USING CONDITIONAL AND UNCONDITIONAL PROCESS APPROACHES TO DETERMINE THE EFFECTIVENESS AND COMPREHENSIVENESS OF INSTRUCTIONAL RISK AND CRISIS COMMUNICATION MESSAGES

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ABSTRACT

Many individuals willingly or unknowingly consume food products that have been implicated in recall announcements. Exposure to potentially contaminated food products puts people at risk for contracting foodborne disease. Given the serious health complications associated with foodborne disease, a new message-design approach was needed that compels and empowers at-risk individuals to take appropriate life-saving actions when food-related, public health crises become imminent. The IDEA protocol was put forth to improve how we instruct and motivate at-risk audiences to self-protect against foodborne disease during food contamination events (T. Sellnow & D. Sellnow, 2013).

IDEA-modeled messages, relative to alternative messages, are predicted to address audience diversity and produce more accurate receiver perceptions, which in turn translate into more appropriate behavioral intentions. The IDEA model has not yet been adequately or appropriately tested, despite arguments to the contrary. This study advanced the IDEA model by presenting: (1) a rigorous tool that more appropriately tested hypotheses, (2) a visually-friendly conceptual diagram for depicting a path-analytic framework, (3) important guidelines that scholars should employ to examine the IDEA model's utility, and (4) justification for theoretical grounding in Witte's (1992a) extended parallel process model (EPPM) in addition to D. Kolb's (1984) learning cycle model.

Rather than relying on tests based on analysis of variance to test theory, the present message-testing study employed a regression-based approach that more appropriately tested the IDEA model hypotheses. My conditional process model efficiently integrated moderators and mediators into a single path-analytic framework. My unconditional process model excluded the

two moderating factors and their interactions from the statistical framework. Both statistical models included six parallel mediating mechanisms and two behavioral intention measures.

The results of this message-testing experiment demonstrated how regression-based approaches that incorporate moderation, mediation, moderated-mediation, and moderated-moderated mediation should be employed to test the IDEA protocol. I found that an IDEA message was not consistently superior to an alternative message. My results suggest that an IDEA-modeled message should be thoughtfully designed to prevent inappropriate outcomes among target audiences. Improved message-design approaches should be explored for motivating and empowering at-risk individuals to self-protect against foodborne disease during contamination events.

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Finally, I thank my husband, Jeffrey; our children, Jessica, Steffanie, Laura, and Kerri, and my parents, Howard and Juanita, for their love and encouragement during my entire education process. I could not have picked a better support group. We were all in this together.

DEDICATION

This dissertation is dedicated to my family – my parents, Howard and Juanita, my husband, Jeffrey, our children, Kerri, Laura, Steffanie, Jessica, their spouses, and all generations that may follow.

I love you all.

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CHAPTER 1. INTRODUCTION

Media reports of food recalls[1] illuminate the surprising nature of supply-chain breaches, the health threat posed by consumption of tainted food, and the urgency for at-risk individuals to take important steps that prevent unnecessary suffering or death. Exposure to potentially contaminated food products puts people at risk for contracting foodborne illness. In some disease cases, individuals develop serious health complications that can lead to life-long disability or death. Far too many individuals willingly or unknowingly consume products that have been implicated in recall announcements (Cuite, Condry, Nucci, & Hallman, 2007; Cuite, Schefske, Randolph, Hooker, & Nucci et al., 2009).

Communication is a central ingredient in minimizing public harm and managing food-contamination crises[2] effectively. Food recall warnings center on the notion that the choices information receivers make will specifically offset their disease risk and survival. It is precisely this contrast that opens the door for message designers and crisis communicators to empower at-risk individuals to control their own destinies. Communication practitioners must bear the burden of formulating warnings that motivate target audiences to take immediate and suitable steps for self-protection, as directed. The sudden eruption of a food contamination event allows little time to gather sufficient detail and formulate a warning, yet, a carefully constructed message transmitted through the media must "accurately describe the nature of the event, the suspected or implicated foods, and [self-protective] measures [that people must] take to prevent [foodborne illness or the adverse effects of illness] (Sobel, Khan, & Swerdlow, 2002, p. 879). The media play an important role in providing information and shaping public understanding, opinion, and concerns

[1] The purpose of an organization's voluntary recall is to remove as much potentially contaminated food product as possible from retail and distribution channels to circumvent public access to product (Food Safety; n.d.b., para. 1).
[2] Coombs (2015) defines crisis as the "perception of an unpredictable event that threatens important expectancies of stakeholders related to health, safety, environmental, and economic issues, and can seriously impact an organization's performance and generate negative outcomes" (p. 3).

(Barnett, McConnon, Kennedy, Shepherd, Verbeke et al., 2011). It is critical that warnings compel affected individuals to take appropriate self-protective actions that prevent foodborne illness from tainted product exposure. Kreps, Alibek, Bailey, Neuhauser, Rowan et al. (2005) point out that, “one of the biggest challenges …[is] making relevant information accessible and understandable to highly varied subgroups in society” (p. 196). Communication studies are needed that identify how to design and deliver food recall warnings that will motivate diverse audience members to take self-protective actions, in accordance with message recommendations.

IDEA Model

In a published essay, T. Sellnow and D. Sellnow (2013) put forward the IDEA model to expedite the development and delivery of effective warning messages. Crisis spokespersons, communication practitioners, and media reporters are encouraged to follow the IDEA protocol when offering information and instructions to affected individuals and groups. Messages developed according to the audience-centered protocol are predicted to produce “more accurate perceptions and more appropriate behavioral intentions among receivers compared to food-related risk messages that are typically provided by experts and in the media today” (T. Sellnow & D. Sellnow, 2013, p. 3). Thus, T. Sellnow and D. Sellnow (2013) suggest that IDEA-modeled messages have the potential to save lives, when crises become imminent and public welfare is threatened.

Their instructional risk and crisis communication model is characterized by four elements: Internalization, distribution, explanation, and action. When introducing the model, T. Sellnow and D. Sellnow (2013) provided direction and examples for operationalizing the elements of internalization, explanation, and action into message features. The scholars also provided guidance for selecting appropriate distribution channels to ensure that “all segments of an at-risk population [have been reached]" (p. 4). Given the serious health complications associated with contracting foodborne disease, T. Sellnow and D. Sellnow's (2013) IDEA model shows promise for incorporating specific message features into a single warning that will help receivers perceive the explained public threat (i.e., explanation) to be imminent, serious, and personally relevant (i.e., internalization), perceive directives for self-protection to be feasible and within their means to perform (i.e., action), which in turn, translate into appropriate behavioral response within a timely fashion.

T. Sellnow and D. Sellnow (2019) claim that the IDEA model has been "tested empirically.... and has demonstrated [its effectiveness]…. across a wide array of disasters, risk situations, and crisis types" (p. 76). My review of literature identified five studies that have been published as experimental tests of the IDEA model. Of these, the IDEA protocol has been examined in the context of a hypothetical food product recall and illness outbreak warning (namely, Littlefield, Beauchamp, Lane, D. Sellnow, T. Sellnow et al., 2014; D. Sellnow, Johansson, T. Sellnow, & Lane, 2018; D. Sellnow, Lane, Littlefield, T. Sellnow, Wilson et al., 2015; D. Sellnow, Lane, T. Sellnow, and Littlefield, 2017), and a hypothetical earthquake early warning (namely, D. Sellnow, Jones, T. Sellnow, Spence, Lane et al., 2019). Most pertinent to my review of literature are the four message-testing studies specific to a food-related, public-health crisis.

These tests of the IDEA model illuminate a trend for scholars to employ posttest-only quasi-experimental designs through an online platform that randomly assigns participants into message variation conditions, and collects participant data (i.e., demographic, perceptual, and self-reported behavioral intentions). For each experiment, the scholars incorporated the message questionnaires and news story simulations developed by T. Sellnow and colleagues, although

D. Sellnow, Johansson et al. (2018) transcribed the questionnaire and message scripts from English into the Swedish language. Individual difference variables were routinely assessed in order to examine potential moderators of the message variation's direct influence on receiver's self-reported behavioral intentions and the message variation's direct influence on receivers' perceptions. In all instances, Littlefield et al. (2014), D. Sellnow, Johansson et al. (2018), D. Sellnow, Lane, Littlefield et al. (2015) and D. Sellnow, Lane, T. Sellnow et al. (2017) relied on tests based on analysis of variance to test hypotheses and address research questions.

There are two key assumptions that must be tested simultaneously when determining the utility of an IDEA-modeled protocol. One assumption is that an IDEA message variation (relative to status quo variations) will indirectly predict more positive self-reported behavioral intentions, while operating through receiver perceptions (see, D. Sellnow, Lane, T. Sellnow et al., 2017). The corresponding assumption is that a single message that addresses all elements of the IDEA model should eliminate the time consuming and resource draining practice of tailoring multiple message variations needed to reach all audience segments within a larger target population (see, D. Sellnow, Johansson et al., 2018; D. Sellnow & T. Sellnow, 2019). This message-design argument is grounded in D. Kolb's (1984) learning cycle model, as predicated on Dewey's (1938) theory of experiential learning (D. Sellnow, Lane, Littlefield et al., 2015). Through his learning cycle model, D. Kolb (1984) argues that learning preference differentials among individuals must be acknowledged so that instruction can be developed and improved to facilitate better learning outcomes among receivers of information.

The general rule of thumb has been for Littlefield et al. (2014), D. Sellnow, Johansson et al. (2018), D. Sellnow, Lane, Littlefield et al. (2015) and D. Sellnow, Lane, T. Sellnow et al. (2017) to support a claim that the IDEA protocol is more effective than a status quo variation and has comprehensively addressed audience diversity if the following tests based on analysis of variance have been met: 1) the data reveal no statistically significant finding for any moderated direct effect of message type on any of the receivers' self-reported behavioral intentions, and 2) the data reveal a statistically significant finding for the unmoderated direct effect of message type on at least one of a receiver's multiple self-reported behavioral intentions indicative of recommendation compliance. However, the tools selected by the scholars to test the relative effectiveness of the IDEA protocol made it impossible to account for and examine the message variation's indirect effects operating through parallel mediators (i.e., affect, cognition) that are foundational to T. Sellnow and D. Sellnow's (2013) message-design framework. By excluding a moderated indirect-effect analysis, Littlefield et al. (2014), D. Sellnow, Johansson et al. (2018), D. Sellnow, Lane, Littlefield et al. (2015) and D. Sellnow, Lane, T. Sellnow et al. (2017) neglected the opportunity to simultaneously test the two key assumptions as predicted in theory by the IDEA model.

In sum, my review of literature revealed that T. Sellnow and D. Sellnow's (2013) IDEA model has not been tested, as theorized. To date, the IDEA model's two key assumptions have not been thoroughly explained in propositional form or analyzed in an integrated fashion through a single statistical framework. Thus, the present study proposes that the IDEA model's predictive and explanatory power may be increased through the use of a rigorous tool to evaluate the model's effectiveness, and through explicit grounding in Witte's (1992a) extended parallel process model (EPPM), a theory of persuasion.

The EPPM provides theoretical guidance for structuring messages that motivate audiences to engage in risk-aversion behaviors. A food recall warning is a form of risk communication because the message serves to alert receivers to the threat of experiencing the dreadful consequences of foodborne disease once tainted foods are consumed. A food-recall warning is considered persuasive in nature because it encourages a temporary change in behavior (e.g., stop eating implicated food products) to prevent against foodborne disease. A communicated threat tends to evoke fear, which makes the EPPM relevant to designing food-recall warnings and evaluating the persuasive impact on receiver outcomes.

The EPPM proposes that receiver perceptions mediate the influence of a risk message on behavioral intentions, and that individual difference variables may impact the effectiveness of a risk communication message. Witte, Cameron, McKeon, and Berkowitz (1996) developed a risk behavior diagnosis (RBD) assessment to examine the relationship between perceived threat and efficacy. The assessment results provide a theoretical explanation for why and when messages have succeeded or failed to achieve intended results. The RBD may be administered as threat and efficacy assessments prior to and following message exposure to more fully explain how populations of interest vary in their perception of foodborne disease and respond differently, if at all, to food-recall recommendations. If individual difference variables (e.g., predispositions to danger control and/or learning preferences) are found to moderate an IDEA message variation's relative direct or indirect influence on receivers' self-reported behavioral intentions, then communicators of risk and crises would be wise to account for these factors in future message designs.

Rationale for Present Study

The present study serves to advance the IDEA model by presenting: 1) a rigorous tool that more appropriately tests hypotheses and addresses research questions, 2) a conceptual diagram that is visually friendly for depicting a path-analytic framework, 3) important guidelines that scholars should employ to examine the IDEA model's utility, and 4) justification for theoretical grounding in Witte's (1992a) EPPM, a theory of persuasion that draws from more than 50 years of empirical research.

The present study will be the first to test the utility of T. Sellnow and D. Sellnow's (2013) IDEA model using conditional process and unconditional process approaches. I draw upon Hayes' (2018b) PROCESS macro program, release 3.0 for IBM SPSS Statistics (version 26) to employ both forms of process analyses. Hayes (2013, 2018a) developed PROCESS as an observed variable ordinary least squares (OLS) and logistic regression path analysis modeling tool. I introduce my custom-syntax tool that runs in conjunction with Hayes' (2018b) macro program, and at the same time overcomes a minor statistical constraint. Coined by Hayes (2013) and Hayes and Preacher (2013), the phrase *conditional process analysis* refers to an analytical strategy that quantifies "boundary conditions of mechanisms and testing hypotheses about [moderation of indirect effects]" (Hayes. 2017a, p. 5). A conditional process analysis is a regression-based analytical approach that efficiently integrates mediation and moderation into a single path-analytic framework (Hayes, 2015). In contrast, the unconditional process analysis cleanses the conditional model of all potential moderating variables. Hayes' (2013, 2018a) regression-based approach, in conjunction with my custom tool, eliminates the need to rely on tests based on analysis of variance when testing IDEA model hypotheses.

I propose that T. Sellnow and D. Sellnow's (2013) framework should be grounded in Witte's (1992a) EPPM to theoretically explain when an IDEA message (relative to a status quo variation) will succeed or fail, if at all, to produce intended outcomes among receivers of information. The present study will be the first to include categorical and continuous measures of Witte et al.'s (1996) RBD within the same statistical framework to test the IDEA model assumptions. Scholars have not yet incorporated Witte et al.'s (1996) RBD as a mediating mechanism or individual difference variable when testing the IDEA model's utility

Through strategic coding, three predictor variables are incorporated into the conditional process analysis to accomplish main effect parameterizations, two-way interactions, and three-way interactions that are comparable to results produced through a factorial ANOVA. To test the tailoring hypotheses predicted by the IDEA model, the results of a conditional process analysis are compared to the results of the unconditional process analysis. In the conditional model, I take a deductive approach to isolate: 1) the IDEA variation's (*X*) portion of a three-way (*XWZ*) interacting direct and interacting indirect effects on each of the two dependent variables ($Y_{3;}$ Y_4), compared to a status quo variation; 2) the IDEA variation's (*X*) portion of a two-way (*XW*) interacting direct and interacting indirect effects on each of the two dependent variables ($Y_{3;}$ Y_4), compared to a status quo variation; 3) the IDEA variation's (*X*) direct and indirect effects on each of the two dependent variables ($Y_{3;}$ Y_4), compared to a status quo variation. In the unconditional model, I examine the direct and indirect effects of the IDEA variation on each of the two dependent variables ($Y_{3;}$ Y_4), compared to a status quo variation. My tool provides a new statistical approach that scholars may employ to test the effectiveness and comprehensiveness of protocols, such as those designed according to T. Sellnow and D. Sellnow's (2013) IDEA model.

I employ a quasi-experimental design using an online platform that randomly assigns participants into message-variation conditions and collects participant responses to questionnaire items (i.e., demographic, perceptual, and self-reported behavioral intentions) prior to and following message exposure. I utilize the video stimuli and participant questionnaire developed by T. Sellnow and colleagues to test the utility of T. Sellnow and D. Sellnow's (2013) IDEA model in the context of a food-related, public health crisis. With the rigorous tools in hand, the overarching goal of my study is to present the IDEA framework as the go-to protocol that should be employed to educate and empower people to “protect themselves before and during high-risk events, [when public welfare is threatened]” (D. Sellnow, Lane, T. Sellnow et. al., 2017, p. 552). Figure 1.1 presents the conceptual diagram put forth by T. Sellnow and D. Sellnow (2013) to illustrate their IDEA model. Figures 1.2 and 1.3 present two visually-friendly conceptual diagrams that depict the present study’s conditional and unconditional path-analytic frameworks.

Conclusion

The chapters of this dissertation are organized in the following manner. Chapter One introduced a statement of problem, previewed T. Sellnow and D. Sellnow’s (2013) IDEA model, proposed additional grounding in Witte’s (1992a) EPPM, and called for a rigorous tool to test theory. Chapter Two expands upon the conceptual frameworks guiding this study. Chapter Three describes the methods and tools employed to conduct this study. Chapter four presents the results of hypotheses tests. Chapter five discusses findings, acknowledges study limitations, and offers directions for future research before drawing conclusions.

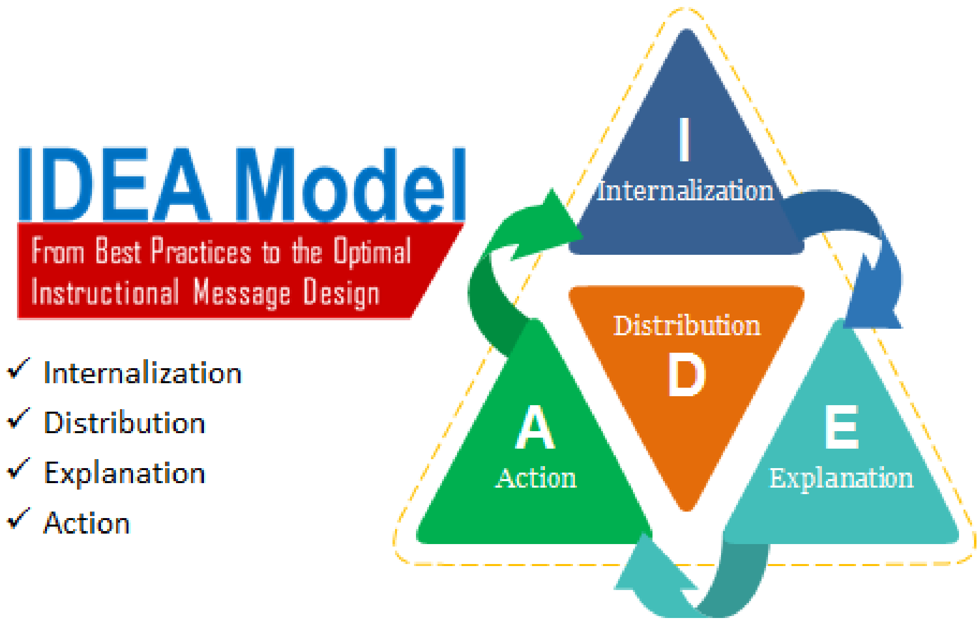

Figure 1.1. IDEA learning cycle model.
SOURCE: The Role of Instructional Risk Messages in Communicating About Food Safety, by T. Sellnow and D. Sellnow (2013), International Food Information Council Foundation, July, p. 1-3. Reprinted with permission.

