decision has been shown to lead to decreased reactance and greater compliance (Crawford et al., 2002). Inducing reflection on family and friends is predicted to engender similar empathic or guilty reactions, thereby reducing anger. Reflections on family and friends are, furthermore, expected to subsume some of the cognitive resources that would otherwise be applied to counter-argument or derogation. Accordingly, the following set of hypotheses was proposed:

H2: Controlling messages that incorporate other-referencing, compared to self-referencing controlling messages, will elicit reduced state reactance, including (a) lower perceived threat to choice, (b) less counter-arguing, (c) less negative cognitive appraisals, and (d) less state anger.

Despite empirical and theoretical studies linking narrative and other-referencing to diminished resistance and enhanced persuasion, there is no indication that the two features complement each other to produce even stronger effects on message processing and outcomes. This is understandable, given the exploratory nature of this research on attenuating reactance. Accordingly, in an attempt to build theory in this area, the following research questions were proposed:

RQ1: Do narrative delivery style and other-referencing interact to influence state reactance?

RQ2: Do narrative delivery style and other-referencing interact to influence message acceptance?

Predicting increased message acceptance

Once aroused, reactance drives the individual to reclaim their threatened sense of autonomy through direct restoration, known colloquially as the “boomerang effect” (Burgoon et al., 2002; Clee & Wicklund, 1980; Fishbein et al., 2002), or through indirect forms of restoration, including such message outcomes as hostility toward the source of the threat, negative evaluations of the message and its advocacy, source derogation, and outright message rejection (Burgoon et al., 2002; Grandpre, Alvaro, Burgoon, Miller, & Hall, 2003; Miller et al., 2007; Quick & Stephenson, 2007a; Silvia, 2006; Wicklund, 1974; Worchel & Brehm, 1970), as well as vicarious or relative performance of the restricted action (Burgoon et al., 2002; Quick & Stephenson, 2007b; Worchel & Brehm, 1971).

Reactance is, essentially, a motivational state that subsequently drives restoration. Reactance theory predicts, therefore, that lower degrees of reactance should equate to lower degrees of restoration. Given the predictions discussed previously that narrative and other-referencing should attenuate reactance, they should accordingly foster more positive message reactions in the form of attitudes (indirect restoration) and behavioral intentions (direct restoration).

Narrative. Scholars have demonstrated effects of narrative persuasion on attitudes and behaviors. Compared to argument-based advertising, narrative advertising has been shown to elicit more positive cognitive appraisals of the message (Durkin et al.,

2009; Feeley et al., 2006) and more positive attitudes toward the message itself (Chang, 2009; Feeley et al., 2006). Additionally, narrative advertising garners more positive evaluations of and attitudes toward the product (Chang, 2008; Dunlop et al., 2008) and brand (Chang, 2009; Polyorat et al, 2007) advertised. Narrative may also lead to greater adoption of story-consistent attitudes (Green & Brock, 2000). Scholars have also reported behavioral effects of using narrative testimonials in public health interventions, including increases in vegetable consumption and exercise length (Larkey & Gonzalez, 2007), contraceptive use (Dutta-Bergman, 2006; Basten, 2009), and cancer screening (Elder et al., 2009).

Given the demonstrated links from narrative to greater acceptance of a message and its advocacy, as well as the theoretical foundations underlying narrative persuasion, the following set of hypotheses was proposed:

H3: Controlling messages that incorporate narrative delivery style, compared to non-narrative controlling messages, will lead to greater message acceptance, including (a) greater intended compliance with the message's recommendation, (b) more positive attitudes toward the message, and (c) more positive attitudes toward the behavior advocated by the message.

Other-referencing. There is evidence that focusing on family diet practices can increase interest and knowledge about healthy eating (Albright et al., 1997), as well as knowledge and efficacy related to diabetes self-care (Teufel-Shone et al., 2005), albeit among a Latino population. Research from public health further supports the idea that family-based referencing strategies lead to behavior change, such as increasing mammography among Chinese women (Turner et al., 2005). Meta-analytic data

comparing message framing tactics in health communication indicate that self-referencing (vs. other-referencing) was negatively correlated ($r = -.13$) with positive behavioral intentions (Keller & Lehmann, 2008). Furthermore, message features that arouse guilty feelings have been shown to positively predict message-related behavioral intentions, albeit for charitable giving (Hibbert et al., 2007; Lindsey, 2005), and feelings of anticipatory regret have been shown to positively predict intentions related to cancer detection practices (Lechner et al., 1997). Indeed, one study found that minimizing regret was a more effective motivator of change than was minimizing risk (Zeelenberg et al., 1996).

Given the demonstrated influence of some forms of message acceptance, and the theoretical pathway from features that induce reflection of these personal, human connections to increased acceptance of messages and their advocacy, the following set of hypotheses was proposed:

H4: Controlling messages that incorporate other-referencing, compared to self-referencing controlling messages, will lead to greater message acceptance, including (a) greater intended compliance with the message's recommendation, (b) more positive attitudes toward the message, and (c) more positive attitudes toward the behavior advocated by the message.

Mediating states: Narrative engagement, guilt arousal and state empathy

Much as freedom-limiting threats do not induce reactance unless the individual perceives a threat, narrative and other-referencing are unlikely to have an impact without arousing a "mediating state" of engagement with the message feature (O'Keefe, 2003). This study intentionally avoids the fallacy of conflating message features with the states they are designed to invoke. Accordingly, the following intervening psychological

processes were proposed to mediate the influence of intrinsic message features on message reactions.

Narrative engagement. Stories engage individuals cognitively (Escalas et al., 2004; Limon & Kazoleas, 2004) and emotionally (Escalas, 2004) as they entice the viewer, listener, or reader to become engrossed in the story action (Chang, 2009; Green & Brock, 2005). The influence of narrative on message reactions is mediated by this engagement, variably conceptualized as absorption (Graesser, 1981), transportation (Green & Brock, 2000), “being hooked” (Escalas et al., 2004), and experiential immersion (Chang, 2008), among others. Despite the different labels, there is consensus that engagement involves both cognitive and affective processes, namely increased attention, decreased resistance, and heightened emotional response, and that it operates to facilitate the influence of narrative structure on message processing.

Although narrative engagement is often studied in the context of lengthy narratives such as novels (Green & Brock, 2000) or TV sitcoms (Busselle & Bilandzic, 2009), it has been demonstrated with shorter messages, such as testimonials (Braverman, 2008) and health promotion advertisements (Dunlop et al., 2008). Accordingly, the following hypothesis was proposed:

H5: Engagement with the narrative will mediate the influence of narrative structure on predicted message outcomes.

Guilt arousal and state empathy. Given the noted lack of attention to the use of other-referencing in persuasion for mainstream audiences, questions remain as to how, exactly, this message features impacts processing and outcomes. Guilt mediates guilt

appeals (Burnett & Lunsford, 1994; Coulter & Pinto, 1995), but it is unclear whether this is the mediating state intervening between other-referencing and message outcomes. Similarly, state empathy has been shown to mediate the influence of high versus low empathy messages on reactance and persuasion (Shen, 2010) and on internalization of another's point of view (Steensma & Erkel, 1999) , but again, this has not been examined in the specific context of other-referencing. The following research questions were proposed in an effort to clarify these processes:

RQ3: Does guilt arousal will mediate the influence of other-referencing on predicted message outcomes?

RQ4: Does state empathy mediate the influence of other-referencing on predicted message outcomes?

Scholars have confirmed the tenets of reactance theory across a variety of choice-limiting (i.e., controlling) health messages, including those condemning adolescent smoking (Grandpre et al., 2003), binge drinking (Dillard & Shen, 2005; Shen, 2010), drug use (Shen, 2010), as well as those promoting exercise (Miller et al., 2007; Quick & Considine, 2008), sun protection (Buller, Burgoon, Hall, Levine, Taylor, Beach, et al., 2000), dental flossing (Dillard & Shen, 2005), and contraceptive use (Quick & Stephenson, 2007a), among others. The present study extends this body of work to messages promoting diabetes self-care behaviors, including healthy diet and regular physical activity. The following chapter outlines the experiment used to generate these data.

IV. METHOD

To test the hypotheses and address the research questions outlined in the previous chapter, an experiment examined the influences of narrative delivery style and other-referencing appeals in the arousal and expression of psychological reactance, in response to controlling diabetes self-care messages. Specifically, this study asked whether these two message features can counteract the negative influence of state reactance on message processing and acceptance of the message's health recommendations. The following chapter details the method for this experiment.

Design

The design for this study is a 2 (narrative/non-narrative) x 2 (self-referencing/other-referencing) x 2 (message) within-subjects experiment. The design also includes a between-subjects order factor (4). Criterion variables include state reactance (cognitive appraisal, counter-arguing, state anger) and message acceptance (attitude toward the message, attitude toward the advocacy, behavioral intentions toward the message advocacy). Proposed mediators include narrative engagement, guilt arousal, and state empathy. The procedure also includes a distracter task between presentation of stimulus videos to guard against potential vulnerabilities of a repeated-measures design, namely participant learning and heightened sensitization to the primary manipulations (Calfee, 1985; Campbell & Stanley, 1963). The distracter task was also designed to prevent carryover and summation effects of multiple reactance arousals (Christensen, 1977; Wicklund, 1974).

This experiment is an exploratory look at message features that may potentially “break” the chain of reactance, which is a relatively uncharted area of reactance scholarship. Should results indicate that narrative and other-referencing can successfully mediate reactance, future research by the author will examine the “how” question by looking more deeply at the processes involved in reception of these messages. The primary question at this point, however, is “if” these strategies might represent an avenue around, or even through, this specific form of message resistance.

Participants

Study participants were recruited from the population of adult type 1 and type 2 diabetics in the Columbia, Missouri area. Diabetics were chosen as participants for several reasons. The participant pool was limited to diabetics primarily to bolster ecological validity in this test of diabetes self-care messages. Testing diabetes messages with actual diabetics also circumvents the problem of confounding the testing audience and the primary target audience for these messages, referred to as the *unknown audience* problem (Bradac, 1986). The participant pool was also limited to account for the influence of individual differences, including documented age differences in trait reactance (Hong et al., 1994; Woller et al., 2007), and narrow the potential range of involvement with the threatened freedoms. Due to the within-subjects design of this study, however, any differences in trait reactance, involvement, or even age, should be controlled across messages, as each individual’s scores are compared directly to her/his own evaluations of other messages.

A total of 58 participants (power analysis follows) were recruited for the experiment. Several recruitment tactics were employed, including an email message distributed to a University of Missouri campus-wide distribution list and community email lists, flyers posted in local health clinics and public institutions such as the local library, and word of mouth. Appendix 3 includes the tactical recruiting materials. Each participant received a \$20 Visa gift card for participating in the study. Additionally, three participants were chosen at random to receive one of three \$100 Visa gift cards following data collection.

Female participants (68.4%) outnumbered male participants (31.6%) two-to-one for this experiment. The average age was 50 (S.D. = 12.176), with a range from 20 to 71 years old. The sample was predominantly Caucasian (79.3%). Latinos (1.7%) were severely underrepresented in this study, and African-Americans (10.3%) were underrepresented compared to their population averages, as well. 3.4% of participants reported their race/ethnicity Asian-American, and 5.2% as American Indian. Three-quarters of the participants (75.9%) had children, and 62.1% had grandchildren. Nearly two-thirds of the participants (62.1%) reported having a bachelor's degree or higher. As for diabetes type, 56 of 58 participants (96.6%) were type 2 diabetics; 3.4% had type 1 diabetes.

Use of a purposive sample. Some scholars, namely, Potter, Cooper and Dupagne (1993, 1995) have voiced concerns over the use of inferential statistics in experimental designs with non-probability participant samples. Critics argue that experiments using non-probability, or convenience, samples cannot validly generalize to a larger population

of individuals, as selection from that population did not occur randomly. Scholars such as Basil (1996) and Lang (1996), conversely, contend that the use of purposive participant samples is appropriate in experimental research designed to generalize to a theoretical message feature rather than a theoretical population value. Lang (1996) emphasized that this latter point is key: experimental designs statistically infer causal relationships between and among the variables that are manipulated and measured in the study's design, *not* population values based on the sample of participants.

Whereas the survey method estimates population values, the experimental method estimates cause and effect in bivariate or multivariate relationships. Random assignment to treatment conditions theoretically distributes error randomly among a sample; randomly-assigned groups should have no systematic variations aside from the treatment manipulation (Babbie, 1992). Within-subjects designs, such as the one employed in this study, more robustly control for error by allowing each individual to serve as her or his individual control group (i.e., differences are assessed within each individual's set of responses, rather than across distinct groups) (Reeves & Geiger, 1994). Experiments could theoretically draw probability samples and thus infer both causal relationships and population values, but the costs of randomly selecting experimental participants, given low response rates and the logistic difficulties of bringing geographically disparate individuals to a single physical location, would outweigh the likely benefits (Lang, 1996). Even in the case of impaired external validity, purposive samples can provide useful exploratory data for relatively unexplored questions, such as those guiding this study (Lang, 1996).

***A priori* power analysis.** The ideal sample size for an experiment may be determined a priori via power analysis, given estimated effect size, desired power, and chosen significance level (Cohen, 1992).

To date, no study has examined the effect of narrative or other-referencing on reactance to persuasion. Studies examining the role of controlling language on state reactance, however, generally report moderate effects of threatening language on perceived threat to freedom, negative cognitions, and state anger. Dillard and Shen (2005) reported effect sizes of $\eta = .20$ to $.34$ for these criterion variables in response to “controlling” pro-flossing and anti-drinking messages. Miller and colleagues (2007) reported effect sizes of $\eta^2_{\text{part}} = .05$ on perceived threat to freedom and $\eta^2_{\text{part}} = .04$ on state anger. Quick (2005) reported an effect size of $\eta^2_{\text{part}} = .14$ for the influence of “threat-to-choice” language on reactance measured as a combination of negative cognition and affect, demonstrating the potential for stronger influence. These estimates translate into f values ranging from $.20$ to $.40$ (calculated using G*Power software), which represent medium-to-large effects for analyses of variance (Cohen, 1992). To ensure adequate power, the lower bound of this range was considered in the *a priori* power analysis.

An *a priori* power analysis was conducted using G*Power version 3 (Faul, Erdfelder, Lang, & Buchner, 2007) to determine the number of participants needed to detect a small-to-medium effect ($f=.2$) for a repeated-measures F test on a within-subjects factor. At a power of $.80$ and alpha level of $.05$, with one group, two repeated measures per factor correlated conservatively at 0.5 , an estimated 52 participants are needed to

detect a significant effect. To provide a buffer against missing data, a total of 58 individuals were recruited for the study.

Stimulus messages

Stimulus messages for this experiment were single-page print messages encouraging diabetes self-care behaviors. The author constructed stimulus messages, guided by patient education materials from leading national health organizations and campaigns including the American Diabetes Association, the American Association of Diabetes Educators, the National Diabetes Education Program, and the National Diabetes Information Clearinghouse. For the treatment manipulations, messages varied in terms of whether the health recommendations were presented in a narrative or non-narrative context, as well as whether the messages featured self-referencing or other-referencing appeals. Two messages were chosen for each treatment condition, for a total of eight messages. Appendix 1 includes the eight stimulus messages used for this experiment.

This study examines the influence of two messages features on reactance arousal and expression, i.e., narrative structure and other-referencing. In experiments that investigate the impact of message attributes on psychological processes and other cognitive, attitudinal, and behavioral outcomes, researchers must consider the complexity of messages under study. Adding message features (i.e., factors) to an ANOVA-based experimental design can provide more information about the phenomenon under study, namely higher-order effects and interactions, but increasing design complexity also inflates the likelihood of Type I error, as the number of pairwise comparisons increases exponentially to the number of factors added to the design (i.e., 1 factor = 1 tests, 2

factors = 3 tests, 3 factors = 7 tests) (Smith, Levine, Lachlan, & Fediuk, 2003).

Corrections to control for this Type I error inflation, such as the omnibus F test and Bonferroni adjustments, may render the test underpowered to detect group differences, thus committing Type II error (Smith et al., 2003). Either way, introducing unnecessary complexity into an experimental design is likely to introduce either Type I or Type II error, depending on choices made by the researcher. For these reasons, the current investigation limits its scope to two predictor variables.

All messages featured controlling, or threat-to-choice, language, in a deliberate attempt to arouse reactance. As detailed in previous chapters, numerous studies have confirmed the link from controlling language to reactance arousal (e.g., Dillard & Shen, 2005; Miller et al., 2007; Quick, 2005). This arousal was essential to test the stated hypotheses, given their focus on reducing aroused reactance and its negative influence on message processing. The measurement design included an induction check to track and ensure that state reactance arousal actually occurred.

Stimulus messages were constructed primarily to maximize differences among treatment conditions and to feature a controlling tone. Messages were manipulated to feature either narrative or non-narrative delivery style, and to feature either other-referencing or self-referencing. These manipulations are explained in the following sections. The design also includes message replication factor; each of the four treatment conditions was represented by one message promoting healthy diet practices (i.e., eating smaller portions and fewer simple carbohydrates) and one message promoting physical

(i.e., being active in small, everyday ways, and getting 30 minutes of moderate exercise several times a week).

Message features aside from the treatment manipulations were held as constant as possible, to maintain the clearest manipulation. All messages were shown in grayscale/black-and-white (i.e., no color). Each message featured a single still photographic image; these photos were used to reinforce manipulations (e.g., an other-referencing message might include a photo with a grandparent/grandchild pair, whereas a self-referencing message would include a photo of an individual; see Appendix 1 for copies of all stimulus messages). All messages were similar in length (i.e., word count ranged from 194 to 212 words), had the same size photo (approximately 1.5" x 1.5"), and were the same shape and orientation (portrait). Participants saw all stimulus messages in their digital form (i.e., on a computer screen).

In addition to these structural features, attention was paid to content features, as well. All recommendation content (e.g., take the stairs instead of the elevator) was taken from existing diabetes patient education materials. Messages were constructed to incorporate both positive and negative emotional content, rather than emphasizing one tone or the other. Messages with mixed emotional tone most closely resemble those actually used in practice; public health campaigns generally use messages that incorporate both pleasant and unpleasant content (Leshner et al, 2009). Moreover, a mixed emotional style may be best for delivering health recommendations. In an experiment studying the processing of breast cancer survivor testimonial messages (Leshner et al., 2008), messages with mixed emotional tone outperformed both positive

and negative messages in eliciting high ratings of self-efficacy, response efficacy, and intended information seeking.

Following the guidelines to evaluate external validity from Jackson and Jacobs (2003), two broad considerations guided message construction. First, messages were constructed to be as prototypical of their category as possible (aside from the atypicality of highly controlling language), in that the recommendation content was drawn from “real-world” patient education materials from organizations such as the American Diabetes Association and CDC. Additionally, messages within a condition should clearly represent their respective treatment level, while also representing differences within that treatment level. Following the sage advice of a number of experimental methodologists (e.g., Grabe & Westley, 2003; Jackson & Jacobs, 1983; Leshner et al, 2009; Reeves & Geiger, 1994), multiple messages were used to represent each condition. Including both diet and exercise messages helped to create within-condition variance.

Several steps were taken to bolster internal validity of the study, as well. First, stimulus messages were designed to maximize the difference between treatment levels, to ensure a clear manipulation. A pretest, detailed in a subsequent section, confirmed that these manipulations were successful. Additionally, messages were defined in terms of their intrinsic message features, such as type of referencing, rather than the responses they are designed to invoke, such as guilt or empathy (O’Keefe, 2003). Finally, this study incorporated a repeated measures design for the experimental factors, as well as the message factor. As such, each participant functioned as her or his own control group (Reeves & Geiger, 1994). Error variance (i.e., variance within groups) may therefore be

trimmed by 20% to 50% (Calfee, 1985), because a single individual is less likely to differ from her/himself than to differ from another person.

Although a between-subjects design may reduce the potential influence of other treatment levels on participants' processing and responses (Reeves & Geiger, 1994), a within-subjects design is more sensitive to between-group differences and has more statistical power than a between-subjects design (Grabe & Westley, 2003). Moreover, within-subjects designs have practical benefits such as reducing sample size while retaining power (Reeves & Geiger, 1994). Researchers may worry that a within-subjects design introduces carryover and contamination effects, as participants may "figure out" the experimental manipulation by comparing stimuli. Reeves and Geiger (1994) counter, however, that experiments that indirectly ask participants to compare exemplars of treatment levels may be more ecologically valid, particularly if all levels of the treatment are plausible in participants' real-world environments.

Narrative. The use of narrative testimonials in public health interventions has been shown to elicit positive health behavior change, including increasing vegetable intake and physical activity (Larkey & Gonzalez, 2007; with an immigrant Latino sample) and reducing tobacco use (Durkin et al., 2009; with a general population sample). Narrative advertising, compared to argument or advocacy advertising, has been shown to garner more positive thoughts and feelings, as well (Chang, 2008; Durkin et al., 2009; Escalas et al., 2004; Green & Brock, 2005).

Given the recent and increasing attention to the use of storytelling in strategic communication, a number of definitions have emerged. Whether described as narrative

(Chang, 2008, 2009; Dunlop et al., 2008; Polyorat et al., 2007), testimonials (Durkin et al., 2009), exemplars (Braverman, 2008), or anecdotes (Slater, 2002), persuasive messages that tell a story generally demonstrate two key properties: causality, or the cause-and-effect justifying the recommendations, and chronology, or a temporally-connected sequence of events, scenes, and/or characters (Chang, 2008; Escalas, 1998).

Narrative delivery style is defined for this study following Kreuter and colleagues (2007), as "a representation of connected events and characters that has an identifiable structure, is bounded in space and time, and contains implicit or explicit messages about the topic being addressed" (p. 222). Narrative formats rely on the human information processing bias toward stories and the organic nature of story processing (Green, Brock, & Strange, 2002) to deliver persuasive and educational content. Presenting a narrative of ideal behavior enables the recipient to draw comparisons between his world and the world created by the story, which may help him better understand his own experience and learn new information or behaviors to guide safe health practices.

Narratives and non-narrative messages may carry the same information (e.g., reduce sugar in your diet), while presenting it in different ways. Narrative advertising, compared to argument or advocacy advertising, is less explicitly persuasive although still deliberately persuasive. For example, a narrative message might depict a diabetic woman advising viewers to reduce simple carbohydrates in their diet by recounting her personal experiences with the change, perhaps by sharing her frustrations about limiting her sugar intake, expressing how much better she feels despite the frustrations, or discussing how her daily habits have changed. As Braverman (2008) described, "In a typical testimonial,

a main character tells a story of his or her personal successful experience and directly or indirectly encourages the audience to follow her example” (p. 666). Message recommendations should still be clear and explicit enough that recipients are able to pick up on them, however; messages that are too implicit are highly unlikely to be effective (Kreuter et al., 2007).

Non-narrative messages adopt a variety of formats, including informational (Braverman, 2008), argumentative (Chang, 2008, 2009), expository (Smith, 1995), advocacy-oriented (Dunlop et al, 2008 – included stats and steps), didactic (Kreuter et al., 2007), statistical (Limon & Kazoleas, 2004), factual (Polyorat et al., 2007; Reinard, 1988), and rhetorical (Green & Brock, 2005). These styles all provide information relevant to the topic and context, but do not feature a particular story tied to the information. These counterparts to testimonial-based messages often adopt an impersonal, even professional , tone, and rely on context such as statistics, reason-based arguments, expert opinions, and factual descriptions of the product, issue, or topic as evidentiary support (Deighton et al., 1989; Durkin et al., 2009; Reinard, 1988). For example, a non-narrative health PSA might enumerate the potential consequences of a health risk or describe symptoms of an illness in a clinical, rather than personal, fashion. These messages may also incorporate aggregated statistics, rather than the single exemplar typical to a narrative format.

While the bulk of communication studies support the use of narrative structure in persuasive communication, it should be noted that narrative is neither automatically nor essentially preferable to non-narrative formats. In particular, scholars have found

persuasive success with informational weight management messages among highly involved audiences (Braverman, 2008), advice-giving breast cancer messages that incorporate both pleasant and unpleasant emotional content (Leshner et al., 2008), and statistical alcohol education messages among audiences that support the message position. More importantly for this study, however, narratives are proposed to be most effective among audiences that are resistant to accepting a message's recommendations (Kreuter et al., 2007), such as those in the throes of state reactance. The distinctive ability of narrative or testimonial evidence to attenuate resistance to persuasion suggests that this form of delivery may reduce state reactance to explicitly controlling messages.

For the current study, non-narrative (i.e., informational) messages will provided recommendations and emphasized the benefits of adopting these recommendations, absent the use of a personal story. For example, one non-narrative message read: "Any sensible person would agree that physical activity is one of the best ways to keep your blood sugar in a normal range and feel the way you want to feel." Narrative messages featured individuals recounting, in a story-based format, their experiences with the recommendations they outlined, while also emphasizing the benefits of adoption of these healthy behaviors. For example, one narrative message read: "After I was diagnosed with diabetes, things like nutrition labels and counting carbs became part of my daily life, but I still have to tell myself, 'This is something you have to do. Eat less, and eat less sugar.'" Appendix 1 includes all stimulus messages, labeled according to type.

Other-referencing. Other-referencing strategies emphasize the potential influence of an individual's choices and actions on others, whether known or unknown,

rather than focusing on personal outcomes related to one's choices. For example, classic public service announcements induce parental guilt for smoking cigarettes or marijuana by depicting the harmful consequences these actions may have on their children (e.g., abandonment and desensitization to illegal drug use, respectively). These messages can be considered to promote change somewhat indirectly, not necessarily aiming to make target audiences feel negatively about the behavior itself, but to induce feelings of guilt for the potential influence of that behavior on loved ones.

Although other-referencing as a message strategy remains a relatively underdeveloped area of in communication scholarship, particularly in conjunction with omega strategies to reduce resistance, this message strategy may be considered as a type of persuasive guilt appeal. Effective guilt appeals incorporate content to both induce and appease feelings of guilt, similar to the way that effective fear appeals arouse fear (i.e., threat component) but also provide a means to quell it (i.e., efficacy component) (Witte, 1992; 1994). A persuasive guilt appeal, therefore, features guilt-inducing *and* guilt-resolving content, to both arouse feelings of guilt and introduce a channel to resolve those feelings (O'Keefe, 2002).