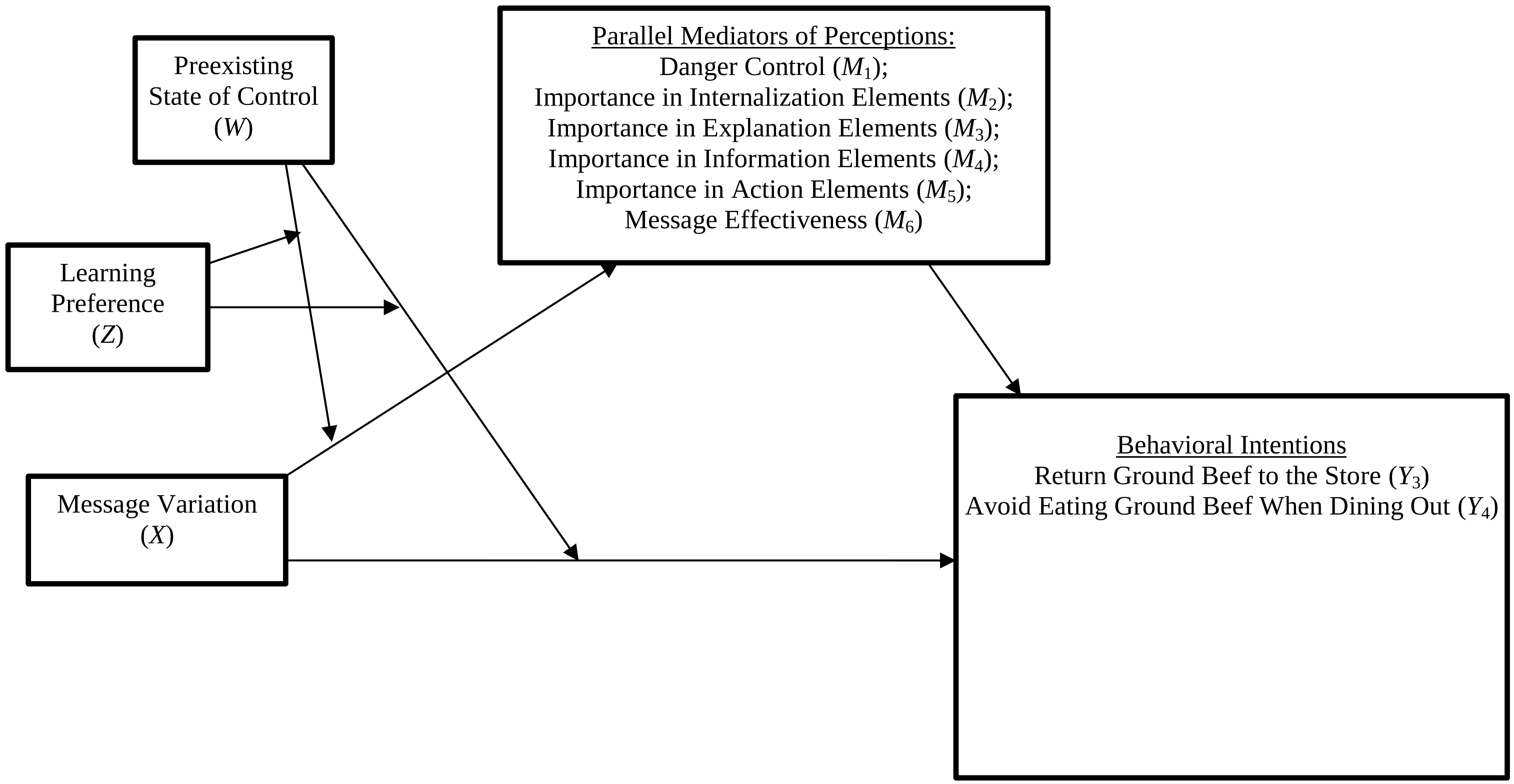

Figure 1.2. Visually-friendly conceptual diagram for conditional process model.
Note. Message variations: IDEA; status quo. Prexisting State of Control dimensions: Fear; Danger. Learning style preference dimensions: explanation-information; internalization; action. Orthogonal contrast 1 (Z1; a.k.a. L1) and contrast 2 (Z2; a.k.a. L2): learning preferences of explanation and information contrasted with internalization and action; learning preferences of action contrasted with internalization. Predictor variables were coded for mean effects parameterization. Variables were not mean centered prior to the construction of products. From the total sample (n=641), 10,000 bootstrap samples were drawn using a seed value of 10,235.

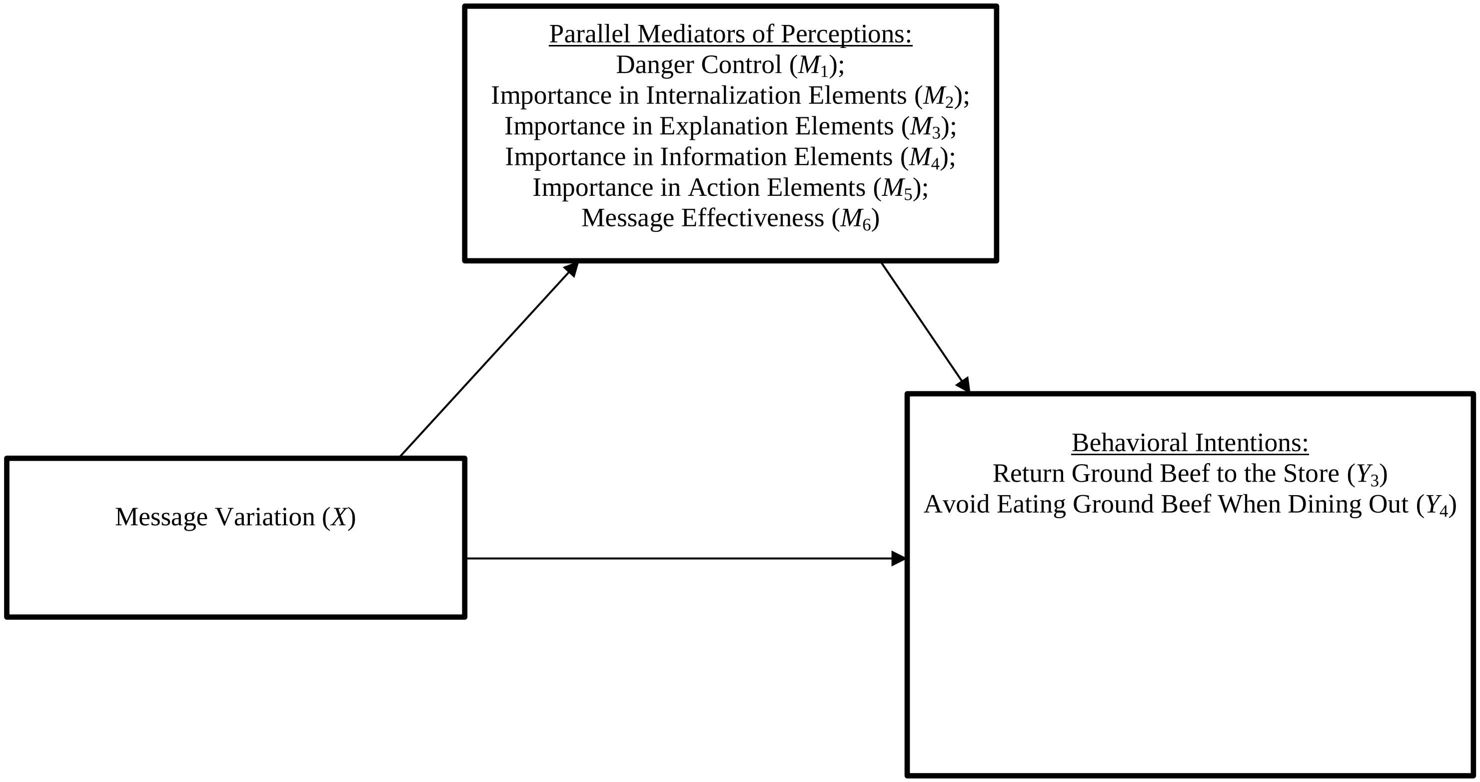

Figure 1.3. Visually-friendly conceptual diagram for unconditional process model.
Note. Message variations: IDEA; status quo. Message variation was coded for mean effects parameterization. From the total sample (n=641), 10,000 bootstrap samples were drawn using a seed value of 10,235.

CHAPTER 2. LITERATURE REVIEW

This study focused specifically on T. Sellnow and D. Sellnow's (2013) IDEA strategy for developing effective instructional risk and crisis messages, when time is of the essence. This chapter is organized into five main sections for examining the IDEA model's concepts, its theoretical grounding, how it has informed the development of a hypothetical food-recall warning, and how scholars have examined its utility through message testing research. The first section introduces the IDEA model as an improved protocol for communicating with the public about crisis events. As noted earlier, the message-design framework is characterized by the elements of internalization, distribution, explanation, and action. The second section briefly summarizes the main concepts of D. Kolb's (1984) learning cycle model and explores how these concepts pertain to the IDEA model assumptions. The third section summarizes the main concepts of Witte's (1992a) EPPM and explores how these may inform the explanatory and predictive power of T. Sellnow and D. Sellnow's (2013) IDEA model. The fourth section reviews the stimuli developed by T. Sellnow and colleagues for scholars to use when testing the utility of the IDEA model. The fifth section examines four experiments that have been published as tests of the IDEA model. The sixth section will summarize this review of literature and propose the hypotheses for the present study.

IDEA Model

In a published essay, T. Sellnow and D. Sellnow (2013) introduced their IDEA model for designing "highly effective risk messages" (p. 3). The IDEA model is a risk-messaging strategy for "instructing people how to protect themselves before and during high-risk events, crises, disasters, and other emergencies" (D. Sellnow, Lane, & T. Sellnow et al., 2017, p. 552).

T. Sellnow and D. Sellnow (2013) maintain that a message designed according to their protocol has the potential to save lives, which is a top priority of managing a crisis effectively. A crisis event emerges suddenly with little-to-no warning, creates extraordinary threatening circumstances that may impact the wellbeing of an organization and its stakeholders (i.e., publics), and poses serious consequences for both if the threat is not addressed immediately and resolved (Hermann, 1963; Ulmer, T. Sellnow, & Seeger, 2011). Communication plays a central role in minimizing public harm throughout the crisis management process.

The crisis evolution is commonly described as a progression of stages, [with each phase having a unique] set of dynamics and dimensions" (Sturges, 1994, p. 299). During the first stage (i.e., pre-crisis), "clues or hints begin to appear about a potential crisis" (Sturges, 1994, p. 299). Usually, the second phase (i.e., crisis) is initiated by a dramatic trigger event. During this phase, the crisis event may inflict tremendous "physical, fiscal, and emotional trauma to an organization [and pertinent] publics [experiencing the crisis]" (p. 300). An immediate public response is required by responsible organizations when public welfare is threatened. A crisis presents a "fluid and dynamic state of affairs [where a pressing need exists for responsible parties and affected individuals to manage the] reality of the situation" (Fink, 2013, p. 7). Crisis communication is typically associated with public relations (Reynolds & Seeger, 2005, p. 46) where communication practitioners shape messages for the purpose of influencing public perceptions and opinions of a reality in order to reduce the harm that may be inflicted on an organization and its stakeholders (i.e., publics).

During the third phase (i.e., post-crisis), the organization settles into a new normal with planning and prevention activities as business operations are resumed (Seeger, T. Sellnow, & Ulmer, 2003). Planning and prevention activities are important, because the next dramatic trigger may be just around the corner. During this post-crisis period, lessons are realized and the organization may focus its communication efforts on building a positive relationship with its stakeholders, including the media and publics. Sturges (1994) suggests that this is the appropriate time for an organization to provide information that helps people formulate perceptions of the organization. In a linear fashion, the post-crisis phase transitions to a new pre-crisis phase from which a crisis life-cycle starts over.

Typically, the explanations coming from organization spokespersons during the crisis phase have been "relegated to generalities about accuracy and timeliness without regard to meeting the audience's psychological and physical needs" (Sturges, 1994, p. 300). Once a crisis event is triggered, an organization's release of information serves to "appease third-party interveners [such as the media, and the same time] …. keep affected individuals informed about the situation" (Sturges, 1994). As third-party interveners, the mass media harbor agendas for ferreting and presenting details of the crisis situation. The information flowing through media channels may be "inaccurate, inappropriate, counterproductive, or downright hostile" (Sturges, 1994, p. 308). Such information serves to form and/or reinforce negative public opinions of organizations responsible for ensuring public safety and wellbeing, including organizations charged with overseeing the safety of the food supply. Given the serious threat of foodborne disease from eating tainted food, it is critical that product recall announcements transmitted through media platforms are formulated with content that will maximize warning effectiveness toward the ultimate goal of saving lives.

Effective crisis communication is essential for ensuring that affected audiences receive "important information about how to react [during the threatening situation]" (Sturges, 1994,

p. 307). The sudden eruption of a food-related crisis leaves spokespersons, practitioners, and media professionals with little time to formulate a comprehensive message that adequately explains the nature of the threat, defines those who are at risk for actually experiencing the threat, and describes steps for at-risk individuals and groups to take as life-saving measures. In most cases, these warnings are often developed and released under tremendous pressure with a sense of urgency. A swift response is necessary to maintain public confidence in the safety of the food supply, the organizations that comprise the food industry, the government agencies that enforce regulations and standards, and the agencies that oversee public health interests.

Through their model, T. Sellnow and D. Sellnow (2013) suggest that public noncompliance with recommendations issued in food-product recalls stems from the way the messages are usually developed and delivered to affected audiences. The scholars argue that most risk messages "presented by experts and in the media today [focus solely on explaining the crisis development, at the expense of providing the type of information desperately needed by at-risk audiences when public welfare is threatened]" (p. 3). More specifically, T. Sellnow and D. Sellnow (2013) contend that most risk messages fail to provide information that will help affected audiences psychologically and physically cope with a crisis-induced threat to safety and wellbeing, and fail to explain and demonstrate what affected audiences must do, should do, or may do to prevent or diminish a threat experience. Thus, the IDEA model guides the effective distribution of a single, audience-centered message that thoughtfully explains how a public threat has emerged, prioritizes the information necessary to help receivers internalize the threat's relevance, and offers doable steps that receivers can easily accomplish for self-protection. A *threat* is defined as an "external stimulus variable [of danger or harm that coexists between affected individuals and their environment, whether they realize the threat or not]" (Witte, 1992a). Severe threats are considered more imminent, more debilitating, and more fatal (Witte, 2001). Individuals must learn of a health threat, and realize its relevance before they can be motivated to take actions that work to prevent against the detrimental consequences associated with the threat experience (Witte, 1993).

Explanation Element

As an IDEA model component, explanation information is operationalized through factual or visual features that articulate the crisis event. To be effective, information about threat should come from a variety of expert sources that target audience members will perceive to be credible and trustworthy (Witte, 2001). The explanation information must be truthful and accurate in its description of how the situation developed, and how the crisis poses a significant public health threat. This detail is necessary to help receivers form a personal understanding about the crisis event, including what responsible parties are doing to resolve the situation and minimize public harm. It is crucial that the explanation translates scientific information using practical examples and terms familiar to the target audience (T. Sellnow & D. Sellnow, 2013). The 'who, what, where, when, why, and how' details about the crisis should be briefly stated, yet provide sufficient detail about efforts underway to prevent reoccurrence (T. Sellnow & D. Sellnow, 2013). For example, in the event of an illness outbreak, the explanation component would use "simple, non-scientific language [to describe] what the disease is and how it is contracted" (D. Sellnow–Richmond, George, & D. Sellnow, 2018, p.140). To be effective, the features that address the IDEA model's explanation element must help receivers answer the questions: "What is happening, and why?" (D. Sellnow–Richmond et al., 2018, p. 159) and "What are officials doing in response to it?" (D. Sellnow, T. Sellnow, Lane et al., 2017, p. 555).

Internalization Element

The IDEA model distinguishes between internalization as a message component and the perceptions formed as receivers internalize the warning information. As an IDEA model component, internalization is operationalized through factual or visual features that illuminate the personal relevance of a public health threat to target audience members (D. Sellnow, Lane, Littlefield et al., 2015; D. Sellnow, T. Sellnow, Lane et al., 2017, D. Sellnow–Richmond et al., 2018). Personal relevance is demonstrated through message features of proximity, timeliness, personal impact (T. Sellnow & D. Sellnow, 2013). These features are essential to catching the attention of message receivers.

As a message cue, *proximity* identifies the geographical location(s) impacted by a threat (T. Sellnow & D. Sellnow, 2013). A warning may pique receiver interest by mentioning the general area where the threat is occurring, as an example: "the entire state of Kentucky" (D. Sellnow, Lane, Littlefield et al., 2015, p. 153). A warning may generate greater attention by situating the threat more specifically within the regional area(s) inhabited by the message receivers, as an example: "the entire state of Kentucky, from Paducah to Pikeville and from Louisville to Lexington" (D. Sellnow, Lane, Littlefield et al., 2015, p. 153). A message may also draw receiver interest by pointing to well-known establishments within the region that have been impacted by the crisis (T. Sellnow & D. Sellnow, 2013). For example, in the event of an illness outbreak, proximity would be emphasized by describing "where the disease is occurring" (D. Sellnow–Richmond et al., 2018, p.140). To be effective, the features that demonstrate proximity must help receivers answer the questions: "Where is the event occurring, how close is that to me and/or those I care about? Is [the] location specified, and to what specificity?" (D. Sellnow–Richmond et al., 2018, p. 158).

As a message cue, *timeliness* underscores the imminence of threat or highlights the urgency for affected individuals to respond quickly (T. Sellnow & D. Sellnow, 2013). For example, in the event of an illness outbreak, timeliness would be emphasized by describing "how much time one has to notice symptoms and to seek medical help" (D. Sellnow–Richmond et al., 2018, p.140). To be effective, the features that demonstrate timeliness must help receivers answer the questions: "When is the event occurring? How much time do I have to prepare? How much time do I have to respond if infected?" (D. Sellnow–Richmond et al., 2018, p. 158).

As a message cue, *personal impact* articulates the severity of the threat and the audience members' susceptibility to experiencing it (T. Sellnow & D. Sellnow, 2013). Information receivers may become more involved in a message that provides personalized examples of victims impacted by the threat (D. Sellnow, T. Sellnow, Lane et al., 2017). Convincing affected audiences to believe that a severe threat exists can be just as challenging as helping individuals acknowledge vulnerability to experiencing the threat (McMahan, Witte, & Meyer, 1998). For example, communication practitioners would be hard-pressed to "motivate vegans to [deliberate about an illness outbreak linked to the consumption of tainted meat products]" (T. Sellnow & D. Sellnow, 2013, p. 3). In the event of an illness outbreak, personal impact would be emphasized by describing "the potential effects of disease on people who become infected (D. Sellnow–Richmond et al., 2018, p.140). To be effective, the features that demonstrate personal impact must help receivers answer the questions: "How likely am I (or those I care about) to be affected? What and how severe might the consequences be?" (D. Sellnow–Richmond et al., 2018, p. 158).

Message features that address the IDEA model's internalization element are intended to invoke corresponding perceptions. The IDEA model predicts that individuals will appraise the magnitude of the threat (i.e., perceive severity) and form a belief in their likelihood of experiencing the threat (i.e., perceive susceptibility). Upon learning about a threat, receivers will begin to think about the threat in terms of its personal relevance (T. Sellnow & D. Sellnow, 2013). If message receivers deem the threat to be trivial and irrelevant, they will stop processing the information (Witte, 1992a). To be effective, the features that address the internalization element must "motivate receivers to internalize the message" (T. Sellnow & D. Sellnow, 2013, p. 3). To be effective, the message must convince target audience members that they are susceptible to experiencing a severe and significant threat.

Action Element

Once receivers have internalized the threat as personally relevant, they will want to know what (if anything) can be done to eliminate the threat experience (T. Sellnow & D. Sellnow, 2013). The IDEA model distinguishes between action as a message component and thoughts about performing actions that protect against a threat. As an IDEA model component, action is operationalized through factual or visual features that explain and demonstrate suitable response steps for self-protection (D. Sellnow, Lane, Littlefield et al., 2015, D. Sellnow, T. Sellnow, Lane et al., 2017, D. Sellnow–Richmond et al., 2018). The proposed action steps must be specific if the message is to be effective (T. Sellnow & D. Sellnow, 2013). Further, the message must demonstrate the ease with which receivers can perform the recommended actions. The IDEA model predicts that a message that omits the action component will likely backfire as affected individuals are forced to create their own solutions for dealing with the threat which may not necessarily be appropriate or effective. Thus, T. Sellnow and D. Sellnow (2013) argue that the warning must clearly spell out and demonstrate what receivers should do to prevent or diminish the threat experience. At the same time, the warning must explain and demonstrate what individuals *should not do* if particular actions will make their personal situation worse (D. Sellnow, T. Sellnow, Lane et al., 2017). As an example, a message about food contamination should instruct affected audiences to avoid eating specific products in order to prevent contracting an illness that is associated with consuming these products. The message should instruct how to identify recalled products and what should be done with the products once found, for example, “return the meat to the store for a full refund” (D. Sellnow, Lane, Littlefield et al., 2015, p. 153).

In the event of an illness outbreak, an effective message would “propose specific actions to take (or not to take) to avoid [becoming sick] as well as what to do (or not to do) [once exposed … or experiencing any of the symptoms” (D. Sellnow–Richmond et al., 2018, p.140). As an example, a message about an illness outbreak should instruct those experiencing symptoms to “contact your physician, go to the nearest emergency room, or call 911” (D. Sellnow, Lane, Littlefield et al., 2015, p. 153). The message should instruct infected individuals to avoid using antidiarrheal drugs that tend to “keep the deadly bacteria in your system longer” (D. Sellnow, Lane, Littlefield et al., 2015, p. 153). To be effective, the features that address the IDEA model’s action element must help receivers answer the question: “What should I (and those I care about) do (or not do) for self-protection?” (D. Sellnow–Richmond et al., 2018). p. 158).

Message features that address the IDEA model action element are expected to invoke corresponding perceptions. The IDEA model predicts that individuals will appraise the effectiveness of the warning recommendations for averting the threat (i.e., perceive response efficacy) and form a belief in their ability to carry out the recommended actions (i.e., perceive self-efficacy). To be effective, the warning must compel receivers to take recommended steps to "protect themselves and their loved ones from harm" (T. Sellnow & D. Sellnow, 2013, p. 3). According to the IDEA model, it is imperative that a warning invokes sufficiently high levels of perceived threat (i.e., internalization), helps receivers form a belief in the ability to take recommended steps that work to avert the threat (i.e., action), and empowers all receivers to follow through with the recommended actions, in a timely fashion (i.e., behavioral intentions).