At some threshold of guilt arousal, individuals feel a need to reduce their guilty feelings (Ghingold, 1981), although this point varies according to the individual as well as the context. Moreover, extremely high guilt arousal may prove detrimental to message outcomes. Highly-intensive guilt appeals, however, may incite counterproductive feelings such as anger or shame, negatively impact attitudes toward the ad, and reduce intentions to adopt its recommendations (Bennett, 1998; Coulter & Pinto, 1995; Hibbert et al.,

2007). Accordingly, other-referencing cues will be designed to invoke moderate levels of anticipated guilt, rather than shame or ridicule the message target. Other-referencing strategies that induce moderate feelings of anticipated guilt or regret may positively influence audiences' likelihood of compliance by negatively influencing the likelihood of experiencing or acting on state reactance.

While the studies cited here primarily examined anticipated guilt for unknown others (e.g., a child affected by one's decision whether or not to donate bone marrow; Lindsey, 2005), the current study focuses specifically on referencing known others, such as family and loved ones. Public health interventions have found success using family-referencing tactics to increase knowledge and efficacy related to health behaviors, albeit generally among collectivist cultures such as Latinos (e.g., Albright et al., 1997; Murray-Johnson et al., 2001; Teufel-Shone et al., 2005).

For the current study, other-referencing messages proposed that the diabetic's choices could in terms of diet and exercise could have potentially harmful or beneficial consequences for their loved ones, and encouraged the reader to adopt the recommendations in the interest of others, not simply for herself/himself. For example, one other-referencing message stated: "When your kids, grandchildren or friends watch your food choices, what lessons are they learning? Think about them when you reach for that second helping or sugary treat." Self-referencing messages, conversely, emphasized the personal consequences (both positive and negative) of the diabetic's choices, rather than mentioning significant others. For example, one self-referencing message stated:

“After spending so much time not feeling or looking the way I wanted to, I said to myself, “You have to do something, and do it now!”

Message replication. The design also included a message replication factor to create variance within treatment levels and guard against idiosyncratic influences of individual message features aside from the treatment manipulation (i.e., treat-to-choice language). As Grabe and Westley (2003) clarify, experimental factors such as narrative and other-referencing are theoretical tools, whereas control factors such as message repetition and order are methodological tools. Each level of each treatment variable (1: narrative/non-narrative; 2: other-referencing/self-referencing) was represented by two messages, one promoting healthy diet and one promoting physical activity. Dietary intake and physical activity are considered the “cornerstones of treatment for persons with type 2 diabetes” (Shultz, Sprague, Branen, & Lambeth, 2001, p. 99), and are essential in healthfully achieving glycemic control for both type 1 and type 2 diabetics (Centers for Disease Control and Prevention, 2007).

Scholars such as Reeves and Geiger (1994) have encouraged researchers to use a sample of messages rather than a single message to test theoretical propositions. While experimenters may take caution to isolate message differences to the treatment variable only, it is simply unrealistic to assume that we can control all “individual peculiarities” between two messages (Jackson & Jacobs, 1983, p. 186). Ultimately, without taking measures to correct for this threat to internal validity, message features other than the experimental factor (IV) could drive changes in the dependent variables (Grabe & Westley, 2003).

Introducing repeated observations of each treatment level reduces systematic error between messages (Reeves & Geiger, 1994) and provides a more rigorous test of the impact of the independent variable (Grabe & Westley, 2003). This also avoids the fallacy of using an individual exemplar to represent a potentially diverse category of messages (e.g., controlling directives or autonomy-supportive messages) (Jackson & Jacobs, 2003) and accounts for idiosyncratic differences of individual messages. Despite the most careful stimulus creation, as Grabe and Westley note, “media messages rarely, if ever, exemplify only one thing” (2003, p. 282).

It is important to note that multiple messages reduce, but do not eliminate, threats to external validity (Bradac, 1986; Morley, 1988). Ideally, more than two messages would be used to create variance among treatment levels; the larger the number of messages per condition, the lower the risk of noise influencing results. For this experiment, however, the two-message limit was implemented to guard against carryover reactance from multiple messages threatening participants’ perceived freedom of choice, as well as to protect against participant fatigue for this within-subjects design.

While the design includes a message factor to avoid the idiosyncratic influence of features unique to a single message (rather than to test the influence of diet vs. exercise messages, for instance), these types of messages are likely to produce different magnitudes of reactance. Threats-to-choice, much like threats in general, vary both in magnitude and type. Reactance studies stretching from the seminal works (Brehm, 1966) to the most current inquiries (e.g., 2010 and 2009 studies) have focused on the link from magnitude of threat to magnitude of reactance, yet types of threats are largely overlooked

(particularly in the prevalent single-message designs). Evidence from Seemann and colleagues (2008), however, indicates that threats of the same magnitude but different type (i.e., classic threat, social influence threat, barrier threat) can produce magnitudes of reactance. Although Seemann and colleagues did not test topically different messages, they found that two types of threat conceptualized by Wicklund (1974), social influence threats (one person attempts to dominate another) and barrier threats (limit or eliminate access to a free behavior) elicited higher state reactance than what they labeled “classic” reactance threats (specifically limits decision-making freedom, i.e., “you cannot disagree”).³

While any significant differences found between message conditions will suggest avenues for future research on resistance to diabetes self-care messages, the message factor will be used in this study only as a repeated measure.

Presentation order. The design also includes an order factor to reduce sequence effects, particularly primacy and recency effects (Grabe & Westley, 2003).

Counterbalancing order of stimulus presentation theoretically distributes order effects equally across treatment conditions, and order may be controlled statistically in data analysis as well. Participants were randomly assigned to one of four counterbalanced orders (Table 1):

³ It should be noted that this experiment used an unconventional methodology. Participants read vignettes where a fictional character was subjected to a particular type of threat, then responded to an open-ended question asking what the character should do next. Student coders analyzed the written responses and coded each as demonstrating no/moderate/high reactance. Although reported intercoder reliability was sufficiently high, this indirect method of arousing and assessing reactance may introduce additional measurement error. Despite these limitations, the significant differences found between threat conditions suggest that the specific target of the threat (i.e., type/class of free behavior threatened), as well as the intensity of the threat, may produce different levels of reactance.

Table 1. *Four Stimulus Message Presentation Orders*

Order 1 (n = 16)	Order2 (n = 14)	Order3 (n = 12)	Order4 (n = 12)
N O E	X S E	X S D	N O D
X O D	N O D	N S E	X S E
N S E	X O E	N S D	X O D
X S D	N S D	X O E	N O E
N S D	X S D	N O E	N S E
X O E	N S E	N O D	X S D
N O D	X O D	X S E	X O E
N = narrative, X = non-narrative O = other-referencing, S = self-referencing D = diet, E = exercise (message factor)			

Additional steps taken to reduce sequence effects included using distracter tasks and allowing one to two minutes to pass between stimulus presentations, in an attempt to increase the psychological distance between responses to different stimulus messages (Reeves & Geiger, 1994).

Controlling language. In order to reduce reactance, it must first be induced. This was accomplished through the use of controlling language in all stimulus messages. Among message features that elicit state reactance, controlling language is most consistently linked to successful inductions of this motivational state across diverse health topics and participant samples (e.g., Dillard & Shen, 2005; Grandpre et al., 2003; Henriksen et al., 2004; Miller et al., 2007; Quick & Considine, 2008; Quick & Kim, 2009; Quick & Stephenson, 2008; Rains & Turner, 2007).

Controlling language is defined as language that threatens an individual's range of free alternatives from which she or he may choose. Controlling language is explicitly restrictive of choice and is characterized by verbally aggressive and strongly opinionated statements that demand compliance (Buller et al., 2000; Burgoon, Alvaro, Broneck, et al., 2002; Cody et al., 1980). Controlling language in persuasive messages generally adopts the form of wording forcefully directing individuals to comply with a message's recommendation (Dillard & Shen, 2005; Miller et al., 2007; Quick & Considine, 2008), typified with diction such as "must," "have to," "need," and "ought" (Lanceley, 1985; McLaughlin et al., 1980; Rains & Turner, 2007). This type of language was used to construct stimulus messages (Appendix 1); for example, messages incorporate phrases such as "absolutely must," "it is imperative," "it is impossible to disagree," and "you have no choice."

Controlling directives rely on imperatives rather than rational propositions (McLaughlin, Shutz, & White, 1980; Miller et al., 2007), and this form of language intensity is characterized by powerful, forceful, dominating, and freedom-limiting demands. Alternate conceptualizations of language intensity include aspects such as explicitness versus implicitness (Burgoon, Alvaro, Broneck et al., 2002; Dillard et al., 1996; Grandpre et al., 2003) and lexical concreteness (Miller et al., 2007), although these delivery styles lie outside of the scope of the current investigation. This study relies on the consistently-demonstrated link from "explicit directiveness" (Miller et al. 2007, p. 235) in persuasive messages (i.e., controlling language) to perceived threats to choice, in

order to effectively induce reactance and map differences based on the predictor variables.

Whereas controlling language dictates freedom-limiting requests, non-controlling language, or autonomy-supportive language (Vansteenkiste et al., 2006), promotes the individual's role in decision-making and pushes the individual only to choose the best option for her or him. Autonomy-supportive language encourages rational consideration of the message's recommendations with intentionally temperate wording (Dillard & Shen, 2005), using diction such as "could," "might want to," "may," and "can" (Miller et al., 2007; Vansteenkiste et al., 2006). Reactance theory predicts, and empirical tests confirm, that autonomy-supportive messages are not generally perceived as threats to one's ability to access to or exercise of freedom, therefore they do not initiate the arousal and expression of reactance.

For the present study, degree of controlling language was held constant across treatment conditions, as confirmed with a pretest (discussed in a subsequent section in this chapter). All messages explicitly demanded compliance with the recommendations, using forcefully directive and restrictive language, as well as underlining of key controlling words/phrases for emphasis.

Pretest. A pretest was conducted to confirm valid treatment manipulations and ensure accurate message categorization. Ten people unaffiliated with the study completed the pretest prior to experimentation. After granting informed consent (Appendix 2), pretest judges rated each of the eight stimulus messages on use of narrative and other-referencing, as well as degree of controlling language. Pretest participants were

60% female and 40% male, and the average age was 34.2 years. The pretest instrument is available online at <http://www.surveymzmo.com/s3/325973/Dissertation-Message-Pretest>.

Narrative delivery style was measured with the item: “To what extent do you think this message is a narrative?” (anchors: 1=*Not at all*, 7=*A lot*), followed by this explanatory text:

Narrative delivery is defined as "a representation of connected events and characters that has an identifiable structure, is bounded in space and time, and contains implicit or explicit messages about the topic being addressed" (Kreuter et al., 2007, p. 222; emphasis added).

As expected, pretest judges rated narrative messages ($M = 5.78$, $S.D. = 1.025$) significantly and substantially higher than non-narrative messages ($M = 2.90$, $S.D. = 1.766$) on narrative delivery style ($t(78) = -8.906$, $p < .001$). There was no significant difference between other-referencing and self-referencing messages ($t(78) = -0.932$, $p = .354$) nor between diet and exercise messages ($t(78) = 0.821$, $p = .414$) for this measure.

Other-referencing style was measured with the item: “To what extent do you think this message incorporates other-referencing?” (anchors: 1=*Not at all*, 7=*A lot*), followed by this explanatory text: “Other-referencing is defined as focusing on consequences that affect people close to the individual, such as friends and family. Self-referencing, conversely, would focus on consequences to the individual her/himself.”

As expected, pretest judges rated other-referencing messages ($M = 6.33$, $S.D. = 1.141$) significantly and substantially higher than self-referencing messages ($M = 1.35$, $S.D. = .700$) on this item ($t(78) = -23.507$, $p < .001$). There was no significant difference

between narrative and non-narrative messages ($t(78) = 0.125, p = .901$) nor between diet and exercise messages ($t(78) = -0.042, p = .967$) in terms of other-referencing ratings.

Two seven-point ratings scales gauged the degree of controlling language. Ideally, conditions should not differ from each other in terms of degree of controlling language. The first item asked, “To what extent was this message worded in a way that it tries to control what the reader does (that is, what choices she or he makes)?” (anchors: 1=*Not at all*, 7=*A lot*). Treatment conditions did not vary significantly for this item; there were no significant differences between narrative and non-narrative messages ($t(78) = 1.285, p = .203$), other-referencing and self-referencing messages ($t(78) = 0.098, p = .922$), or diet and exercise messages ($t(78) = -1.693, p = .094$). A second item asked, “To what extent was this message worded in a way that it supports or promotes the reader's freedom to make his or her own decisions?” (anchors: 1=*Not at all*, 7=*A lot*). Treatment conditions did not vary significantly for this item, either; there were no significant differences between narrative and non-narrative messages ($t(78) = -1.625, p = .108$), other-referencing and self-referencing messages ($t(78) = 0.107, p = .915$), or diet and exercise messages ($t(78) = 0.320, p = .750$).

In summary, the pretest confirmed that narrative and non-narrative messages were distinct in terms of narrative delivery, but not referencing or controlling language. Other-referencing and self-referencing messages differed in terms of referencing style, but not narrative delivery or controlling language. Exercise and diet messages did not differ from each other in narrative delivery, referencing style or controlling language.

Measures

Criterion variables include state reactance (cognitive appraisal, counter-arguing, state anger) and message acceptance (attitude toward the message, attitude toward the advocacy, behavioral intentions toward the message advocacy). Proposed mediators include narrative engagement, guilt arousal, and state empathy.

Where possible (i.e., for all but the behavioral intention items), multiple measures were used to analyze dependent variables. Including multiple observations (e.g., indexes) for measures in an experimental design is a useful tactic to provide evidence of reliability, increasing external and internal validity (Stamm, 2003).

State reactance. The prevailing operationalization of state reactance in the communication literature defines this motivational state as a latent factor comprising negative cognitions and state anger. Multiple studies have validated this “intertwined” or “two-step” process model using structural equation modeling techniques (Dillard & Shen, 2005; Quick & Considine, 2008; Quick & Stephenson, 2007a; Rains & Turner, 2007), although each of these studies relied on single-message designs.

Despite the prominence of the intertwined model, other operational definitions exist in recent communication research. Reinhart and colleagues (2007) employed a four-item reactance scale from Lindsey (2005) probing responses to items such as “I dislike/do not like/am uncomfortable that I am being told how to feel about [topic].” Both studies reported acceptable reliability for the scale (.85 and .86, respectively). Scholars in other disciplines, such as marketing, also operationally define reactance in different ways, such as performance on a decision-making purchasing task, where a reactance condition is

predicted to choose different options than a non-reactance condition (Fitzsimons & Lehmann, 2004).

The cognitive component of state reactance is generally assessed through a thought-listing task (Cacioppo & Petty, 1981), where participants spend 90 seconds writing thoughts they had while reading or viewing a message. The statements are then coded as favorable/supportive (agrees with the message), unfavorable/negative (disagrees with the message), or neutral (neither agrees nor disagrees with the message) by either the participants themselves (Quick & Considine, 2008; Quick & Stephenson, 2007a; Rains & Turner, 2007) or by trained coders (Dillard & Shen, 2005; Quick & Stephenson, 2008; Rains & Turner, 2007). The number of unfavorable/negative thought statements is the ratio-level measure of the cognitive dimension of reactance. Other studies have assessed negative cognitions using a reliable three-item counterarguing index (Silvia, 2006), and a reliable 18-item scale measuring nine dimensions of cognitive appraisal (Dillard et al., 1996; Miller et al., 2007).

There are unique limitations introduced by using the thought-listing technique to capture cognitive responses, particularly in a repeated-measures design. First, ruminating on anger-inducing stimuli can further elevate anger. The thought-listing procedure directs participants specifically to ruminate on their thoughts during message presentation, which may falsely inflate the degree of negativity in participants' thought-listing responses. Psychological studies indicate that rumination leads to higher-than-baseline anger levels following an anger-induction task, whereas non-ruminating tasks such as free writing on a neutral topic can reduce anger from baseline levels following the induction task (Gerin,

Davidson, Christenfeld, Goyal, & Schwartz, 2006; Rusting & Nolen-Hoeksema, 1998). Moreover, the thought-listing technique may initiate a “more controlled search of memory” (Dougherty & Hunter, 2003, p. 277), leading respondents to generate reaction statements that they may not have come to naturally, unless directed to reflect on the topic. It should not be overlooked that participants are aware also that their statements will be viewed by researchers, and may edit their thoughts accordingly (Paulhaus, 1984). Finally, on a practical level, administering a thought-listing procedure eight times per participant (i.e., for each of eight stimulus videos) would likely introduce testing and instrumentation error, and also elevate participant fatigue (Grabe & Westley, 2003; Reeves & Geiger, 1994). For these reasons, thought-listing was not used for this study.

The affective component of reactance, state anger, is generally measured with an index comprising Likert scales to gauge anger, irritation, aggravation, and annoyance. This scale has been validated across a host of studies.

These operationalizations have produced rich, useful findings regarding the influence of message features such as threat-to-choice language on rejection or acceptance of persuasive recommendations, although they are beset with methodological limitations inherent for post-hoc self-report measures, in addition to those enumerated for thought-listing tasks. Capturing message responses does not necessarily equate to capturing message processing, and self-report items face threats to validity, ranging from peoples’ difficulty accurately detecting and describing their thoughts and feelings (Stone, Turkkan, Bachran, Jobe, Kurtzman, & Cain, 2000) to issues of social desirability bias (e.g., Edwards, 1953; Paulhaus, 1984). To counteract these limitations, a series of

causally-linked mediating and dependent measures taken from theory-driven empirical research were used to map the sequential processes in the arousal and expression of reactance. Moreover, multiple measures were incorporated for nearly all criterion variables.

Perceived threat to choice. In order for reactance to occur, a person must first feel that her/his freedom to choose is threatened or eliminated by an external stimulus. A perceived threat to choice scale assessed whether participants perceived the controlling language as a threat to their personal freedom to choose among alternate thoughts and actions related to diet and exercise.

Perceived threat to choice was measured with a four-item index from Dillard and Shen (2005): “The message threatened my freedom to choose,” “The message tried to make a decision for me,” “The message tried to manipulate me,” and “The message tried to persuade me.” Participants rated their agreement on seven-point Likert scales ranging from 1=*Strongly disagree* to 7=*Strongly agree*. Multiple published studies confirm the reliability and strong internal consistency of this index, reporting alpha coefficients of 0.95 (Quick & Considine, 2008), 0.92 (Quick & Stephenson, 2008), 0.83 (Miller et al. 2007), and 0.83 and 0.87 (Dillard & Shen, 2005). For this experiment, factor analysis using principal axis factoring confirmed unidimensionality of the threat-to-choice index (eigenvalue = 2.803; % variance explained = 70.085) and reliability analysis confirmed its internal consistency ($\alpha = .831$).

Quick and Stephenson (2007a) measured perceived threat to choice with a single, 11-point reverse coded item (“The condom ad I just viewed made me feel like the choice

is mine to use a condom every time I have sexual intercourse”). The current study employed multiple measures for this key construct to limit idiosyncratic effects of question wording or participant perceptions.

Negative cognitions (Cognitive reactance output). The prevailing process model of reactance operationalizes the construct as an amalgamation of negatively-valent cognitive and affective output. Accordingly, each of these dimensions was measured. Negative cognitions, the cognitive component of state reactance, were measured with two self-report indices gauging (1) counter-arguing during message exposure and (2) cognitive appraisal of the message.

Counter-arguing was measured with a three-item index adapted from Silvia (2006): “Did you criticize the message you just saw while you were reading it?,” “Did you think of points that went against what was being said while you were reading the message?,” and “While reading the message, were you skeptical of what was being said?” Participants rated their agreement on seven-point scales ranging from 1=*No, not at all* to 7=*Yes, very much so*. Silvia (2006) reported an alpha reliability of 0.81 for this three-item index. For this study, factor analysis using principal axis factoring confirmed unidimensionality of the counter-arguing index (eigenvalue = 2.665; % variance explained = 88.848) and reliability analysis confirmed its internal consistency ($\alpha = .935$).

Cognitive appraisal was measured with a four-item index adapted from an 18-item scale introduced by Dillard and colleagues (1996; $\alpha = .85, .91$) and validated by Miller and colleagues (2007; $\alpha = .87$ to $.92$). The reduced scale included items that tapped the three evaluative dimensions significantly associated with controlling/dominating

language in studies using the larger scale, including: valence (The message was pleasant”), obstacle (“The message got in the way of what I wanted,” reverse coded), and legitimacy (“The message was reasonable,” “The message was fair”). Participants rated their agreement on seven-point Likert scales ranging from 1=*Strongly disagree* to 7=*Strongly agree*. Dillard et al.’s (1996) 18-item scale measured nine dimensions of cognitive appraisal, yet only valence, obstacle and legitimacy appraisals were significantly associated with controlling/dominating language across both experimental trials reported. In the interest of minimizing participant fatigue, this study used the shortened scale reduced to dimensions of primary interest for studying the attenuation of reactance to threat-to-choice language. Factor analysis using principal axis factoring confirmed unidimensionality of the cognitive appraisal index (eigenvalue = 2.879; % variance explained = 71.986) and reliability analysis confirmed its internal consistency ($\alpha = .867$).

State anger (Affective reactance output). State anger, the affective component of reactance, was measured with three items commonly used in reactance studies. Participant were asked, “To what extent did this message make you feel [irritated, angry, annoyed],” and rated their response on seven-point scales ranging from 1=*Not at all* to 7=*Very strongly*. Previous reactance studies have reported alpha coefficients for a four-item index (also including “aggravated”) in the .9 range (Dillard & Shen, 2005 = 0.92, 0.94; Miller et al., 2007 = 0.83; Quick & Considine, 2008 = 0.93; Quick & Stephenson, 2007a = 0.91; Quick & Stephenson, 2008 = 0.94, 0.93). For this experiment, factor analysis using principal axis factoring confirmed unidimensionality of the anger index

(eigenvalue = 2.853; % variance explained = 95.100) and reliability analysis confirmed its internal consistency ($\alpha = .974$).

Combined scale for state reactance. In addition to forming reliable sub-scales for the individual components of reactance, these four components (perceived threat, counter-arguing, cognitive appraisal, and state anger) combined to form a highly reliable ($\alpha = .953$) 14-item scale for state reactance. Although principal axis factoring detected two underlying factors (eigenvalues = 9.243, 1.360; % variance explained = 75.730) for the scale, this was due primarily to cross-loadings of the threat items across both factors. Moreover, the scale demonstrated strong second-order internal consistency.

Reactance restoration/Message acceptance. Reactance theory predicts that individuals will attempt to regain their sense of freedom following a threat to choice (Brehm, 1966; Quick & Stephenson, 2007b), a phenomenon known more commonly as the “boomerang effect.” In situations of direct restoration, the individual adopts the restricted alternative outright, such as performing a forbidden behavior (e.g., eating larger portions instead of the recommended smaller portions) or refusing to perform a proscribed action (e.g., not exercising). A host of studies have demonstrated that reactance leads to reduced intentions to comply with health recommendations (Bensley & Wu, 1991; Burgoon, Alvaro, Broneck et al., 2002; Miller et al., 2007; Rains & Turner, 2007). Accordingly, respondents were asked to state their likelihood of complying with the message’s recommendation. Low compliance represents direct restoration (e.g., Dillard & Shen, 2005; Miller et al., 2007).

Restoration of freedom may be achieved more indirectly, however, through methods such as associating with people performing the forbidden act (i.e., vicarious restoration) or rejecting the source of the threat, often a message or person telling them what to do. Experimental studies have linked reactance to reduced perceived message persuasiveness (Grandpre et al., 2003; Quick & Stephenson, 2007a) and source derogation (Burgoon, Alvaro, Broneck et al., 2002; Miller et al., 2007). Respondents therefore also evaluated each message and rated their attitudes toward the behavior it advocated. Negative evaluations indicate message rejection and negative reactions to the message, whereas positive evaluations indicate message acceptance and positive message reactions.

Intended compliance with health recommendation. The participant's degree of intended compliance with the message's recommendation was measured with two related questions. Following diet messages, participants were asked: "Based on the video you just saw, how likely is it that you will [eat smaller portions, eat fewer simple carbohydrates ("carbs")] in the next week?" Following exercise messages, participants were asked: "Based on the video you just saw, how likely is it that you will [be more active in small, everyday ways, get 30 minutes of moderate activity at least four times] in the next week?" Participants responded to each item on a 100-point likelihood continuum ranging from 0=*Definitely Will Not* to 100=*Definitely Will*. Low ratings represent noncompliance and direct restoration of personal freedom through message rejection. This likelihood continuum is a common measure in research testing message-related

outcomes following reactance to persuasive messages (e.g., Dillard and Shen, 2005; Miller et al., 2007).

Attitude toward the message. Attitude toward the message was measured with a three-item index from Mackenzie and Lutz (1989; validated by Lafferty and Goldsmith, 1999). The question, “How would you rate your overall impression of this ad on the following scale?” was followed by three seven-point semantic differentials: bad/good, favorable/unfavorable (reverse-coded), and negative/positive. Negative attitudes toward the message (i.e., low ratings) indicate indirect restoration (Quick & Stephenson, 2007b). Factor analysis using principal axis factoring confirmed unidimensionality of this four-item index (eigenvalue = 2.946; % variance explained = 98.201) and reliability analysis confirmed its internal consistency ($\alpha = .991$).

Attitude toward the advocated behavior. Attitude toward the advocated behavior was measured with a five-item semantic differential index adapted from Dillard and Shen (2005)⁴. The question, “Based on this message, how would you rate your attitude toward [healthy eating, regular exercise and physical activity]?” was followed by four seven-point semantic differentials: negative/positive, It’s not necessary/It’s necessary, good/bad (reverse coded), and favorable/unfavorable (reverse coded). Negative attitudes toward the message’s advocacy (i.e., low ratings) indicate indirect restoration (Quick & Stephenson, 2007b). Factor analysis using principal axis factoring confirmed unidimensionality of this

⁴ Dillard and Shen (2005) used two additional items (foolish/wise or detrimental/beneficial) that were removed from this study due to time constraints and considerations of face validity. While it seems plausible that Dillard and Shen’s college student sample might rate anti-alcohol messages (their stimulus messages) as foolish or detrimental, it seems unlikely that diabetics would feel similarly about pro-healthy eating and activity messages.

four-item index (eigenvalue = 3.400; % variance explained = 85.007) and reliability analysis confirmed its internal consistency ($\alpha = .941$).