Distribution Element

As a message component, the distribution element of the IDEA model focuses on delivering the right information to the right audiences at the right time (T. Sellnow & D. Sellnow, 2013). Communication practitioners must thoughtfully match the message to the medium and the delivery preferences of intended audience (Witte, 2001). A warning involving a public health threat should be distributed via multiple channels [in order to] reduce the number of inaccurate, misleading, or conflicting messages, [and] to ensure [that the best information reaches] as many people as possible [within the target audience]" (D. Sellnow-Richmond et al., 2018, p. 140).

Keeping in mind that the print medium is "limited in its ability to transmit emotional tone and quality" (Witte, 2001, p. 131), the audiovisual formats afforded to television may be important for conveying the public health threat that has emerged from the crisis. While television remains a widely used medium, social media platforms are increasing in popularity as news sources, and many major television stations are using live-streams via the Internet to channel their news broadcasts (D. Sellnow, Lane, T. Sellnow et al., 2017). It is crucial to utilize a variety of channels when distributing a message so that various segments of at-risk target populations will not be overlooked (T. Sellnow & D. Sellnow, 2013). For example, crisis communicators must keep in mind that not all members of a target audience will have access to

Internet, or subscribe to cable television. Thus, IDEA model's distribution element focuses on helping crisis communicators answer the question: 'To what extent will the selected distribution channel(s) reach the most, if not all, members of a target audience?'

IDEA Model Assumptions

There are two key assumptions that must be tested simultaneously when evaluating the utility of the IDEA model. A message designed with features that address the elements of internalization (i.e., proximity, timeliness, personal impact) and action (i.e., self-protective steps) is predicted to induce corresponding receiver perceptions (i.e., affective learning[3], cognitive learning[4]), which in turn, become the "critical catalysts….[and the means through which] desired behavioral learning[5] outcomes [are achieved]" (D. Sellnow, Lane, T. Sellnow et al., 2017, p. 555). At the same time, the IDEA-modeled message variation is presumed to account for individual differences in the target audience, and rule out the need to tailor multiple message variations for multiple groups within the target population. A formal test of the IDEA model should utilize an experimental design and include at least two message variations with one adhering to the IDEA protocol, random assignment of participants into the treatment (a.k.a. IDEA) and control (a.k.a. status quo) conditions, a questionnaire to gather receiver data (i.e., demographics, perceptions, behavioral intentions) and a rigorous tool to test theory.

Learning Cycle Model

T. Sellnow, D. Sellnow, and Venette (2012b) proposed that D. Kolb's (1984) learning cycle model could be a useful framework for developing and evaluating risk and crisis messages.

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[3] Affective learning refers to the "[learner's] attitudes, beliefs, and feelings about what [has been] learned" (Mottet, Richmond, & McCrosky, 2006, p. 8).
[4] Cognitive learning refers to the learner's acquisition, comprehension, and use of knowledge (Bloom, 1956).
[5] Behavioral learning refers to the learner's development of physical skills through physical action (Bloom, 1956).

D. Kolb (1984) put forward his model to conceptualize the continuous learning process that naturally occurs as individuals develop intellectually over time. From D. Kolb's (1984) perspective, learning is "the major process whereby knowledge is created through transformation of experience" (p. 14). A rounded learning cycle occurs as "immediate or concrete experiences [form] the basis for observations and reflections….that become assimilated and distilled into abstract concepts from which new implications for action can be drawn" (A. Kolb & D. Kolb, 2013, p. 8).

From an instructional communication standpoint, D. Kolb's (1984) conceptualization of four learning modes correspond with T. Sellnow and D. Sellnow's (2013) conceptualization of three IDEA model elements: Internalization (i.e., feeling), explanation (i.e., watching, thinking), and action (i.e., doing) (D. Sellnow, Lane, Littlefield et al., 2015). Communication through instruction refers to all information "sent and received in the process of teaching and learning" (T. Sellnow, D. Sellnow, Lane, & Littlefield., 2012a, p. 634). D. Kolb (1984) developed his framework to synthesize the intellectual works of experiential learning scholars (i.e., John Dewey, 1938; Kurt Lewin, 1951; Jean Piaget, 1952) who conceptualized a learning process that results when conflicting ways for dealing with the world are resolved. He put forward a learning cycle model to improve the development and delivery of instructional materials in order to facilitate optimal learning achievements among receivers of information.

As can be seen in Figure 2.1, D. Kolb's (1984) learning cycle model comprises four dialectically opposed, yet adaptive learning modes that reflect four basic ways for making sense of the world: Concrete experience (CE; a.k.a. feeling), reflective observation (RO; watching), abstract conceptualization (AC; thinking), and active experimentation (AE; doing). Each learning preference mode reflects distinct ways that people grasp and transform experience for a given learning situation. A. Kolb and D. Kolb (2018) maintain that the motivation to learn lies in the unique relationship between the dialectic poles of opposing modes positioned within an overall learning cycle. The perceiving continuum (i.e., feeling versus thinking) refers to how learners "perceive the environment and grasp experiences in the world" (Jonassen & Grabowski, 1993, p. 249). Concrete experience (a.k.a. feeling) and abstract conceptualization (a.k.a. thinking) differ fundamentally in the way people understand experience, yet individuals need both processes in order "to make sense of the world" (A. Kolb & D. Kolb, 2018, p. 11).

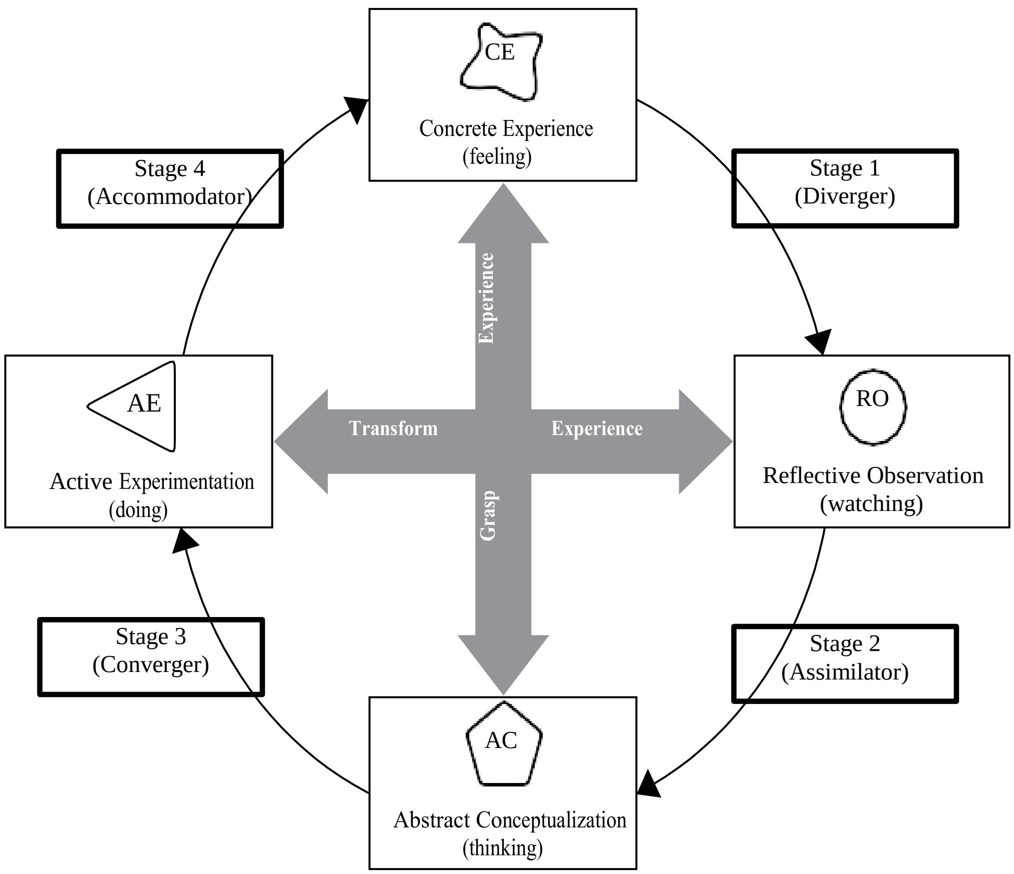

Figure 2.1. Motivating dialectic poles of the learning cycle and four-stage learning cycle. Adapted from A. Kolb & D. Kolb, 2018. Used with permission.

D. Kolb (1984) characterized concrete experience as the learning that emerges from specific experiences that tap sensitivities related to self and others. Concrete experience is important because the mode requires one to react in the moment, using their immediate intuition to affectively respond to a situation (Atkinson & Murrell, 1988). D. Kolb (1984) characterized abstract conceptualization as the learning that occurs when generalized principles are created to transform observations into rational thoughts or theories. Abstract conceptualization is essential because the mode requires one to use "logical thinking and rational evaluation [of the situation to create ideas that turn observations into theory]" (Atkinson & Murrell, 1988, p. 375).

The processing continuum (i.e., doing versus watching) represents how learners "process or transform incoming information" (Jonassen & Grabowski, 1993, p. 249). Active experimentation (a.k.a. doing) and reflective observation (a.k.a. watching) are fundamentally different ways of transforming experience, yet both are needed to enhance understanding (A. Kolb & D. Kolb, 2018, p.11). D. Kolb (1984) defined active experimentation as the learning that occurs when generalized and rationalized thoughts are put into action through new and complex situations. Active experimentation is important because the mode requires the individual to take action or participate in risk taking by testing previous concepts (Atkinson & Murrell, 1988). D. Kolb (1984) defined reflective observation (watching) as the learning that occurs while hesitating to form judgements from the observable experiences of self or others. Reflective observation is essential because the mode allows one to explore neutral perspectives toward the situation (Atkinson & Murrell, 1988).

A general premise of D. Kolb's (1984) learning cycle model is that an individual has a potential learning flexibility "to engage all [four learning] modes in a holistic and fluid manner" (A. Kolb & D. Kolb, 2018, p.11). In theory, the "dialectic poles [present] a *stereo perspective* [that stimulates the process of] learning" (A. Kolb & D. Kolb, 2018, p.11). The learning cycle dynamic is driven by an inherent need to resolve creative tension among the “dual dialectics of action/reflection and experience/abstraction” (A. Kolb & D. Kolb, 2013, p. 7).

D. Kolb (1984) conceptualized an interaction between the perception and processing continua to explain four different learning styles that individuals rely on to relate to the world: Diverging (feeling + watching); assimilating (watching + thinking), converging (thinking + doing), accommodating (doing + feeling). Learning style is an experiential learning theory (ELT) concept that describes the “habit of learning that forms when an individual [exercises a preferred mode (or modes) of learning] to shape experience” (A. Kolb & D. Kolb, 2018, p. 11). Variations in learning styles illuminate the flexibility necessary to engage all learning modes in a “holistic and fluid manner” (p. A. Kolb & D. Kolb, 2018, p. 11).

D. Kolb (1984) maintains that individuals with a diverging learning style prefer to grasp experience through feelings and transform experience through thought. Divergent learners are oriented toward people and feelings, and are generally open to alternative points of view (Evans, Forney, Guido, Patton, & Renn, 2010). These individuals are less oriented toward thinking, are less able to make decisions, have little concern for theoretical models, and are less able to apply ideas (Jonassen & Grabowski, 1993). An instructional risk and crisis message would likely capitalize on the diverging style by including “lots of concrete examples and multiple perspectives” (T. Sellnow, D. Sellnow, Lane et al., 2012a, p. 106).

D. Kolb (1984) reasons that individuals with an assimilating learning style prefer to grasp experience through reflective observation and transform experience through thought. Assimilative learners are focused on ideas and utilize inductive reasoning to integrate observations into theoretical concepts (Evans et al., 2010). These individuals are less oriented toward people, feelings or actions, are less creative, and are less able to make decisions

(Jonassen & Grabowski, 1993). An instructional risk and crisis message would likely capitalize on the assimilating style by including “logically ordered facts, definitions, and explanations” (T. Sellnow, D. Sellnow, Lane et al., 2012a, p. 106).

D. Kolb (1984) posits that individuals with a converging learning style prefer to grasp experience through thought and transform experience through action. Convergent learners are generally good at problem solving and decision-making, and tend to navigate toward new approaches of thoughts and actions (Evans et al., 2010). These individuals are less oriented toward people or feelings, are more closed-minded toward alternative points of view, have narrow interests, and are less concerned with observations or finding absolutes (Jonassen & Grabowski, 1993). An instructional risk and crisis message would likely capitalize on the converging style by providing solutions to “real-world problems through practical applications” (T. Sellnow, D. Sellnow, Lane et al., 2012a, p. 106).

D. Kolb (1984) reasons that individuals with an accommodating learning style prefer to grasp experience through feelings and transform experience through action. Accommodative learners are action oriented, open to new experiences, and adaptive to change (Evans et al., 2010). These individuals depend on others information, are less concerned with scientific inquiry, systematic approaches, theoretical models, or finding the absolute truths (Jonassen & Grabowski, 1993). An instructional risk and crisis message would likely capitalize on the converging style by incorporating “creative problem-solving strategies, teamwork, and [opportunities to think] outside the box” (T. Sellnow, D. Sellnow, Lane et al., 2012a, p. 106).

Learners begin at their preferred learning style and progress through the cycle by engaging the modes in their own way (A. Kolb & D. Kolb, 2018). According to D. Kolb (1984), the learning cycle comprises “successive iterations of experiencing, reflecting, thinking, and acting" that set the stage for new experiences and continued cycling (p. 186). Ideally, instructional content must be designed in a manner that empowers each learner to touch all four learning modes "in a recursive process that is sensitive to learning situation, [including the topic]" (A. Kolb & D. Kolb, 2013, p. 7). Through his learner-centric model, D. Kolb (1984) argues that optimal learning is achievable for all receivers when information is presented "to round the entire learning cycle" (T. Sellnow, D. Sellnow, Lane et al., 2012a, p. 106). Thus, a distinguishing feature of D. Kolb's (1984) framework is the assumption that learning "involves the integrated function of the total organism – thinking, feeling, perceiving [a.k.a. watching], and behaving [a.k.a. doing]" (p. 31).

From the experiential learning standpoint, a crisis message constrained to features that simply explain a high-risk situation will serve receivers who are motivated to learn through "logically, ordered facts, definitions, [and expert opinions]" (T. Sellnow, D. Sellnow, & Venette, 2012b, p. 106). This narrowed approach is predicted to overlook receivers who are motivated to learn through real-life examples that allow them to "experience the crisis through emotions …. [and receivers who are stimulated to learn through details of] specific actions [that will] keep them safe" (T. Sellnow, D. Sellnow, Lane et al., 2012a, p. 641). To facilitate optimal learning for all receivers, T. Sellnow, D. Sellnow, and Venette (2012b) suggested that a comprehensive risk and crisis message should include: "Concrete examples and multiple perspectives …. logically-ordered facts, definitions, and explanations [about the situation]…. practical applications [that solve real-world problems]…. strategies that promote problem-solving [activities], teamwork, and [creative] thinking outside the box" (p. 106-107). Risk and crisis messages formulated to "address information dissemination, discussion, and activities …. [should help] learners internalize ideas" (T. Sellnow, D. Sellnow, & Venette, 2012b, p. 107). This message-design argument makes D. Kolb's (1984) learning cycle model foundational to hypotheses proposed in studies that compare the relative persuasiveness of an IDEA-modeled message to that of a status quo variation. An advantage of following the IDEA protocol is that the end result is a "single message that is sensitive to audience variance" (D. Sellnow, Lane, Littlefield et al., 2015, p. 157), and at the same time capitalizes on Kolb's (1984) learning theory to address receivers' preferred methods for hearing, learning, and applying the information.

The IDEA model's effectiveness is determined by its positive impact on receivers' learning-based outcomes: "Affective (personal relevance), cognitive (comprehension, understanding, efficacy), and behavioral (intended action)" (D. Sellnow, Lane, T. Sellnow et al., 2017, p. 555). A crisis message tailored to address each of D. Kolb's (1984) learning modes will target the overall audience's ability to acquire information, comprehend details, and engage in recommended behaviors for self-protection (Frisby, D. Sellnow, Lane, Veil, & T. Sellnow, 2013). In crisis situations, instructional messages "tailored to learning style preferences will maximize their persuasive impact" (T. Sellnow, D. Sellnow, Lane et al., 2012a, p. 641).

Learning Style Instrument

D. Kolb (1971; 1976) developed the Learning Style Inventory (KLSI) to validate his theory of experiential learning. The instrument was designed to "capture the learning differences [of individuals]" (D. Kolb, 2000, p. 8). In 1969, the first learning style inventory (Kolb, 1971; 1976) emerged as part of a curriculum development project at MIT (see Kolb, Rubin, & McIntyre, 1971). At that time, the scholar was dissatisfied "with traditional methods of teaching and managing students" (Coffield, Moseley, Hall, & Ecclestone, 2004, p. 60). He began to "experiment with experiential teaching methods…. and found that some students preferred certain learning activities over other activities" (Coffield et al., 2004, p. 60). The purpose of the project was to “help learners understand their unique style of learning from experience” within the process of experiential learning (A. Kolb & D. Kolb, 2013, p. 41). Four behavioral scientists familiar with ELT identified 12 inventory items from a list of words and phrases specific to social desirability, and pilot-tested the statements among a group of 20 graduate students. Following correlation analysis, the scholars identified “six scored items for each learning mode” (A. Kolb & D. Kolb, 2013, p. 41). From this project, the term *learning style* was coined to describe the “individual differences in how people learn” (A. Kolb & D. Kolb, 2013, p. 41).

Since the release of the first inventory, there have been three additional versions leading up to the most current (i.e.,version 4.0) that highlights a nine-learning style typology. From a published bibliography of experiential learning theory (ELT) research, A. Kolb and D. Kolb (2000) identified more than 1000 applications of his theoretical model and instrument across 17 years from its inception. The scholars noted applications of Kolb’s (1984) model and KLSI in the fields of management, education, computer studies, psychology, medicine, nursing, accounting, and law.

Individuals completing the 12-item KLSI are asked to rank-order 48 statements that best describes how they learn. Each completed sentence corresponds to a mode of learning: Concrete experience, reflective observation, abstract conceptualization, active experimentation. To identify an individual’s preferred learning style, the KLSI relies on a split-means method that produces ipsative scores. In turn, the scores are plotted along the processing and perceiving axes to form a kite-shaped profile that characterizes the respondent’s unique learning preference comprised of the four learning modes (e.g. feeling, watching, thinking, doing). The KLSI computes the relative strength of one variable compared to relative others in the set which creates method-induced negative correlations among the variables (A. Kolb & D. Kolb, 2013).

Although the KLSI is widely used, the inventory has been largely criticized for producing ipsative scores that pose statistical limitations, and unreliable and uninterpretable results when included in parametric statistical analyses. Barron (1996) argued that ipsative scores do not meet the interval scale requirements of parametric statistical analysis and when used, produce lower estimates of internal reliability and validity coefficients. Cornwell & Dunlap (1994) argued that ipsative scores cannot be factored or included in tests based on analysis of variance, and will produce invalid results that are uninterpretable when included in correlational analysis.
A. Kolb and D. Kolb (2013) argued that ipsative scoring is justified because ELT theory is focused on the relative comparison of one learning mode to the other three, rather than on absolute preferences. Nonetheless, the forced choice method of the KLSI poses statistical limitations that must be considered before administering it to collect data and incorporating measures of preferred learning styles into an analysis.

Learning Style Quiz

To address the statistical constraints of ipsative scores, D. Sellnow (2002) adapted the items from D. Kolb's (1985) KLSI to develop her 12-item learning style quiz (LSQ). D. Sellnow (2005) put forward a second version comprised of 15 items (see Appendix A). D. Sellnow's (2005) LSQ eliminates the need to rely on forced rank ordering, and split-mean calculations when gathering responses from study participants. Although the LSQ results may be used to categorize individuals into one of four learning modes (as an example, see T. Sellnow, D. Sellnow, Lane et al., 2012a), the traditional approach is to identify a dominant learning stage, which in turn corresponds to a learning style preference. When D. Sellnow's (2005) traditional approach for calculating the preferred learning style is employed, there are potentially 60 tie score values out of a total of 226 potential results. When ties are found for an individual, the next step is to delete the participant’s responses from the data set. A potential loss of data (up to 26%) may be realized when employing the LSQ’s traditional method for determining an individual’s dominant learning style. Whether assessing learning modes or learning styles using D. Sellnow’s (2005) LSQ, the results provide a categorical measure that accommodates tests based on analysis of variance. A new approach is needed that aligns the categorical results produced through D. Sellnow’s (2005) LSQ to coincide with the IDEA model’s elements of internalization, explanation, and action.