Narrative engagement. Narrative structure in persuasive message is proposed to impact attitudinal and behavioral outcomes by fostering a unique style of message processing, in which an individual's immersion in the story guides her or his cognitions and emotions. In other words, the influence of narrative structure on message processing and reactions is mediated by engagement with the story (Graesser, 1981; Green & Brock, 2000; Escalas et al., 2004; Chang, 2008; Slater & Rouner, 2002; Slater, 2002). Although studies often examine narrative engagement in the context of longer messages, such as novels (Green & Brock, 2000) or TV sitcoms (Busselle & Bilandzic, 2009), the influence of narrative processing emerges even with shorter messages, such as advertising (Chang, 2008; Dunlop et al., 2008), which more closely represent the stimuli for this study.

Narrative engagement was measured with six items adopted from Escalas and colleagues' (2004) "being hooked" scale, including: "This message did not really hold my attention" (reverse-coded), "This message did not draw me in" (reverse-coded), "This message really intrigued me," "If I had seen this message in a newspaper or magazine at home, I'd have read the whole thing," "I could not relate to this message" (reverse coded), and "This message reminded me of experience or feelings I've had in my own life." Participants rated their agreement with each statement on seven-point Likert scales ranging from 1=*Strongly disagree* to 7=*Strongly agree*. Higher average scores on the index indicate engagement with the narrative. Escalas and colleagues (2004) reported a

reliability of $\alpha = .90$ for the full, eight-item scale.⁵ For this study, factor analysis using principal axis factoring confirmed unidimensionality of the narrative engagement index (eigenvalue = 4.116; % variance explained = 68.594) and reliability analysis confirmed its internal consistency ($\alpha = .907$).

Guilt arousal. Much as narrative structure is proposed to influence message outcomes by engaging the viewer in narrative processing, other-referencing is proposed to induce emotional and motivational desires to change by arousing feelings of anticipated guilt, specifically in the context of potentially-harmful consequences to loved ones. Felt guilt is often reactive, generally tinged with regret for one's actions or inactions, but feelings of guilt may also be anticipatory, that is, in response to the foreseeing rather than the occurrence of an adverse outcome (Lazarus, 1991; Lindsey, 2005). Guilt arousal is often examined in studies of charitable giving (e.g., Hibbert et al., 2007; Lindsey, 2005) but has received less attention in health message design research.

Guilt arousal is conceptualized as the mediating state aroused by other-referencing message appeals. Guilt arousal was measured with a seven-item guilt measurement index from Coulter and Pinto (1995). Participants rated the degree to which each message made them feel: accountable, guilty, ashamed, bad, irresponsible, uneasy, and upset on seven-point Likert scales ranging from 1=*Not at all* to 7=*Very strongly*. Coulter and Pinto (1995) reported an alpha reliability of 0.94 for this scale, in the context of guilt appeals in advertising. Hibbert et al. (2005) reported an alpha reliability of 0.82 for the scale when examining messages encouraging charitable giving. For this study,

⁵ Two items, "I felt as though I was right there in the commercial experiencing the same thing," and "I would like to have an experience like the one shown in the commercial," were omitted in the interest of time, given that participants will respond to this index eight times during experimentation.

factor analysis using principal axis factoring confirmed unidimensionality of the guilt arousal index (eigenvalue = 4.395; % variance explained = 73.256) and reliability analysis confirmed its internal consistency ($\alpha = .916$).

State empathy. Given the exploratory nature of this look at the role of referencing in the attenuation of reactance, it may be possible that empathy, rather than guilt, mediates the influence of other-referencing on message outcomes. Indeed, Shen (2010) found that state empathy enhanced persuasiveness of anti-smoking and drunk driving video PSAs both directly and indirectly, by reducing state reactance.

State empathy was measured with six items from Shen's (2010) scale, including: "I can see this speaker's point of view," "I can related to the characters in this message," "I can understand what the character was going through in this message," "I can feel this speaker's emotions," "I experienced the same emotions as the speaker when reading this message," and "I can identify with the situation described in this message." Participants rated their agreement with each statement on seven-point Likert scales ranging from 1=*Strongly disagree* to 7=*Strongly agree*. Higher average scores on the index indicate greater state empathy. Shen (2010) reported a reliability of $\alpha = .93$ for her 12-item scale. Factor analysis using principal axis factoring confirmed unidimensionality of the state empathy index (eigenvalue = 5.109; % variance explained = 85.154) and reliability analysis confirmed its internal consistency ($\alpha = .964$).

Measures of participant characteristics. While this study focuses on message features rather than dispositional traits, several individual difference variables may affect the arousal and expression of state reactance. Specifically, trait reactance, involvement

with diabetes and diabetes self-care, and socio-demographic variables may lead to different styles of processing persuasive directives. All variables discussed below were measured before treatment to ensure that responses were independent of treatment manipulations.

In an ideal world, each of these variables would be built into the experimental design to test interactions with experimental factors as well as interactions among these dispositional traits. In the *real* world of the present study, however, time and budgetary constraints limit the maximum participant sample size. Because measured variables can only differ between conditions, not within (Grabe & Westley, 2003) (e.g., an individual could not be counted in two mutually-exclusive age conditions, or could not be simultaneously high and low in trait reactance), introducing a between-subjects predictor necessitates a virtual doubling of the sample size, to ensure (1) sufficient representation of each level of the predictor variable and (2) sufficient power to detect differences among groups. Were individual differences the focus of this study, such an expansion would be essential, but given this study's focus on message features that drive reactance, such questions are outside the scope of the current investigation. As will be discussed in the concluding chapter, follow-up studies will test the role of these individual differences in reactance, should a pattern of promising results emerge.

Tabachnick and Fidell (2007) contend that covariate analysis is most appropriate for non-experimental tests, which cannot randomly assign participants to treatment conditions. In true experiments, randomization theoretically controls for all potential confounds (Beatty, 1996); potential confounds may vary within groups, but they should

not vary systematically between randomly-assigned groups (Grabe & Westley, 2003). Subsequently introducing a covariate into statistical analysis, therefore, either is logically redundant, if the covariate and predictor are uncorrelated, or can suppress treatment effects if the covariate and predictor are correlated (Tabachnick & Fidell, 2007). Despite these considerations, identifying a true covariate and including it in analysis fosters greater sensitivity to detect group differences. Adding covariates increases statistical power, though at the expense of degrees of freedom within groups (Tabachnick & Fidell, 2007).

The majority of studies on situational reactance to persuasive health communication have focused on message features rather than individual differences (Quick & Stephenson, 2008), but there is evidence that trait reactance influences the relationship between controlling language in a message and outcomes such as and message acceptance. Miller and colleagues (2007) reported that trait reactance, but not gender nor age, was a significant covariate in the omnibus test of controlling language and lexical concreteness on multivariate measures of message persuasiveness.

Trait reactance may further cleave along dimensions of age, gender and ethnicity (Hong, Giannakopoulos, Laing & Williams, 1994; Woller, Buboltz & Loveland, 2007), suggesting that these variables could potentially impact the reactance process as well. Although findings regarding individual differences and trait reactance are not always consistent, there are indications that young adults and seniors, males, and some racial/ethnic minorities are prone to higher dispositional reactance. For example, Woller and colleagues (2007) found a curvilinear effect of age on trait reactance; the highest age

group (55-64) reported mean levels of reactance similar to the youngest groups (18-24, 25-34), which were significantly higher than the middle age groups (35-44, 45-54).

Accordingly, measured individual difference variables included trait reactance, age, gender, and ethnicity, as well as involvement with compliance behaviors (diet, exercise) and length of time since a person's diabetes diagnosis. These variables were measured prior to stimulus exposure.

Trait reactance. Trait reactance proneness may compound with state reactance to make freedom-limiting threats more salient (Quick & Stephenson, 2008), and this interaction can intensify the reactant response. For example, Dillard and Shen (2005) reported an additive interaction between perceived threat to freedom and trait reactance on subsequent state reactance levels, albeit for their pro-flossing but not anti-binge drinking condition. Dispositional reactance may moderate the impact of state reactance such that high trait reactant individuals respond more strongly to freedom-limiting threats than low trait reactant people do (Bushman & Stack, 1996; Graybar et al., 1989). Moreover, trait reactance is negatively correlated with medical recommendation compliance (Fogarty & Youngs, Jr., 2000; Seibel & Dowd, 1999).

Though it has received criticism (Jonason, 2007), Hong's Psychological Reactance Scale (Hong & Fraedda, 1996; Hong & Page, 1989; Shen & Dillard, 2005) has been validated extensively – and used more often than other trait reactance scales – in recent reactance research (Dillard & Shen, 2005; Jonason & Knowles, 2006; Quick & Stephenson, 2008; Thomas, Donnell, & Buboltz, 2001). Shen and Dillard (2007) compared three trait reactance scales, including Merz's QMPR, Dowd et al.'s TRS and

Hong's PRS; they concluded that Hong's scale is the only valid measure of trait reactance among those in the current literature.

Trait reactance was measured with Hong's 11-item index. Factor analysis with principal axis factoring and oblique rotation found three latent factors with eigenvalues greater than 1, encompassing 10 of the 11 items (the final item did not load on any factor). Following this exploratory analysis, confirmatory factor analysis using principal components analysis and three forced factors produced the factor loadings in Table 2 below. The factors were only weakly to moderately correlated ($r_{12} = .205$, $r_{23} = .060$, $r_{13} = .377$), therefore, Varimax rotation was used for the confirmatory analysis.

Table 2. A Factor Analysis of Trait Reactance Variables

	I	II	III
When something is prohibited, I usually think, "That's exactly what I am going to do."	.797		
Advice and recommendations usually induce me to do just the opposite.	.815		
I find contradicting others stimulating.	.468		
I consider advice from others to be an intrusion.	.572		
When someone forces me to do something, I feel like doing the opposite.	.468		
I become frustrated when I am unable to make free and independent decisions.		.750	
It irritates me when someone points out things which are obvious to me.		.576	
I become angry when my freedom of choice is restricted.		.784	
Regulations trigger a sense of resistance in me.		.521	
It makes me angry when another person is held up as a role model for me to follow.			.900
I resist the attempts of others to influence me.	--	--	--
Eigenvalue	3.617	2.089	1.152
% of total variance explained	32.886%	18.993%	10.470%

Note. Extraction method: Principal axis factoring; Rotation method: Varimax with Kaiser Normalization. Factor loadings < .4 were suppressed from the table for clarity.

The 10 items that loaded onto factors formed a moderately reliable second-order index ($\alpha = .778$), which was used for analyses.

Involvement with compliance behaviors. Pre-existing attitudes toward and prior exercise of diet and exercise compliance-related behaviors are likely to influence

reactance arousal and evaluations of messages involving these behaviors (Snyder, & Wicklund, 1976). Involvement also positively influences effort, focus, and elaboration in processing persuasive messages (see Gelsi & Olson, 1988 for a review).

Given its likely impact on compliance with the recommended diet and exercise behaviors, involvement, or perceived personal relevance (Gelsi & Olson, 1988), was measured using an adapted version of the Personal Involvement Inventory (Zaichowsky, 1994) for each of the two message topics. The stem, “To me, [regular exercise/healthy eating] is:” was followed by seven seven-point semantic differential scales with anchor pairs including: important/unimportant (reverse-coded), boring/interesting, relevant/irrelevant (reverse-coded), exciting/unexciting (reverse-coded), appealing/unappealing (reverse-coded), worthless/valuable, not needed/needed. This inventory and its 20-item predecessor have been used extensively in marketing and advertising research.

Factor analysis explored the dimensionality of the diet and exercise indices. For the seven exercise items, principal axis factoring with Varimax rotation⁶ uncovered two factors that explained a cumulative 68.186% of the total variance. The first factor (eigenvalue = 2.670, 38.136% of variance explained) captured the more cognitive dimensions of involvement, including: important, relevant, valuable, and needed ($\alpha = .787$). The second factor (eigenvalue = 1.757, 30.050% of variance explained) captured the more emotional aspects of involvement, including: interesting, exciting, and appealing ($\alpha = .808$).

⁶ The exercise involvement factors did not correlate with each other ($r = .060$), therefore, orthogonal rotation was used.

This pattern was mirrored for the seven diet items. Factor analysis with principal axis factoring and Varimax rotation⁷ found two latent factors that explained 72.428% of the total variance. Again, items converged into a cognitive involvement factor (eigenvalue = 3.309, 47.278% of variance explained, $\alpha = .821$) and an emotional involvement factor (eigenvalue = 1.761, 25.150% of variance explained, $\alpha = .783$).

Participants were also asked whether they currently have a diet/meal plan and an exercise plan recommended by a healthcare provider or educator. 55.2% of participants ($n = 32$) reported having a diet/meal plan, and 44.8% ($n = 26$) reported having an exercise plan.

Time since diabetes diagnosis. Participants were asked to provide the length of time (in months) since they were diagnosed with diabetes. The mean was 79.97 months since diagnosis (approximately 6.5 years; S.D. = 67.395 months), the median and mode were 60 months (5 years). There was considerable variability for this measure, as indicated by the large standard deviation and a range from 1 month to 20 years. Table 3 groups individuals by time since diagnosis according to ordinal categories:

⁷ The diet involvement factors also did not correlate with each other ($r = .295$), therefore, orthogonal rotation was used.

Table 3. *Participants' Length of Diagnosis with Diabetes*

<i>Length of time</i>	<i>N</i>	<i>% of sample</i>
0 - 6 months	5	8.6
7 months - 1 year	5	8.6
>1 year - 2 years	4	6.9
>2 years - 3 years	8	13.8
>3 years - 4 years	2	3.4
>4 years - 5 years	9	15.5
> 5 years - 8 years	5	8.6
>8 years - 10 years	8	13.8
>10 years - 15 years	6	10.3
>15 years	6	10.3
Total	58	100.0

Demographic variables. Participants were asked to provide their age at the time of participation in the study (in years), their gender (female/male), their racial/ethnic classification (White/Caucasian; Hispanic/Latino/Latina; African-American; Asian-American/Pacific Islander; Other: _____). The two individuals who specified their race as “Other” were American Indian. Participant were also asked to report the highest level of education they had completed (Less than high school; High school diploma/G.E.D.; Some college, no degree; 2-year or associate degree; Bachelor’s degree; Some graduate school; Master’s degree; Doctoral degree), and whether or not they had children and grandchildren. Descriptive statistics and measures of central tendency for participant demographics can be found in the “Participants” section, earlier in this chapter.

Procedure

Participants completed this study in a computer lab on the University of Missouri campus. Participants completed the study individually, but sessions included up to 7 participants apiece. Upon arrival, participants were greeted by the author and asked to

read a written informed consent form (Appendix 2). Once any questions were answered, participants signed the form and data collection began. Participants were also free to stop at any point to ask questions.

Following the informed consent process, each participant completed a printed pretest questionnaire with measures for individual difference variables, as outlined in the previous section. Once the participant completed the pretest questionnaire, message testing began. The online survey tool SurveyGizmo controlled the presentation of all instructions, stimulus messages, questionnaire items, and distracter items. At the start of the experiment, participants were instructed that they would read print advertisements, answer questions, and view video clips. Participants controlled the pace of the experiment by clicking a “Next” button to advance to the next portion of the experiment after reading a message, answering questions, or viewing a distracter video.

Participants viewed all stimulus and distracter materials on a flat-screen computer monitor while seated in a comfortable desk chair. Each participant saw all eight stimulus messages, in one of four counterbalanced orders, as well as seven distracter videos (following all but the final stimulus message).

After reading each stimulus message, the participant completed a series of questions measuring state reactance (perceived threat to choice, counterarguing, cognitive appraisal, and anger), proposed mediators (narrative engagement, guilt arousal, state empathy), and message persuasiveness (intended compliance with the recommendation, attitude toward the ad, attitude toward the health behavior). After responding to questions for all but the final stimulus message, participants viewed a short comedy clip and rated

their approval of the clip on two distracter items. Brief descriptions of and hyperlinks to the distracter videos are included in the following section.

After completing the study, participants were given a \$20 Visa gift card for their time, reminded that they are eligible to win one of three \$100 gift cards following data collection, and thanked. Each participant was asked if they had any questions about the study and was debriefed accordingly. The entire procedure lasted approximately one hour for each participant.

Distracter task. Repeated-measures tests of reactance theory introduce the possibility of carryover and summation effects (Brehm & Brehm, 1981; Christensen, 1977; Wicklund, 1974) from multiple arousals of state reactance. Sensitization to freedom-limiting threats renders participants more critical of subsequent messages, as persuasive intent becomes more salient to the target of a previous persuasive attempt (Brehm & Brehm, 1981; Christensen, 1977). Moreover, threatening multiple freedoms with multiple threats in close proximity to each other can create abnormally large amounts of reactance through carryover or summation effects. For example, the newly-diagnosed diabetic whose diet has just been severely limited may exhibit unexpectedly strong reactance to subsequent requests to follow an exercise schedule. Brehm and Brehm (1981) suggest that this effect is particularly strong if the threats or freedoms are connected in some way, such as freedoms related to diet and exercise, although Christensen (1977) documented carryover effects across two unrelated threat/freedom conditions. In Christensen's study, opposition to influence (a dependent measure that is

conceptually similar to reactance) was significantly greater for individuals exposed to two threatening conditions than for individuals exposed to a single threat.

Carryover reactance from exposure to a controlling stimulus may compound with reactance aroused by subsequent messages, artificially inflating both the level of state reactance and cardiac reactivity following subsequent messages. Perhaps for this reason, the vast majority of state reactance experiments, particularly those published following the theory's resurgence in health communication in the early 2000s, employ between-subjects designs exclusively.

Distracter tasks can successfully prevent or limit rumination on aroused feelings of anger (Gerin et al., 2006; Rusting & Nolen-Hoeksema, 1998). Distracting participants following an anger-induction task, compared to leaving them free to ruminate on their anger, leads to quantitatively fewer angry thoughts. For example, in the Gerin and colleagues (2006) study, the proportion of angry thoughts during a 12-minute distraction period was 17% for distracted participants compared to 31% for the non-distraction condition ($p = .002$). In the Rusting and Nolen-Hoeksems (1998) study, distraction led to reductions from baseline levels of anger, whereas rumination increased anger from baseline.

Distracter tasks have been shown also to provide a buffer period for cardiovascular activity to return to baseline levels following a personally-relevant anger-induction task, indexed using blood pressure and heart rate (Gerin et al., 2006; Glynn, Christenfeld, & Gerin, 2002) as well as heart rate variability (Neumann, Waldstein, Sollers, Thayer, & Sorkin, 2004). Distractions such as viewing vivid, colorful images on

a nearby monitor and playing with puzzles for 12 minutes (Gerin et al., 2006), free writing on a neutral topic for 10 minutes (Denson, Pedersen, & Miller, 2006), or completing a lengthy yet non-stressful questionnaire on moral decision-making (Glynn et al., 2002) have demonstrably reduced both vascular (blood pressure) and cardiac (heart rate) dimensions of cardiovascular reactivity compared to baseline levels. Rumination, conversely, is associated with sustained blood pressure elevation following anger induction (Gerin et al., 2006).

In order to increase experimental control by employing a repeated-measures design while minimizing the risk of carryover, sensitization, and summation effects, participants completed a distracter task after answering each set of message-response measures and before reading the next stimulus message. Following each message (except the final message), participants watched a 1-to-2 minute video clip from classic television comedy shows:

- Distracter video 1: The Andy Griffith Show, “Barney and the Choir” (2:30) <http://www.youtube.com/watch?v=kJ7EaPH5pjk>
- Distracter video 2: The Cosby Show, “How Ugly Is He?” (1:15) <http://www.youtube.com/watch?v=e7DaPcSb7cI>
- Distracter video 3: The Golden Girls, “A Piece of Cake” (2:05) <http://www.youtube.com/watch?v=9UQbWe11pFk>
- Distracter video 4: I Dream of Jeannie, “My Wild-Eyed Master” (1:25) <http://www.youtube.com/watch?v=C0yGX57nW58>
- Distracter video 5: The Andy Griffith Show, “Andy and the Woman Speeder” (1:55) <http://www.youtube.com/watch?v=VZczKsuYIp4>
- Distracter video 6: I Love Lucy, “Lucy Does a TV Commercial” (2:24) http://www.youtube.com/watch?v=Q9ROT_XOO0w

- Distracter video 7: I Love Lucy, “Job Switching” (2:28)
http://www.youtube.com/watch?v=mZz2y_6T2EU

Participants also rated how much they liked each of the video, again to distract them from the purpose of the study. Video clips were shown on the same monitor used to view stimulus messages and response items, and participants used headphones to hear the videos.

Apparatus

Data for the pretest and main experiment were collected using surveygizmo 3.0, an online survey tool, accessed via Dell and Macintosh desktop computers with full-color flat screen monitors. An online survey instrument created with surveygizmo (www.surveygizmo.com) was used to present all stimulus messages and message response questions. Instruments for each of the four orders may be found online: Order 1: <http://www.surveygizmo.com/s3/330578/Dissertation-Main-Order1>, Order 2: <http://www.surveygizmo.com/s3/330522/Dissertation-Main-Order-2>, Order 3: <http://www.surveygizmo.com/s3/333208/Dissertation-Main-Order3>, Order 4: <http://www.surveygizmo.com/s3/333209/Dissertation-Main-Order4>. Distracter videos were hosted on YouTube (www.youtube.com) and embedded in the surveygizmo instruments.

V. RESULTS

The general question guiding this research asks whether certain message features can attenuate resistance to persuasive attempts. Specifically, the influences of narrative structure and other-referencing in the context of controlling (i.e., reactance-inducing) messages directed at adult diabetics were examined. Drawing from previous research on psychological reactance, narrative persuasion, other-referencing, and guilt arousal, the following hypotheses and research questions were proposed:

H1: Controlling messages that incorporate narrative delivery style, compared to non-narrative controlling messages, will elicit reduced state reactance, including (a) lower perceived threat to choice, (b) less counter-arguing, (c) less negative cognitive appraisals, and (d) less state anger.

H2: Controlling messages that incorporate other-referencing, compared to self-referencing controlling messages, will elicit reduced state reactance, including (a) lower perceived threat to choice, (b) less counter-arguing, (c) less negative cognitive appraisals, and (d) less state anger.

RQ1: Do narrative delivery style and other-referencing interact to influence state reactance?

H3: Controlling messages that incorporate narrative delivery style, compared to non-narrative controlling messages, will lead to greater message acceptance, including (a) greater intended compliance with the message's recommendation, (b) more positive attitudes toward the message, and (c) more positive attitudes toward the behavior advocated by the message.

H4: Controlling messages that incorporate other-referencing, compared to self-referencing controlling messages, will lead to greater message acceptance, including (a) greater intended compliance with the message's recommendation, (b) more positive attitudes toward the message, and (c) more positive attitudes toward the behavior advocated by the message.

RQ2: Do narrative delivery style and other-referencing interact to influence message acceptance?

H5: Engagement with the narrative will mediate the influence of narrative structure on predicted message outcomes.

RQ3: Does guilt arousal will mediate the influence of other-referencing on predicted message outcomes?

RQ4: Does state empathy mediate the influence of other-referencing on predicted message outcomes?

Independent variables included narrative structure and other-referencing message appeals. Dependent variables included state reactance (perceived threat to choice, counter-arguing, negative thoughts, state anger), attitude toward the message, attitude toward the behaviors promoted by the message, and behavioral intentions related to the message advocacy. Proposed mediating variables included narrative engagement (for narrative structure) and guilt arousal and state empathy (for other-referencing). Individual difference variables including trait reactance, involvement with diet and exercise behaviors, and trait empathy were also examined, not as part of hypothesis testing, but to explore their potential moderating role in the attenuation of state reactance and suggest avenues for future research.

Data preparation and analysis procedures

Prior to analysis, data were screened for outliers and missing data. Less than 1% of data were missing (27 of 4104 cells used for analysis = 0.657% missing), which falls well below the problematic 5% threshold for missing data (Tabachnick & Fidell, 2007). Due to instrumentation error, four participants did not complete measures for one message apiece and one participant did not complete measures for two messages. These individuals were deleted listwise in statistical analyses. One participant did not complete

the study and was not retained for the analysis. Unless noted otherwise, test of hypotheses and other analyses are therefore based on a sample size of $N = 52$.

Preliminary analyses included examining the dimensionality of all scales and conducting reliability analyses to compute alpha reliability measures of internal consistency, as detailed in the method chapter. All scales achieved a reliability of .75 or greater, and the vast majority were reliable at .8 or higher. A power analysis was also conducted prior to participant recruitment, to ensure sufficient power would be achieved with the chosen sample size. The power analysis is also detailed in the method chapter, and observed power is noted in the analyses in this chapter.

The statistical software package SPSS 18.0 was used to analyze all data. A significance criterion of .05 was employed to test hypotheses and research questions, primarily to guard against Type I error in statistical analyses. Given the exploratory nature of this study, results that approached significance (i.e., using a significance criterion of .1 instead of .05) are also noted, where appropriate.

Repeated measures factorial analyses of variance were used to test for direct effects and interactions of the predictor variables. Prior to analyses, assumptions of these statistical tests were assessed, including: univariate and multivariate normality, between-groups equality of variance (when violated, a more stringent criterion of $\alpha = .01$ was used), and independence of observations and errors of prediction. Sphericity was not an issue for these data, as each independent variable had only two levels.

Collinearity among the primary variables was also assessed. Spearman's rho correlations (used instead of Pearson's r due to some significant skewness and kurtosis

among the variables) indicated that there was significant and substantial collinearity among the dependent variables, therefore univariate rather than multivariate ANOVAs were used. Tabachnick and Fidell (2007) note that MANOVA is inappropriate when the majority of DVs are correlated at .65 or higher, as multi-collinearity among dependent measures in MANOVA inflates familywise Type I error. Table 4 shows the zero-order correlation matrix for the dependent and mediating variables.

Table 4
Zero-Order Spearman's Rho Correlations for Dependent and Mediating Variables

	Counter-arguing	Cognitive Appraisal	Anger	Attitude Ad	Attitude Behavior	Narrative Engmnt	Guilt	State Empathy
Threat	.688***	-.707***	.653***	-.694***	-.562***	-.533***	-.027	-.385***
Counter-arguing	1	-.771***	.773***	-.762***	-.686***	-.607***	-.053	-.550***
CognitiveAppraisal		1	.750***	.856***	.706***	.720***	.035	.651***
Anger			1	-.749***	-.666***	-.578***	.216***	-.515***
AttitudeTowardAd				1	.727***	.749***	.082	.659***
AttitudeTowardBehavior					1	.608***	-.026	.602***
NarrativeEngagement						1	.217***	.704***
Guilt							1	.256***
StateEmpathy								1

*** $p < .001$

Testing for indirect effects. To test for indirect effects, the bootstrapping method popularized by Preacher, Hayes and colleagues was employed. Analyses of mediation are concerned primarily with the series of causes and effects in paths from an input variable to an output variable, governed by the presence of one or more intervening variables. This process contributes to theory primarily by determining causal relationships among a series of variables.

Several methods exist for testing indirect effects with either single or multiple mediators. The most common method is Baron and Kenny's (1986) causal steps approach, in which the researcher confirms a number of causal paths through simple mediation analyses. To satisfy mediation, and thus causality, there must be a significant path from the predictor to the mediator (a path in Figure 3, below), from the mediator to the criterion (b path), and from the predictor through the mediator to the criterion (c path, or ab). Moreover, when controlling for the mediator, the path from predictor to criterion (c' path) must be zero (complete mediation) or reduced (partial mediation).

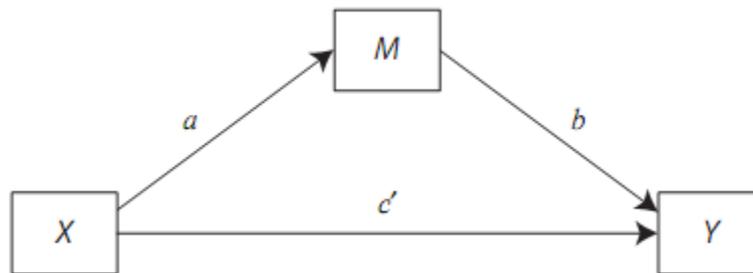


Figure 3. *Indirect Effect of X on Y, Mediated by M (diagram from Preacher & Hayes, 2008a)*

While the Baron and Kenny approach is most prevalent in the communication literature, it is beset by a number of concerns such as focusing on the arguably arbitrary a and b paths, rather than the c path; indeed, Preacher and Hayes (2008b) note that a significant direct (i.e., unmediated) effect of X on Y is not required for there to be a significant indirect (i.e., mediated) effect of X on Y , yet the unmediated effect (the c path) is a requirement under the Baron and Kenny method. This difference may be semantic, however, and Hayes notes that whether you call it mediation or an indirect effect matters less than what the data tell us about theory.

The more pressing concern regarding the causal steps approach is potential error inflation. Using a single-mediator, simple mediation model requires the researcher to conduct a series of tests for models with multiple single-step mediators or multiple-step mediators. Conducting multiple tests inflates the likelihood of Type I error, necessitating Type I error corrections which, in turn, increase Type II error rate and decrease power. Studies comparing the power of various mediation methods consistently find that the causal-steps approach has lower power than other approaches. Underpowered designs pose a substantial threat to communication research by potentially failing to detect meaningful and significant effects at the expense of rigorous internal control.

Preacher and Hayes (2008a) discuss several advantages to considering multiple mediators in a single model, such as enabling the researcher to tease out unique individual effects while controlling for other intervening variables. In the complex world of human communication, these models more closely stimulate or approximate real-world contexts than simple mediation models. For example, models such as the single-step multiple mediation model (Figure 4) allow for the combined influence of multiple intervening factors.

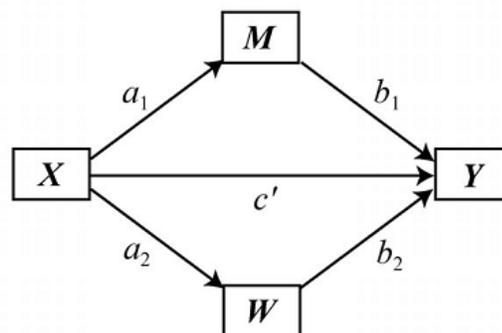


Figure 4. A *Single-Step Multiple Mediator Model with Two Proposed Mediators* (Hayes, 2009)

Of particular interest for this study, the bootstrapping method can be used to test for multiple *and* sequential intervening factors, (Hayes, Preacher & Myers, in press; illustrated by Figure 5, below), such as examining the causal chain from a message feature like narrative (X) to narrative engagement (M_1) to reactance (M_2) to message outcomes (Y). The causal-steps approach does not allow for multiple-step mediation models in a single test.

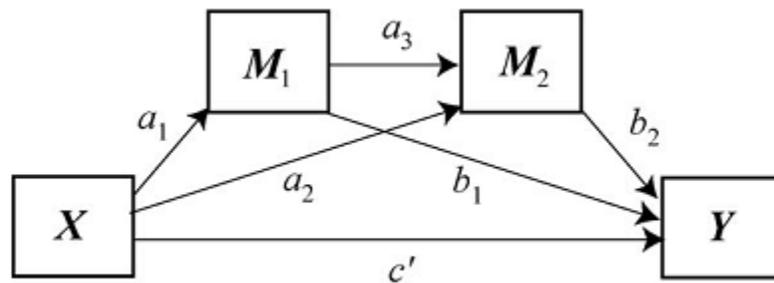


Figure 5. A Multiple-Step Multiple Mediator Model with Two Proposed Mediators (Hayes, 2009)

Methods such as SEM and the Sobel test have advanced the Baron & Kenny approach and are able to quantify indirect effects and multiple-step mediation models, generally by calculating standard error for the estimated indirect paths (i.e., the ab path that is the product of a and b paths). While these tests increase power by requiring fewer individual null hypothesis tests, they rely on assumptions of normally-distributed data. Bootstrapping, conversely, is robust against non-normality, and appropriate for smaller sample sizes, such as the one in this study.

In response to concerns about power, sample size, and normality, Hayes and Preacher (2006; Preacher & Hayes, 2008b) introduced the bootstrapping method of

testing for indirect effects. This method essentially considers the experimental sample a “pseudo-population,” from which thousands of samples are drawn to create an empirical representation of the theoretical distribution of indirect effects. Members of the “population” are sampled with replacement, meaning that after an individual is selected, she or he re-enters the original sample and can be selected again. Bootstrapping re-samples k times to create k theoretical sampling distributions of the estimated indirect effects in the population (for this study, k was set to 2000). Doing this creates an empirical representation of the theoretical distribution of the total and specific indirect effects (i.e., the total indirect effect of X on Y mediated by intervening variables, and the specific indirect effect of any one mediated path from X to Y), which is used to compute confidence intervals that quantify the indirect effect. When these intervals do not capture zero, the specific indirect effect is considered significant, and mediation is said to occur. Hayes provides a number of SPSS macros to enable testing different mediation models with bootstrapping (see <http://www.comm.ohio-state.edu/ahayes/macros.htm>).

For this experiment, several models were used, including simple mediation models (e.g., narrative > narrative engagement > reactance), single-step multiple mediation models (e.g., other-referencing > guilt arousal, state empathy > reactance), and multiple-step models with two mediators⁸ (e.g. other-referencing > guilt arousal > reactance > behavioral intention), to test for causal processes.

⁸ At the time of this writing, available bootstrapping methods can estimate only two multiple-step mediators in a single model. Analyses will be re-examined as more sophisticated macros are introduced.

Tests of hypotheses and research questions

Direct effects on state reactance. Main effects and interactions between the predictors on state reactance were tested with a 2 (narrative/non-narrative) x 2 (other-referencing/self-referencing) x 2 (message) x 4 (order) repeated measures factorial ANOVA. Order was the only between-subjects factor. Dependent variables included (presented in order of the results that follow) combined state reactance, perceived threat to choice, counter-arguing, cognitive appraisal, and state anger.

H1 predicted that controlling messages that incorporate narrative delivery style, compared to non-narrative controlling messages, will elicit reduced state reactance, including (a) lower perceived threat to choice, (b) less counter-arguing, (c) less negative cognitive appraisals, and (d) less state anger. H2 predicted an identical pattern for messages that incorporate other-referencing, compared to self-referencing messages. These hypotheses were strongly supported on all counts, as detailed over the following pages. First, there was a highly significant effect of narrative on the combined measure for state reactance ($F_{(1, 51)} = 20.121, p < .001, \eta^2_{\text{part}} = .283$, see Table 5a), such that narrative messages ($M = 3.61$) elicited less reactance than did non-narrative messages ($M = 3.96$) (see Table 5b). There was also a significant effect of referencing style on state reactance ($F_{(1, 51)} = 13.207, p = .001, \eta^2_{\text{part}} = .206$, see Table 5a), such that other-referencing messages ($M = 3.62$) elicited less reactance than did self-referencing messages ($M = 3.95$) (see Table 5b).

Table 5a. Analysis of Variance for Narrative and Referencing by Message and Order on Combined State Reactance

Source	Type III SS	df	MS	F	p	η^2_{part}	obs. power
<i>Within-subjects factors</i>							
Narrative	13.510	1	13.510	20.121	.000	.283	.993
Narrative * Order	9.008	3	3.003	4.472	.007	.208	.854
Error (Narrative)	34.243	51	.671				
Referencing	12.284	1	12.284	9.817	.003	.161	.867
Referencing * Order	13.476	3	4.492	3.590	.020	.174	.760
Error (Referencing)	63.817	51	1.251				
Message	5.583	1	5.583	5.520	.023	.098	.635
Message * Order	6.360	3	2.120	2.096	.112	.110	.505
Error (Message)	51.574	51	1.011				
Narrative * Referencing	10.013	1	10.013	13.207	.001	.206	.946
Narrative * Referencing * Order	6.554	3	2.185	2.882	.045	.145	.655
Error (Narrative * Referencing)	38.665	51	.758				
Narrative * Message	2.880	1	2.880	2.993	.090	.055	.397
Narrative * Message * Order	5.265	3	1.755	1.824	.154	.097	.446
Error (Narrative * Message)	49.060	51	.962				
Referencing * Message	.881	1	.881	.895	.349	.017	.153
Referencing * Message * Order	24.596	3	8.199	8.323	.000	.329	.989
Error (Referencing * Message)	50.240	51	.985				
Narrative * Referencing * Message	.094	1	.094	.118	.733	.002	.063
Narrative * Referencing * Message * Order	1.275	3	.425	.535	.660	.031	.152
Error (Narrative * Referencing * Message)	40.465	51	.793				
<i>Between-subjects factors</i>							
Order	16.611	3	5.537	.505	.680	.029	.146
Error	558.795	51	10.957				

Table 5b. Means and Standard Deviations by Condition for Combined State Reactance

Condition	<i>N</i>	<i>M</i>	<i>S.D.</i>
Narrative Other Exercise	55	3.31	1.44
Narrative Other Diet	55	3.83	1.42
Narrative Self Exercise	55	3.56	1.54
Narrative Self Diet	55	3.76	1.53
Non-narrative Other Exercise	55	3.52	1.53
Non-narrative Other Diet	55	3.72	1.55
Non-narrative Self Exercise	55	4.29	1.39
Non-narrative Self Diet	55	4.25	1.57

Perceived threat to choice. The pattern of results for the combined reactance measure held for the individual components of state reactance, as well. While all messages were generally perceived as threatening to personal freedom (i.e., means averaged above 4 on a seven-point scale), there were significant differences by condition. Compared to non-narratives, narrative messages predicted lower perceived threat to choice ($F_{(1, 51)} = 24.535, p < .001, \eta^2_{\text{part}} = .325; M_{\text{narr}} = 4.57, M_{\text{non-narr}} = 4.90$). Additionally, compared to self-referencing messages, other-referencing messages predicted lower perceived threat to choice ($F_{(1, 51)} = 5.226, p = .026, \eta^2_{\text{part}} = .093; M_{\text{other}} = 4.63, M_{\text{self}} = 4.85$). Tables 6a and 6b provide the ANOVA table and descriptive statistics for this test.

Table 6a. *Analysis of Variance for Narrative and Referencing by Message and Order on Perceived Threat to Choice*

Source	Type III SS	df	MS	F	p	η^2_{part}	obs. power
<i>Within-subjects factors</i>							
Narrative	12.189	1	12.189	24.535	.000	.325	.998
Narrative * Order	6.421	3	2.140	4.309	.009	.202	.839
Error (Narrative)	25.336	51	.497				
Referencing	5.236	1	5.236	5.226	.026	.093	.611
Referencing * Order	7.070	3	2.357	2.352	.083	.122	.557
Error (Referencing)	51.097	51	1.002				
Message	5.209	1	5.209	5.065	.029	.090	.598
Message * Order	2.432	3	.811	.788	.506	.044	.208
Error (Message)	52.456	51	1.029				
Narrative * Referencing	9.109	1	9.109	10.375	.002	.169	.885
Narrative * Referencing * Order	2.391	3	.797	.908	.444	.051	.235
Error (Narrative * Referencing)	44.775	51	.878				
Narrative * Message	4.448	1	4.448	4.069	.049	.074	.508
Narrative * Message * Order	2.697	3	.899	.822	.488	.046	.216
Error (Narrative * Message)	55.748	51	1.093				
Referencing * Message	.195	1	.195	.278	.600	.005	.081
Referencing * Message * Order	14.461	3	4.820	6.867	.001	.288	.968
Error (Referencing * Message)	35.800	51	.702				
Narrative * Referencing * Message	.153	1	.153	.198	.658	.004	.072
Narrative * Referencing * Message * Order	1.277	3	.426	.548	.652	.031	.155
Error (Narrative * Referencing * Message)	39.575	51	.776				
<i>Between-subjects factors</i>							
Order	34.418	3	11.473	.952	.423	.053	.245
Error	614.820	51	12.055				

Table 6b. Means and Standard Deviations by Condition for Perceived Threat to Choice

Condition	<i>N</i>	<i>M</i>	<i>S.D.</i>
Narrative Other Exercise	55	4.43	1.56
Narrative Other Diet	55	4.79	1.51
Narrative Self Exercise	55	4.35	1.58
Narrative Self Diet	55	4.80	1.60
Non-narrative Other Exercise	55	4.63	1.51
Non-narrative Other Diet	55	4.70	1.63
Non-narrative Self Exercise	55	5.18	1.24
Non-narrative Self Diet	55	5.18	1.45

Counter-arguing and cognitive appraisal. In terms of cognitive reactions, narratives led to significantly less counter-arguing ($F_{(1, 51)} = 4.498, p = .039, \eta^2_{\text{part}} = .081$; $M_{\text{narr}} = 3.24, M_{\text{non-narr}} = 3.50$) and more positive cognitive appraisals ($F_{(1, 51)} = 20.506, p < .001, \eta^2_{\text{part}} = .287$; $M_{\text{narr}} = 4.50, M_{\text{non-narr}} = 4.12$) than did non-narrative messages. In a similar fashion, other-referencing messages led to significantly less counter-arguing ($F_{(1, 51)} = 8.490, p = .005, \eta^2_{\text{part}} = .143$; $M_{\text{other}} = 3.18, M_{\text{self}} = 3.56$) and more positive cognitive appraisals ($F_{(1, 51)} = 9.409, p = .003, \eta^2_{\text{part}} = .156$; $M_{\text{other}} = 4.48, M_{\text{self}} = 4.13$) than did self-referencing messages. Tables 7a and 7b provide the ANOVA table and descriptive statistics for the counter-arguing test. Tables 8a and 8b provide information for the cognitive appraisal test.

Table 7a. *Analysis of Variance for Narrative and Referencing by Message and Order on Counter-arguing*

Source	Type III SS	df	MS	F	p	η^2_{part}	obs. power
<i>Within-subjects factors</i>							
Narrative	7.652	1	7.652	4.498	.039	.081	.548
Narrative * Order	15.229	3	5.076	2.984	.040	.149	.672
Error (Narrative)	86.767	51	1.701				
Referencing	15.845	1	15.845	8.490	.005	.143	.816
Referencing * Order	18.594	3	6.198	3.321	.027	.163	.723
Error (Referencing)	95.183	51	1.866				
Message	4.467	1	4.467	2.210	.143	.042	.308
Message * Order	3.813	3	1.271	.629	.600	.036	.172
Error (Message)	103.060	51	2.021				
Narrative * Referencing	8.989	1	8.989	5.332	.025	.095	.620
Narrative * Referencing * Order	4.540	3	1.513	.898	.449	.050	.233
Error (Narrative * Referencing)	85.979	51	1.686				
Narrative * Message	2.122	1	2.122	1.644	.206	.031	.242
Narrative * Message * Order	4.145	3	1.382	1.070	.370	.059	.273
Error (Narrative * Message)	65.821	51	1.291				
Referencing * Message	4.054	1	4.054	2.328	.133	.044	.322
Referencing * Message * Order	36.396	3	12.132	6.966	.001	.291	.971
Error (Referencing * Message)	88.825	51	1.742				
Narrative * Referencing * Message	.369	1	.369	.258	.614	.005	.079
Narrative * Referencing * Message * Order	3.287	3	1.096	.764	.520	.043	.202
Error (Narrative * Referencing * Message)	73.153	51	1.434				
<i>Between-subjects factors</i>							
Order	23.328	3	7.776	.406	.750	.023	.125
Error	977.390	51	19.165				

Table 7b. *Means and Standard Deviations by Condition for Counter-arguing*

Condition	<i>N</i>	<i>M</i>	<i>S.D.</i>
Narrative Other Exercise	55	2.85	1.92
Narrative Other Diet	55	3.46	2.01
Narrative Self Exercise	55	3.30	2.01
Narrative Self Diet	55	3.32	2.00
Non-narrative Other Exercise	55	2.99	1.95
Non-narrative Other Diet	55	3.27	1.92
Non-narrative Self Exercise	55	3.89	1.93
Non-narrative Self Diet	55	3.75	2.06

Table 8a. *Analysis of Variance for Narrative and Referencing by Message and Order on Cognitive Appraisal*

Source	Type III SS	df	MS	F	p	η^2_{part}	obs. power
<i>Within-subjects factors</i>							
Narrative	15.366	1	15.366	20.506	.000	.287	.993
Narrative * Order	11.259	3	3.753	5.008	.004	.228	.894
Error (Narrative)	38.217	51	.749				
Referencing	13.148	1	13.148	9.409	.003	.156	.853
Referencing * Order	19.967	3	6.656	4.763	.005	.219	.877
Error (Referencing)	71.267	51	1.397				
Message	6.757	1	6.757	5.711	.021	.101	.650
Message * Order	3.980	3	1.327	1.121	.349	.062	.285
Error (Message)	60.339	51	1.183				
Narrative * Referencing	8.821	1	8.821	13.650	.001	.211	.952
Narrative * Referencing * Order	7.637	3	2.546	3.939	.013	.188	.802
Error (Narrative * Referencing)	32.957	51	.646				
Narrative * Message	4.527	1	4.527	3.620	.063	.066	.463
Narrative * Message * Order	9.105	3	3.035	2.427	.076	.125	.572
Error (Narrative * Message)	63.772	51	1.250				
Referencing * Message	3.644	1	3.644	3.184	.080	.059	.417
Referencing * Message * Order	17.510	3	5.837	5.101	.004	.231	.900
Error (Referencing * Message)	58.360	51	1.144				
Narrative * Referencing * Message	.018	1	.018	.017	.898	.000	.052
Narrative * Referencing * Message * Order	.285	3	.095	.088	.966	.005	.065
Error (Narrative * Referencing * Message)	55.309	51	1.084				
<i>Between-subjects factors</i>							
Order	15.820	3	5.273	.678	.569	.038	.183
Error	396.562	51	7.776				

Table 8b. Means and Standard Deviations by Condition for Cognitive Appraisal

Condition	<i>N</i>	<i>M</i>	<i>S.D.</i>
Narrative Other Exercise	55	4.88	1.33
Narrative Other Diet	55	4.23	1.28
Narrative Self Exercise	55	4.52	1.42
Narrative Self Diet	55	4.33	1.45
Non-narrative Other Exercise	55	4.60	1.51
Non-narrative Other Diet	55	4.32	1.44
Non-narrative Self Exercise	55	3.74	1.36
Non-narrative Self Diet	55	3.89	1.51

State anger. In terms of affective reactions to these controlling messages, narratives elicited significantly less state anger than did non-narratives ($F_{(1, 51)} = 10.641$, $p = .002$, $\eta^2_{\text{part}} = .173$; $M_{\text{narr}} = 2.83$, $M_{\text{non-narr}} = 3.26$). Other-referencing messages similarly predicted less state anger ($F_{(1, 51)} = 9.383$, $p = .003$, $\eta^2_{\text{part}} = .155$; $M_{\text{other}} = 2.83$, $M_{\text{self}} = 3.26$) than did self-referencing messages. Tables 9a and 9b below provide the ANOVA table and descriptive statistics for this test.

Table 9a. *Analysis of Variance for Narrative and Referencing by Message and Order on State Anger*

Source	Type III SS	df	MS	F	p	η^2_{part}	obs. power
<i>Within-subjects factors</i>							
Narrative	20.295	1	20.295	10.641	.002	.173	.893
Narrative * Order	12.810	3	4.270	2.239	.095	.116	.535
Error (Narrative)	97.267	51	1.907				
Referencing	20.158	1	20.158	9.383	.003	.155	.852
Referencing * Order	13.820	3	4.607	2.144	.106	.112	.515
Error (Referencing)	109.572	51	2.148				
Message	5.778	1	5.778	3.809	.056	.069	.482
Message * Order	36.359	3	12.120	7.988	.000	.320	.986
Error (Message)	77.374	51	1.517				
Narrative * Referencing	14.324	1	14.324	11.109	.002	.179	.905
Narrative * Referencing * Order	19.340	3	6.447	5.000	.004	.227	.893
Error (Narrative * Referencing)	65.755	51	1.289				
Narrative * Message	.661	1	.661	.337	.564	.007	.088
Narrative * Message * Order	10.986	3	3.662	1.866	.147	.099	.455
Error (Narrative * Message)	100.089	51	1.963				
Referencing * Message	.170	1	.170	.075	.785	.001	.058
Referencing * Message * Order	43.950	3	14.650	6.478	.001	.276	.959
Error (Referencing * Message)	115.327	51	2.261				
Narrative * Referencing * Message	1.352	1	1.352	1.159	.287	.022	.184
Narrative * Referencing * Message * Order	3.634	3	1.211	1.038	.384	.058	.265
Error (Narrative * Referencing * Message)	59.489	51	1.166				
<i>Between-subjects factors</i>							
Order	78.167	3	26.056	1.426	.246	.077	.356
Error	932.186	51	18.278				

Table 9b. *Means and Standard Deviations by Condition for State Anger*

Condition	<i>N</i>	<i>M</i>	<i>S.D.</i>
Narrative Other Exercise	55	2.52	1.94
Narrative Other Diet	55	2.97	2.00
Narrative Self Exercise	55	2.85	1.94
Narrative Self Diet	55	2.91	1.97
Non-narrative Other Exercise	55	2.73	1.95
Non-narrative Other Diet	55	2.90	2.09
Non-narrative Self Exercise	55	3.54	2.01
Non-narrative Self Diet	55	3.69	2.30

Interaction of predictors on state reactance. RQ1 asked whether narrative and other-referencing would interact in their attenuation of state reactance. The interaction between narrative and other-referencing on state reactance was indeed significant ($F_{(1, 51)} = 13.207, p = .001, \eta^2_{\text{part}} = .206$, see Table 5a). As Figure 6 illustrates, state reactance was greatest in response to non-narrative, self-referencing messages ($M = 4.28$), indicating that they were the least effective at attenuating resistance to persuasion. Mean reactance scores were lowest for narrative, other-referencing messages ($M = 3.59$), although this was only slightly lower than the averages for narrative self-referencing messages ($M = 3.62$) and non-narrative other-referencing messages ($M = 3.64$) (Table 10).

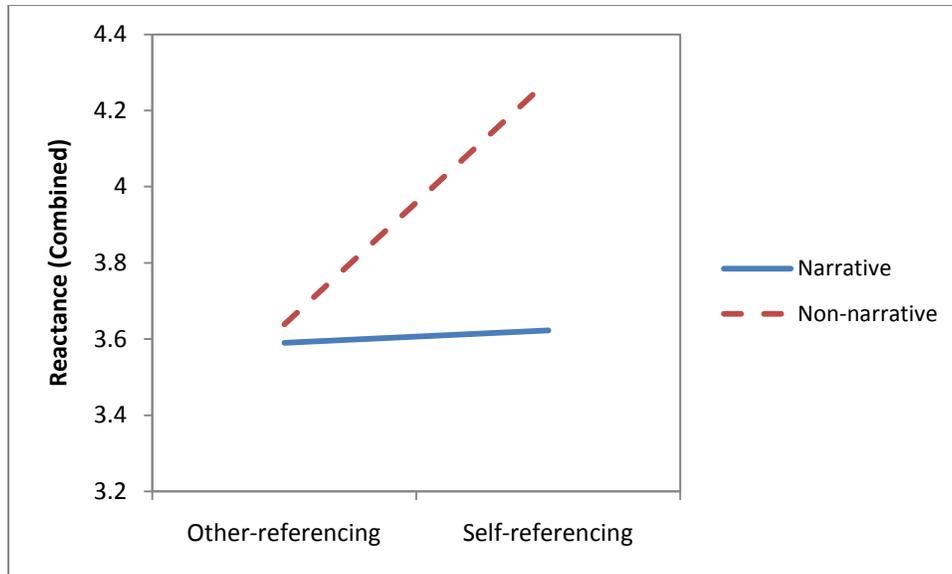


Figure 6. *Interaction of Narrative and Referencing on Combined Reactance*

This interaction held for the individual components of reactance, including perceived threat to choice ($F_{(1, 51)} = 10.375$, $p = .002$, $\eta^2_{\text{part}} = .169$, see Tables 6a and 6b), counter-arguing ($F_{(1, 51)} = 5.332$, $p = .025$, $\eta^2_{\text{part}} = .095$, see Tables 7a and 7b), cognitive appraisal ($F_{(1, 51)} = 13.650$, $p = .001$, $\eta^2_{\text{part}} = .211$, see Tables 8a and 8b), and state anger ($F_{(1, 51)} = 11.109$, $p = .002$, $\eta^2_{\text{part}} = .179$, see tables 9a and 9b). With each of these dependent variables, non-narrative self-referencing messages were considerably less effective than the other message combinations, as indicated by Table 10 and Figures 7-10. The figures illustrate this pattern of interactions, as well as the main effects on state reactance discussed in the previous paragraphs.