Extended Parallel Process Model

Witte’s (1992a) EPPM may be a useful framework for developing and evaluating the utility of instructional risk and crisis messages that address all elements of T. Sellnow and D. Sellnow’s (2013) IDEA model. Witte (1993) maintains that if a particular risk communication strategy is to achieve its goals, “Individuals must not only be taught [how to take safety precautions, but they must also be] *persuaded* to be safe” (p. 220). The EPPM provides direction for developing and delivering persuasive risk messages, when public welfare is threatened. Risk communication is primarily rooted in persuasion and how people evaluate risk. Risk communication efforts often focus on educating the public about risks, and developing communication strategies that will successfully influence risk-aversion, rather than risk taking behaviors (Witte, 1992a).Technically, all health risk messages qualify as threat appeals because the communication strategies “outline some sort of risk or threat that will be experienced [by affected individuals when recommended procedures are not followed]” (McKay, Berkowitz, Blumberg, & Goldberg, 2000, p. 357). The EPPM provides a theoretical explanation regarding how, why, when, and for whom risk messages will succeed or fail, if at all, to produce the intended outcomes among receivers of information. From a risk communication standpoint,

T. Sellnow and D. Sellnow's (2013) conceptualization of the IDEA model is strikingly similar to Witte's (1992a) conceptualization of the EPPM.

Witte (1992a) put forward the EPPM as an audience-centered framework to assist scholars and practitioners in the design of effective risk communication messages. The EPPM grounded in persuasion theory, and draws from more than 50 years of empirical research on fear appeals (a.k.a. threat appeals). This persuasive strategy is known for spelling out "the terrible things that will happen [to people if they decide not to follow message recommendations]" (Roberto, Goodall, & Witte, 2009, p. 286). The EPPM integrates bits and pieces from the fear-as acquired drive model (Hovland, Janis, & Kelly, 1953), parallel process model (Leventhal, 1970), and protection motivation theory (PMT; Rogers, 1975, 1983). When introducing the EPPM, Witte (1992a) provided a visually-friendly diagram (see Figure 2.2) to approximate the complex relationships between external stimuli, cognitive appraisals, fear, and two different response outcomes (i.e., danger control, fear control).

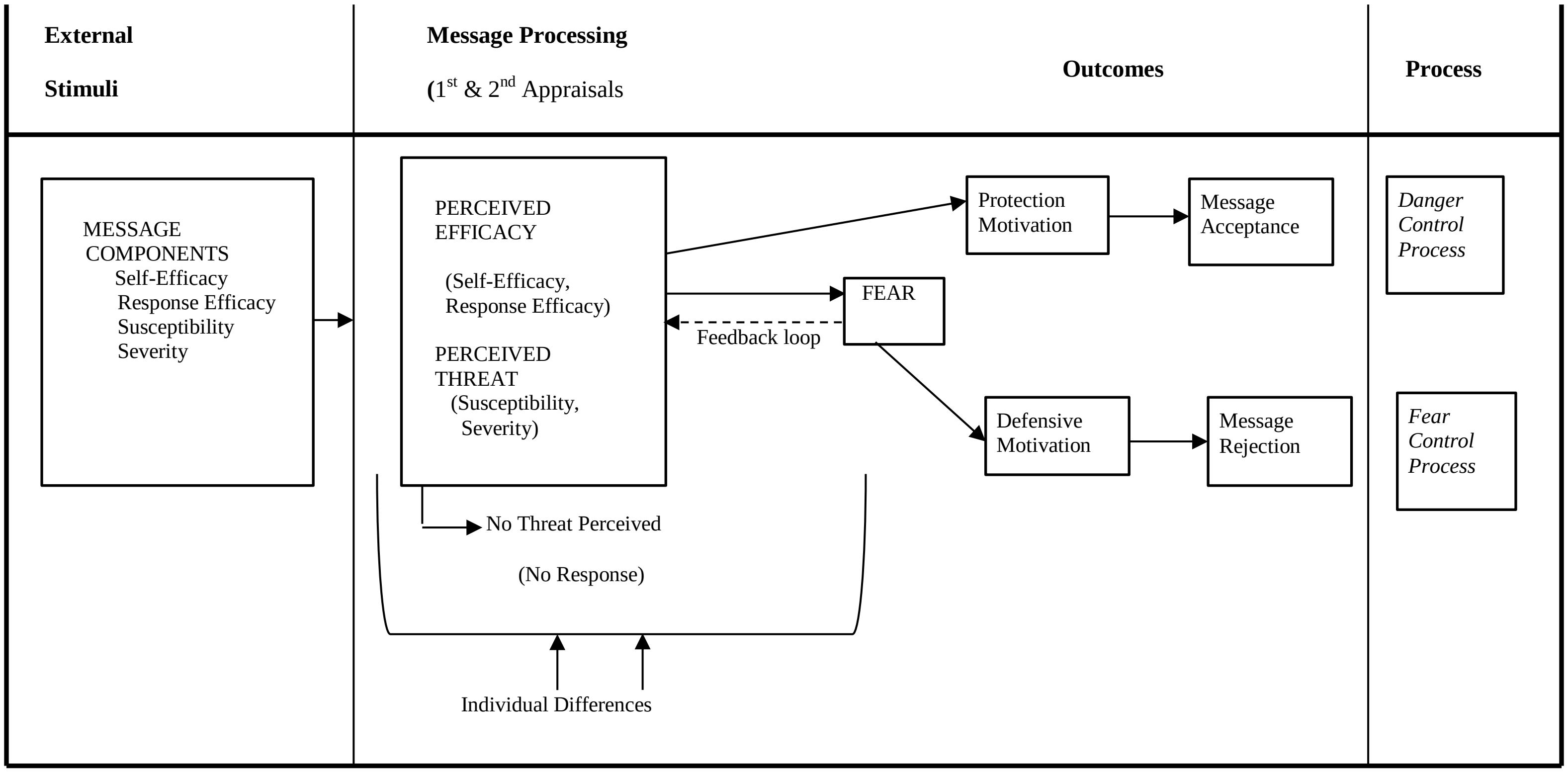

Figure 2.2. Witte's (1992a) extended parallel process model.
Used with permission.

Drive Model

In the early 1950s, scholars began to study how persuasive, fear-arousing messages could be used to teach people about health risks, in order to influence healthy behavior. Hovland et al. (1953) adopted a learning theory perspective and believed that an individual's sense of fear would be a powerful motivator for taking action to reduce the unpleasant state. This theoretical approach attempted to "explain human behavior in terms of learned responses and subsequent rewards" (Popova, 2012, p. 455). Hovland et al. (1953) developed the fear-as-acquired drive model and hypothesized that any actions that resulted in fear reduction would become an individual's "preferred, habitual response [when faced with similar threats in the future]" (Witte, 1998, p. 425). Hovland et al. (1953) proposed that receivers would reduce feelings of fear by attending to and adopting or rejecting the recommended actions. If the reassuring recommendations did not assuage fear, then receivers would attempt other strategies such as "defensive avoidance or perceived manipulative intent" (Witte, 1998, p. 425). Janis (1967) proposed a curvilinear relationship between fear and behavior change such that a moderate level of fear would result in adoption of recommendations, too much fear would lead to rejection of recommendations, and too little fear arousal would generate no response at all (Janis & Feshbach, 1953). The drive theory was abandoned in the 1960s when research findings failed to provide empirical support (e.g., Leventhal, 1970; Rogers & Deckner, 1975) for the predicted curvilinear relationship. However, Hovland et al.'s (1953) model offered insight into the impact of fear on message rejection outcomes (e.g., denial, defensive avoidance). Witte (1992a) incorporated the message rejection component into the fear control side of the EPPM to explain why fear appeals sometimes fail to produce intended outcomes.

Parallel Process Model

Leventhal's (1970, 1971) dual processing approach moved beyond Hovland et al.'s (1953) drive model by distinguishing two distinct reactions to fear appeals. Leventhal (1970, 1971) proposed the parallel process model, formally known as the parallel response model, to explain the "primarily cognitive [appraisal] where people thought about the threat and ways to avert it" (Witte, 1998, p. 426). Danger control, as a cognitive process, translated into the adoption of message recommendations (i.e., attitudes, intentions, behaviors). Further, Leventhal (1970, 1971) proposed a "primarily emotional [appraisal where individuals overwhelmed by] fear would engage in coping strategies to control [their feelings]" (Witte, 1998, p. 426). Fear control, as an emotional process, translated into actions such as denial, avoidance, or reactance, rather than adoption of recommendations. The parallel process model drew criticism for not specifying "when one process would dominate the other" (p. Witte, 2001, p. 19). However, Leventhal (1970, 1971) made a significant contribution to fear appeal research by making a "useful distinction between cognitive and emotional reactions to fear appeals [within a single framework]" (Witte, 1992a, p. 333). Witte (1992a) integrated Leventhal's (1970, 1971) dual process approach into the EPPM to isolate the "mechanisms underlying reactions to fear appeals [that lead to distinct outcomes of message acceptance and message rejection] (Witte, 2001, p. 19).

Protection Motivation Theory

Rogers' (1975, 1983) expanded Leventhal's (1970, 1971) work and introduced the protection motivation theory (PMT) to explain how a message's persuasive impact on receivers' action tendencies is mediated by danger control processes. Through the PMT, Rogers (1975, 1983) was the first to operationalize message features (i.e., susceptibility, severity, response efficacy, self-efficacy) of fear appeals as predictors of corresponding cognitions. Rogers (1975, 1983) argued that a fear appeal should include features that emphasize: (a) a threat's magnitude of noxiousness (i.e., severity), (b) a threat's probability of occurrence (i.e., susceptibility), (c) the feasibility of threat-averting recommendations (i.e., response efficacy), and (d) the belief in being able to perform the recommended actions (i.e., self-efficacy). By incorporating Bandura's (1977) concept of self-efficacy into the revised PMT, Rogers (1983) was able to more clearly define the danger control process using two dimensions: Perceived threat (with underlying components of susceptibility and severity) and perceived efficacy (with underlying components of response efficacy and self-efficacy). A key assumption of Rogers' (1983) revised PMT was that fear did not directly influence danger control responses. Rather, he presumed a positive correlation between fear and severity, and hypothesized that perceived severity mediated the influence of perceived fear on action tendencies (Witte, 1992a). Rogers' (1983) updated model predicted that a message's persuasive impact on danger control responses (i.e., attitudes, intentions, behavior changes) was mediated by a four-way interaction between perceptions of severity, susceptibility, response efficacy, and self-efficacy. However, this four-way interaction was never empirically supported through fear appeal research (e.g., Maddux & Rogers, 1983; Rogers & Mewborn, 1976). While Rogers' (1975, 1983) PMT predicted and explained how fear appeals succeed to produce danger control responses, his framework lacked an explanation for how or when messages fail to do so (Witte, 2001). Witte incorporated Rogers' (1975) original PMT plus the concept of self-efficacy into the EPPM to reflect how danger control processes lead to message acceptance.

Through the EPPM, Witte (1992a) picked up where Rogers (1975, 1983) left off with the PMT. She integrated earlier theoretical perspectives to explain how fear leads to message rejection (similar to Janis, 1967) and how cognitions lead to message acceptance (similar to Leventhal, 1970; Rogers, 1975, 1983). The EPPM extended the earlier models in several ways.

Witte (1992a) emphasized the important role of fear in fear appeal research, and reinstated the need for scholars to measure fear and danger control processes. Witte laid out clear conceptual definitions that are central to the fear appeal research. She found that earlier models had used the terms perceived threat and fear interchangeably. Witte clarified that perceived threat and fear are distinct and will lead to different outcomes. Additionally, she formulated a statistical process to measure the relationship between the two concepts of perceived threat and efficacy. This was a departure from earlier models that made no distinction regarding how people process message information. The EPPM changed this approach by identifying two appraisal processes that operate sequentially. Earlier research efforts had typically accounted for message success and failure using measures of an individual's willingness to adopt or not adopt recommendations. The EPPM departed from this practice by providing a way for scholars to statistically measure and explain why some fear appeals fail (Witte, 1992a, 1994; Witte & Allen, 2000; Witte et al., 1998).

Message Characteristics

A fear appeal, designed according to EPPM guidelines, is characterized by its structure, style, and extra-message features that influence the persuasion process (Witte, 1993). As a message cue, threat is operationalized through factual or visual features that characterize the threat's likelihood of occurrence (i.e., susceptibility) and the magnitude of noxiousness regarding the experience of threat (i.e., severity) (Rogers, 1975, 1983, Witte, 1992a, 1998). Efficacy, as a message cue, is operationalized through factual or visual features that characterize the ease in performing recommended actions (i.e., self-efficacy) that work to avert or diminish the threat (i.e., response efficacy) (Rogers, 1975, 1983; Witte, 1992a, 1998). The structural component refers to the order in which a message presents the components of threat and efficacy. From a structural standpoint, the features of danger or harm (i.e., threat component) should be presented first, followed by the features about recommendation(s) to avert or diminish the threat (i.e., efficacy component) (Witte, 1993).

For experimental studies, a core message is typically manipulated to vary across levels of the threat and efficacy components (Witte, 1993). Stylistic features refer to the “words, audios, or visual [elements that are embedded in fear appeals to vary the dynamism between message variations (Witte, 1993). The threat component can be minimized in a message variation by using “neutral, bland, or impartial language, audios, and visuals [that emphasize severity] …. and “general and vague references [that emphasize susceptibility]” (Witte, 1993, p. 148). The threat component can be intensified and personalized in a message variation through highly “emotional language, as well as [through extremely] graphic and vivid visuals” (Witte, 1993, p. 148). The efficacy component can be minimized in a message variation by providing vague descriptions and inexplicit demonstrations of coping strategies that work and can be easily performed to minimize or avert threat (Witte, 2001). The efficacy component can be intensified in a message variation by providing clear descriptions and explicit demonstrations of coping strategies that work and can easily be performed to minimize or avert threat (Witte, 2001).

Extra-message features refer to variables that “have the capacity to influence the persuasion process …. [yet are easily] separated from the content of the message” (Witte, 1993). Witte (1993) indicated that source credibility, message sidedness, message length, or medium of message may have a confounding effect, yet may still contribute to message acceptance. Confounding consistency can be maintained by equating the extra-message features across message variations that are being compared. For example, if one variation is 500 words in length, the comparable variation should also be 500 words in length. If one variation simulates a television news story, the comparable variation should reflect the same medium. If one variation's source is a government official, the comparable variation should indicate the same source. When extra message features vary inconsistently across message variations, it is quite difficult, if not impossible, to discern whether the persuasive effects are attributable to the components of threat or efficacy, or simply artifacts of the extra-message features (Witte, 1993).

Theoretical Assumptions

Witte' (1992a) EPPM relies on several assumptions about behavior and information processing (Popova, 2012). The EPPM presumes a temporal sequence between the cognitive processes that individuals engage to assess threat and efficacy regarding an issue. The appraisal processes of threat and efficacy are activated once an individual is exposed a message with features that operationalize the components of threat and efficacy (Witte, 1994). While the appraisal of threat is predicted to precede the appraisal of efficacy, the transition between the two processes occurs at "lightning fast speed" (Witte, 1998, p. 433).

Threat. Upon learning of a threat, individuals will think about the threat to determine its relevance (Witte, 2001). *Perceived threat* is defined as the "cognitions or thoughts [formed] about the danger or harm" (Witte et al., 1996, p. 320). This primary cognitive appraisal draws upon its two underlying dimensions of perceived susceptibility and perceived severity. *Perceived susceptibility* refers to an individual's belief about the likelihood of experiencing the threat, as an example, "I am at risk for skin cancer because I do not use sunscreen" (Witte et al., 1996, p. 320). Message features that operationalize susceptibility to a threat must help receivers answer the question: "Am I at risk for experiencing this threat?" (Witte, 2001, p. 24). *Perceived severity* refers to an individual's appraisal of the realized threat's magnitude of noxiousness, as an example, "Skin cancer leads to death" (Witte et al., 1996, p. 320). Message features that operationalize the severity of a threat must help receivers answer the questions: "Is the threat severe?" (Witte, 1998, p. 426); "Could I be significantly harmed by experiencing this threat?" (Witte, 2001, p. 24).

Central to a fear appeal is the emotion of fear that may or may not become stimulated as an individual perceives a serious threat to be personally relevant or relevant to others (Witte, 1994). However, the EPPM maintains that threat and fear are positively correlated such that as perceived threat levels increase, feelings of fear will typically follow suit (Witte, 1994). *Fear* is an "internal emotional reaction [comprised of] psychological and physiological dimensions" (Witte, 1998, p. 429). The negative emotional reaction may be aroused when a realized threat is perceived to be "serious and personally relevant" (Witte et al., 1996, p. 320). According to the EPPM, fear arousal will not occur without a sense of threat (Witte, 1994). The EPPM predicts that individuals will stop processing the risk message if they believe they are not personally at-risk for experiencing the threat (i.e., low perceived susceptibility) and/or that the threat is trivial (i.e., low perceived severity) (Witte, 1998). At this point, individuals will have no motivation to engage in the second cognitive appraisal (Witte, 1992a).

Efficacy. Perceived threat must reach a sufficiently high threshold before receivers will engage in the efficacy appraisal where the recommended response is "weighed against the perceived strength of the threat" (Witte, 1998, p. 148). *Perceived efficacy* is defined as the "thoughts or cognitions [formed about the ease and effectiveness of a recommended response to diminish threat]" (Witte et al., 1996, p. 320). This secondary cognitive appraisal draws upon its underlying dimensions of perceived response efficacy and self-efficacy. *Perceived response* *efficacy* refers to beliefs formed regarding the "effectiveness of the recommended response in deterring the threat" (Witte et al., 1996, p. 320). Message features that operationalize response efficacy must help receivers answer the question: "Will the recommendations work to avert or diminish the threat?" (Witte, 1998, p. 426). *Perceived self-efficacy* refers to beliefs formed regarding the "ability to perform the recommended response" (Witte, 1998, p. 429). Message features that operationalize self-efficacy must help receivers answer the question: "Am I able to perform the recommendations for averting the threat?" (Witte, 1998, p. 426).

Danger control. Danger control processes are elicited when perceived threat and efficacy are high, and levels of efficacy exceed levels of threat (Witte et al., 1996). Because fear may or may not be aroused during the initial appraisal of threat, the EPPM maintains that individuals may engage in danger control processes with or without fear arousal (Witte, 1994). Danger control is a cognitive process that occurs when individuals sense an ability to "easily, feasibly, and effectively [diminish a significant and relevant threat through the recommended response]" (Witte et al., 1996, p. 318). When motivated to control the danger, individuals will make a conscious effort to elaborate on solutions that work to eliminate the threat (Witte, 1994). This careful deliberation "generates protective motivation which in turn stimulates action, such as attitude, intention, or behavior changes, [that are aligned with message recommendations]" (Witte, 1992a). The goal of any risk message must be to promote optimal balances of perceived threat and efficacy that stimulate danger control and the adoption of message recommendations. The EPPM includes a feedback loop to account for the complex relationship between perceived threat and fear arousal. While fear does not directly influence message acceptance, the emotion may contribute indirectly to message acceptance if it is cognitively appraised. The EPPM maintains that individuals engaged in danger control processes may thoughtfully assess their emotion of fear and upgrade their perceptions of threat, which in turn may lead to message acceptance (Witte, 1992a).

Fear control. At some critical point, fear control processes will begin to dominate over danger control processes when individuals perceive they are unable to prevent the experience of a severe and relevant threat (Witte, 1995). This shift from danger to fear control process occurs when individuals believe the recommended response to be ineffective and/or they believe they are unable to carry out the recommended action (Witte, 1992a). Thus, the critical point is triggered when perceptions of threat remain high and begin to outweigh perceptions of efficacy (Witte et al., 1996). Fear control processes cannot occur without a sense of fear (Witte, 1994).

Witte (1998) maintains that individuals are driven by emotion when they sense that they are unable to feasibly and effectively avert the experience of a serious threat. Fear control is primarily an emotional process where individuals become compelled to cope with their feelings of fear. Without a sense of efficacy to manage high levels of perceived threat, individuals have no choice but to find ways to control their fear. The uncomfortable feeling elicits an emotionally-charged effort to diminish the aroused fear, and circumvents "all thoughts about threat and efficacy" (Witte, p. 2001, p. 27). When frightened, individuals become motivated to take "any action that will reduce their fear" (Witte et al., 1996, p. 318). According to the EPPM, fear control processes induce defensive motivation which leads to message rejection. As examples, individuals may control their fear by: (a) ignoring any thoughts of threat (i.e., defensive avoidance), (b) refusing to accept the reality of a threat (i.e., denial), or (c) discounting the message as manipulative (i.e., reactance). If the level of fear associated with the original threat appraisal continues to intensify, defensive motivation will automatically be activated and lead to message rejection (Witte, 1992a). Thus, fear is the catalyst for defensive motivation and any “other fear control responses [that indicate message rejection]” (Witte, 1998, p. 430). When defensively avoiding a threat, individuals are not thinking about ways to protect against the threat (Witte, 1992a). Thus, individuals engaged in fear control processes “will make no attitude, intention, or behavior changes [in accordance with message recommendations]” (Witte, 1998, p. 428). Risk messages will backfire as individuals turn to controlling their fear rather than managing the danger.

Individual differences. Witte (1994) explains that perceived efficacy determines whether the reaction to a message is driven by cognitions or emotions, and “perceived threat determines the degree of the reaction [(i.e., strength of message acceptance or message rejection)]” (p. 116). If the message does not specify a recommended response for averting a threat, individuals will form perceptions of efficacy based on their past experiences with similar threats (Witte, 1995). The EPPM predicts that individual differences moderate the direct effect of a message variation on receivers’ appraisals of threat and efficacy (Witte, 1992a; Witte & Morrison, 2000). Thus, individual differences also moderate the direct effect of a message variation on receivers’ danger or fear control processes which in turn, will translate into one of three outcomes: No response, danger control response, or fear control response.

Risk Behavior Diagnosis

The RBD assessment, validated by Witte et al. (1996), identifies the underlying mechanisms of danger and fear control processes, predicts when one process will dominate over the other, and explains the outcomes associated with each process (Witte, 2001). The discriminating value that is calculated from the RBD differentiates “whether an individual is in fear control or danger control” (Witte et al., 1996, p. 321). For a given topic of interest, it is typical for the RBD assessment to include three items for each measure of perception: Severity, susceptibility, response efficacy, and self-efficacy (Witte et al., 1996). To complete the RBD assessment, participants typically respond to the 12 items using a 7-point, Likert-type scale, ranging from 1 (strongly disagree) to 7 (strongly agree) (Witte et al., 1996).

Witte (1998) referred to the relationship between severity, susceptibility, response efficacy, and self-efficacy as additive in nature. For example, responses to three items are combined to form the total raw score of perceived severity. In a similar fashion, raw scores are calculated for perceived susceptibility, response efficacy, and self-efficacy. In turn, the indices of perceived severity and perceived susceptibility are combined to create the overall index of perceived threat (Witte, 2001). In a similar fashion, the indices of perceived response efficacy and perceived self-efficacy are combined to create the overall index of perceived efficacy (Witte, 2001). Finally, the score representing the index of perceived threat is subtracted from the score representing the index of perceived efficacy to create a discriminating value. To calculate the discriminating value for an entire audience, the discriminating values for all individuals are summed to form a total and then divided by the total number of participants to form the average for the audience.

A key component of the EPPM was the introduction of the *critical point* value that identifies when people shift out of danger control into fear control processes (Maloney et al., 2011; Witte, et al., 1996). Witte (1992a) identified a statistical threshold to determine when this transition takes place. The critical point representing danger control occurs when an individual's raw score for perceived efficacy begins to outweigh the raw score for perceived threat. The critical point representing fear control occurs when an individual's raw score of perceived threat begins to outweigh the raw score for perceived efficacy. When the average discriminating value for the entire audience is above zero, the EPPM proposes that the entire group is in danger control. When the average discriminating value for the entire audience is not above zero, the EPPM proposes that the entire group is in fear control.

Witte et al.'s (1996) RBD tool may be administered prior to and following message exposure to assess receivers' perceived efficacy levels relative to perceived threat levels. For example, when administered prior to message exposure, the calculated discriminating score may create an individual difference variable that distinguishes those who are in a state of danger control (>0) from those who are not (≤ 0). As an individual difference variable, the RBD result may be utilized to test a moderation hypothesis and explain when an effect occurs. Popova (2012) and O'Keefe (2003) called for more rigorous tools that retain the original metric of the RBD results and utilize the continuum as an intervening mechanism to explain how message feature variations have succeeded or failed to predict danger control responses (i.e., behavioral intentions) among receivers of information. As an individual difference variable and mediating mechanism, the RBD results may help explain when and how an IDEA message (relative to status quo variation) has succeeded or failed to produce predicted outcomes, if at all.

The RBD discriminating value is a useful tool for assessing audiences, tailoring messages, and predicting specific instances when a message will succeed or fail to influence appropriate recommended behavior for a given health issue (Witte, 2001). The goal of message designers must be to formulate content that stimulates receivers in the direction of danger control. In order for a message to be effective, Witte (2001) demonstrated that all message receivers need to reach sufficiently high levels of perceived threat and perceived efficacy. For example, the EPPM predicts that when individuals are in fear control, exposure to message content that emphasizes the magnitude of the threat and probability of experiencing the threat will likely push them toward taking actions that contradict the appropriate recommended behavior. The EPPM also predicts that individuals already in danger control will need to be exposed to a strategic combination of message content in order to "motivate them to [take] further action" and extra precautions in designing content need to be taken when danger control levels are very low (Witte, 2001, p. 72).

In the case of foodborne illness stemming from food contamination, individuals (or groups) in fear control (e.g., negative discriminating value) should be exposed to message content that deemphasizes the magnitude of the illness (severity) that results from eating contaminated food, deemphasizes the probability of contracting the disease (susceptibility), emphasizes actions that work to avoid contracting illness (response efficacy), and demonstrates how to perform the appropriate action. Individuals (or groups) in danger control (e.g., positive discriminating value) should be exposed to message content that emphasizes the magnitude of the illness (severity), emphasizes the probability of contracting the disease (susceptibility), emphasizes actions that work to avoid contracting illness (response efficacy), and demonstrates how to perform the appropriate action. Individuals (or groups) with low threat perceptions (e.g., low score for perceived severity and susceptibility) should be exposed to message content that emphasizes the magnitude of the illness (severity), emphasizes the probability of contracting the disease (susceptibility), emphasizes actions that work to avoid contracting illness (response efficacy), and demonstrates how to perform the appropriate action.

In sum, to motivate individuals (or groups) with a positive discriminating value (i.e., danger control), communication practitioners should tailor a message with content that emphasizes the "risks, hazards, harmful effects of a threat, and [adequately describes and demonstrates] effective responses to avert the threats" (Witte, 2001, p. 75). To motivate individuals (or groups) with a negative discriminating value (i.e., fear control), communication practitioners should tailor a message with content that emphasizes how the recommended actions work to avert the threat, and include content that demonstrates the ease of performing the recommended steps for threat aversion (Witte, 2001). To motivate individuals (or groups) with low perceived threat, communication practitioners should carefully tailor the message content to increase "their perceptions of severity and susceptibility" (Witte, 2001, p. 75). To do this, communication practitioners should tailor the message content to emphasize the dangerous effects of a threat while also describing and demonstrating ways to avert it (Witte, 2001).

EPPM Propositions

Popova (2012) conducted a systematic review of 29 EPPM studies, and categorized the studies based on propositions tested. She narrowed her review to studies that had been published since 1992 in the English language. To be included Popova's (2012) review, "a study had to be… explicitly guided by the EPPM and… present an empirical test of at least one the EPPM's propositions" (p. 460). The review excluded studies that were published before 1992, lacked enough information to draw a conclusion, were unpublished doctoral theses, or were qualitative by design.

Popova's review has relevance for my dissertation because it illuminated the various ways that scholars have applied the RBD assessments in their research. While not meant to be a meta-analysis of all EPPM studies, the review focused on the "constructs, propositions and assumptions of the EPPM in order to illuminate the gaps in research that [hampered] development" (Popova, 2012, p. 469). She found that while the EPPM propositions have been thoroughly developed, a few lacked explicit testing, and none have received unequivocal empirical support. Her review efficiently directed my literature review to several key studies that have applied the RBD assessments in various ways. Thus, the RBD structure is a key component of my study.

Popova (2012) noted that scholars incorporating Witte's (1992a) EPPM components have commonly categorized individuals' survey responses according to perceived efficacy levels, and have done so using median splits (e.g., McMahan et al., 1998; Muthusamy et al, 2009; Witte et al., 1994; Witte et al., 1998). Rather than respecting the continuous nature of the perceived threat measure, scholars have often converted the measure to fit the categorical needs of analyses. This procedure has the potential to overlook linear and non-linear relationships that likely exist among variables, at the expense of reduced variance, and loss of power and effect size (MacCallum, 2002). Popova (2012) called for more sophisticated methodological approaches when applying the EPPM framework. This call was relevant to my dissertation, because I incorporate two RBD assessments into my statistical model as a moderator and mediating mechanism. Popova's (2012) review offered a comprehensive and convenient summary of criticisms and future recommendations to advance EPPM. Table 2.1 presents my synthesis of the propositions based on the level support found in EPPM studies, adapted from Popova's (2012) systematic review.

EPPM Applications

In a study on AIDS prevention, Witte (1992b) employed an experimental design to examine the impact of a message strategy on attitudes, intentions, and behaviors. The context of her study was HIV/AIDS prevention. Her messages were designed to differ by combinations of threat and efficacy, where threat varied three levels and message efficacy varied by two levels. Participants in the message groups were asked to carefully read print materials, and underline

Table 2.1

Support Level Found in EPPM Studies Testing at Least One of Twelve Propositions

		Number of Times Tested			
	EPPM Propositions	Full Support	Partial Support	Contradictory Findings	Total
1	When perceived threat is low, regardless of perceived efficacy level, there will be no further processing of the message.	-	2	-	2
2	As perceived threat increases when perceived efficacy is high, so will message acceptance.	5	5	5	15
3	Cognitions about threat and efficacy cause attitude, intentions, or behaviors (i.e. danger control responses).	6	10	1	17
4	As perceived threat increases when perceived efficacy is low, people will do the opposite of what is advocated.	1	4	5	10
5	As perceived threat increases when perceived efficacy is moderate, message acceptance will first increase, and then decrease, resulting in an inverted U-shaped function.	-	-	1	1
6	Fear causes fear control responses.	2	3	2	7
7	When perceived efficacy is high, fear indirectly influences adaptive outcomes, as mediated by perceive threat.	-	1	1	2
8	When perceived efficacy is high, there is a reciprocal relationship between perceived threat and fear.	-	-	-	-
9	Cognitions about efficacy are unrelated to fear control responses.	3	6	4	13
10	Cognitions about threat are indirectly related to fear control responses.	-	2	-	2
11	Perceived threat determines the intensity of a response (how strong the response) and perceived efficacy determines the nature of the response (either fear or danger control).	1	2	1	4
12	Individual differences influence outcomes indirectly, as mediated by perceived threat and efficacy.	4	-	3	7
	Totals	22	35	23	80

Note: Adapted from Popova (2012). Propositions from Witte (1992a). Used with Permission.

important passages, before completing an immediate post assessment. A follow-up assessment was completed six weeks later. Witte (199b2) employed a full-factorial analysis of variance to assess attitudes and intentions toward condom use. The data revealed a significant main effect for efficacy on attitudes, and a significant main effect for threat on intentions. An important finding of this study was the confirmation of an interacting effect of threat and efficacy on attitude change and behaviors. Subsequently, Witte (1994) re-examined this data and used correlational analyses and *t* tests to study the relationship between fear arousal and outcomes of danger or fear control.

Witte (1994) assessed variables of perceived efficacy, perceived threat, fear, message acceptance (attitudes, intentions, actual behaviors), and message rejection (defensive avoidance, and reactance). To identify whether or not fear arousal and threat increase as a function of efficacy, a median split was employed to categorize individuals into groups based on low-efficacy beliefs or high-efficacy beliefs. The effect fear had on acceptance of a message was revealed when analyzing the responses of the two groups. Using tests of correlation, Witte (1994) was able conclude that fear is an emotional process that is significantly associated (negatively or positively) with rejection of messages, but no association exists with acceptance. Perceived efficacy was found to be positively and significantly related to message acceptance (attitudes, intentions, and behavior changes). While “perceived threat was positively related to message acceptance outcomes,” only the relationship with intentions was significant (Witte, 1994, p. 127). The analyses revealed the mediating influence of perceived threat on the fear and intentions relationship, for individuals perceiving high efficacy. An important outcome of the study was the conclusion that the intensity of responses to fear appeals will be affected by the combination of fear and threat, and perceived efficacy will determine the nature of the response to messages.

McKay et al. (2000) conducted an experiment to test whether written information would promote compliant behavior. They designed two messages as high threat with high efficacy and high threat with low efficacy. The context of their study was heart disease prevention through proper eating and vitamin supplementation. Measures included perceived fear, severity, susceptibility, response efficacy (food versus vitamin), self-efficacy (food versus vitamin), and danger and fear control responses.

McKay et al. (2000) analyzed their data using independent samples *t* tests. They found that individuals exposed to a high-threat high-efficacy message were significantly higher in food-related response efficacy and vitamin-related response efficacy, compared to individuals exposed to a high-threat low-efficacy message. Additionally, they found that individuals exposed to a high-threat high-efficacy message were relatively higher in their attitudes toward vitamins, compared to the high-threat low-efficacy message group. In contrast, results indicated that individuals exposed to the high-threat low-efficacy message were significantly higher in perceived manipulation, compared to those exposed to the high-threat high-efficacy message.

McKay et al. (2000) demonstrated the importance of drawing upon a sound theoretical framework when designing fear appeals. Compliant behaviors are likely to result when the message includes strongly worded high-efficacy statements. Whereas, fear control processes will likely result from messages containing ambiguously worded factual statements.

Motivating people to respond in a specific manner can be difficult for message designers when they do not have all the risk-related details on hand. In the context of electromagnetic fields, McMahan, Witte, and Meyer (1998) examined the extent to which EPPM would generalize from known hazards to risks that are difficult to determine. Through their experiment, the goal was to identify the type of message that would be most effective at influencing proactive response. Two messages were designed with specific elements to reflect high versus low threat strategies. Measures included perceived threat (severity, susceptibility), perceived efficacy (response efficacy, self-efficacy), fear arousal, and danger and fear control responses.

McMahan et al. (1998) ran independent samples *t* tests, using the RBD assessment as a manipulation check for the message designs. Through median splits, individuals were categorized as having high or low efficacy perceptions. The scholars conducted a series of tests based on analysis of variance. They reported significant main effects for efficacy on intentions and behaviors, and a significant interaction between the message variation and efficacy on attitudes. Among those exposed to the high-threat message, people with high perceived efficacy displayed the highest attitudes, while people with low perceived efficacy had the weakest attitudes. Among those exposed to the low-threat message, people were fairly unresponsive, regardless of their perceived efficacy level. From the results of the ordinary least squares multiple regression analysis, McMahan et al. (1998) reported that perceived fear, self-efficacy and response efficacy significantly predicted greater intentions to reduce exposure to the hazard. The scholars recommended that practitioners should design messages with elements that will promote high levels of threat, as well as high levels of response and self-efficacy, when dealing with unknown risks.

Witte et al. (1998) argued that the EPPM is a theoretically sound framework that can guide the development of health-promotion campaign materials, although practitioners “may view fear appeals suspiciously” (p. 572). To demonstrate the strength of the EPPM, the scholars developed and tested a campaign message targeting prevention of the Human Papillomavirus

(HPV). This study emphasized the important role of perceived self-efficacy in promoting a successful outcome. Measures included perceived threat (severity, susceptibility), perceived efficacy (response efficacy, self-efficacy), fear arousal, and danger and fear control responses.

The data were analyzed using tests based on of analysis of variance. From the initial analysis, Witte et al. (1998) found that a message will fail to motivate danger or fear control responses when perceptions of efficacy are not considered. Subsequently, Witte et al. (1998) used median splits to categorize individuals as having high or low efficacy perceptions, and performed subgroup analyses. Focusing only on those who viewed the fear appeal campaign message, the scholars reported that individuals with high perceived efficacy were significantly higher in danger control responses of attitudes, intentions, and behaviors, compared to individuals with low perceived efficacy. Using a median split, Witte et al. (1998) identified individuals with low threat perceptions for a subgroup analysis. Among those with low perceived threat, the danger control responses did not differ significantly between those who saw the fear appeal message and those who did not. The scholars reported that the message had no effect on individuals with low perceived threat.

This study demonstrated that campaigns do not always produce the desired results. Witte et al. (1998) advocated for the use of subgroup analysis to account for perceptions of efficacy. They argued that without the subgroup analysis approach, the true impact of the campaign can be overlooked. The scholars drew upon the EPPM framework and put forth recommendations for message designers. To motivate people to action, the message should include elements to make people feel the threat is severe, and that they are susceptible to it. Additionally, a campaign message should include elements that emphasize the feasibility of the recommended response. In the case that a campaign cannot address low efficacy perceptions, a fear appeal strategy should not be employed. This study provided convincing evidence to practitioners that the EPPM was a theoretical tool that could guide campaigns to success.

Muthusamy, Levine, and Weber (2009) employed an experiment to investigate the effectiveness of fear-inducing messages at changing behavior, when people already have pre-existing and high levels of fear. The backdrop of their study was the HIV/AIDS pandemic region of Namibia. Measures for this study included fear, perceived threat (susceptibility and severity), perceived efficacy (susceptibility and self-efficacy), danger control response (attitude, intentions), and fear control responses (defensive avoidance, message derogation, and perceived manipulation).

Data were analyzed using correlational and statistical tests for the equivalence of population means. Results revealed that participants reported high levels of fear, regardless of threat induction from high or low-threat messages. Correlational analyses revealed that fear was not significantly associated with attitudes, intentions, or behaviors. When examining perceived threat, small but significant correlations were found with attitudes and behavior. The scholars determined that perceived efficacy "had little impact on attitudes and intentions, but had a marginal impact on behaviors" (Muthusamy, et al., 2009, p. 338). While a main effect for perceived efficacy existed, perceived efficacy and threat did not interact to effect positive changes in behavioral intentions. Findings from this context-specific study demonstrated that fear and threat inductions are ineffective at changing behavior when people are already scared (Muthusamy et al., 2009). This study emphasized the importance for communication practitioners to identify and consider the threshold cutoff points of target audiences when designing messages.

Gore and Bracken (2005) designed an experiment "to test the extreme parameters of EPPM" (p. 39) by "polarizing threat and efficacy conditions" (p. 30). They used realistic props in a real-world setting to increase ecological validity. Specifically the study was conducted in college classrooms and examined students' reactions to the health risk of meningitis. While one message was designed with elements to present highly threatening information but no recommendations, the second message was designed to reflect elements reflective of high-efficacy but very little threat.

Measures for this study included baseline and post assessments of perceived threat (susceptibility, severity) and perceived efficacy (response efficacy, self-efficacy). The data were analyzed between and within groups using tests based on analysis of variance, and the RBD assessments were retained in their original metric. Important findings of their study were individuals' shifts in responses along the danger and fear control continuum. Gore and Bracken (2005) reported that an extremely high-efficacy and low-threat message could successfully motivate people to shift from fear to danger control processes. They also found that a high-threat and no-efficacy message would likely push people from danger control across a critical threshold into fear control. Additionally, they reported that a high-threat and low-efficacy message would shift people from fear control into greater fear control processes. However, they also found that individuals predisposed to danger control would remain in danger control but shift very little when exposed to a high-efficacy and no-threat message. Gore and Bracken (2005) recommended that practitioners draw upon the EPPM to design their messages, and incorporate the easy-to-use RBD assessment.

Goei, Boyson, Lyon-Callo, Schott, Wasilevich, et al. (2010) examined the EPPM in the context of a threat to someone else. The experiment was conducted in the field (in schools), rather than in a lab. The context of their study was asthma management. Measures included perceived threat (severity, susceptibility), perceived efficacy (response efficacy, self-efficacy), intentions, and asthma knowledge. Using a repeated-measures analysis, Goei et al. (2010) found that the stimuli consistently increased the outcomes of "severity, susceptibility, response efficacy, self-efficacy, intentions, and [asthma] knowledge" from Time 1 to Time 2 (p. 340). Severity and susceptibility were combined to form the measure of perceived threat; while response efficacy and self-efficacy were combined to form the measure of perceived efficacy.

Results of the individual path analysis indicated that the stimulus significantly predicted perceived threat and perceived efficacy. Additionally, perceived threat significantly predicted behavioral intentions, as did perceived efficacy. While Goei et al. (2010) did not conduct a formal test of mediation, they reported that "results suggest the stimuli had an indirect effect on behavioral intent mediated independently by threat and efficacy" (p. 341). Goei et al. highlighted the robustness of the EPPM by examining how individuals would take action to protect other individuals.

Using a video-based message, Tay and Watson (2002) analyzed the impact of "fear arousal and perceived efficacy on message acceptance or rejection" (p. 58) by examining driver fatigue and road safety among individuals living in Queensland, Australia. They developed video messages for the stimuli with one high-threat video message versus one high-threat video message plus three high-efficacy messages. The messages used for this study were actual advertisements that had been televised in Australia and New Zealand. The constructs measured in the study were fear arousal, response efficacy, and self-efficacy, adaptive behavioral intentions, maladaptive behavioral intentions, and self-reported behaviors.