Table 10. Means and Standard Errors by Condition for Interactions on Reactance

<i>Dependent variable</i>	<i>Narrative Other-ref</i>	<i>Narrative Self-ref</i>	<i>Non-narrative Other-ref</i>	<i>Non-narrative Self-ref</i>
	<i>M (s.e.)</i>	<i>M (s.e.)</i>	<i>M (s.e.)</i>	<i>M (s.e.)</i>
Reactance (combined)	3.59 (.18)	3.62 (.18)	3.64 (.18)	4.23 (.17)
Perceived threat to choice	4.60 (.19)	4.54 (.19)	4.65 (.19)	5.16 (.16)
Counter-arguing	3.19 (.24)	3.28 (.25)	3.17 (.22)	3.84 (.23)
Cognitive Appraisal	4.53 (.14)	4.46 (.15)	4.44 (.17)	3.80 (.17)
State Anger	2.80 (.23)	2.86 (.22)	2.87 (.24)	3.66 (.24)

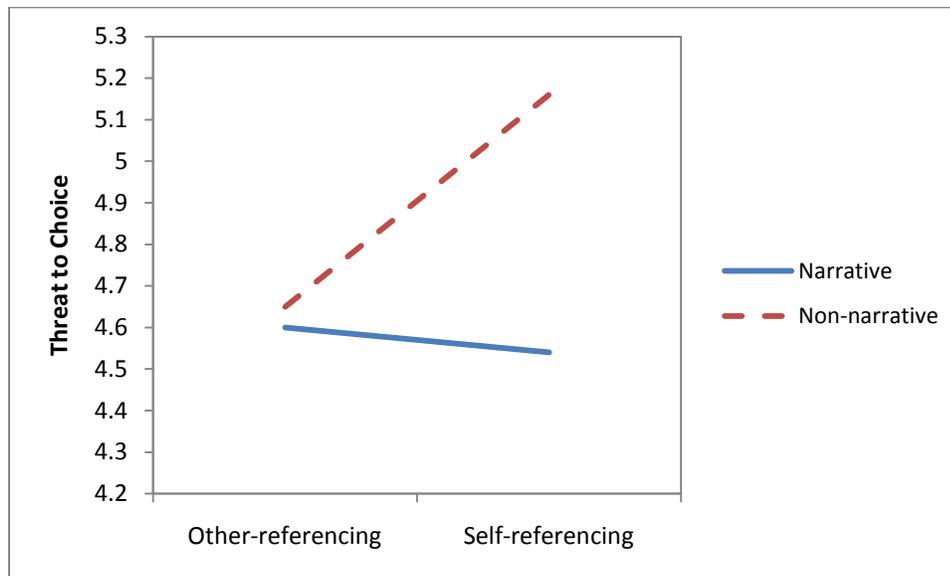


Figure 7. Interaction of Narrative and Referencing on Perceived Threat to Choice

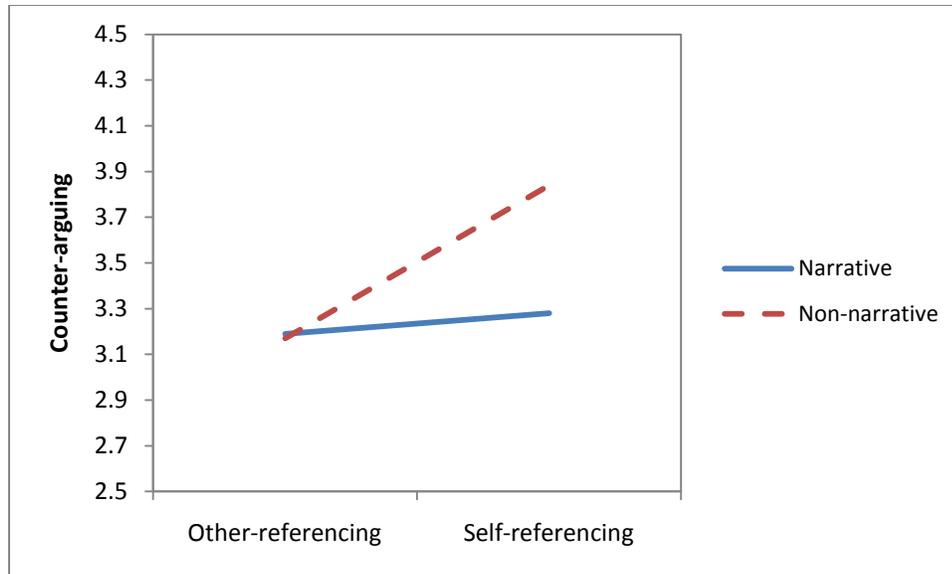


Figure 8. *Interaction of Narrative and Referencing on Counter-arguing*

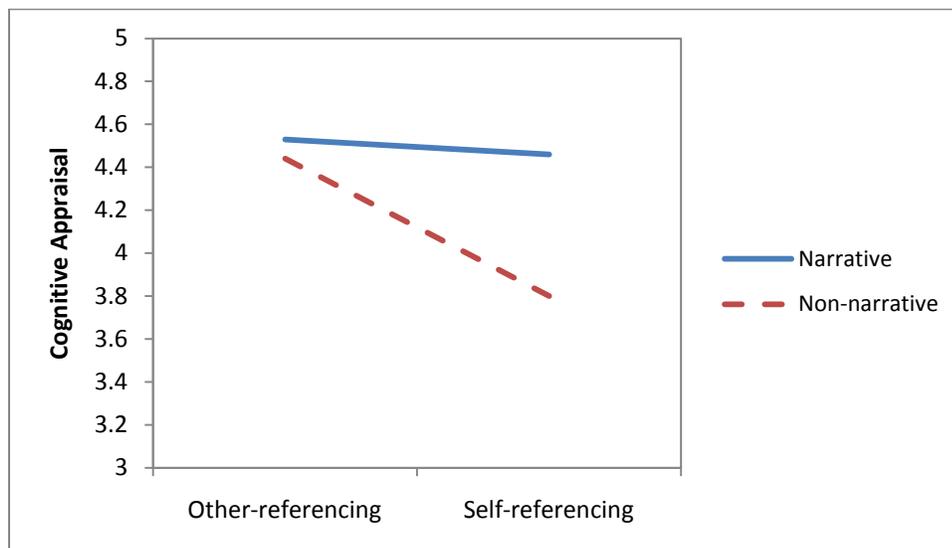


Figure 9. *Interaction of Narrative and Referencing on Cognitive Appraisal*

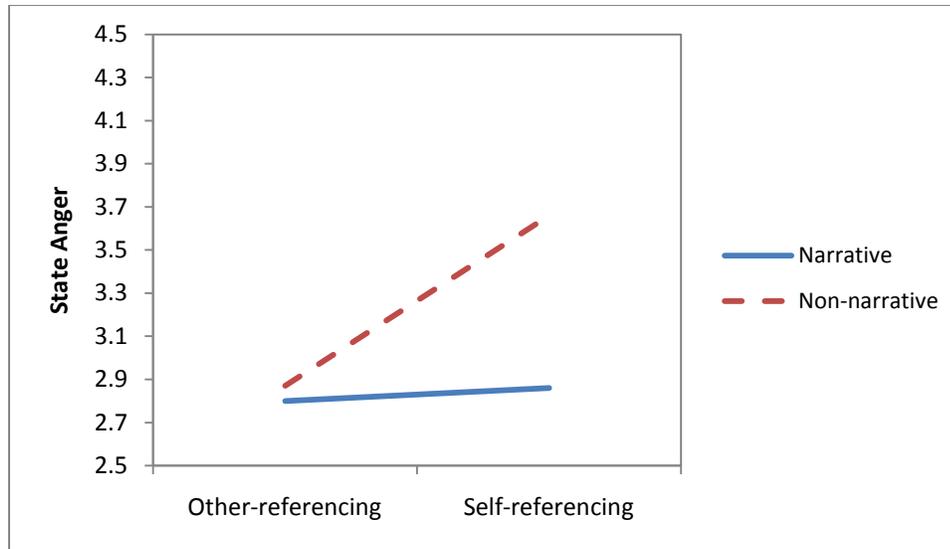


Figure 10. *Interaction of Narrative and Referencing on State Anger*

Influence of control factors. In terms of control factors in the experimental design, the main effect of order was not significant for any of the state reactance variables, although this may be due to very low power for this between-subjects factor. Although not hypothesized, message topic had a significant influence on most reactance measures, including combined reactance ($F_{(1, 51)} = 5.520, p = .023, \eta^2_{\text{part}} = .098$), perceived threat to choice ($F_{(1, 51)} = 5.065, p = .029, \eta^2_{\text{part}} = .090$), and cognitive appraisal ($F_{(1, 51)} = 5.711, p = .021, \eta^2_{\text{part}} = .101$). The effect of message topic on state anger approached significance ($F_{(1, 51)} = 3.809, p = .056, \eta^2_{\text{part}} = .069$) (see Tables 5a, 6a, 8a, and 9a, respectively for ANOVA tables). Resistance was greater for diet messages than for exercise messages; compared to exercise messages, diet messages led to greater combined reactance ($M_{\text{diet}} = 3.90, M_{\text{exercise}} = 3.67$), were perceived as more threatening to personal freedom ($M_{\text{diet}} = 4.85, M_{\text{exercise}} = 4.63$), elicited more negative cognitive appraisals ($M_{\text{diet}} = 4.18, M_{\text{exercise}} =$

4.43), and marginally induced greater state anger ($M_{diet} = 3.16$, $M_{exercise} = 2.93$) (see Tables 5b, 6b, 8b, and 9b, respectively for descriptive statistics by condition).

Direct effects on message acceptance. Main effects and interactions between the predictors on message acceptance measures were tested with a 2 (narrative/non-narrative) x 2 (other-referencing/self-referencing) x 2 (message) x 4 (order) repeated measures factorial ANOVA. Order was the only between-subjects factor. Dependent variables included (presented in order of the results that follow) attitude toward the message, attitude toward the behavior advocated by the message, and intended compliance with the message's recommendation.

H3 predicted that controlling messages that incorporate narrative delivery style, compared to non-narrative controlling messages, will lead to greater message acceptance, including (a) greater intended compliance with the message's recommendation, (b) more positive attitudes toward the message, and (c) more positive attitudes toward the behavior advocated by the message. H4 predicted an identical pattern of results for other-referencing messages, compared to self-referencing messages. As detailed below, these hypotheses were partially supported; the predictors significantly impacted attitudes (b, c) but not necessarily likelihood of behavioral compliance with the message's recommendation (a).

Attitudes toward the message and its advocacy. In terms of attitudinal responses, both narrative and other-referencing had significant and substantial influence. Compared to non-narratives, narrative messages predicted significantly more positive attitudes toward the message ($F_{(1, 49)} = 22.315$, $p < .001$, $\eta^2_{part} = .313$; $M_{narr} = 4.56$, $M_{non-narr} =$

4.02) and the behaviors it advocates ($F_{(1, 49)} = 6.927, p = .011, \eta^2_{\text{part}} = .124; M_{narr} = 5.34, M_{non-narr} = 5.09$). Additionally, compared to self-referencing messages, other-referencing messages predicted significantly more positive attitudes toward the message ($F_{(1, 49)} = 9.941, p = .003, \eta^2_{\text{part}} = .169; M_{other} = 4.56, M_{self} = 4.02$) and its advocacy ($F_{(1, 49)} = 4.923, p = .031, \eta^2_{\text{part}} = .091; M_{other} = 5.34, M_{self} = 5.08$). Tables 11a and 11b provide the ANOVA and descriptive statistics for attitudes toward the message. Tables 12a and 12b provide the ANOVA and descriptive statistics for attitudes toward the message advocacy.

Table 11a. *Analysis of Variance for Narrative and Referencing by Message and Order on Attitude toward the Message*

Source	Type III SS	df	MS	F	p	η^2_{part}	obs. power
<i>Within-subjects factors</i>							
Narrative	30.606	1	30.606	22.315	.000	.313	.996
Narrative * Order	10.444	3	3.481	2.538	.067	.134	.592
Error (Narrative)	67.207	49	1.372				
Referencing	29.784	1	29.784	9.941	.003	.169	.871
Referencing * Order	34.418	3	11.473	3.829	.015	.190	.788
Error (Referencing)	146.803	49	2.996				
Message	4.285	1	4.285	1.860	.179	.037	.267
Message * Order	23.559	3	7.853	3.409	.025	.173	.734
Error (Message)	112.873	49	2.304				
Narrative * Referencing	18.550	1	18.550	9.513	.003	.163	.856
Narrative * Referencing * Order	4.811	3	1.604	.822	.488	.048	.215
Error (Narrative * Referencing)	95.554	49	1.950				
Narrative * Message	.000	1	.000	.000	.996	.000	.050
Narrative * Message * Order	8.985	3	2.995	1.206	.317	.069	.304
Error (Narrative * Message)	121.664	49	2.483				
Referencing * Message	1.645	1	1.645	.953	.334	.019	.160
Referencing * Message * Order	34.462	3	11.487	6.655	.001	.289	.963
Error (Referencing * Message)	84.582	49	1.726				
Narrative * Referencing * Message	1.719	1	1.719	.965	.331	.019	.161
Narrative * Referencing * Message * Order	5.533	3	1.844	1.035	.385	.060	.264
Error (Narrative * Referencing * Message)	87.302	49	1.782				
<i>Between-subjects factors</i>							
Order	11.874	3	3.958	.235	.872	.014	.091
Error	825.430	49	16.846				

Table 11b. *Means and Standard Deviations by Condition for Attitude toward the Message*

Condition	<i>N</i>	<i>M</i>	<i>S.D.</i>
Narrative Other Exercise	53	4.89	1.90
Narrative Other Diet	53	4.41	1.92
Narrative Self Exercise	53	4.37	1.98
Narrative Self Diet	53	4.50	1.96
Non-narrative Other Exercise	53	4.72	2.12
Non-narrative Other Diet	53	4.36	2.00
Non-narrative Self Exercise	53	3.60	2.00
Non-narrative Self Diet	53	3.47	2.15

Table 12a. Analysis of Variance for Narrative and Referencing by Message and Order on Attitude toward the Message Advocacy

Source	Type III SS	df	MS	F	p	η^2_{part}	obs. power
<i>Within-subjects factors</i>							
Narrative	6.577	1	6.577	6.927	.011	.124	.732
Narrative * Order	2.137	3	.712	.750	.527	.044	.199
Error (Narrative)	46.525	49	.949				
Referencing	7.122	1	7.122	4.923	.031	.091	.585
Referencing * Order	6.996	3	2.332	1.612	.199	.090	.397
Error (Referencing)	70.889	49	1.447				
Message	.139	1	.139	.161	.690	.003	.068
Message * Order	5.440	3	1.813	2.097	.113	.114	.504
Error (Message)	42.368	49	.865				
Narrative * Referencing	5.954	1	5.954	10.231	.002	.173	.880
Narrative * Referencing * Order	5.749	3	1.916	3.293	.028	.168	.718
Error (Narrative * Referencing)	28.516	49	.582				
Narrative * Message	.091	1	.091	.075	.785	.002	.058
Narrative * Message * Order	5.504	3	1.835	1.510	.224	.085	.374
Error (Narrative * Message)	59.557	49	1.215				
Referencing * Message	.014	1	.014	.014	.906	.000	.052
Referencing * Message * Order	11.886	3	3.962	3.857	.015	.191	.791
Error (Referencing * Message)	50.330	49	1.027				
Narrative * Referencing * Message	.225	1	.225	.262	.611	.005	.079
Narrative * Referencing * Message * Order	2.641	3	.880	1.024	.390	.059	.261
Error (Narrative * Referencing * Message)	42.134	49	.860				
<i>Between-subjects factors</i>							
Order	17.871	3	5.957	.646	.589	.038	.176
Error	452.014	49	9.225				

Table 12b. *Means and Standard Deviations by Condition for Attitude toward the Message Advocacy*

Condition	<i>N</i>	<i>M</i>	<i>S.D.</i>
Narrative Other Exercise	53	5.40	1.45
Narrative Other Diet	53	5.38	1.28
Narrative Self Exercise	53	5.22	1.41
Narrative Self Diet	53	5.38	1.44
Non-narrative Other Exercise	53	5.40	1.45
Non-narrative Other Diet	53	5.33	1.42
Non-narrative Self Exercise	53	4.87	1.36
Non-narrative Self Diet	53	4.84	1.61

Intended compliance with the message's recommendation. Four individual dependent measures were used to assess likelihood of compliance with the message's recommendations, including two physical activity items for (a) getting regular moderate exercise and (b) being more active in small, everyday ways, and two diet items for (c) eating fewer simple carbohydrates and (d) eating smaller portions.

Both narrative and other-referencing had significant influences on reported likelihood to engage in regular exercise. Intended compliance was greater in response to narrative ($M = 52.30$) than non-narrative ($M = 47.41$) messages ($F_{(1, 50)} = 4.959, p = .030, \eta^2_{\text{part}} = .090$), and in response to other-referencing ($M = 54.10$) compared to self-referencing ($M = 45.60$) messages ($F_{(1, 50)} = 6.330, p = .015, \eta^2_{\text{part}} = .112$, see Tables 13a and 13b). Only referencing style exerted a significant influence on intentions to be active in more general ways ($F_{(1, 50)} = 6.926, p = .011, \eta^2_{\text{part}} = .122$), such that likelihood was greater following other-referencing messages ($M = 58.01$) than for self-referencing messages ($M = 48.94$, see Tables 14a and 14b). The influence of narrative for this item approached significance ($F_{(1, 50)} = 3.311, p = .075, \eta^2_{\text{part}} = .062$), indicating a potential

advantage for narratives ($M = 55.56$) compared to non-narratives ($M = 51.39$, see Tables 14a and 14b).

Table 13a. *Analysis of Variance for Narrative and Referencing by Order on Behavioral Intentions – Exercise (Among Exercise Messages Only)*

Source	Type III SS	df	MS	F	p	η^2_{part}	obs. power
<i>Within-subjects factors</i>							
Narrative	1675.037	1	1675.037	4.959	.030	.090	.589
Narrative * Order	1991.712	3	663.904	1.966	.131	.105	.477
Error (Narrative)	16888.621	50	337.772				
Referencing	2809.567	1	2809.567	6.330	.015	.112	.694
Referencing * Order	6602.545	3	2200.848	4.959	.004	.229	.890
Error (Referencing)	22191.955	50	443.839				
Narrative * Referencing	10.102	1	10.102	.037	.848	.001	.054
Narrative * Referencing * Order	554.672	3	184.891	.680	.569	.039	.183
Error (Narrative * Referencing)	13598.532	50	271.971				
<i>Between-subjects factors</i>							
Order	13730.942	3	4576.981	1.274	.293	.071	.320
Error	179590.318	50	3591.806				

Table 13b. *Means and Standard Deviations by Condition for Behavioral Intentions – Exercise*

Condition	N	M	S.D.
Narrative Other Exercise	54	56.26	35.03
Narrative Self Exercise	54	48.33	33.53
Non-narrative Other Exercise	54	51.94	36.23
Non-narrative Self Exercise	54	42.87	33.91

Table 14a. *Analysis of Variance for Narrative and Referencing by Order on Behavioral Intentions – Being Active in Small Ways (Among Exercise Messages Only)*

Source	Type III SS	df	MS	F	p	η^2_{part}	obs. power
<i>Within-subjects factors</i>							
Narrative	1494.873	1	1494.873	3.311	.075	.062	.431
Narrative * Order	4943.474	3	1647.825	3.650	.019	.180	.767
Error (Narrative)	22573.526	50	451.471				
Referencing	2957.046	1	2957.046	6.926	.011	.122	.733
Referencing * Order	10336.999	3	3445.666	8.071	.000	.326	.986
Error (Referencing)	21346.205	50	426.924				
Narrative * Referencing	1667.492	1	1667.492	4.284	.044	.079	.528
Narrative * Referencing * Order	471.463	3	157.154	.404	.751	.024	.124
Error (Narrative * Referencing)	19463.407	50	389.268				
<i>Between-subjects factors</i>							
Order	11081.837	3	3693.946	1.371	.262	.076	.342
Error	134673.496	50	2693.470				

Table 14b. *Means and Standard Deviations by Condition for Behavioral Intentions – Being Active in Small Ways*

Condition	N	M	S.D.
Narrative Other Exercise	54	57.22	32.54
Narrative Self Exercise	54	53.89	30.82
Non-narrative Other Exercise	54	58.80	35.41
Non-narrative Self Exercise	54	43.98	31.31

Neither narrative nor referencing style had a significant influence on either of the diet-related intention items, nor did either effect approach significance, although observed power for these tests were low (i.e., power = .076, .131, .050, .349, see Tables 15a and 16a). Tables 15a and 15b provide the ANOVA and descriptive statistics for likelihood to eat fewer carbohydrates. Tables 16a and 16b provide the ANOVA and descriptive statistics intentions to eat smaller portions.

Although not predicted, this finding was in line with the effects of message topic on reactance reported earlier in this chapter; because participants were more reactant in response to diet messages than exercise messages, theory predicts that they would seek greater restoration (i.e., non-compliance) in response to those higher-reactance-inducing messages.

Table 15a. *Analysis of Variance for Narrative and Referencing by Order on Behavioral Intentions – Fewer Simple Carbohydrates (Among Diet Messages Only)*

Source	Type III SS	df	MS	F	p	η^2_{part}	obs. power
<i>Within-subjects factors</i>							
Narrative	47.618	1	47.618	.229	.634	.004	.076
Narrative * Order	1011.824	3	337.275	1.622	.195	.086	.401
Error (Narrative)	10812.636	52	207.935				
Referencing	356.667	1	356.667	.704	.405	.013	.131
Referencing * Order	1169.363	3	389.788	.769	.516	.042	.204
Error (Referencing)	26349.919	52	506.729				
Narrative * Referencing	995.693	1	995.693	3.839	.055	.069	.485
Narrative * Referencing * Order	860.990	3	286.997	1.106	.355	.060	.281
Error (Narrative * Referencing)	13487.791	52	259.381				
<i>Between-subjects factors</i>							
Order	5777.444	3	1925.815	.648	.588	.036	.177
Error	154477.695	52	2970.725				

Table 15b. *Means and Standard Deviations by Condition for Behavioral Intentions – Fewer Simple Carbohydrates*

Condition	N	M	S.D.
Narrative Other Diet	56	51.05	29.64
Narrative Self Diet	56	52.55	33.35
Non-narrative Other Diet	56	53.71	28.26
Non-narrative Self Diet	56	47.59	33.18

Table 16a. *Analysis of Variance for Narrative and Referencing by Order on Behavioral Intentions – Smaller Portions (Among Diet Messages Only)*

Source	Type III SS	df	MS	F	p	η^2_{part}	obs. power
<i>Within-subjects factors</i>							
Narrative	.133	1	.133	.001	.978	.000	.050
Narrative * Order	1454.970	3	484.990	2.785	.050	.138	.639
Error (Narrative)	9055.169	52	174.138				
Referencing	1247.603	1	1247.603	2.566	.115	.047	.349
Referencing * Order	1118.179	3	372.726	.767	.518	.042	.203
Error (Referencing)	25279.281	52	486.140				
Narrative * Referencing	415.539	1	415.539	1.510	.225	.028	.226
Narrative * Referencing * Order	804.781	3	268.260	.975	.412	.053	.251
Error (Narrative * Referencing)	14307.179	52	275.138				
<i>Between-subjects factors</i>							
Order	4788.307	3	1596.102	.462	.710	.026	.137
Error	179783.688	52	3457.379				

Table 16b. *Means and Standard Deviations by Condition for Behavioral Intentions – Smaller Portions*

Condition	N	M	S.D.
Narrative Other Diet	56	51.71	30.60
Narrative Self Diet	56	49.34	34.11
Non-narrative Other Diet	56	53.89	29.97
Non-narrative Self Diet	56	46.82	36.10

Interactions of predictors on message acceptance. RQ2 asked whether narrative and other-referencing would interact to influence message acceptance. The interaction between narrative and other-referencing on attitude toward the message was significant ($F_{(1, 49)} = 9.513, p = .003, \eta^2_{part} = .163$, see Table 11a). As Figure 11 illustrates, participants had the most negative attitudes toward non-narrative self-referencing messages. Table 17 provides descriptive statistics by condition.

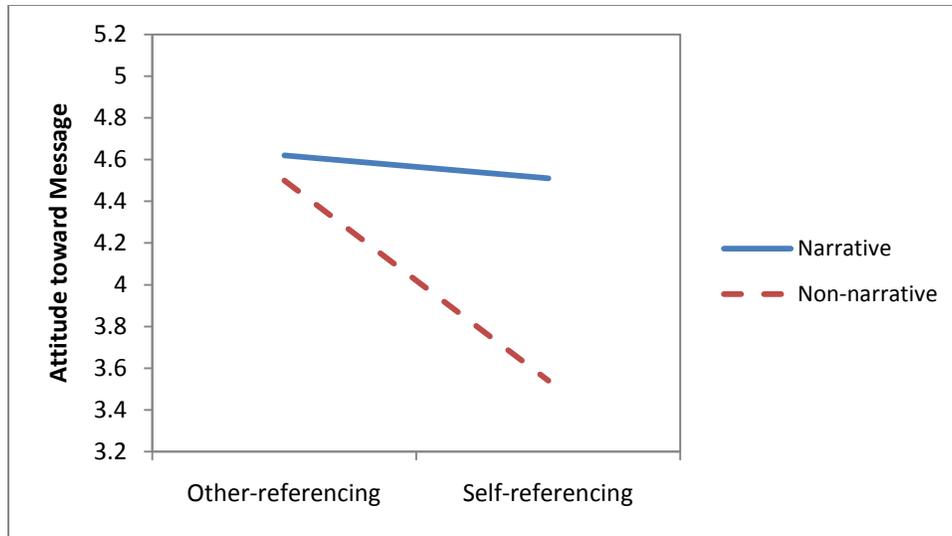


Figure 11. *Interaction of Narrative and Referencing on Attitude toward the Message*

Table 17. *Means and Standard Errors by Condition for Interactions on Message Acceptance*

	<i>Narrative Other-ref</i>	<i>Narrative Self-ref</i>	<i>Non-narr Other-ref</i>	<i>Non-narr Self-ref</i>
<i>Dependent variable</i>	<i>M (s.e.)</i>	<i>M (s.e.)</i>	<i>M (s.e.)</i>	<i>M (s.e.)</i>
Attitude toward the message	4.62 (.24)	4.51 (.223)	4.50 (.24)	3.54 (.24)
Attitude toward behaviors advocated by the message	5.35 (.16)	5.33 (.17)	5.34 (.17)	4.84 (.18)

The interaction between narrative and other-referencing on attitude toward the message's advocacy was also significant ($F_{(1, 49)} = 10.231, p = .002, \eta^2_{\text{part}} = .173$, see Table 12a). As Figure 12 illustrates (and Table 14 demonstrates numerically), non-narrative self-referencing messages elicited the most negative evaluations of diet and exercise behaviors of all conditions.