To examine the effects of fear arousal and efficacy on message acceptance or rejection, Tay and Watson (2002) used standard ordinary least squares regression for behavioral intentions, and logit regression for self-reported behavior. Fear arousal significantly influenced maladaptive behavioral intentions, at the post treatment assessment. The scholars found a significant effect of self-efficacy on adaptive behavioral intentions at the post-treatment assessment, but this relationship had decreased by the follow-up assessment. Response efficacy was the only factor that had a significant influence on adaptive and maladaptive behavioral intentions at the post-treatment assessment, and a significant influence on adaptive behavioral intentions and self-reported adaptive behavior at the follow-up assessment. This study demonstrated that perceived response efficacy plays a critical role in influencing behavioral change, and reinforced the fact that "fear in itself is not important at eliciting behavior change" (Tay & Watson, 2002, p. 64). Based on the results of this study, they identified a low-moderate and high-efficacy fear appeal as more effective than a high-fear and high-efficacy appeal or a high-fear and low-efficacy appeal. The scholars recommended that messages provide explicit coping strategies to have a positive effect on message acceptance.

The EPPM predicts that a message variation will indirectly predict danger control responses (i.e., behavioral intentions), while exerting influence through danger control processes. The sampling of previous studies demonstrates typical applications of EPPM. Most often, message characteristics were manipulated and evaluated for effectiveness through measures of participants' responses. The review of EPPM studies illuminated the common practice for scholars to assess the measures that are core to EPPM: Perceived severity, susceptibility, response efficacy, and self-efficacy. Although tests based on analysis of variance were commonly used by scholars to analyze their data, mediation and moderated mediation analyses could be performed to test most of the propositions, which would incorporate the RBD measures in continuous form. For example, it is possible to design a study to test Propositions 1, 2, and 4 by varying the efficacy levels in a message and keeping the message threat level constant across messages. By design, one message could reflect a high-threat and low-efficacy combination, while the other message could reflect a high-threat and high-efficacy combination. However, the high-threat and low-efficacy combination raises some ethical concerns when a message is manipulated to threaten or scare people, without providing recommendations for alleviating threat or fear.

It appears that T. Sellnow and D. Sellnow's (2013) concepts of internalization and action align well with Witte's (1992) concepts of threat and efficacy, respectively. Thus, the EPPM propositions presented in Table 2.1 are also applicable to tests of the IDEA model's impact. The indirect effect predicted by the EPPM also coincides with the indirect effect predicted by the IDEA model. Overall, Witte's (1992a) EPPM is well suited for evaluating the persuasive outcomes of a food-recall warning designed according to the T. Sellnow and D. Sellnow's (2013) IDEA model.

IDEA Testing Stimuli

T. Sellnow and colleagues created two message variations for scholars (including the present) to utilize as experimental stimuli when testing the IDEA model's utility. Electronic mail correspondence between T. Sellnow, colleagues (including the present), several food scientist experts, and a broadcast journalist confirmed the basis of the two message script variations developed for testing the IDEA model's utility. In 2011, the U.S. Department of Agriculture (USDA) Food Safety Inspection Service (FSIS)[6] issued a press release issued to media outlets to

[6] The FSIS has regulatory authority meat, poultry, and processed egg products. The agency ensures that these products are wholesome, accurately labeled, and safe for human consumption (FoodSafety.gov, n.a.a, para 1)

report Hannaford Foods' voluntary recall of ground beef products. The FSIS (2011) recall announcement pointed to Hannaford Foods' grocery stores located within the state of Maine, New Hampshire, New York, and Vermont. Hannaford Foods issued its voluntary recall due to a possible link between *Salmonella typhimurium* found in its beef products and the bacterial strain of salmonellosis[7] circulating among populations who had reportedly consumed ground beef products purchased from its grocery stores, as identified by the Centers for Disease Control and Prevention[8] (CDC).

When developing the message variations, T. Sellnow and colleagues intended the features characterizing the treatment condition (a.k.a. IDEA) to operationalize the IDEA model elements of internalization, explanation, and action. The scholars intended the features comprising the control condition (a.k.a. status quo) to operationalize the IDEA model's element of explanation, and to a much greater degree (see, D. Sellnow, Lane, Littlefield et al., 2015). The message variations were reviewed and revised numerous times by subject matter experts, food scientists, and broadcast professionals before the final transcripts were submitted for production. The approved message scripts were converted into video format to simulate variations in televised news reports. Thus, both variations reflected the same message-delivery channel to address the distribution element of T. Sellnow and D. Sellnow's (2013) IDEA model. The scripts depicting these message variations can be found in Appendix B (i.e., IDEA) and Appendix C (i.e., status quo).

[7] Salmonellosis is a human illness (a.k.a. foodborne disease, food poisoning) that is contracted from ingesting or inadvertent exposures to food(s) infected by bacteria, such as *Salmonella typhimurium*, a microscopic bacterium (FoodSafety.gov, n.d.c, para 1).
[8] The CDC leads federal efforts to investigate and analyze foodborne illness data, illnesses and outbreaks as they occur, while monitoring disease control and prevention efforts (CDC, n.d.a, para 1).

Research Claims and Generalizations

O'Keefe (2003) described how conceptualization and relationships of message properties, psychological states, and pervasive outcomes strategically inform the types of conclusions that may be drawn from research results. He explained that experimental stimuli are characterized through effect-oriented definitions. An effect-independent message variation emphasizes the message features or properties (O'Keefe, 2003). As examples, messages can be defined by the absence of presence of a particular feature such as an explicitly-stated instruction, or by variations in word length. In this sense, the effect-independent message variation is indexed by message content and structural features. In contrast, an effect-based variable definition emphasizes the observed effects on message recipients, such as an induced psychological effect. For example, fear appeal stimuli are often described in terms of high or low threat, in relation to psychological states that will likely be aroused in message receivers. From this perspective, the effect-based variable definition is indexed by psychological dimensions attributed to viewers' perceptions. The characterization of message attributes will have a significant impact on the conclusions that may be drawn (O'Keefe, 2003).

There are three classes of claims that are of interest to theorists and researchers conducting tests of message variations on persuasion outcomes (O'Keefe, 2003). O'Keefe (2003) argued that study designs focused on a Class I research claim should be avoided precisely because they "impede progress in understanding persuasion processes and effects" (p. 251). Operationally, the stimuli have been simply considered the methodological devices needed to induce variations in the psychological state. This approach falls short of shedding light on the communication processes that are of interest to researchers and theorists. O'Keefe (2003) warns that "when messages are defined in terms of effects, rather than intrinsic properties, researchers forfeit the ability speak to questions of the relationship between message properties and persuasive outcomes" (p. 268).

For the Class II research claim, the stimuli have been described in terms of intrinsic, effect-independent message properties. In this case, psychological states are ignored, and the analysis centers on the relationship between stimuli and persuasive outcomes. If, for example, it turned out that a specific message feature resulted in higher persuasive outcomes, message designers would have discovered an important element to include in future messages (O'Keefe, 2003).

For the Class III research claim, the direct and indirect effects of message variation on persuasive outcomes are examined. As a mediator, the psychological state is both an effect and a cause. When mediation analysis is incorporated, explanations for observed effects of message variations become possible. These findings provide considerable insight into the communication processes at work (O'Keefe, 2003). Because the mediation model can accommodate complex analysis, this approach is most informative for message designers who seek to identify a message that will have the greatest impact indirectly on persuasive outcomes.

When defined by intrinsic, effect-independent properties, the stimuli of experimental designs do not require a manipulation check. The message characteristics were either embedded, or they were not. However, when the message is defined by an anticipated psychological state of the message receiver, a manipulation check is necessary to prove that the stimuli "engendered the required responses" (O'Keefe, 2016, p. 184). The most important advantage for characterizing messages using the effect-independent definition is the informative capability for future designs that will benefit communication practitioners (O'Keefe, 2003, 2016). Clearly little light is shed to inform communication practitioners when effect-based definitions are employed, and O'Keefe (2003) argued that researchers should avoid this approach when characterizing messages in study designs.

The distinction between research claims is extremely important to understand because the methodological tools employed to evaluate the effectiveness of message designs will have a significant impact on the conclusions that may be drawn (O'Keefe, 2003). Generalizations across studies should only be made between messages that are similarly characterized. Using a threat appeal as an example a message characterized as a receiver's response (e.g., low efficacy) compared to an element (e.g., graphic image) makes it "difficult to draw reliable generalizations that encompass the two studies" (O'Keefe, 2016, p. 184).

Message Properties of IDEA Stimuli

D. Sellnow-Richmond et al. (2018) published the *IDEA Model Thematic Analysis Codebook* for operationalizing the elements of internalization, explanation, and action as message features. This codebook has relevance for clarifying how the IDEA model elements were operationalized in the message variations created by T. Sellnow and colleagues. More specifically, the codebook is a useful tool for verifying that the elements of internalization and action were not operationalized as message features in the status quo message variation, and that the explanation element was operationalized as features to greater extent when compared to the IDEA message variation. Further, the codebook serves to verify that the elements of internalization and action were operationalized through features in the IDEA message variation as intended by T. Sellnow and colleagues. A failure to accurately and consistently define the IDEA model elements in published studies will lend to growing discrepancy in the literature over time. Thus, the features in both message variations developed by T. Sellnow and colleagues are reviewed for evidence of the IDEA model elements of internalization, action, and explanation.

Proximity. According to the IDEA model, proximity is characterized through features that point to geographical locations impacted by a crisis. In an IDEA message (relative to a status quo variation), proximity is demonstrated by emphasizing to a greater extent the specificity of locations and product impacted in the areas inhabited by receiver of crisis information (T. Sellnow & D. Sellnow, 2013; D. Sellnow-Richmond et al., 2018). In the event of an illness outbreak, proximity would be established by describing "where the disease is occurring" (D. Sellnow–Richmond et al., 2018, p.140). As noted earlier, features of proximity serve to motivate receivers to internalize the message.

As evidenced in T. Sellnow and colleagues' message scripts, the IDEA and status quo variations situated the illness outbreak and food contamination scenario within a single state (i.e., Kentucky). Compared to the status quo message variation, the IDEA variation was enhanced with more specific detail to define the crisis impact at a regional level (i.e., from Paducah to Pikeville and from Louisville to Lexington). Technically, the geographical description at the statewide level (i.e., Kentucky) in both message variations served to operationalize the IDEA model's internalization element (i.e., proximity) in a more generalized manner. However, the geographical specificity at the regional level distinguished the IDEA message variation from the status quo message variation. Based on the IDEA model criteria, features of proximity were evidenced in both message variations, albeit at varying degrees. Thus, it appears that internalization (i.e., proximity) as a message cue was minimized in the status quo variation and maximized in the IDEA message variation.

Timeliness. According to the IDEA model, timeliness is characterized through features that define the imminence of a crisis event and emphasize the urgency for affected audiences to take recommended actions for self-protection in a timely fashion. In an IDEA message variation (relative to a status quo variation), timeliness is demonstrated by emphasizing to a greater extent how much time the affected audiences have to prepare for or protect against a public threat (T. Sellnow & D. Sellnow, 2013; D. Sellnow-Richmond et al., 2018). In the event of an illness outbreak, timeliness would be established by describing “how much time one has to notice symptoms and to seek medical help” (D. Sellnow–Richmond et al., 2018, p.140). As noted earlier, features of timeliness serve to motivate receivers to internalize the message.

Each message script developed by T. Sellnow and colleagues included a description about when to expect illness symptoms to appear, in relation to consuming tainted meat product: ‘The symptoms of salmonellosis include diarrhea, abominable cramps, and fever within 12 to 72 hours of eating the contaminated meat.’ Compared to the status quo message variation, the IDEA variation was enhanced with more specific detail to define the timeframe for seeking medical attention: ‘If you or someone you know has eaten beef over the past three days and is experiencing any of the symptoms, you should contact your physician, go to the nearest emergency room, or call 911.’ Technically, the description regarding when symptoms emerge (i.e., within 12 to 72 hours) in both message variations served to operationalize the IDEA model’s internalization element (i.e., timeliness) in a more generalized manner. However, the reference to beef consumption (i.e., over the past three days) distinguished the IDEA message variation from the status quo variation. More specifically, the IDEA variation identified a timeframe that would warrant the need for symptomatic individuals to respond immediately by seeking medical attention. Based on the IDEA model criteria, features of timeliness were evidenced in both message variations, albeit at varying degrees. Thus, it appears that internalization (i.e., timeliness) as a message cue was minimized in the status quo variation and maximized in the IDEA message variation.

Personal impact. According to the IDEA model, personal impact is characterized through features that define the severity of and susceptibility to threat. In an IDEA message (relative to a status quo variation), personal impact is demonstrated by emphasizing to a greater extent the magnitude of the noxiousness of a threat (i.e., severity) and the likelihood of experiencing the threat (i.e., susceptibility) (T. Sellnow & D. Sellnow, 2013; D. Sellnow-Richmond et al., 2018). In the event of an illness outbreak, personal impact would be established by describing “the potential effects of disease on people who become infected” (D. Sellnow–Richmond et al., 2018, p.140). As noted earlier, features of personal impact serve to motivate receivers to internalize the message.

The IDEA and status quo message variations provided a general description of the disease impact on infected individuals: ‘So far, 27 people are officially confirmed as sickened by *Salmonella typhimurium* – and at least three of those have life threatening conditions. There is also one death that is under investigation. Nineteen of those infected reported consuming ground beef…’ The IDEA variation was enhanced with a scenario to personalize what can happen to people who contract foodborne disease: ‘One infected individual was 54-year old Winona Richards, a deli cook at a local grocery. She became ill two nights ago with cramps and diarrhea and believed it would pass. But when her husband discovered her unconscious the next morning, he called 911 and she was rushed to the emergency room. Just hours later, she died at the hospital.’ Technically, the description of severity and susceptibility (i.e., 27 people confirmed sickened; at least three have life threatening conditions; one death) in both message variations served to operationalize the IDEA model’s internalization element (i.e., personal impact) in a more generalized manner. However, the victim scenario distinguished the IDEA message variation from the status quo variation. Based on the IDEA model criteria, features of personal impact were evidenced in both message variations, albeit at varying degrees. Thus, it appears that internalization (i.e., personal impact) as a message cue was minimized in the status quo variation and maximized in the IDEA message variation.

Action. According to the IDEA model, action is characterized through features that instruct and empower affected audiences to take doable steps that work to avert or diminish a threat experience. In an IDEA message (relative to a status quo variation), action is demonstrated by emphasizing to a greater extent the specific actions that work to avert a threat (i.e., response efficacy) and how affected audiences can easily perform the recommendations for self-protection (i.e. self-efficacy) (T. Sellnow & D. Sellnow, 2013; D. Sellnow-Richmond et al., 2018). In the event of an illness outbreak, action (i.e., efficacy) would be established by describing or demonstrating "specific actions to take (or not to take) to avoid [becoming sick] as well as what to do (or not to do) [once exposed … or experiencing any of the symptoms" (D. Sellnow–Richmond et al., 2018, p.140). As noted earlier, features of action serve to empower and compel receivers to follow through with the recommendations for self-protection.

As evidenced in the message scripts, the IDEA and status quo variations provided a general instruction to prevent against illness by not eating ground beef: 'Health officials are also warning the public to refrain from eating ground beef at any locations – including fast food restaurants, grocery store delis, as well as at home. They do not want anyone else to become infected.' The IDEA variation provided specific action steps for the purpose of empowering audience members with appropriate alternatives for dealing with the threat. More specifically, the IDEA variation provided the doable option of identifying contaminated beef products and returning products to the store: 'Consumers who have purchased ground beef with sell-by dates of October 15 or earlier should return the meat to the store for a full refund.' As another option, the IDEA variation provided the doable option of appropriately handling and cooking ground beef product before eating it: ‘Use a food thermometer to cook all fresh or frozen ground beef to an internal temperatures of at least 160 degrees and to wash hands often with soapy water.’ As noted earlier, the IDEA variation provided several options for seeking medical attention: (i.e., contact physician, go to nearest emergency room, call 911). The IDEA variation also explained what should not be done to diminish the serious consequences once sickened: ‘Do not use over-the-counter antidiarrheal drugs as these could keep the deadly bacteria in your system longer.’

Technically, the instruction common to both message variations (i.e., refrain from eating ground beef at any location) served to operationalize the IDEA model’s action element (i.e., timeliness) in a more generalized manner. However, numerous actions steps were unique to the IDEA message variation (i.e., return product, use a food thermometer, wash hands often, seek medical attention, avoid over-the counter medicine) distinguished the strategy from that of the status quo variation. Based on the IDEA model criteria, action steps were evidenced in both message variations, albeit at varying degrees. Thus, it appears that action (i.e., specific steps) as a message cue was minimized in the status quo variation and maximized in the IDEA message variation.

Explanation. According to the IDEA model, explanation information is characterized through features that articulate the crisis event. In an IDEA message (relative to a status quo variation), explanation is demonstrated by describing the crisis in a briefer manner. The review of the message variations confirmed that the crisis explanation was described in the status quo variation to a much greater extent compared to the features that explained the crisis in the IDEA variation. This finding aligns with T. Sellnow and D. Sellnow’s (2013) recommendation that the explanation information should be condensed in the IDEA message variation.

In sum, the IDEA elements in the stimuli created by T. Sellnow and colleagues have been characterized using effect-independent message variable definitions and can be mapped to Witte's (1992a) characterization of features typical of EPPM messages. The IDEA and status quo message scripts are distinguishable by a varied intensity in features embedded to operationalize the elements of internalization, action, and explanation. Such variation is strikingly similar to the strategy used to distinguish experimental stimuli for EPPM studies. While the IDEA message variation produces an experimental condition similar to Witte's (1992a) high-threat/high-efficacy condition, the status quo variation produces an experimental condition similar to Witte's (1992a) moderate-threat/low-efficacy condition, or at minimum, a low-threat/low-efficacy condition.

IDEA Model Applications

In this section, four published tests of the IDEA model are explored in detail. The review is focused on the tools used by scholars to test theory. Additionally, the four applications are examined for the type of claims that have been put forth, in light of the IDEA model's key assumptions. The first application summarizes the study of Littlefield et al. (2014). The second application summarizes the study of D. Sellnow, Lane, Littlefield et al. (2015). The third application summarizes the study of D. Sellnow, Lane, T. Sellnow et al. (2017). The fourth application summarizes the study of D. Sellnow, Johansson et al. (2018).

Application One

To test the utility of the IDEA model, Littlefield et al. (2014) employed a posttest-only quasi-experimental design through an online platform that randomly assigned participants into message variation conditions, and collected participant data (i.e., demographic, perceptual, behavioral intentions). The scholars utilized the participant questionnaire and news story stimuli created by T. Sellnow and colleagues. Their sample was drawn from a student population enrolled in communication courses in a large Southern university (n=496) and populations recruited from communities located in the South Central U.S., Eastern U.S., and Upper Midwest (n=250).

Individual difference variables for this study included sex (i.e., female, male), ethnicity (i.e., African American, Native American, White), and learning style preference (i.e., diverging, assimilating, converging, accommodating). Littlefield et al. (2014) administered D. Sellnow's (2005) LSQ and calculated the results using the traditional approach to identify each participant's dominant learning style preference. The outcome variables for this study included two of the twelve behavioral intentions measures developed by T. Sellnow and colleagues (see Appendix D), and a seven-item perceived message effectiveness scale adapted from Harris (2007) and Noar, Palmgreen, Zimmerman, Lustria and Lu (2010) (see Appendix E). Participants responded to each behavioral intention item using a 5-point Likert-type scale ranging from 1 (very unlikely) to 5 (very likely). As single-item indicators of behavioral learning, Littlefield et al. (2014) asked participants to indicate their likely intent to: (1) 'Return ground beef to the store where it was purchased,' and (2) 'Ask someone else what he or she would do.' Participants responded to each perceived message effectiveness item using 5-point Likert-type scales ranging from 1 (strongly disagree) to 5 (strongly agree). As a measure of cognitive learning, Littlefield et al. (2014) asked participants to indicate video effectiveness by responding to the items: (1) 'This video would catch my attention,' (2) 'This video make me more likely to not eat potentially contaminated food, (3) 'This video is memorable,' (4) 'This video is effective,' (5) 'This video would make people my age more likely to not eat potentially contaminated food,' (6) 'This video would help convince people my age to not eat potentially contaminated food,' and (7) 'This video would help convince me to not eat potentially contaminated food.' In all instances, Littlefield et al. (2014) relied on tests based on analysis of variance to test hypotheses and address research questions.

Littlefield et al. (2014) hypothesized that an IDEA message variation, as a function of ethnicity, would predict significantly higher perceived message effectiveness, compared to a status quo variation. This hypothesis was tested with a full-factorial 2 x 3 (message type x ethnicity) univariate analysis of variance (UNOVA). Although the data revealed no significant interaction, the scholars reported significant main effects for message type and ethnicity on perceived message effectiveness.

Littlefield et al. (2014) hypothesized that an IDEA message variation would have a more positive impact on self-reported behavioral intentions, compared to a status quo variation. The tests of each one-way analysis of variance indicated that IDEA receivers, compared to status quo receivers, were significantly more likely to "return ground beef to the store …. [and significantly] less likely to ask someone else what [he or she] would do" (p. 20). Thus, the scholars claimed support for this hypothesis.