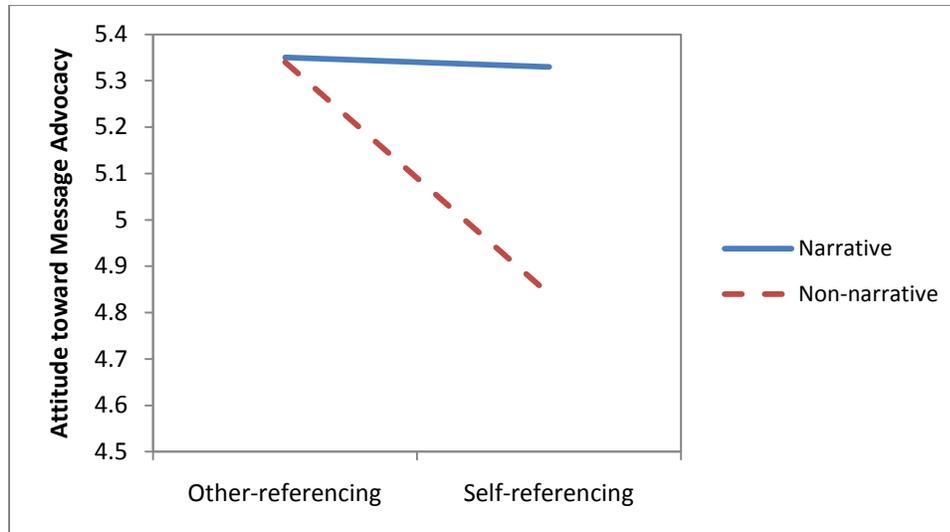


Figure 12. *Interaction of Narrative and Referencing on Attitude toward the Message's Advocacy*

Interactions were also tested on each of the four behavioral intention messages. Examining physical activity messages only, the interaction of narrative and other-referencing on reported intentions to be more active in small, everyday ways was significant ($F_{(1, 50)} = 4.284, p = .044, \eta^2_{\text{part}} = .079$, see Table 14a). As illustrated in Figure 13, reported likelihood was significantly lower for non-narrative, self-referencing messages, compared to the other conditions. Conditional means are reported in Table 11b. There was no significant interaction for reported intentions related to moderate exercise ($F_{(1, 50)} = .037, p = .848, \eta^2_{\text{part}} = .001$, see Table 13a).

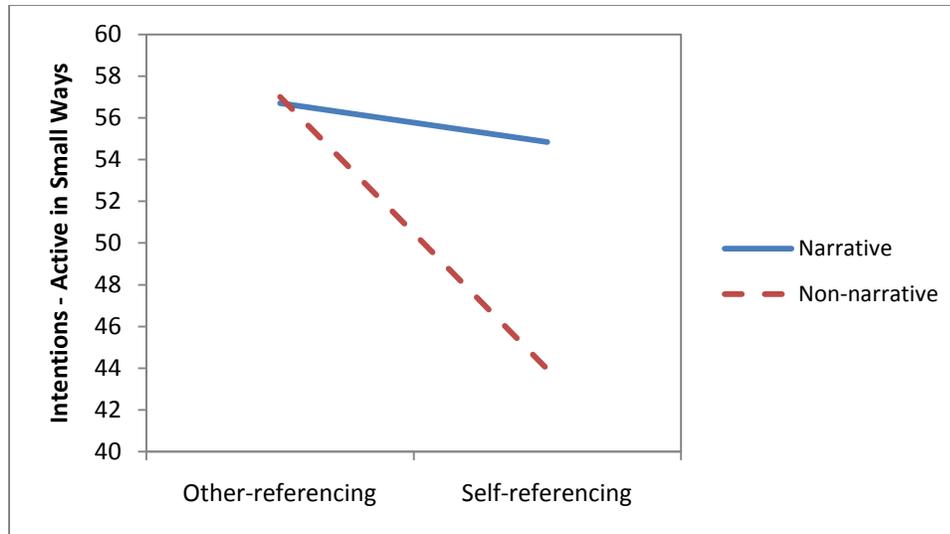


Figure 13. *Interaction of Narrative and Referencing on Behavioral Intentions to Be More Active in Small, Everyday Ways*

Examining diet messages only, the interaction of narrative and other-referencing on reported intentions to eat fewer simple carbohydrates approached significance ($F_{(1, 52)} = 3.839, p = .055, \eta^2_{\text{part}} = .069$, see Table 15a). Similar to the findings for other message outcomes, non-narrative self-referencing messages were the least effective of all message types at bolstering intentions to eat fewer simple carbohydrates. Unexpectedly, however, other-referencing messages were most effective at increasing intentions when delivered in a non-narrative format, and narratives were more effective when they incorporated self-referencing. Figure 14 illustrates this pattern of results, and conditional means are reported in Table 15b. There was no significant interaction for reported intentions related to eating smaller portions ($F_{(1, 52)} = 1.510, p = .225, \eta^2_{\text{part}} = .028$, see Table 16a).

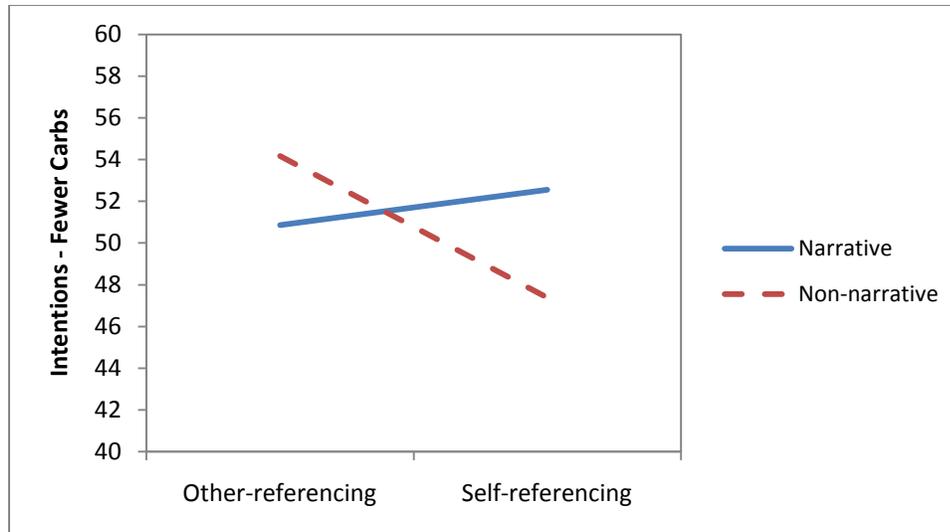


Figure 14. *Interaction of Narrative and Referencing on Behavioral Intentions to Eat Fewer Simple Carbohydrates*

Influence of control factors on message acceptance. Neither order nor message topic exerted a significant main effect on any of the message acceptance variables, as demonstrated by Tables 11-16a.

Indirect effects on state reactance and message outcomes. Indirect effects of message features through mediating states on state reactance and message acceptance were examined using single-step and multiple-step multiple mediator models, estimated by using the bootstrapping method. Single-step models were used to test for indirect effects of the predictors on reactance. Multiple-step models were used to incorporate reactance as a mediator when predicting message acceptance.

The bootstrapping method allows researchers to compare the influence of multiple mediators in a single model, by calculating confidence intervals for pairwise contrasts of the specific indirect effects; this is useful for testing, for example, whether guilt arousal and/or state empathy mediate the influence of other-referencing on message outcomes.

Furthermore, this method enables testing of multiple-step multiple mediator models, which were used to examine the combined, sequential influence of mediating states such as narrative engagement and reactance in the causal chain from message feature to message outcome.

As current bootstrapping methods allow for only a single independent variable (in addition to covariates), the following sections first examine the indirect effects of narrative on reactance and message acceptance, then the indirect effects of referencing on reactance and message acceptance. The combined state reactance scale ($\alpha = .953$, as reported in the Method chapter) was used to model state reactance in all analyses. For each of the models, bias corrected and accelerated confidence intervals are reported; unlike percentile confidence intervals, these are robust against the non-normality that often accompanies modest sample sizes (Hayes, 2009). The confidence intervals, as well as point estimates, standard errors, coefficients and p values for specific and total indirect effects, are reported in the tables and text that accompany each individual analysis.

Indirect effects of narrative on reactance. H3 predicted that narrative engagement would mediate the influence of narrative on message outcomes. Separate models were estimated to determine indirect effects of narrative on (a) state reactance, (b) attitude toward the message, and (c) attitude toward the behaviors advocated by the message.

A single-step multiple mediation model (Figure 15) was estimated, with narrative as the independent variable, narrative engagement, guilt arousal, and state empathy as

mediators, and state reactance as the dependent variable. Trait reactance and age were controlled in the model⁹.

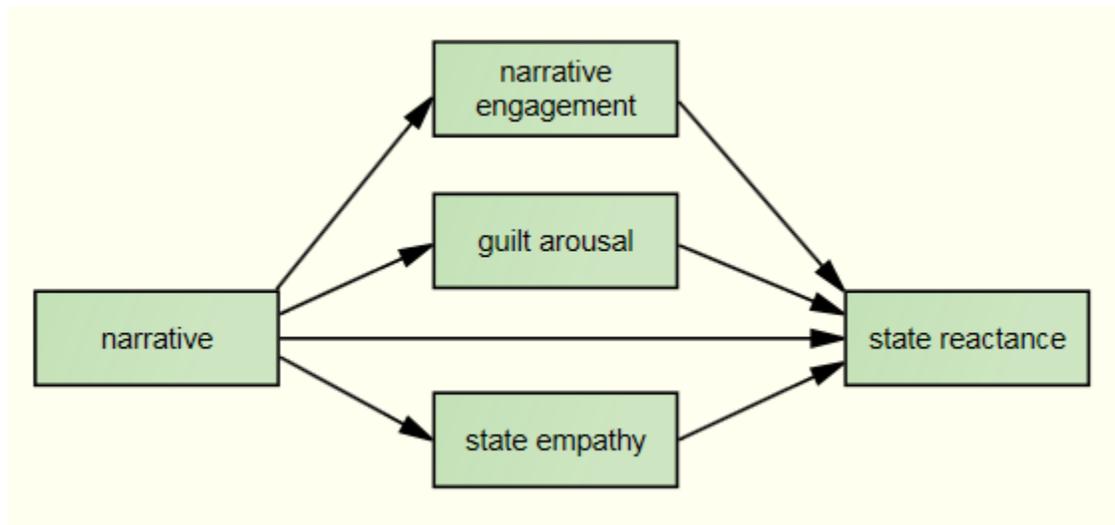


Figure 15. *Multiple Mediation Model for the Influence of Narrative on State Reactance through Narrative Engagement, Guilt and State Empathy*

Taken together, narrative engagement, guilt and state empathy mediated the influence of narrative on state reactance. The total effect of narrative on reactance was significant ($c = 0.3428, p = .013$). The direct effect of narrative on reactance was not significant ($c' = 0.0798, p = .401$). The total indirect effect through the three mediators was the difference of these effects, 0.2680, and had a 95% bias corrected and accelerated (BCA) bootstrap confidence interval of 0.0594 to 0.4618. Given that the confidence interval does not include zero, the total indirect effect is significant, indicating complete mediation. Table 18 reports the bootstrapping results.

Examining specific indirect effects, only narrative engagement (CI = 0.0476 to 0.3459) was a significant mediator. Neither guilt (CI = -0.0547 to 0.0677) nor state

⁹Preliminary estimates for each mediation model tested the following covariates: age, gender, education, ethnicity, whether the person has children, whether the person has grandchildren, and the four involvement scales (exercise-cognitive, exercise-emotional, diet-cognitive, diet-emotional). Only covariates that were significant were retained for the final models reported here.

empathy (CI = -0.0010 to 0.1621) were significant mediators, although they contributed to the total indirect effect.

Despite these findings, comparing the specific indirect effects indicates that narrative engagement did not differ from guilt arousal or state empathy in magnitude, although guilt and empathy differed from each other. Pairwise contrasts of the specific indirect effects are reported in Table 18. Where confidence intervals for a pairwise contrast include zero, the indirect effects are not considered to be of significantly different magnitude (Preacher & Hayes, 2008a).

The path from narrative to narrative engagement was consistent with the predicted model, such that narratives significantly predicted greater narrative engagement ($a = -0.3225^{10}$, $p = .008$). Narrative engagement, in turn, predicted lower reactance ($b = -0.5854$, $p < .001$). To summarize, narrative messages elicited less state reactance, but only through the influence of engagement with the message.

Table 18. *Mediation of the Influence of Narrative on Reactance through Narrative Engagement, Guilt and State Empathy*

	Estimate (<i>standard error</i>)	BCA 95% Confidence Interval	
		<i>Lower</i>	<i>Upper</i>
Indirect Effects			
Narrative engagement	.1921 (.0741)	.0476	.3459
Guilt arousal	.0035 (.0318)	-.0547	.0677
State empathy	.0724 (.0420)	-.0010	.1621
TOTAL	.2680 (.1012)	.0594	.4618
Contrasts			
Engagement vs. Guilt	.1886 (.0862)	.0218	.3548
Engagement vs. Empathy	.1197 (.0610)	.0121	.2544
Guilt vs. Empathy	-.0689 (.0585)	-.1874	.0450

Note: BCA = bias corrected and accelerated; bootstrap resamples = 2000

¹⁰ Narrative was coded as 1=narrative and 2=non-narrative, thus the negative sign for the coefficient.

Indirect effects of narrative on attitude toward the message. A multiple-step multiple mediation model (Figure 16) was estimated, with narrative as the independent variable, narrative engagement and state reactance as mediators, and attitude toward the message as the dependent variable. Trait reactance, presence of grandchildren, and emotional involvement with exercise were controlled in the model.

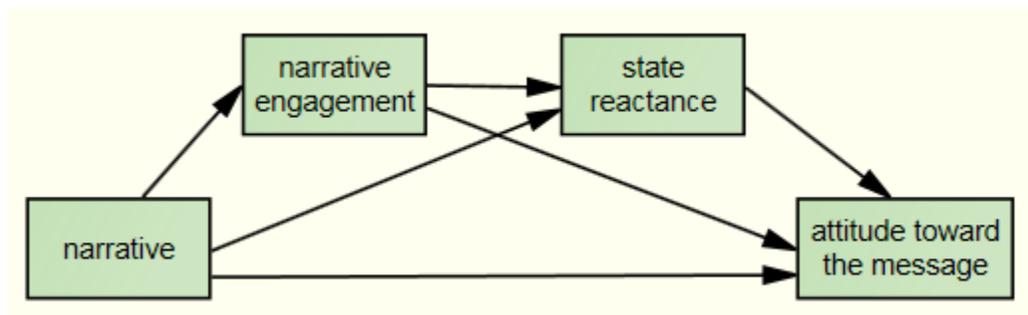


Figure 16. *Multiple-Step Mediation Model for the Influence of Narrative on Attitude toward the Message through Narrative Engagement and State Reactance*

Taken together, narrative engagement and state reactance mediated the influence of narrative on attitude toward the message, as Table 19 illustrates. The total effect of narrative on attitude was significant ($c = -0.4385, p = .019$). The direct effect of narrative on attitude was not significant ($c' = -0.0355, p = .687$). The total indirect effect through the two mediators was significant, -0.4029 , 95% bootstrap CI = -0.7093 to -0.0863 . The significant indirect effect and non-significant direct effect indicate complete mediation.

Examining specific indirect effects, narrative engagement was a significant mediator (CI = -0.2336 to -0.0158). The combined specific indirect path through both narrative engagement and state reactance was also significant (CI = -0.3452 to -0.0265). The mediated path through reactance alone was not significant (CI = -0.2843 to 0.0889), indicating that engagement was necessary for mediation to occur.

Predicted paths were also in the expected direction. Narratives led to greater engagement ($a_1 = -0.2809^{11}$, $p = .021$), engagement fostered lower reactance ($a_3 = -0.7145$, $p < .001$), and this attenuated reactance strongly predicted more positive attitudes toward the message ($b_2 = -0.9064$, $p < .001$). Engagement also predicted more positive attitudes ($b_1 = 0.4313$, $p < .001$). To summarize, narrative messages led to more positive attitudes toward the message, both through the influence of engagement reducing reactance, and through engagement alone.

Table 19. *Mediation of the Influence of Narrative on Attitude toward the Message through Narrative Engagement and Reactance*

	Effect (<i>standard error</i>)	95% Confidence Interval	
		<i>Lower</i>	<i>Upper</i>
Indirect Effects			
Narrative engagement	-.1211 (.0545)	-.2336	-.0158
State reactance	-.0930 (.0961)	-.2843	.0889
Engagement + reactance	-.1888 (.0835)	-.3542	-.0265
TOTAL	-.4029 (.1612)	-.7093	-.0863

Note: bootstrap resamples = 2000

Indirect effects of narrative on attitude toward the behaviors advocated by the message. A multiple-step multiple mediation model (Figure 17) was estimated, with narrative as the independent variable, narrative engagement and state reactance as mediators, and attitude toward the behaviors advocated by the message as the dependent variable. Trait reactance, age, gender, presence of children and grandchildren, and emotional involvement with exercise were controlled in the model.

¹¹ Negative because narrative was coded as 1=narrative and 2=non-narrative

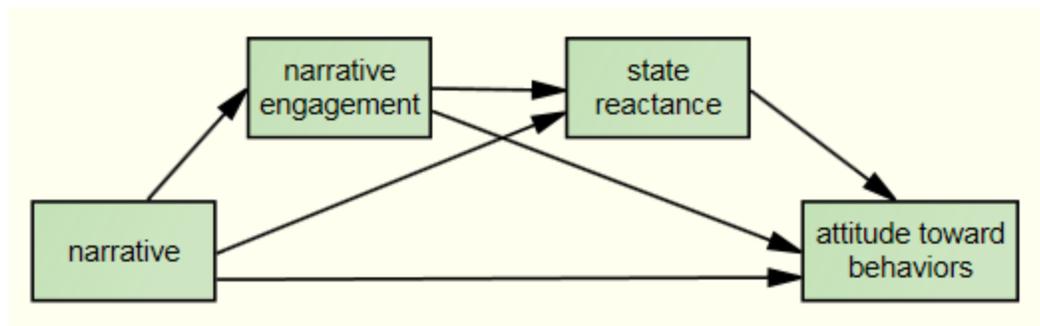


Figure 17. *Multiple-Step Mediation Model for the Influence of Narrative on Attitude toward the Advocated Behaviors through Narrative Engagement and State Reactance*

Taken together, narrative engagement and state reactance mediated the influence of narrative on attitude toward the advocated behaviors, as Table 20 illustrates. The total effect of narrative on attitude was not significant ($c = -0.1905$, $p = .146$), nor was the direct effect of narrative on attitude ($c' = -0.0453$, $p = .619$). The total indirect effect through the two mediators, however, was significant, -0.2385 , 95% bootstrap CI = -0.4278 to -0.0509 . As noted by Preacher and Hayes in each of the publications cited earlier, an advantage of bootstrapping over the causal steps approach is that it can estimate indirect effects, even in the absence of an unmediated total effect.

The pattern of specific indirect effects mirrored that for attitude toward the message. Narrative engagement was a significant mediator (CI = -0.1470 to -0.0130). The combined specific indirect path through both narrative engagement and state reactance was also significant (CI = -0.2180 to -0.0196). The mediated path through reactance alone was not significant (CI = -0.1576 to 0.0589), indicating that engagement was necessary for mediation to occur.

Predicted paths were in the expected direction. Narratives led to greater engagement ($a_1 = -0.2876^{12}$, $p = .019$), engagement fostered lower reactance ($a_3 = -0.7633$, $p < .001$), and this attenuated reactance predicted more positive attitudes toward the advocated behaviors ($b_2 = -0.5071$, $p < .001$). Engagement also predicted more positive attitudes ($b_1 = 0.2561$, $p < .001$). To summarize, narrative messages led to more positive attitudes toward the advocated diabetes self-care behaviors, both through the influence of engagement reducing state reactance, and through engagement alone.

Table 20. *Mediation of the Influence of Narrative on Attitude toward the Advocated Behaviors through Narrative Engagement and State Reactance*

	Effect (<i>standard error</i>)	95% Confidence Interval	
		<i>Lower</i>	<i>Upper</i>
Indirect Effects			
Narrative engagement	-.0736 (.0336)	-.1470	-.0130
State reactance	-.0508 (.0549)	-.1576	.0589
Engagement + reactance	-.1113 (.0500)	-.2180	-.0196
TOTAL	-.2358 (.0951)	-.4278	-.0509

Note: bootstrap resamples = 2000

As demonstrated by these models, narrative engagement mediated the influence of narrative delivery style on reactance, as well as on attitudes toward the message and its advocacy. H5 was supported.

Indirect effects of referencing on reactance. RQ3 and RQ4 asked whether guilt arousal and state empathy, respectively, would mediate the influence of other-referencing on message outcomes. Mediation analyses first examined the intervening influence of these variables on state reactance aroused by the message. A single-step multiple

¹² Negative because narrative was coded as 1=narrative and 2=non-narrative

mediation model (Figure 18) was estimated, with referencing as the independent variable, guilt arousal and state empathy as mediators, and state reactance as the dependent variable. Trait reactance, number of months since diabetes diagnosis, and age were controlled in the model.

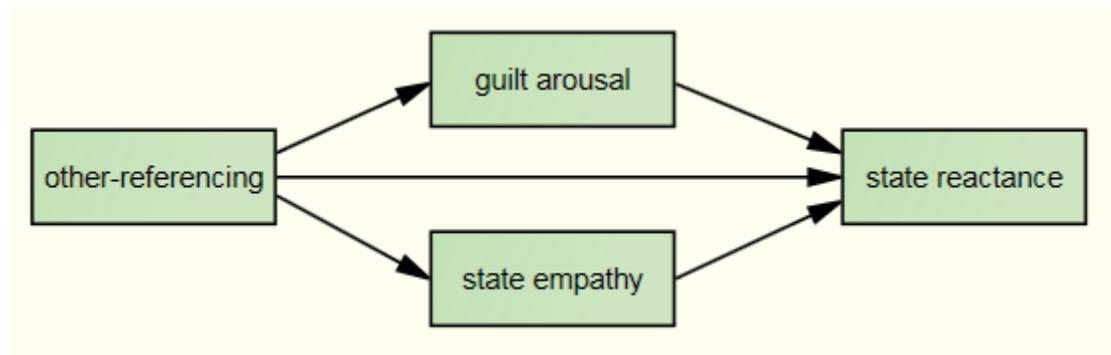


Figure 18. *Multiple Mediation Model for the Influence of Other-Referencing on State Reactance through Guilt Arousal and State Empathy*

Taken together, guilt and state empathy mediated the influence of referencing on state reactance. The total effect of referencing on reactance was significant ($c = 0.3633$, $p = .008$). The direct effect of referencing on reactance was not significant ($c' = 0.1690$, $p = .120$). The total indirect effect through the two mediators was the difference of these effects, 0.1963, and had a 95% BCA bootstrap confidence interval of 0.0175 to 0.3640. Given that the confidence interval does not include zero, the total indirect effect is significant, indicating complete mediation.

Examining specific indirect effects, neither guilt (CI = -0.0209 to 0.1076) nor state empathy (CI = -0.0225 to 0.3283) were significant mediators, as Table 21 illustrates. Despite these non-significant individual paths, these states contributed to the total indirect effect in combination with each other. Preacher and Hayes (2008a, end note #4) note that

this seeming anomaly may occur in mediation analyses, much as multiple regression models may be significant absent the presence of individually significant predictors. A pairwise contrast between guilt and empathy further indicated that the effects did not differ in magnitude (CI for the contrast = -0.3129 to 0.0850).

Although the paths from referencing to guilt and empathy were non-significant, the overall model was in the expected direction. Self-referencing messages led to greater state reactance via the total indirect effect.

Table 21. *Mediation of the Influence of Referencing on Reactance through Guilt and State Empathy*

	Estimate (<i>standard error</i>)	BCA 95% Confidence Interval	
		<i>Lower</i>	<i>Upper</i>
Indirect Effects			
Guilt arousal	.0363 (.0313)	-.0209	.1076
State empathy	.1602 (.0898)	-.0225	.3283
TOTAL	.1965 (.0870)	.0175	.3640
Contrasts			
Guilt vs. Empathy	-.1238 (.1025)	-.3129	.0850

Note: BCA = bias corrected and accelerated; bootstrap resamples = 2000

Indirect effects of referencing on attitude toward the message. Given the question of whether guilt arousal or state empathy (if either) mediate the influence of referencing on message outcomes, separate models were computed to test each potential mediator. First, a multiple-step multiple mediation model (Figure 19) was estimated, with referencing as the independent variable, guilt arousal and state reactance as sequential mediators, and attitude toward the message as the dependent variable. Trait reactance, age, gender, and presence of children and grandchildren were controlled in this model.

Following this, a model was estimated with state empathy and state reactance as sequential mediators, using with the same covariates.

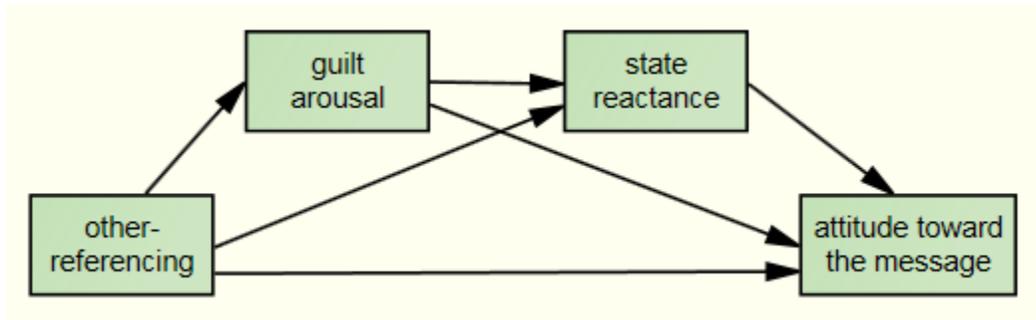


Figure 19. *Multiple-Step Mediation Model for the Influence of Other-Referencing on Attitude toward the Message through Guilt Arousal and State Reactance*

Taken together, guilt and reactance mediated the influence of referencing on attitude toward the message, although as Table 22 illustrates, the effect was largely due to the intervening role of state reactance (i.e., $0.3959/0.4009 = 98.8\%$ of the total indirect effect). The total effect of referencing on attitude was significant ($c = -0.5755^{13}$, $p = .002$). The direct effect of referencing on attitude was nearly but not significant ($c' = -0.1796$, $p = .061$). The total indirect effect through the two mediators (guilt, state reactance) was significant, -0.3959 , 95% bootstrap CI = -0.7156 to -0.0858 . The significant indirect effect and non-significant direct effect indicate complete mediation.

Examining specific indirect effects, guilt arousal was not a significant mediator (CI = -0.0081 to 0.0533), nor was the combined specific indirect path through both guilt and reactance (CI = -0.0506 to 0.0142). The mediated path through reactance, however, was significant (CI = -0.7198 to -0.0912). Other-referencing negatively predicted

¹³ Negative because referencing was coded as 1=other-referencing, 2=self-referencing

reactance ($a_2 = 0.3479^{14}$, $p = .012$), and reactance negatively predicted attitudes toward the message ($b_2 = -1.1522$, $p < .001$), indicating that referencing exerted an influence on attitudes toward diabetes self-care messages by reducing reactance to those messages.

Table 22. *Mediation of the Influence of Referencing on Attitude toward the Message through Guilt Arousal and Reactance*

	Effect (standard error)	95% Confidence Interval	
		Lower	Upper
Indirect Effects			
Guilt arousal	.0166 (.0158)	-.0081	.0533
State reactance	-.4009 (.1579)	-.7198	-.0912
Guilt + reactance	-.0117 (.0157)	-.0506	.0142
TOTAL	-.3959 (.1583)	-.7156	-.0858

Note: bootstrap resamples = 2000

The pattern of results for state empathy was similar to those for guilt arousal. A multiple-step multiple mediation model (Figure 20) was estimated with referencing as the independent variable, state empathy and state reactance as sequential mediators, and attitude toward the message as the dependent variable. Trait reactance, age, gender, and presence of children and grandchildren were controlled in the model.

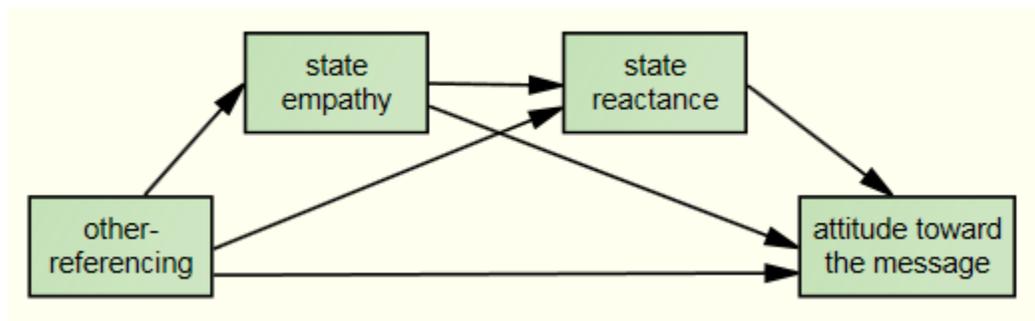


Figure 20. *Multiple-Step Mediation Model for the Influence of Other-Referencing on Attitude toward the Message through State Empathy and State Reactance*

¹⁴ Positive because referencing was coded as 1=other-referencing, 2=self-referencing

Taken together, empathy and reactance mediated the influence of referencing on attitude toward the message, as illustrated by Table 23. The total effect of referencing on attitude was significant ($c = -0.5755, p = .002$). The direct effect of referencing on attitude was not significant ($c' = -0.1558, p = .087$). The total indirect effect through the two mediators (empathy, reactance) was significant, -0.4197 , 95% bootstrap CI = -0.7352 to -0.1068 . The significant indirect effect and non-significant direct effect indicate complete mediation.

Examining specific indirect effects, state empathy was not a significant mediator (CI = -0.1514 to 0.0050), nor was the combined specific indirect path through both empathy and reactance (CI = -0.2809 to 0.0109). The mediated path through reactance alone, however, was significant (CI = -0.4400 to -0.0067). Other-referencing negatively predicted reactance ($a_2 = 0.2226, p = .0050$), and reactance negatively predicted attitudes toward the message ($b_2 = -.9831, p < .001$), indicating again that referencing exerted an influence on attitudes toward diabetes self-care messages by reducing reactance to them.

Table 23. *Mediation of the Influence of Referencing on Attitude toward the Message through State Empathy and Reactance*

	Effect (standard error)	95% Confidence Interval	
		Lower	Upper
Indirect Effects			
State empathy	-.0677 (.0409)	-.1514	.0050
State reactance	-.2188 (.1132)	-.4400	-.0067
Empathy + reactance	-.1332 (.0770)	-.2809	.0109
TOTAL	-.4197 (.1605)	-.7352	-.1068

Note: bootstrap resamples = 2000

Indirect effects of referencing on attitude toward behaviors advocated by the message. The findings for indirect effects of referencing on attitudes towards advocated behaviors echoed those for attitudes toward the message. Again, separate models were computed to test each potential mediator (guilt, empathy), as detailed below.

A multiple-step multiple mediation model (Figure 21) was estimated, with referencing as the independent variable, guilt arousal and state reactance as sequential mediators, and attitude toward the advocated behaviors as the dependent variable. Trait reactance, age, gender, and presence of children and grandchildren were controlled in this model.

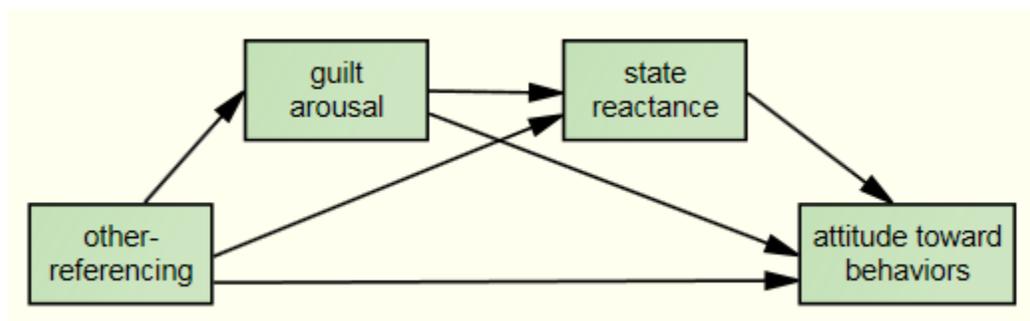


Figure 21. *Multiple-Step Mediation Model for the Influence of Other-Referencing on Attitude toward the Advocated Behaviors through Guilt Arousal and State Reactance*

Taken together, guilt and state reactance mediated the influence of referencing on attitude toward the advocated behaviors, although as Table 24 illustrates, the effect was largely due to the intervening role of reactance (i.e., $0.2302/0.2400 = 95.9\%$ of the total indirect effect). The total effect of referencing on attitude was significant ($c = -0.2637, p = .043$). The direct effect of referencing on attitude was not significant ($c' = -0.0237, p = .801$). The total indirect effect through the two mediators was significant, -0.2400 , 95% bootstrap CI = -0.4328 to -0.0597 , indicating complete mediation.

Examining specific indirect effects, guilt arousal was not a significant mediator (CI = -0.0240 to 0.0140), nor was the combined specific indirect path through both guilt and reactance (CI = -0.0299 to 0.0089), but the mediated path through reactance alone was significant (CI = -0.4230 to -0.0462). Other-referencing negatively predicted reactance ($a_2 = 0.3479$, $p = .012$), and reactance negatively predicted attitudes toward the advocated behaviors ($b_2 = -0.6617$, $p < .001$), indicating that referencing exerted an influence on attitudes toward diabetes self-care behaviors by reducing state reactance aroused by messages advocating the adoption of these behaviors.

Table 24. *Mediation of the Influence of Referencing on Attitude toward Advocated Behaviors through Guilt Arousal and Reactance*

	Effect (<i>standard error</i>)	95% Confidence Interval	
		<i>Lower</i>	<i>Upper</i>
Indirect Effects			
Guilt arousal	-.0031 (.0091)	-.0240	.0140
State reactance	-.2302 (.0945)	-.4230	-.0462
Guilt + reactance	-.0067 (.0094)	-.0299	.0089
TOTAL	-.2400 (.0947)	-.4328	-.0597

Note: bootstrap resamples = 2000

A similar pattern emerged for empathy. A multiple-step multiple mediation model (Figure 22) was estimated with referencing as the independent variable, state empathy and state reactance as sequential mediators, and attitude toward the advocated behaviors as the dependent variable. Trait reactance, age, gender, and presence of children and grandchildren were controlled in the model.

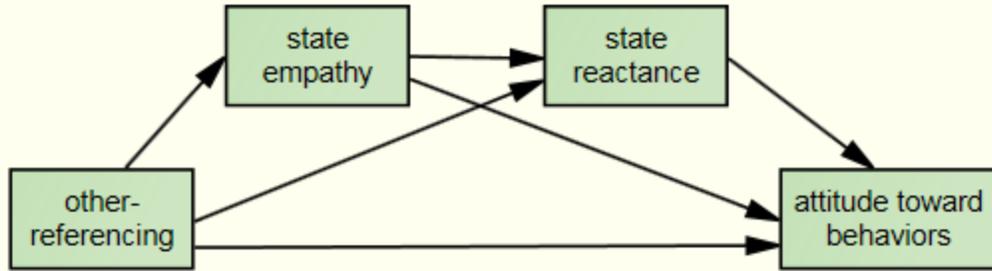


Figure 22. *Multiple-Step Mediation Model for the Influence of Other-Referencing on Attitude toward the Advocated Behaviors through State Empathy and State Reactance*

Taken together, empathy and reactance mediated the influence of referencing on attitude toward the advocated behaviors, as illustrated by Table 25. The total effect of referencing on attitude was significant ($c = -0.2637, p = .043$). The direct effect of referencing on attitude was not significant ($c' = -0.0188, p = .835$). The total indirect effect through the two mediators (empathy, reactance) was significant, -0.2450 , 95% bootstrap CI = -0.4491 to -0.0650 , indicating complete mediation.

Examining specific indirect effects, state empathy was not a significant mediator (CI = -0.1311 to 0.0061), nor was the combined specific indirect path through both empathy and reactance (CI = -0.1613 to 0.0085). The mediated path through reactance alone, however, was significant (CI = -0.2415 to -0.0011). Other-referencing negatively predicted reactance ($a_2 = 0.2226, p = .0500$), and reactance negatively predicted attitudes toward the advocated behaviors ($b_2 = -0.5285, p < .001$), indicating again that referencing exerted an influence on attitudes toward diabetes self-care behaviors by reducing reactance to messages recommending their adoption.

Table 25. *Mediation of the Influence of Referencing on Attitude toward Advocated Behaviors through State Empathy and State Reactance*

	Effect (<i>standard error</i>)	95% Confidence Interval	
		<i>Lower</i>	<i>Upper</i>
Indirect Effects			
State empathy	-.0557 (.0352)	-.1311	.0061
State reactance	-.1176 (.0613)	-.2415	-.0011
Empathy + reactance	-.0716 (.0426)	-.1613	.0085
TOTAL	-.2450 (.0976)	-.4491	-.0650

Note: bootstrap resamples = 2000

To summarize the indirect effects of referencing on state reactance and message acceptance, neither guilt arousal nor state empathy was a significant mediator, although they contributed to the total indirect effects for these outcomes. The answer to both RQ3 and RQ4 appears to be a qualified “no.” State reactance, however, significantly mediated the impact of referencing on attitudes toward the messages and their advocacy, such that other-referencing messages attenuated reactance, thus leading to more positive attitudes.

VI. DISCUSSION AND CONCLUSION

This study was predicated on the idea that resistance to persuasion is not absolute, but rather, that it can be attenuated by particular message features. Following research indicating that psychological reactance to persuasive messages can be mitigated by tactics such as inducing empathy (Shen, 2010) or appending a coercive message with a reminder that the individuals remains in control of their decisions (Miller et al., 2007), an experiment examined whether delivering an overt directive in narrative format and/or supported by other-referent appeals could similarly counteract reactance, as well as its negative influence on message reactions.

The data indicate that, yes, these strategies can effectively attenuate reactance, thereby decreasing resistance to messages promoting healthy behaviors. In the context of reactance-inducing print messages encouraging demand healthy diet and physical activity for adult diabetics, narrative and other-referencing had both direct and indirect effects on attitudes and behavioral intentions related to the messages and their recommendations.

Discussion of findings and implications for theory and message design

The following sections review the findings reported in the previous chapter, exploring their implications for reactance theory, as well as theory related to narrative and other-referencing where appropriate. First, findings regarding the attenuation of reactance are discussed, including the potential for a new measure of reactance. This is followed by a discussion of the patterns of message acceptance, including differences between diet-focused and exercise-focused messages. Finally, the reported indirect effects on persuasion through reduced resistance are examined.

Attenuating reactance through narrative and other-referencing. The first hypothesis predicted that reactance-inducing messages would be met with less resistance if they incorporated narrative delivery style. Specifically, narrative messages, compared to non-narratives, were predicted to elicit reduced state reactance, including (a) lower perceived threat to choice, (b) less counter-arguing, (c) less negative cognitive appraisals, and (d) less state anger. The hypothesis was supported on all counts. Participants reported that, relative to non-narratives, messages that incorporated elements of storytelling seemed less threatening and generated fewer counter-arguments. Participants also reported higher cognitive appraisals and fewer angry feelings in response to narrative messages. Additionally, narrative delivery had a significant negative influence on a combined reactance scale that merged these individual measures.

The second hypothesis predicted, similarly, that reactance-inducing messages would elicit less resistance if they incorporated other-referencing, such that messages encouraged change for the good of family members or other loved ones, not just for the message target her/himself. This hypothesis was also supported on all counts. Other-referencing messages, compared to self-referencing messages, were rated as less threatening to personal freedom. Other-referencing messages also predicted less reported counter-arguing, more positive cognitive appraisals, and less reported anger. Other-referencing also had a significant negative influence on the combined scale for reactance. These findings add to the growing literature on mitigating reactance to persuasion (Festinger & Maccoby, 1967; Miller et al., 2007; Reinhart et al., 2007; Shen, 2010; Silvia, 2006), and add two additional strategies – narrative delivery style and other-

referencing loved ones – to the metaphorical toolbox of omega strategies to enhance persuasion by decreasing resistance.

The first research question asked whether narrative and other-referencing would interact in their influence on state reactance. The interaction was indeed significant for the combined reactance scale, perceived threat to choice, counter-arguing, cognitive appraisal, and state anger. When messages featured other-referencing appeals, narratives and non-narratives did not differ significantly, but narratives enjoyed a significant advantage over non-narratives when self-referencing appeals were central. Viewed another way, there was no distinct advantage of other-referencing over self-referencing for narratives, but with non-narrative messages, other-referencing appeals were more successful at reducing resistance than were self-referencing appeals.

For each of these interactions, non-narrative self-referencing messages were met with more resistance than narrative other-referencing, narrative self-referencing, and non-narrative other-referencing messages. The latter three conditions were not substantially different from each other. This pattern illustrates that using either narrative or other-referencing can effectively reduce state reactance, although there is no clear advantage for combining both strategies. Previous studies that have attempted to circumvent or mitigate reactance (e.g., Festinger & Maccoby, 1967; Miller et al., 2007; Shen, 2010) generally examined one rather than two pathways to reduce resistance; future research is needed to uncover combinations of message strategies that enhance persuasion above and beyond that of their individual contributions.

Was reactance induced? The threat-to-choice index can also serve as an induction check that reactance actually was provoked (Dillard & Shen, 2005; Miller et al., 2007; Quick & Considine, 2008; Quick & Stephenson, 2008). Messages in each treatment condition averaged above the midpoint on the threat-to-choice scale, indicating that they indeed induced reactance. The grand mean for threat-to-choice for these messages was 4.741 (s.d. = 1.531) on a seven-point scale.

Examining other grand means provides additional information about the larger picture created by these data. Overall, although messages were generally threatening, they did not generate substantial counter-arguing ($M = 3.322$, s.d. = 1.987). Anger in response to these messages was even lower ($M = 2.980$, s.d. = 2.034), although there was more variability among these measures than for perceived threat. Moreover, attitudes both toward the messages themselves ($M = 4.278$, s.d. = 2.032) and the behaviors they promoted ($M = 5.190$, s.d. = 1.415) were generally positive, although reactance theory would predict that threatened individuals would attempt to indirectly restore their sense of control by rejecting or derogating the messages.

These comparisons suggest, if only tentatively, that narrative and other-referencing may be most effective at attenuating reactance after it is aroused; that is, attenuating the expression rather than arousal of reactance. In other words, although individuals perceived the directives as threatening, this perceived threat did not necessarily translate into angry thoughts and feelings, nor did they culminate in attempts to restore the threatened sense of autonomy. The mechanisms that intervened between reactance arousal (i.e., perceived threat) and reactance expression (i.e., anger, negative

thoughts) and restoration, given these data, appear to be narrative and other-referencing. Expanded replications are needed, however, to examine exactly where in the causal chain these features were able to attenuate reactance.

Measuring reactance: A new scale? In addition to theoretical implications of these findings for reactance theory, this study also introduced a new method of measuring reactance. A 14-item index combining scales for perceived threat to choice, counter-arguing, cognitive appraisal and state anger demonstrated a high degree of internal consistency ($\alpha = .953$). This strong reliability is complemented by face validity, given that the index comprises four sub-scales that have been validated across multiple studies. These scales also align with the three demonstrated components of reactance arousal and expression, that is threat-to-choice, anger, and negative/counter-message thoughts (Dillard & Shen, 2005; Dillard et al., 1996; Miller et al., 2007; Quick & Stephenson, 2008; Rains & Turner, 2007; Silvia, 2005, 2006).

While the scale appears promising, additional research is needed, especially with larger participant samples, to test the psychometric properties of this scale, including test-retest validity, discriminant validity, and particularly construct validity. Moreover, it should be tested in conjunction with the Reactance Restoration Scale (Quick & Stephenson, 2007b) to determine its predictive validity. In this study, reactance correlated negatively with attitudes in favor of the messages and their advocacy, indicating that it successfully predicts indirect restoration. Additional tests are needed to confirm this relationship.

Should subsequent testing validate this index, it would present a viable alternative to the current operationalization of reactance, which involves administering thought-listing tasks to assess negative cognitions. This would circumvent several limitations of the technique, including inflated negativity driven by heightened anger from ruminating on the reactance-inducing stimulus (Gerin et al., 2006; Rusting & Nolen-Hoeksema, 1998) and response bias driven by participants' awareness that their thoughts are open to interpretation by the researchers (Dougherty & Hunter, 2003; Paulhaus, 1984). The scale would be particularly useful for repeated-measures designs, which are not conducive to thought-listing assessments.

Fostering positive attitudes and behavioral intentions. The first two hypotheses predicted negative direct effects of narrative and other-referencing on reactance. The next two hypotheses predicted positive direct effects of these message features on message acceptance, in the form of attitudes and behavioral intentions.

The third hypothesis predicted that controlling messages that incorporated narrative delivery style, compared to non-narrative controlling messages, would lead to greater message acceptance, including (a) greater likelihood of compliance with the message's recommendation, (b) more positive attitudes toward the message, and (c) more positive attitudes toward the behavior advocated by the message. The fourth hypothesis predicted an identical pattern of acceptance following other-referencing compared to self-referencing messages. These hypotheses were supported on two of three counts. Participants reported significantly more positive attitudes toward narrative and other-referencing messages and the behaviors they recommended compared to non-narrative

and self-referencing messages, respectively. This was the case whether messages centered on healthy diet or physical activity.

This pattern was not consistent for behavioral intentions, however. Participants reported greater likelihood to engage in regular exercise and be more active in everyday ways (e.g., taking the stairs instead of the elevator) following narrative messages, compared to non-narratives, but there was no difference in diet-related intentions between the two conditions. Neither narrative nor referencing style had a significant influence on intentions to eat smaller portions or eat fewer simple carbohydrates, despite predictions.

It may be that participants were more receptive to diabetes self-care recommendations that proffered exercise strategies than to messages encouraging changes in diet. Although not hypothesized, message topic (i.e., diet vs. exercise) also had a significant or nearly significant influence on all components of reactance except for counter-arguing, such that reactance was habitually greater in response to diet messages than to exercise messages.

Studies from the diabetes education literature may provide some insight into this discrepancy. Among diabetes self-care behaviors such as taking oral medication and self-monitoring of blood glucose, diet and exercise behaviors are met with the greatest resistance due to barriers such as having to eat differently from others, facing limited options (not to mention larger portions) when eating at restaurants, experiencing difficulty arranging time and locations for exercise, and physical limitations that make physical activity uncomfortable (Shultz, Sprague, Branen & Lambeth, 2001). Of the two, diet is considered the more difficult domain for diabetics to change and maintain (Ary,

Toobert, Wilson, & Glasgow, 1986; Lockwood Frey, & Gladish, 1986). As Schlundt and colleagues (1994) write, “Patients and health professionals typically regard diet as the biggest problem in diabetes management” (p. 874). The findings here seem to uphold that claim. Participants were more reactant toward diet messages, and also were less likely to report likelihood to adopt the healthy diet behaviors encouraged by diet-focused messages.

The simple idea of getting more exercise may be more attractive than the idea of eating less, or eating less of what a person likes to consume. We often develop personal relationships with food, such as choosing favorites or forming strong preferences against certain types of food, and these patterns are often reinforced by social norms. For example, celebrations are often accompanied by food, and unhealthy food, at that – think of a wedding or a child’s birthday without a accompanying cake – and these norms plausibly affect our resistance to lifestyle changes, such as those required of diabetics.

There also exists the possibility that this finding is an artifact of the specific messages and measures, however. Although the two primary recommendations related to diet – eating smaller portions, eating fewer simple carbohydrates – were taken directly from diabetes patient education materials produced by leading health organizations (e.g., American Diabetes Association, CDC), they may not cover the full spectrum of changes the diabetic chooses to make to control her or his illness. Results may have been different if participants had been asked to estimate their likelihood of greater vegetable intake or reduced fat intake, for example. These possibilities remain for subsequent studies to test.

The second research question asked whether these message features would interact in their influence on message acceptance. Narrative and other-referencing also interacted significantly on attitudes, such that non-narrative self-referencing messages were the least effective at increasing positive attitudes toward the messages and the self-care behaviors advocated. Participants reported attitudes for each of these outcomes that were more negative by approximately a full point (on seven-point scales) for self-referencing non-narratives compared to the other three message types, which did not differ from each other. Participants also reported substantially lower likelihood to become more active in small, everyday ways following non-narrative self-referencing messages promoting physical activity. There was no interaction for intentions related to moderate exercise or eating smaller portions. These interactions matched the interactions found for reactance; non-narrative self-referencing messages under-performed in terms of persuasion compared to all other categories.

A somewhat different interaction emerged for intentions to eat fewer simple carbohydrates. For self-referencing messages, non-narratives remained less effective than narratives, but this was also the case for other-referencing messages. In other words, narrative delivery style outperformed non-narrative for self-referencing appeals, but the reverse was true for other-referencing. Conditional differences except for non-narrative self-referencing messages were not substantial, however (i.e. means for these three conditions ranged from 51.1 to 53.7 on a 100-point scale). Moreover, this analysis was restricted to diet messages only; therefore, each condition was represented by a single

message. Replication, ideally with multiple diet messages, is needed to confirm that this finding was not driven idiosyncratically by the messages used for this particular study.

Indirectly enhancing persuasion by attenuating reactance. Once direct effects of the message features were confirmed, their indirect influence on persuasiveness through mediating states was examined using the bootstrapping method.

Analyses indicated that narrative engagement indeed mediated fully the influence of narrative structure on state reactance, as predicted by hypothesis five. Moreover, both engagement and reactance intervened in the path from narrative to attitudes. Narratives fostered greater engagement with the message, which decreased reactance, which, in turn, led to more positive attitudes toward the message and its advocacy. Engagement also enhanced attitudes directly (i.e., without decreasing reactance), indicating that narrative worked both directly and indirectly to boost persuasiveness of these messages.

These results confirm findings from previous research, and more abstractly, the argument from O’Keefe (2003), that the experience of being immersed (e.g., Chang, 2008), “hooked” (Escalas et al., 2004), transported (Green & Brock, 2000), or involved (Slater & Rouner, 2002; Slater, 2002) with the narrative imbues these story-based messages with their ability to augment attitudes and other message reactions. Moreover, these findings provide greater insight into the chain from message feature to message outcomes by empirically demonstrating (and, in a sense, replicating) the sequence of intervening states that mediate the influence of narrative on attitude change. The primary new finding here is the role that narrative plays *through* reactance, in addition to its more direct positive influence on message outcomes.

These results also support previous studies that examined the influence of narrative structure in relatively short mediated messages. While the transportive and persuasive effects of narrative on message processing and reactions may be most pronounced for longer-format narratives such as films (e.g., Busselle & Bilandzic, 2009), novels (e.g., Green & Brock, 2000), or entertainment education (e.g., Slater & Rouner, 2002) programming such as soap operas (e.g., Dutta-Bergman, 2006), these findings demonstrate that narrative structure can effectively augment reception and impact for shorter persuasive educational messages. This adds to the growing body of research illustrating the effectiveness of narrative within relatively short messages, such as print advertisements (Chang, 2008; 2009), brief (i.e., 1-2 minutes) audio (Braverman, 2008) and video (Leshner et al., 2008) testimonials, and storyboard advertisements (Escalas et al., 2004)

The third and fourth research questions asked whether guilt arousal or state empathy, respectively, would operate similarly to narrative engagement, albeit with referencing style instead of narrative structure. Analyses to address these questions were less conclusive, however.

Taken together, guilt and state empathy mediated the influence of referencing on state reactance, yet neither was a significant mediator by itself. Though this is a possibility in multiple-mediator models, much as multiple regression models may be significant in an omnibus test absent the presence of individually-significant coefficients (Preacher & Hayes, 2008a), it makes interpretation of the causal chain from referencing to attitudes more difficult. Self-referencing messages led to greater state reactance via the

combined influence of the two mediators, yet these data cannot confirm the relative contribution of either mediator. Additional studies, using path analysis and structural equation modeling, are needed to compare the magnitude of these individual paths.

Turning to message acceptance, models proposing paths from other-referencing through either guilt or empathy, to reactance and ultimately to attitude change were both significant. In both cases however, the proposed mediating state (guilt arousal, state empathy) did not play a meaningful role. Other-referencing strongly and negatively predicted less reactance, which led to more positive attitudes, but neither the path through guilt/empathy alone, or through guilt/empathy and reactance, was significant for either model. Theoretically, guilt and empathy could be dropped from these models, and they would still illustrate significant indirect effects of referencing through reactance on message outcomes.