Littlefield et al. (2014) explored the extent that learning styles affect perceived message effectiveness and the four behavioral intention items. A full-factorial 2 x 3 x 4 (message type x ethnicity x learning style) univariate analysis of variance (UNOVA) was performed to examine these relationships. Although the data revealed no significant interactions, the scholars reported a significant main effect for ethnicity on perceived message effectiveness. Although the data revealed no significant interactions, the scholars reported significant main effects for message type and ethnicity on receivers' intentions to return ground beef to the store, suggesting that the

IDEA message was more effective than the status quo message at influencing the intention, regardless of ethnicity or learning style.

To rule out any need to tailor a message to individual differences, Littlefield et al. (2014) explored relationships between message type, sex, and learning styles relative to perceived message effectiveness and the four behavioral intention items. A full-factorial 2 x 3 x 4 x 2 (message type x race x learning style x sex) multivariate analysis of variance (MANOVA) was performed to examine these relationships. The results revealed a statistically significant four-way interaction and the scholars reported that Native American females with a converging learning style and African American females with a converging learning style were significantly more likely than any other groups to return ground beef to the store.

Littlefield et al. (2014) relied on tests based on analysis of variance when testing their two hypotheses. Their first hypothesis focused the analysis on the direct effect of message variation on receivers' perceived message effectiveness. Their second hypothesis aligned with O'Keefe's (2003) classification of a Class II research claim by focusing the analysis on the direct effect of message variation on receivers' self-reported intentions. A Class III research claim could have been achieved by performing an indirect-effect analysis that would explain the observed effects of the message variation. The tools selected by Littlefield et al. (2014) to test the relative effectiveness of the IDEA protocol made it impossible to account for and examine the message variation's indirect effects operating through the parallel mediators (i.e., affect, cognition) that are foundational to T. Sellnow and D. Sellnow's (2013) message-design framework. By excluding a conditional indirect effect analysis, Littlefield et al. (2014) neglected the opportunity to *simultaneously test* the two key assumptions as predicted in theory by the IDEA model. Thus, this experiment did not formally test the utility of the IDEA model.

Application Two

For their study, D. Sellnow, Lane, Littlefield et al. (2015) employed a posttest-only quasi-experimental design through an online platform that randomly assigned participants into message variation conditions, and collected participant data (i.e., demographic, perceptual, behavioral intentions). The scholars utilized the participant questionnaire and news story stimuli created by T. Sellnow and colleagues. Their sample was drawn from a student population enrolled in communication courses in a large Southern university (n=496).

Individual difference variables for this study included sex (i.e., female, male) and learning style preference (i.e., diverging, assimilating, converging, accommodating). D. Sellnow, Lane, Littlefield et al. (2015) administered D. Sellnow's (2005) LSQ and calculated the results using the traditional approach to identify each participant's dominant learning style preference. The outcome variables for this study included four of the twelve behavioral intentions measures developed by T. Sellnow and colleagues (see Appendix D), and the seven-item perceived message effectiveness scale adapted from Harris (2007) and Noar et al. (2010) (see Appendix E).

Participants responded to each behavioral intention item using a 5-point Likert-type scale ranging from 1 (very unlikely) to 5 (very likely). As single-item indicators of behavioral learning, D. Sellnow, Lane, Littlefield et al. (2015) asked participants to indicate their likely intent to: (1) 'Return ground beef to the store where it was purchased,' (2) 'Ask for no ground beef when ordering food that usually contains ground beef,' (3) 'Continue to order food as normal when eating out,' (4) 'Never purchase ground beef again.' Participants responded to each perceived message effectiveness item using 5-point Likert-type scales ranging from 1 (strongly disagree) to 5 (strongly agree). As a measure of cognitive learning, D. Sellnow, Lane, Littlefield et al. (2015) asked participants to indicate video effectiveness by responding to the items:

(1) ‘This video would catch my attention,’ (2) ‘This video make me more likely to not eat potentially contaminated food, (3) ‘This video is memorable,’ (4) ‘This video is effective,’ (5) ‘This video would make people my age more likely to not eat potentially contaminated food,’ (6) ‘This video would help convince people my age to not eat potentially contaminated food,’ and (7) ‘This video would help convince me to not eat potentially contaminated food.’ In all instances, D. Sellnow, Lane, Littlefield et al. (2015) relied on tests based on analysis of variance to test hypotheses and address research questions.

The scholars hypothesized that an IDEA message variation would predict significantly higher perceived message effectiveness, compared to a status quo variation. The results of their independent samples *t* tests provided no support for this hypothesis. D. Sellnow, Lane, Littlefield et al. (2015) hypothesized that an IDEA message variation would predict significantly more appropriate self-reported behavioral intentions, compared to a status quo variation. To test this hypothesis, the scholars performed a multivariate analysis of variance (MANOVA). The test results indicated that the IDEA message variation had a more positive impact on self-reported behavioral intentions to return ground beef to the store, compared to a status quo variation. The test results also indicated that the IDEA message variation had a more positive impact on self-reported behavioral intentions to ask for no ground beef when ordering food that usually contains ground beef. D. Sellnow, Lane, Littlefield et al. (2015) reported full support for the hypotheses when the results of their descriptive statistics and between–participants effects analyses confirmed statistically significant differences for two of four behavioral intentions.

D. Sellnow, Lane, Littlefield et al. (2015) explored the extent that learning styles affect perceived message effectiveness and the four behavioral intention items. A full-factorial 2 x 4 (message type x learning style) MANOVA was performed to test the effects. The scholars found no statistically significant main effects for learning styles on perceived message effectiveness or on the four behavioral intentions. The data revealed that learning styles and message type did not interact to influence perceived message effectiveness or any of the four behavioral intentions. From these results, D. Sellnow, Lane, Littlefield et al. (2015) concluded that "learning style preference [does not appear to influence] message effectiveness or any of the four behavioral intentions" (p. 155).

To rule out any need to tailor a message to individual differences, D. Sellnow, Lane, Littlefield et al. (2015) explored relationships between message type, sex, and learning styles relative to perceived message effectiveness and the four behavioral intention items. A full-factorial 2 x 4 x 2 (message type x learning style x sex) MANOVA was performed to test the relationship. The test results indicated a significant interaction involving message type and sex, such that females exposed to the IDEA message were significantly higher in perceived message effectiveness compared to women who viewed the status quo variation, or compared to males who viewed either the IDEA or status quo message variation.

In light of their findings, D. Sellnow, Lane, Littlefield et al. (2015) argued that when time and resources are at a premium, the IDEA protocol can be followed to produce a "comprehensive message…. that is sensitive to audience variance" (p. 157). D. Sellnow, Lane, Littlefield et al. (2015) relied on tests based on analysis of variance when testing their two hypotheses. The first hypothesis focused the analysis on the direct effect of message variation on receivers' perceived message effectiveness. Their second hypothesis aligned with O'Keefe's (2003) classification of a Class II research claim by focusing the analysis on the direct effect of message variation on receivers' self-reported intentions. A Class III research claim could have been achieved by performing an indirect-effect analysis that would explain the observed effects of the message variation. The tools selected by D. Sellnow, Lane, Littlefield et al. (2015) made it impossible to account for and examine the message variation's indirect effects operating through parallel mediators (i.e., affect, cognition) that are foundational to T. Sellnow and D. Sellnow's (2013) message-design framework. By excluding a conditional indirect effect analysis, D. Sellnow, Lane, Littlefield et al. (2015) neglected the opportunity to *simultaneously test* the two key assumptions as predicted in theory by the IDEA model.

Application Three

To conduct their study, D. Sellnow, Lane, T. Sellnow et al. (2017) employed a posttest-only quasi-experimental design through an online platform that randomly assigned participants into message variation conditions, and collected participant data (i.e., demographic, perceptual, behavioral intentions). The scholars utilized the news story stimuli created by T. Sellnow and colleagues (described earlier). Their sample (n=525) was drawn from a student population enrolled in communication courses in a large Southern university.

Individual difference variables for this study included sex (i.e., female, male) and race (i.e., non-White, Caucasian). The outcome variables for this study included eight behavioral intention measures adapted from T. Sellnow and colleagues, and the seven-item perceived message effectiveness scale adapted from Harris (2007) and Noar et al. (2010) (see Appendix E). Participants responded to each behavioral intention item using a 5-point Likert-type scale ranging from 1 (very unlikely) to 5 (very likely). As single-item indicators of behavioral learning, D. Sellnow, Lane, T. Sellnow et al. (2017) asked participants to indicate their likely intent to: (1) 'Return ground beef to the store,' (2) 'Contact a physician for self,' (3) 'Go to the emergency room,' (4) 'Call 911 for self,' (5) 'Contact a physician for other,' (6) 'Take other to emergency room, (7) 'Call 911 for other,' and (8) 'Cook ground beef to 160 degrees.'

Participants responded to each perceived message effectiveness item using 5-point Likert-type scales ranging from 1 (strongly disagree) to 5 (strongly agree). As a measure of cognitive learning, D. Sellnow, Lane, T. Sellnow et al. (2017) asked participants to indicate video effectiveness by responding to the items: (1) ‘This video would catch my attention,’ (2) ‘This video make me more likely to not eat potentially contaminated food, (3) ‘This video is memorable,’ (4) ‘This video is effective,’ (5) ‘This video would make people my age more likely to not eat potentially contaminated food,’ (6) ‘This video would help convince people my age to not eat potentially contaminated food,’ and (7) ‘This video would help convince me to not eat potentially contaminated food.’ In all instances, D. Sellnow, Lane, T. Sellnow et al. (2017) relied on tests based on analysis of variance to test hypotheses and address research questions.

The scholars hypothesized that an IDEA message variation would predict significantly higher perceived message effectiveness, compared to a status quo variation. The results of their independent samples *t* tests provided full support for this hypothesis. D. Sellnow, Lane, T. Sellnow et al. (2017) hypothesized that an IDEA message variation would predict significantly more appropriate self-reported behavioral intentions, compared to a status quo variation. The results of their multivariate analysis of variance (MANOVA) revealed a statistically significant model. They reported full support for the hypotheses when the results of their descriptive statistics and between–participants effects analyses confirmed statistically significant differences for all eight dependent variable.

To rule out any need to tailor a message to individual differences, D. Sellnow, Lane, T. Sellnow et al. (2017) explored relationships between message type, sex, and learning styles relative to the eight behavioral intention items. The scholars conducted a full-factorial 2 x 2 x 2 (message type x sex x race) MANOVA to test the relationships. Although the data revealed no significant interactions, the scholars reported a significant main effect for message type on all eight behavioral intentions, suggesting that the IDEA variation was more effective than a status quo variation across all behavioral intentions. Although they found a significant main effect for sex, D. Sellnow, Lane, T. Sellnow et al. (2017) concluded that there is no need to tailor features of an IDEA message to the individual difference variables of sex or race.

D. Sellnow, Lane, T. Sellnow et al. (2017) concluded that the IDEA learning cycle model is an effective message-design protocol that will "ultimately achieve the desired behavioral learning outcomes among receivers" (p. 14). D. Sellnow, Lane, T. Sellnow et al. (2017) relied on tests based on analysis of variance when testing their two hypotheses. The first hypothesis focused the analysis on the direct effect of message variation on receivers' perceived message effectiveness. Their second hypothesis aligned with O'Keefe's (2003) classification of a Class II research claim by focusing the analysis on the direct effect of message variation on receivers' self-reported intentions. A Class III research claim could have been achieved by performing an indirect-effect analysis that would explain the observed effects of the message variation. The tools selected by D. Sellnow, Lane, T. Sellnow et al. (2017) to test the relative effectiveness of the IDEA protocol made it impossible to account for and examine the message variation's indirect effects operating through the parallel mediators (i.e., affect, cognition) that are foundational to T. Sellnow and D. Sellnow's (2013) message-design framework. By excluding a conditional indirect effect analysis, D. Sellnow, Lane, T. Sellnow et al. (2017) neglected the opportunity to *simultaneously test* the two key assumptions as predicted in theory by the IDEA model.

Application Four

For their study, D. Sellnow, Johansson et al. (2018) employed a posttest-only quasi-experimental cross-sectional survey research design through an online platform that randomly assigned participants into message variation conditions, and collected participant data (i.e., demographic, perceptual, behavioral intentions). Before conducting their experiment, D. Sellnow, Johansson et al. (2018) translated the IDEA and status quo news story transcripts by T. Sellnow and colleagues (described earlier) from the English language into the Swedish language. Technical modifications to the two transcripts included the contamination source (i.e., ground beef and blended meat), information sources (i.e., Swedish agencies), and outbreak locations (i.e., in Sweden) (D. Sellnow, Johansson et al., 2018). The scholars formatted the IDEA and status quo transcripts to simulate variations in a newspaper story. The sample (n=1,488) was drawn from a "nationwide citizen panel managed by the Laboratory of Opinion Research (LORE)… in Gothenburg, Sweden" (p. 4).

Individual difference variables for this study included sex (i.e., female, male), age (< 30 years, >30<40 years, >40<50 years, >50<60 years, >60 years), and location (i.e., Sweden, other Northern European country, outside Europe, not reported). The outcome variables for this study included five items adapted from T. Sellnow and colleagues to measure behavioral intentions, and six items adapted from T. Sellnow and colleagues to measure perceived importance in message characteristics. Before conducting their study, D. Sellnow, Johansson et al. (2018) translated the questionnaire items from the English language into the Swedish language. Participants responded to each behavioral intention item using a 5-point Likert-type scale ranging from 1 (very unlikely) to 5 (very likely). As single-item indicators of behavioral learning, D. Sellnow, Johansson et al. (2018) asked participants to indicate their likely intent to:

(1) ‘Throw away blended meat,’ (2) ‘Return ground beef to the store,’ (3) ‘Continue to eat meat,’ (4) ‘Ask someone else what they would do,’ and (5) ‘Seek additional information.’ Participants responded to the message characteristic items using a 7-point scale ranging from 1 (very unimportant) to 7 (very important). As single-item indicators of affective learning, D. Sellnow, Johansson et al. (2018) asked participants to indicate how important it was to read:
(1) ‘*Salmonella* had been detected in ground beef and blended meat,’ (2) ‘*Salmonella* was detected in ground beef and blended meat sold in stores in Stockholm,’ (3) ‘The involvement of the Manager at the Division of Preventative Medicine,’ (4) ‘What *Salmonella* is,’ (5) ‘What can happen to people who get *Salmonella* poisoning,’ and (6) ‘What to do if you or a love one gets sick from tainted meat.’ In all instances, D. Sellnow, Johansson et al. (2018) relied on tests based on analysis of variance to test hypotheses and address research questions.

D. Sellnow, Johansson et al. (2018) hypothesized that an IDEA message variation would predict significantly more appropriate self-reported behavioral intentions, compared to a status quo variation. To test this hypothesis, the scholars performed a multivariate analysis of variance (MANOVA). D. Sellnow, Johansson et al. (2018) reported full support for the hypotheses when the results of their descriptive statistics and between–participants effects analyses confirmed statistically significant differences for three of five dependent variables (i.e., throw away blended meat, return meat to the store, continue to eat meat). The scholars explored the direct effect of the IDEA message variation, relative to a status quo variation, on each of the six items measuring perceived importance in message characteristics. The results of their multivariate analysis of variance (MANOVA) revealed significant differences between message variations for two of the six dependent variables. More specifically, D. Sellnow, Johansson et al. (2018) found that IDEA message receivers reported significantly higher levels of perceived importance in the message characteristics of: '*Salmonella* had been detected in ground beef and blended meat,' and 'What to do if sickened from tainted meat.'

To rule out any need to tailor a message to individual differences, D. Sellnow, Johansson et al. (2018) explored relationships between message type, sex, age, and location relative to five behavioral intention items. A full-factorial 2 x 2 x 6 x 4 (message type x sex x age x location) MANOVA was performed to test these relationships. Although the data revealed no significant interactions, the scholars reported a significant main effect for message type, age, and location. Without a statistically significant interaction, D. Sellnow, Johansson et al. (2018) concluded that there is no need to adapt an IDEA message toward the individual difference variables of sex, age, or location. D. Sellnow, Johansson et al. (2018) relied on tests based on analysis of variance when testing their two hypotheses. The first hypothesis focused the analysis on the direct effect of message variation on receivers' perceived message effectiveness. Their second hypothesis aligned with O'Keefe's (2003) classification of a Class II research claim by focusing the analysis on the direct effect of message variation on receivers' self-reported intentions. A Class III research claim could have been achieved by performing an indirect-effect analysis that would explain the observed effects of the message variation. The tools selected by D. Sellnow, Johansson et al. (2018) to test the relative effectiveness of the IDEA protocol made it impossible to account for and examine the message variation's indirect effects operating through the parallel mediators (i.e., affect, cognition) that are foundational to T. Sellnow and D. Sellnow's (2013) message-design framework. By excluding a conditional indirect effect analysis, D. Sellnow, Johansson et al. (2018) neglected the opportunity to *simultaneously test* the two key assumptions as predicted in theory by the IDEA model.

Application Summary

The experiments of Littlefield et al. (2014), D. Sellnow, Johansson et al. (2018), D. Sellnow, Lane, Littlefield et al. (2015) and D. Sellnow, Lane, T. Sellnow et al. (2017) represent the majority of existing published tests of the IDEA model. The review of these experiments revealed that the common practice has been for scholars to assess two, although not all three, learning outcomes that are foundational to the IDEA model prediction. D. Sellnow, Lane, T. Sellnow et al. (2017) were clear that when "messages are constructed [with features that appeal to what people feel and think, affective and cognitive learning outcomes] are the means to achieve desired behavioral learning outcomes" (p. 555). Although D. Sellnow, Lane, T. Sellnow et al. (2017) argue that, "in the context of a crisis situation, the most important outcome is behavioral" (p.555), it is critical that scholars do not overlook the behavioral outcome that is achieved indirectly.

The trend has been for scholars to demonstrate the IDEA message's comprehensiveness by ruling out statistically significant interactions between message variation and individual difference variables of interest. Littlefield et al. (2014), D. Sellnow, Johansson et al. (2018), D. Sellnow, Lane, Littlefield et al. (2015) and D. Sellnow, Lane, T. Sellnow et al. (2017) reported main effects for the message variation variable and the individual difference variables, before reporting the statistical significance of the interaction effects between the predictor variables. If the overall goal is to find no significant interacting effects involving the message variation, I recommend that the analysis should follow a deductive approach where the interaction effects are examined and reported for statistical significance, before examining and reporting the direct and indirect effects of the IDEA message (relative to a status quo variation) on receivers' behavioral intentions. If statistically significant interactions are found, then the

IDEA message (relative to a status quo variation) has failed to demonstrate the level of comprehensiveness predicted in theory by T. Sellnow and D. Sellnow's (2013) IDEA model.

Direct Effect Hypotheses

Conditional process analysis. As described in the first chapter, the present study introduces a rigorous approach and recommendations for improving how stimuli are designed, assessments are structured, and tools are selected to test theory. My conditional process model includes three predictor variables: Message variation, preexisting state of control, and learning preference. These variables must be examined for relationships that directly predict receivers' self-reported behavioral intentions (H1). Thus, to examine the direct three-way interaction effects of the three predictor variables on behavioral intentions, the following hypothesis (H1a) is proposed for the present study: An IDEA message (relative to a status quo variation) will have a significantly more positive direct impact on receivers' self-reported behavioral intentions, when the effect is moderated by receivers' preexisting state of control as a function of learning preference. This three-way interaction is statistically unpacked by examining the direct two-way interaction effect for the message variation and preexisting state of control on behavioral intentions. Thus, to isolate this two-way interaction effect, the following hypothesis (H1b) is proposed for the present study: An IDEA message (relative to a status quo variation) will have a significantly more positive direct impact on receivers' self-reported behavioral intentions, when the effect is moderated by receivers' preexisting state of control (W) as learning preference is held constant (Z).

This two-way interaction is statistically unpacked by examining the direct conditional effect of the IDEA message (relative to a status quo variation) on receivers' behavioral intentions. Thus, to isolate this direct conditional effect, the following hypothesis (H1c) is proposed for the present study: An IDEA message (relative to a status quo variation) will have a significantly more positive direct impact on receivers' self-reported behavioral intentions, when individual differences are held constant (i.e., receivers' preexisting state of control, learning preference).

Unconditional process analysis. Further, the unconditional direct effect of the message variation must be examined to determine the extent that the IDEA message (relative to a status quo variation) directly predicts behavioral intentions when individual difference variables are excluded from a statistical model. Thus, the following hypothesis (H2) is proposed for the present study: An IDEA message (relative to a status quo variation) will have a significantly more positive direct impact on receivers' self-reported behavioral intentions, regardless of receivers' individual differences.