The most obvious explanation for these findings is that neither guilt arousal nor state empathy is the mechanism by which other-referencing influences subsequent message outcomes. This is not necessarily surprising – recall that these were research questions rather than hypotheses – but it does indicate that researchers are tasked with identifying (and then operationalizing) the experience that translates perception of other-referencing into attitude change, through additional studies.

Despite the lack of conclusiveness in terms of what psychological process mediates the influence of other-referencing on message outcomes, these findings underscore the effectiveness of this message feature in strategic communication, at least

in this context. For these diabetes self-care messages, other-referencing successfully enhanced persuasion by attenuating reactance, as did narrative delivery style.

Anomalies and limitations

Influence of control factors. Two control factors, message replication and order, were introduced into the design to increase internal and external validity. As noted earlier, there were some differences between exercise and diet messages, in that participants were less resistant to, and also more accepting of, messages promoting exercise behaviors than those encouraging dietary changes. Proposed reasons for this discrepancy were discussed earlier in this chapter.

The second control factor, presentation order, also influenced findings in unpredicted ways. Although the impact of order alone did not reach significance for any of the tests, likely due to low power for this between-subjects factor, order interacted with treatment variables for most tests, as illustrated by tables 3-11a. The interaction of order and narrative was significant or approached significance for all of the reactance variables and attitude toward the message. The interaction of order and referencing was fully or marginally significant for all of these tests, as well as for both exercise-related and diet-related behavioral intentions. There were several three-way interactions of narrative*referencing*order, including one for the combined reactance scale. Order interacted with message and narrative for cognitive appraisals only, but a referencing*message*order interaction was present, and often significant at the 99% confidence level, for all dependent measures. Although order effects were consistently present, they were not systematic.

Given the nature of this study, order effects were not entirely surprising. Repeated-measures designs are more vulnerable to sensitization and learning effects than are between-subjects designs (Calfee, 1985; Campbell & Stanley, 1963; Grabe & Westley, 2003). The within-subjects design introduces the possibility that participants became either desensitized to controlling language during the course of the experiment. There is also the possibility that carryover reactance and summation effects of multiple reactance inductions led to participants becoming more sensitive to the controlling language with each subsequent message (Christensen, 1977; Wicklund, 1974). Indeed, it is possible that both these phenomena occurred, albeit for different participants. Despite these limitations, a repeated-measures design was used to enhance internal validity; by allowing each participant to serve as her or his own control, and also statistically controlling for presentation order, results should be driven solely by the treatment manipulations, thereby eliminating the influence of alternate explanations (e.g., Grabe & Westley, 2003).

Limitations. Using the experimental method to examine the hypothesized claims introduces a certain degree of artificiality into the test. Participants viewed these messages on computer screens in a computer lab, while fully aware that they were participating in a research study. Moreover, while a monetary incentive was used for this study to bolster participant recruitment, it also stands to reason that people may not play such close attention to messages when they are not being paid to do so. It remains to be seen whether these effects would exist if the messages were received via print media such as magazines or brochures from a physician. Despite this potential limitation, the

experimental method was chosen to provide a high degree of control against alternate explanations. Given the steps taken to boost the internal validity of this test (e.g., repeated measures design, multiple messages to represent treatment conditions), one can be relatively confident that the findings are the result of the treatment manipulations alone. External validity is a concern to be addressed with subsequent studies.

An issue that further undermines the generalizability of these findings involves the makeup of the participant pool. In particular, Latinos were severely underrepresented among this group of participants. Only one participant (of 58) reported Latino/Latina ethnicity. The 1.7% not only pales in comparison to the 13% of the general population that are of Hispanic ethnicity, but also does not account for the heightened prevalence of diabetes among this population. African-Americans were also under-represented among these participants: 10.3% ($n = 6$) compared to 13.3% of the U.S. population, according to the March 2008 Current Population Survey. Future research, particularly in the context of diabetes messages, should strive to recruit a more diverse pool of participants to more accurately reflect the portrait of diabetes in America.

Future extensions

Two primary veins of future research are planned to extend this project: (1) an applied public health path, replicating this study with an immigrant Latino population to draw cross-cultural comparisons and address diabetes disparities facing Latinos, and (2) a more theoretical path, incorporating psychophysiological measures to explore more closely the processes driving the arousal and expression of state reactance.

Replication with other populations, particularly Latinos. Latinos are twice as likely to develop type II diabetes compared to non-Hispanic whites, due to factors such as limited access to preventive care and unhealthy eating practices related to acculturation, as well as genetic predisposition (Elder et al. 2009; Millan-Ferro & Caballero, 2007; Seligman, Wallace, DeWalt, Schillinger, Arnold, Shilliday, et al., 2007; Whittemore, 2007). These health disparities are often exacerbated for Latino immigrant populations, who face significant language and access barriers in the U.S. health system. In addition, the rapid growth of this population highlights the need for attention to improving its health: Hispanics are the largest and fastest-growing minority population in the United States (c.f., Elder, 2009; Millan-Ferro & Caballero, 2007), and are estimated to expand from their current 13% to 24% of the population by 2050 (Wilkin & Ball-Rokeach, 2006).

Conducting this study with a Latino population will accomplish several goals: (1) replicating this empirical test of message features that can attenuate reactance, (2) testing potential message features for diabetes self-care messages targeted to a primarily Latino population rather than a mainstream or primarily Caucasian population, and (3) allowing for cross-cultural comparisons of the influence of narrative and other-referencing in reducing resistance to persuasion. It is expected that the influence of other-referencing would be even more pronounced among this primarily collectivist culture, given public health interventions illustrating the effectiveness of family-oriented other-referencing for Latino audiences (e.g., Albright et al., 1997; Sampson, 2001; Teufel-Shone et al., 2005)

and the generally strong influence of *familismo* on Latino individuals (Millan-Ferro & Caballero, 2007; Whitemore, 2007), especially women (Stevens, 1973).

A recent study by Quick and Kim (2009) demonstrated that threat-to-choice language induced reactance among a sample of South Korean adults. Replicating this study with a Latino population would further confirm the validity of reactance theory for collectivist cultures, not just relatively individualistic cultures (e.g., Americans). Further extensions may incorporate other at-risk diabetic populations, such as African-Americans or audiences with lower health literacy. Groups that are lower in socioeconomic status are generally more resistant to messages from the health care system (Boulware, Cooper, Ratner, LaVeist, & Powe, 2003). These individuals are arguably in the greatest need of messages that can permeate this resistance and foster greater knowledge about and more positive attitudes toward healthy behaviors.

Extensions should also explore the potential of additional message features, such as emotional valence and efficacy appeals, to attenuate reactance. Leshner and colleagues, for instance, found that emotional valence interacted with narrative/non-narrative delivery to influence attention paid to a health message. A similar pattern may emerge for reactance-inducing messages. The current study adds two strategies to circumvent reactance to the growing literature on mitigating this form of resistance to persuasion (e.g., Miller et al., 2007; Shen, 2010; Silvia, 2006). Given the increasing attention to this area of scholarship, it would be useful to conduct a comparative test that determines the efficacy of these different anti-reactance strategies relative to each other. Also, it flows logically that narrative and other-referencing may function similarly in

non-diabetes contexts, such as anti-tobacco or anti-drug advertising, although empirical tests are needed to confirm this proposition.

Cognitive and emotional processing during reactance. While replications are useful to confirm these findings and inform message design across a variety of health contexts, the more pressing concern may be theoretical in nature. Although scholars such as Dillard and Shen (2005), Rains and Turner (2007) and Quick and Stephenson (2008) have refined the process model of reactance over the past several years, questions remain, however, as to how these processes unfold psychologically. For example, through what psychological mechanisms does threat-to-choice appraisal arouse reactance, or does reactance elicit restorative tendencies? Much metaphorical heavy lifting remains before we have answers to these questions, and a correspondingly better understand of the cognitive and emotional processes that constitute reactance arousal, expression, and restoration, and how they unfold over time during message reception.

Current research on psychological reactance, including the present study, draws almost exclusively from self-report measures of cognitive and affective responses. Self-report measures are subject to bias and error, as individuals are imperfectly able to register their inner thoughts and feelings, or as they are motivated to provide a particular response. The validity of language-based self-report measures, moreover, depends on individuals' interpretation of the wording used in the items. Incorporating psychophysiological measures in a test of reactance theory would alleviate the need to rely purely on self-report measures, by assessing uncontrolled responses such as heart

rate and electrodermal activity. Researchers can therefore detect changes without having to prompt individuals to identify them.

Physiological measures are also captured time-locked to message presentation, which is beneficial to scholars examining how processing changes with stimulus presentation rather than following exposure. This would allow analysis of whether cognitive and emotional output is truly simultaneous rather than sequential (as suggested by the current process model). The real-time measurement of how individuals process mediated content is essential to build more precise and comprehensive models of how the human brain interacts with persuasive attempts. Greater depth of understanding of the reactance process may ultimately give us a better indication of how message features, including narrative and other-referencing, counteract it. This study indicates that these features effectively attenuate reactance; the question now becomes, *how* is this accomplished?

Conclusion

This study aimed to chart pathways through resistance to enhance the persuasiveness of messages encouraging individuals to make smarter health decisions. Reactance theory purports to explain why messages sometimes fail, but reactance research has not yet given much attention to ways to avoid that failure. An experiment indicated that both narrative and other-referencing can create effective avenues to message acceptance: not only do they directly increase positive evaluations of the messages and their advocacy, but these message features also successfully attenuated resistance to reactance-inducing messages. Recent studies have demonstrated other

successful omega strategies (Knowles & Linn, 2004b) to counter-act reactance, including inducing state empathy (Shen, 2010), establishing interpersonal similarity with the communicator (Silvia, 2006), using gain framing to deliver a message (Reinhart et al., 2007), and appending coercive messages with a freedom-restoring postscript (Miller et al., 2007). This study adds two additional pieces to the metaphorical puzzle examining not what causes reactance, but what can end it, and prevent its negative influence on message processing and outcomes.

Previous studies demonstrate the importance of clear, explicit directions in driving individuals toward positive health behavior change, but the threat of inducing reactance is always present with overt persuasion. This study indicates two tactics that message creators may be able to use in order to benefit from directiveness while avoiding the resistance it often provokes. Given previous research linking narrative and other-referencing in persuasive messages to diminished counter-arguing, increased engagement with the message, and greater compliance with requests, it was predicted that they may possess unique abilities to circumvent reactance. These predictions were confirmed across nearly all outcome measures.

Furthermore, this theoretical investigation was grounded in an applied context, as messages promoting diabetes self-care behaviors related to diet and exercise were tested among a group of adult diabetics. These are precisely the people the messages would be designed to reach, and using this pool of participants enhances the validity – and, in a more altruistic sense, the meaning – of these findings. The primary focus in this experiment was to build theory, but the findings could easily be used to guide

construction of actual educational messages. Given the rapidly increasing prevalence of diabetes, the need for effective messages, especially those able to combat the resistance that is disproportionately present among at-risk populations, is pressing.

This study illustrates the importance of thinking of audiences as people. These message features – essentially, telling a story and focusing on the importance of family and loved ones – are ultimately very personal, even emotional appeals. These findings, combined with those on empathy and interpersonal similarity breaking the chain of reactance, demonstrate that appealing to audiences on this personal level may be the key to making them feel less threatened by persuasion. Perhaps, this capability to simultaneously think *and* feel is the key mechanism that communicators can tap to help people make smarter health decisions.

VII. APPENDICES

1. Stimulus messages

Narrative, Other-referencing, Diet



**My choices
matter...
to him.**

Diabetes affects a diabetic's life every day, but it also affects the lives of those closest to us. When I see my grandson, I know that it is absolutely imperative to eat and drink the right things to make that influence a positive one. Any reasonable person would absolutely have to agree – learn to pay attention to what you eat, and then make some changes.

As I watch him grow, I understand the importance of smarter food choices, such as choosing smaller amounts of food and opting for meals and snacks that are low in simple carbs. When our family eats at a restaurant, I box up half my meal or share it with my grandson. Any smart person who cares about health would do the same thing. For example, tell yourself “Don't even look at the medium or large sizes!”

It is impossible to disagree that avoiding simple carbohydrates and cutting back on food are essential to manage your blood sugar and get your diet in balance. As a diabetic, and as a grandparent, I simply don't have a choice. The same is true for you. Do it for the people you love. Eat better today.



**I know:
There is only
one way.**

Healthy eating was not something that came easily to me. After I was diagnosed with diabetes, things like nutrition labels and counting carbs became part of my daily life, but I still have to tell myself, “This is something you have to do. Eat less, and eat less sugar.”

Like me, you must educate yourself about correct portion sizes and limit yourself to these guidelines to reach and maintain a healthy weight. Sometimes I want to order something I know I shouldn’t, because I’m in a bad mood or just feel like it. I tell myself... “No! You have no choice but to find something without all that sugar. Don’t eat that piece of cake.” This brings me back to reality. Or, if you go to a buffet, you need to visit once, and only once. If you want more, choose a fresh salad. It would take a fool to disagree with this strategy!

You need to change your eating habits to consume smaller portions and avoid simple carbohydrates. I think about how the future would look for me if I didn’t do these things, and it’s just not good. This is just something you have to do. Eat better today.



**My choices
matter...
to him.**

Diabetes affects a diabetic's life every day, but it also affects the lives of those closest to us. When I see my grandson, I know that it is absolutely imperative to eat and drink the right things to make that influence a positive one. Any reasonable person would absolutely have to agree – learn to pay attention to what you eat, and then make some changes.

As I watch him grow, I understand the importance of smarter food choices, such as choosing smaller amounts of food and opting for meals and snacks that are low in simple carbs. When our family eats at a restaurant, I box up half my meal or share it with my grandson. Any smart person who cares about health would do the same thing. For example, tell yourself “Don't even look at the medium or large sizes!”

It is impossible to disagree that avoiding simple carbohydrates and cutting back on food are essential to manage your blood sugar and get your diet in balance. As a diabetic, and as a grandparent, I simply don't have a choice. The same is true for you. Do it for the people you love. Eat better today.



Replace mistakes with smart choices today.

If you have diabetes, your only real choice is to eat right every day to keep your blood sugar levels even and stay healthy. It simply does not make sense to indulge in sugary snacks and eat large amounts of food. As a diabetic, you have an obligation to choose foods that will help you feel and live better.

Eating the right portion sizes helps you lose weight. As a diabetic, you will feel better if you lose even a few pounds. Get in the habit of reading food labels and avoid filling up on simple carbohydrates. Losing weight does not mean you have to stop eating your favorite foods, but it absolutely does mean eating smaller amounts of food. Force yourself to adopt strategies like drinking a glass of water before meals to feel more full. Replace mistakes such as chips and pizza with smart choices such as pretzels and fresh salads.

Eating well to stay at a healthy weight is good for everyone, but it is absolutely necessary for diabetics. Set goals to cut sugars and portion sizes, and once you start, do not quit under any circumstance. The choice is simple – there really is no choice. Eat better today.



Some things about tomorrow require you to make changes today.

Diabetes may keep me from some things, but missing her wedding day was out of the question. Anna, my daughter, told me, “You simply don’t have a choice. You have to be more active and eat better so that you can be there to walk me down the aisle.”

Any reasonable person would agree that getting regular exercise is a smart idea – not just for yourself, but for your family. It was hard for me to get in the habit, but that isn’t a good enough excuse. It is essential to get 30 minutes of moderate activity at least four times a week to maintain a healthy diabetic lifestyle. Don’t say that you can’t find time – make time. We go on a walk after dinner instead of watching TV, for example. Force yourself to become active in small ways, too. My wife’s request? “Put away the remote control, and get off of the couch to change the TV channel.”

Regular physical activity was absolutely necessary to help me feel better. More importantly, it’s something I knew I had to do to be there for the moments that matter—like my little girl’s wedding day. You simply don’t have a choice. Be more active today.

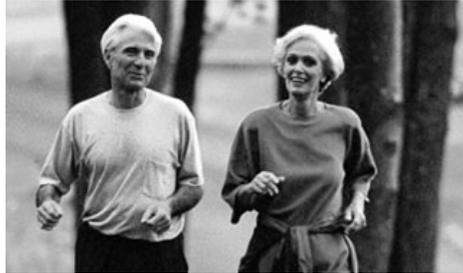


**Your choice,
like my choice,
is crystal clear.**

Before I was diagnosed with type 2 diabetes, I always found excuses not to exercise. Now I realize that there is no choice, and that my excuses don't matter. After spending so much time not feeling or looking the way I wanted to, I said to myself, "You have to do something, and do it now!"

Diabetics ought to get 30 minutes of moderate activity at least four times a week to maintain blood sugar levels. Find an activity that you enjoy, such as water sports or weight lifting, and stick with it. In addition to formal exercise, it is imperative that you take steps to be more active throughout the day. I told myself that it was ridiculous to sit instead of walking around while I talked on the phone, for instance. Now, I feel better, and I know that my risk for complications like heart and foot problems is lower, too.

Any sensible person would agree that physical activity is one of the best ways to keep your blood sugar in a normal range and feel the way you want to feel. Do like I did – stop the excuses and don't give up. You have to do something. Be more active today.



**It's not
just
about you.**

As a diabetic, you have an obligation to yourself. You have an obligation to your loved ones, too. Make physical activity part of your daily life if you want to feel healthy enough to enjoy the time you spend together.

It is impossible to disagree with the fact that exercise is an essential part of a healthy diabetic lifestyle. You must get 30 minutes of moderate activity at least four times a week, not just for yourself, but for the people who matter to you. Whether you walk, swim or bike, regular exercise is a requirement for your health – and so is the habit of being more active in general. Park your car farther away from places like stores, your office, and movie theaters, and make yourself walk. Why would you want to take the easy way out?

Any sensible person would realize that you absolutely must make exercise a lifelong commitment, in order to enjoy the life you share with others. Don't just do it for yourself. Do it for them. You have no choice if you want to be there for them tomorrow. Be more active today.



**There's no
question about it.**

Shaping up through regular physical activity is necessary to manage your blood sugar and help you feel better. If you have diabetes, you need to exercise and make healthy food choices to stay at a healthy weight. It is absolutely necessary that you get 30 minutes of moderate activity at least four times a week. You have no choice but to do things that keep you on your feet and moving to balance your blood sugar and reduce your risk of complications like heart or eye problems.

Start taking a brisk walk after dinner, or find a water sport that you enjoy. Whatever you decide, do not stray from your plan for any reason! You must move around more frequently during your normal day, too, not just during time dedicated to exercise. Any sensible person who wants to be healthy knows to take the stairs instead of the elevator, for example.

Adopting a plan to get regular exercise and be more physically active simply is not optional for diabetics. It is your responsibility to make the change. No other conclusion makes sense. Be more active today.

2. Informed Consent Forms

(Pretest)

Researcher's Name: Elizabeth Gardner (elizabethgardner@mizzou.edu)
Project Title: Reactance and type 2 diabetes messages (IRB#1171117) - pretest

YOU ARE BEING ASKED TO VOLUNTEER TO PARTICIPATE IN A RESEARCH STUDY.

Researchers are conducting this study to pretest messages that will be used in an experiment on how people perceive messages about type 2 diabetes. This pretest takes approximately 15 minutes to complete. You will be asked to read a few print advertisements and answer a few short questions following each ad. Your participation is voluntary and you do not have to be in the study if you do not want to be.

Please contact Elizabeth Gardner at elizabethgardner@mizzou.edu if you have any questions about this study. If you have questions about your rights as a study participant, or are dissatisfied with any aspect of this study, you may contact, anonymously if you wish, the Campus Institutional Review Board, 483 McReynolds, University of Missouri, Columbia, MO 65211, (573) 882-9585.

What are the benefits of being in the study? Your participation will benefit communication science by contributing to a better understanding of individuals perceive messages about type 2 diabetes.

What are the risks of being in the study? Your participation should not cause you any risks greater than those encountered in everyday life, and there are no adverse consequences (physical, social, economic, legal, or psychological) for a participant's decision to withdraw from the research.

CONFIDENTIALITY: Your identity and participation will remain anonymous and your individual privacy will be maintained in all published and written work resulting from this study.

By clicking "Yes" below, you indicate that you have read this consent form and your questions have been answered. Your signature below means that you do want to be in the study, and know that you can remove yourself from the study at any time without any problems.

Your Signature

Date

(Main Experiment)

Researcher's Name: Elizabeth Gardner (elizabethgardner@mizzou.edu)

Project Title: Reactance and type 2 diabetes messages (IRB#1171117)

YOU ARE BEING ASKED TO VOLUNTEER TO PARTICIPATE IN A RESEARCH STUDY.

Researchers are conducting this study to better understand how individuals perceive messages about type 2 diabetes. This study will take approximately 45 minutes for you to complete. You will be asked to view a collection of print advertisements and answer a series of questions following each message. Your participation is voluntary and you do not have to be in the study if you do not want to be. You may stop participating at any time without penalty or loss of benefits to which you are otherwise entitled. There will be approximately 60 people in the study, but the number of participants involved in the study is not important to a decision to take part in the research.

Please contact Elizabeth Gardner at elizabethgardner@mizzou.edu if you have any questions about this study. If you have questions about your rights as a study participant, or are dissatisfied with any aspect of this study, you may contact, anonymously if you wish, the Campus Institutional Review Board, 483 McReynolds, University of Missouri, Columbia, MO 65211, (573) 882-9585.

What are the benefits of being in the study?

Your participation will benefit communication science by contributing to a better understanding of individuals perceive messages about type 2 diabetes. You will also receive monetary compensation for your participation.

What are the risks of being in the study?

Your participation in this study is not expected to cause you any risks greater than those encountered in everyday life. The messages that you will see do not contain graphic or violent content. There are no adverse consequences (physical, social, economic, legal, or psychological) for a participant's decision to withdraw from the research.

What will I receive for being in the study?

You will receive a Visa gift card in the amount of \$20 when you leave today. You are also eligible to win one of three gift cards worth \$100 apiece, to be awarded to randomly-selected participants following data collection.

CONFIDENTIALITY: Your identity and participation will remain confidential. Neither your name nor your information will be given to anyone outside the research team. Your individual privacy will be maintained in all published and written work resulting from this study. Your name will not be connected to your answers or included in any data analysis.

A copy of this Informed Consent form will be given to you before you participate in the research.

I have read this consent form and my questions have been answered. My signature below means that I do want to be in the study. I know that I can remove myself from the study at any time without any problems.

Your Signature

Date

3. Participant Recruitment Tactics

MU Info posting (sent 7/14/10, 7/21/10)

Diabetics: Receive up to \$120 for participation in a study on health messages

Adults who have been diagnosed with type 2 diabetes are invited to participate in a one-hour, on-campus research study about health messages. Participants will read print advertisements and watch videos, and answer questions about each. **Each participant will receive a \$20 Visa gift card, plus a chance to win one of three \$100 gift cards at the completion of the study.** The study takes place in an on-campus computer lab, and evening and weekend sessions are available. If you are (or know) an adult who has been diagnosed with diabetes, please contact elizabethgardner@mizzou.edu for more information.

Announcement sponsored by School of Journalism, Graduate Studies

Columbia MO Freecycle and Kwikswap posting (sent 7/21/10)

[Diabetics: Receive up to \\$120 for a 1-hour study on health messages](#)

Posted by: "Liz Gardner" lizinatlanta@yahoo.com lizinatlanta

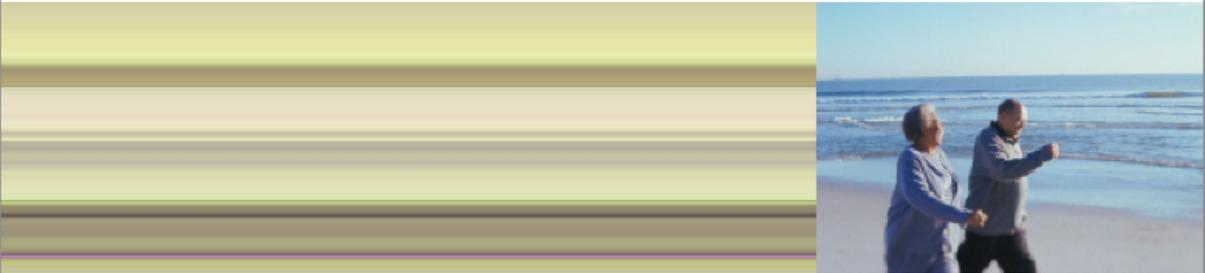
Wed Jul 21, 2010 8:49 am (PDT)

Adults who have been diagnosed with type 1 or type 2 diabetes are invited to participate in a one-hour, research study about health messages. People in the study will read print advertisements and watch videos, and answer questions about each.

Each participant receives a \$20 Visa gift card when they leave the study, plus a chance to win one of three \$100 gift cards. The study takes place in a computer lab on the MU campus. Evening and weekend sessions are available.

If you are (or know) an adult who has diabetes, and would like more information, please email elizabethgardner@mizzou.edu or visit <http://gardner-research.com>. Spaces are limited - please act quickly.

Website (<http://gardner-research.com>)



Diabetes Health Messages Study

Researcher: Elizabeth Gardner, PhD Candidate, University of Missouri

Adults with type 1 or type 2 diabetes are invited to participate in a one-hour research study. The purpose of this research is to better understand how people respond to persuasive health messages.

To schedule a time to participate in this study, please email elizabethgardner@mizzou.edu with times that you are available for a one-hour study located on the University of Missouri campus. Evening and weekend sessions are available.

Each participant will receive a \$20 Visa gift card when they leave the study. Participants will also have a chance to win one of three \$100 cards, to be chosen at random once the study is complete. Participants in this study will read print messages, watch video clips, and answer questions. This study takes approximately one hour to complete.

This study is being conducted as part of my dissertation research and has been approved by the Institutional Research Board at the University of Missouri (project #1171117).

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Flyer (posted in local health clinics and businesses)

Diabetics: Receive up to \$120

for participation in a one-hour study on health messages



Adults with type 1 or type 2 diabetes are invited to volunteer for a one-hour research study

Each participant will receive a \$20 Visa gift card, plus a chance to win one of three \$100 cards.

Participants will read print messages, watch video clips, and answer questions. This study takes place on the MU campus. Evening and weekend sessions are available.

If you are interested, email elizabethgardner@mizzou.edu or visit <http://gardner-research.com>.

Please act quickly – space is limited.

Diabetes health messages study
ElizabethGardner@mizzou.edu
<http://gardner-research.com>

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