Tailoring hypothesis. Finally, the direct-effect results of the unconditional process analysis must be compared to the direct-effect results of the conditional process analysis to confirm the comprehensiveness of an IDEA message (relative to a status quo variation) when individual differences are excluded from the statistical model. Thus, the following tailoring hypothesis (H5) is proposed for the present study regarding the message variation's direct effects on receivers' self-reported behavioral intentions (H5a). An unconditional process analysis was more appropriate for testing and demonstrating the comprehensiveness of an IDEA message (relative to a status quo variation) to directly predict receivers' self-reported behavioral intentions, compared to an unconditional process analysis.

Indirect Effect Hypotheses

Conditional process analysis. Because the IDEA model predicts an indirect effect for message variation on behavioral intentions, the message variation, preexisting state of control, and learning preference must be examined for relationships that indirectly predict receivers' self-reported behavioral intentions (H3). Thus, to examine the indirect three-way interaction effects of the three predictor variables on behavioral intentions, the following hypothesis (H3a) is proposed for the present study: An IDEA message (relative to a status quo variation) variation will have a significantly more positive indirect impact on receivers' self-reported behavioral intentions, when the effect is moderated by receivers' preexisting state of control as a function of learning preference. This three-way interaction is statistically unpacked by examining the indirect two-way interaction effect for the message variation and preexisting state of control on behavioral intentions. Thus, to isolate this two-way interaction effect, the following hypothesis (H3b) is proposed for the present study: An IDEA message (relative to a status quo variation) will have a significantly more positive indirect impact on receivers' self-reported behavioral intentions, when the effect is moderated by receivers' preexisting state of control (*W*) as learning preference is held constant (*Z*).

This two-way interaction is statistically unpacked by examining the indirect conditional effect of the IDEA message (relative to a status quo variation) on receivers' behavioral intentions. Thus, to isolate this indirect conditional effect, the following hypothesis (H3c) is proposed for the present study: An IDEA message (relative to a status quo variation) will have a significantly more positive indirect impact on receivers' self-reported behavioral intentions, when individual differences are held constant (i.e., receivers' preexisting state of control, learning preference).

Unconditional process analysis. Further, the unconditional indirect effect of the message variation must be examined to determine the extent that the IDEA message (relative to a status quo variation) indirectly predicts behavioral intentions when individual difference variables are excluded from a statistical model. Thus, the following hypothesis (H4) is proposed for the present study: An IDEA message (relative to a status quo variation) will have a significantly more positive indirect impact on receivers' self-reported behavioral intentions, regardless of receivers' individual differences.

Tailoring hypothesis. Finally, the indirect-effect results of the unconditional process analysis must be compared to the indirect-effect results of the conditional process analysis to confirm the comprehensiveness of an IDEA message (relative to a status quo variation) when individual differences are excluded from the statistical model. Thus, the following tailoring hypothesis (H5) is proposed for the present study regarding the message variation's indirect effects on receivers' self-reported behavioral intentions (H5b). An unconditional process analysis was more appropriate for testing and demonstrating the comprehensiveness of an IDEA message (relative to a status quo variation) to indirectly predict receivers' self-reported behavioral intentions, compared to an unconditional process analysis.

Conclusion

Chapter Two was organized into five main sections. The first section introduced the concepts of T. Sellnow and D. Sellnow's (2013) IDEA model. The second section briefly summarized the main concepts of D. Kolb's (1984) learning cycle model and explored how these concepts pertain to the IDEA model assumptions. The third section reviewed the main concepts of Witte's (1992a) EPPM and explored how the concepts may increase the explanatory and predictive power of T. Sellnow and D. Sellnow's (2013) IDEA model. The fourth section reviewed the stimuli developed by T. Sellnow and colleagues for scholars to use when testing the utility of the IDEA model. The fifth section examined four experiments that have been published as tests of the IDEA model. The sixth section summarized this review of literature and proposed the hypotheses for the present study. In Chapter Three, the methods for data collection and analysis will be presented in detail.

CHAPTER 3. METHODS

This chapter presents the methods necessary to conduct this study. The first section explains the research design. The second section describes the participants for this study. The third section outlines the study implementation, including message design interpretation. The fourth section describes the measures to be used in the data analysis. The fifth section provides the a-priori analysis, and the sixth section details the data analysis plan.

Research Design

This study incorporated a between-subjects post-test only experimental design where an accessible sample was drawn from the target United States population. The study consisted of an online component, where the Qualtrics software system randomly assigned participants to a treatment or control condition. Through the Qualtrics random generator, individuals were equally distributed between the two conditions. Following the completion of D. Sellnow's (2005) LSQ, and Witte et al.'s (1996) baseline RBD assessment, participants were exposed to one of two simulated video news broadcasts about a food-contamination warning. Following video exposure, participants were asked to complete post assessment measures. Participants in both conditions were treated the same, with the exception of the message element manipulation and participation recruitment strategies. Metadata were collected to reflect the participant's amount of time completing the study, treatment assessment measures, the site location, and to track whether participants were assigned to view either the IDEA or the status quo message variation.

Message Attribute Summary

Two news clip messages developed by T. Sellnow and colleagues served as the stimuli for the present study. The message variations were described and evaluated at great length in the previous chapter. For clarity and review, the variations are briefly summarized below.

Base text. One treatment and one control message were shown in each of four regional locations. An example of the treatment message script is provided in Appendix B, and an example of the control message script is provided in Appendix C. The source of the base text variation was a USDA-FSIS press release issued in 2011 to announce a Hannaford Foods' voluntary recall for ground beef products. Each message variation was modified to reflect the regional proximity of research participants. North Dakota, Mississippi, Virginia, and Kentucky were mentioned in the message for the appropriate region. Thus, the same base text was included in the treatment and control message, with slight differences in regional proximities of the studies sites. The base text included a generalized warning coming from public health officials urging the public to refrain from eating ground beef products from any locations, in order to prevent against contracting foodborne disease.

Treatment enhancement. To form the treatment condition, T. Sellnow and colleagues enhanced inserted internalization-specific features in accordance with the IDEA guidelines. Specifically, the treatment variation was enhanced through references to hamburger meat in prepared foods, names of cities, and an emotional story that highlighted a specific death. The scholars also enhanced the treatment condition with action-specific features to include directions to seek medical help, instructions to avoid over-the-counter drugs, and food-safety guidance for averting the threat (i.e., use a meat thermometer, wash hands frequently). The final treatment message was 198 seconds long. For this study, the treatment message is referred to as the IDEA message**.**

Control enhancement. Beyond the base text, the control message was enhanced as well. More specifically, the additions were made to include comments that no further product descriptions were available, a general reference to the state level impact of threat, a scientific explanation about the bacterium involved in the tainted product, and its antibiotic resistance in human infections. No explicit directions were provided regarding how to identify the product, what to do with the product if found, what do to if sick, or which food-safety steps could be performed to minimize the health threat. The final treatment message was 172 seconds long. For this study, the control message is referred to as the status quo message.

As noted in the previous chapter, food scientist experts from the FPDI provided a review of the proposed message scripts, to make sure that the message claims were scientifically sound. Additional advice was sought from broadcast news experts to make sure the message content and reporting format aligned with industry standards. Broadcast news industry professionals were hired to record the two message variations.

Participants

Participants were required to be at least 18 years of age. Of the participants (n= 641), 61% were female. The majority (89%) of the participants reported that they use television on a daily basis, and many (60%) reported that they have never experienced a foodborne illness. Participants for this study were drawn from locations in the Mid-South (58%), Deep-South (19%), Eastern U.S. (13%), and the upper Midwest (10%). Individuals ranged in ages: 18-21 years (65%), 22 to 25 years (6%), 26 to 29 years (4%), 30 to 33 years (5%), and 34 years and older (20%). Choosing from income-range categories, individuals self-reported an annual income level as low (42%), low-middle (13%), middle (27%), upper-middle (15%), or high income (3%). When asked if they were currently in school, participants reported their status as undergraduates (45%), second-year undergraduates (13%), third-year undergraduates (11%), fourth-year undergraduates (5%), or fifth-year undergraduates (1%). While 20% of the participants indicated that they were not students, 4% reported their status as ‘other,’ and one individual chose not to respond. When asked about their ethnicity, participants identified as being Caucasian (48%), African-American/Black (29%), Native American (13%), Latino/Hispanic (4%), Asian American (2%), or "other" (4%), and one individual chose not to respond.

The sample was further characterized by individual differences regarding risk behavior toward foodborne disease and learning preference modes. Witte et al.'s (1996) RBD assessment (described later in this chapter) was administered to participants prior to message exposure to determine danger-control predispositions toward foodborne illness. The RBD results indicated that the majority of individuals assigned to the treatment condition (a.k.a. IDEA) were in a state of danger control (n=190; 60%; RBD score >0), compared to those who were in fear control (n=128; 40%; RBD score ≤ 0). The RBD results indicated that the majority of individuals assigned to the control condition (a.k.a. status quo) were in a state of danger control (n=198; 61%; RBD score >0), compared to those who were in fear control (n=125; 39%; RBD score ≤ 0).

D. Sellnow's (2005) LSQ (described later in this chapter) was administered to participants prior to message exposure. The LSQ results were calculated with a new approach to identify each individual's dominant learning preference mode based on one of three possible categories. From the results, the treatment condition (a.k.a. IDEA) comprised individuals with preferred learning modes of feeling (a.k.a. internalization; n=135; 42%); doing (a.k.a. action; n=88; 28%) or watching-thinking (a.k.a. explanation-information; n=95; 30%). The control condition (a.k.a. status quo) comprised individuals with preferred learning modes of feeling (a.k.a. internalization; n=125; 39%); doing (a.k.a. action; n=77; 24%) or watching-thinking (a.k.a. explanation-information; n=121; 37%).

Of the participants randomly assigned to the treatment condition (a.k.a. IDEA), the majority of individuals with a learning preference mode of internalization had predispositions toward danger control (n=86; 27%; RBD score >0), compared to those in fear control (n=49; 15%; RBD score ≤ 0) regarding foodborne disease. Among those with a learning preference mode of action, a few more had predispositions toward danger control (n=47; 15%; RBD score >0), compared to those in fear control (n=41; 13%; RBD score ≤ 0). Among individuals with a learning preference mode of explanation, there were more individuals with predispositions toward danger control (n=57; 18%; RBD score >0), compared to individuals in fear control (n=38; 12%; RBD score ≤ 0).

Similar results were found for the participants randomly assigned to the control condition (a.k.a. status quo). The majority of individuals with a learning preference mode of internalization had a predisposition toward danger control (n=80; 2%; RBD score >0), compared to those in fear control (n=45; 14%; RBD score ≤ 0). Among those with a learning preference mode of action, there were more with predispositions toward danger control (n=47; 15%; RBD score >0), compared to those in fear control (n=30; 9%; RBD score ≤ 0). Among those with a learning preference mode of explanation, there were more individuals with predispositions toward danger control (n=71; 22%; RBD score >0), compared to those in fear control (n=50; 15%; RBD score ≤ 0). Taken together, these results provided important demographic data regarding the study participants, and at the same time demonstrated that the data cell sizes would be large enough (n>30) in the computation of three-way interactions between message type (X), preexisting state of control (W), and learning preference modes (Z) when testing hypotheses.

Study Implementation

Sampling Procedures

The study was conducted between September 28, 2012 and April 2, 2013. The target population of the study was adult individuals of the general population who rely on the U.S. food supply, and would be responsible for making decisions pertaining to a food-recall and related foodborne illness outbreak warning. The intention was to draw an accessible sample representative of the general population, from communities across four regional locations in the continental U.S. Thus, participants were randomly selected from four locations across the continental U.S., to increase diversity within the sample. Individuals were recruited from: A large Mid-southern university student pool enrolled in communication courses (n=372); a large community in the U.S. Deep South (n=122); church groups in the Eastern U.S (n=83); and a Native American community located in the upper Midwest (n=64). For each location, the site administrators made an effort to balance the sample of men and women. However, the four samples drawn for this study varied greatly in size.

The recruiting procedures for this study differed between the four research site locations. At the large Mid-southern university, individuals were recruited from a university students enrolled in communication courses. A snowball method including face-to-face and E-mail was used to recruit participants from the large community in the U.S. Deep South. To gather participants in the Eastern U.S., church pastors invited congregation members to take part in the study. In the upper Midwest, cultural agents were hired to contact local leaders to spread the word about the study and identify individuals who might be interested in participating.

The recruiting incentives that were implemented to encourage study participation were intentionally varied across locations. Individuals from the Mid-Southern University received course credit for participating, while participants from the U.S. Deep South received $25 gift card usable at a large chain retailer. Participants from the upper Midwest received a $25 cash stipend, while individuals recruited by church pastors in the Eastern U.S. converted their $25 cash participation stipends into church donations upon completing the study.

Site Administrators

Instructional communication consultants were hired to assist with the development of the assessment measures, recruit participants, and manage the data gathering administration at sites in their general area. As noted in Appendix O, this project was approved by the North Dakota State University (NDSU) Institutional Review Board (IRB). Before administering the study, all consultants completed their online training as a requirement of the NDSU IRB.

Participation Process

Interested individuals were asked to report to a pre-designated community location where they provided access to the equipment for the online study. Site administrators explained how to use a laptop and headphone equipment to watch a stimulus message and respond to the online treatment measures. The online process comprised the following order: 1) accepting consent to participate in the study, 2) completion of a questionnaire, 3) exposure to a video message, 4) completion of a post video assessment, and 5) debriefing.

Once logged into the computer, participants were provided the online consent to participate in the study. Individuals indicated consent to participate in the online study by clicking a *start* button. As participants accessed the study's Website at Qualtrics.com, the software system randomly assigned individuals to a treatment or control condition. Treatment group participants were assigned to watch a new story version (i.e. IDEA) that differed from the news story version (i.e. status quo) presented to participants in the comparison group. The message variation for each group consisted of a news clip, approximately three-minutes in length. After watching the video and completing the post assessment questionnaire, participants were debriefed and informed that the news clip was not real, before being excused from the study site.

Instrumentation

For this study, participants completed assessments prior to and following video exposure. Beyond the collection of demographic information (see Appendix H), responses to D. Sellnow's (2005) LSQ (see Appendix A), and baseline and post assessment of Witte et al.'s (1996) RBD (see Appendix F), the present study incorporated two of 12 behavioral intention items developed by T. Sellnow and colleagues (see Appendix D). The present study also incorporated eight items developed by Sellnow and colleagues to measure perceived importance in IDEA message elements (see Appendix G), and eight items adapted from Harris (2007) and Noar et al. (2010) to assess perceived message effectiveness (see Appendix E). All measurement items were extracted from an original survey instrument developed by T. Sellnow and colleagues for a larger study, funded by the Food Protection and Defense Institute (FPDI), formally known as the National Center for Food Protection and Defense (NCFPD), established by the U.S. Department of Homeland Security (DHS).

Measures

Predictor Variables

Message variation. As noted earlier, two news clip messages developed by T. Sellnow and colleagues served as the stimuli for this study: IDEA message, status quo message. The message groups were coded as: 0.5 (IDEA condition) and -0.5 (status quo condition). Coding in this manner allowed for the reporting of main effects rather than simple effects in the results.

That is, main effects parameterization for message variation was accomplished by strategically coding the categories to differ by a unit of one (-0.5 and 0.5). Had they been categorized as 0 and 1, simple effects would have been the only reporting option in the tests based on regression analysis.

Learning preferences. For the present study, participants completed D. Sellnow's (2005) LSQ (see Appendix A) and their response scores were calculated to assign individuals into one of three learning preference mode categories as aligned with the IDEA model elements of internalization, explanation-information, or action. To complete the LSQ, participants were asked to read each item and respond by selecting one of four descriptors that they perceive to be most like them. As noted earlier, D. Sellnow's (2005) 15-item LSQ was adapted from D. Kolb's (1985) learning style instrument. D. Sellnow's (2005) LSQ results provide four categorical response options that align with D. Kolb's (1984) learning preference dimensions: (a) feeling, (b) watching, (c) thinking, (d) doing. As an example, participants would read and complete the following statement: 'I tend to: (a) Trust my feeling and intuition, (b) observe and reflect, (c) analyze and evaluate, (d) actively experiment.' To identify an individual's learning preference dimension, the response options per category are counted. In turn, the counted scores are systematically combined to identify an individual's dominant learning style: a+b = stage one, diverging; b+c = stage two, assimilating; c+d = stage three, converging; d+a = stage four, accommodating. The highest systematically combined score would determine where an individual is at within D. Kolb's (1984) four-stage cycle of learning.

Typically, communication scholars administering D. Sellnow's (2005) LSQ have followed this traditional method when incorporating participants' learning style as an individual difference variable that can be factored into tests based on analysis of variance (e.g., Frisby et al., 2013; Littlefield et al., 2014; D. Sellnow, Lane, Littlefield et al., 2015). As a different approach, T. Sellnow, D. Sellnow, Lane et al. (2012a) calculated an individual's dominant learning preference mode as an indifference variable. In this case, the scholars counted the LSQ scores for each category (i.e., a, b, c, d), and identified the highest summed score as an indicator of the dominant learning mode: a= feeling; b=watching; c=thinking; d=feeling. They included the individual difference variable as a moderating factor in their tests based on analysis of variance. As another variation, T. Sellnow, D. Sellnow, and Venette (2012b) followed the traditional approach to first identify each individual's dominant learning style, and then systematically assigned the individual into one of two groups: Group One (accommodating and converging); Group Two (diverging and assimilating). The four original groups were collapsed into two groups in order to accommodate their correlational analyses.

For the present study, each participant's LSQ responses were counted to produce a summed score for each response category (a=feeling, b=watching, c=thinking, d=doing). In turn, the summed scores per individual were scanned for a single highest value. A single highest score immediately served to place the individual into one of three categories: Feeling, doing, or the shared category of watching-thinking. For example, a score for watching (e.g., 5) would dominate as the single highest score over values for thinking (e.g., 4), doing (e.g., 3) and feeling (e.g., 3). In this instance, the individual was assigned to the shared category of watching-thinking, as it aligns with the IDEA model element of explanation. When a single high score could not be isolated for a participant, the next step was to search for the highest tied scores. For example, when scores for watching (e.g., 5) and thinking (e.g., 5) were tied, these values still dominated over the scores for doing (e.g., 3) and feeling (e.g., 2). In this instance, the individual was assigned to the shared category of watching-thinking. Of course there was the possibility that ties between scores could not be resolved. For example, when scores for watching (e.g., 3) and thinking (e.g., 2) were lower than the tied scores for doing (e.g., 5) and feeling (e.g., 5), such a participant was removed from the study because a dominant mode could not be determined between the distinct categories of feeling or doing. As another example, when the score for watching (e.g., 5) tied with the score for doing (e.g., 5), and the scores for feeling (e.g., 3) and thinking (e.g., 2) were untied, such a participant was removed from the study because a dominant mode could not be determined to assign the individual into the category of feeling or the shared category of watching-thinking. This categorization method prevented the loss of cases (n=82) that would have been deleted with the original approach due to ties between categories.

Once all LSQ results were finalized, the categories were re-labeled to coincide with the IDEA model elements: Internalization (feeling); action (doing) and explanation (watching and thinking). Because learning preference was categorical in nature, two orthogonal contrasts were necessary to examine the direct and indirect effects involving this variable. Of the three groups comprising this variable, no two were formally merged for the sake of analysis. Rather, a Helmert coding system was implemented to yield two planned orthogonal contrasts. The first orthogonal contrast (L1) quantified the effect-mean difference in assessments between the category of explanation (coded as -0.667) and the categories of internalization (coded as 0.333) and action (coded as 0.333). Because the categories were coded to differ by a unit of one, main effects parameterization was accomplished for the first orthogonal contrast. The second orthogonal contrast (L2) excluded the explanation category (coded as 0) and quantified the effect-mean difference in assessments between the category of action (coded as 0.5) and the category of internalization (coded as -0.5). Because the categories were coded to differ by a unit of one, main effects parameterization was accomplished for the second orthogonal contrast. In theory, control stimuli (a.k.a. status quo) are predicted by the IDEA model to be constrained to explanation alone, while treatment stimuli (a.k.a. IDEA) are enhanced beyond explanation to also include internalization and action. Thus, the explanation learning mode was established as the control group within the Helmert coding system as orthogonal contrasts were planned. The advantage of using this coding system was the ability to include the individual difference variable as a moderator in my conditional process analyses when testing hypotheses.

Preexisting state of control. Witte et al.'s (1996) RBD was adapted for the present study and administered prior to and following message exposure. The RBD tool was originally administered to patients in health clinics to evaluate the effectiveness of warning messages specific to sexually transmitted diseases (STDs), human immunodeficiency virus (HIV), and the advanced stages of acquired immunodeficiency syndrome (AIDS) (Witte et al., 1996). The RBD assessment explains how and why recipients process and respond to warnings and self-protective recommendations.

For the present study, participants completed RBD assessments by responding to 12 statements, using a 7-point Likert-type scale ranging from 1 (strongly disagree) to 7 (strongly agree) to indicate perceptions (i.e., severity, susceptibility, response efficacy, self-efficacy) toward foodborne illness and food contamination (see Appendix F). Of the 12 items, three were used to measure participants' perceived *severity*. For example, the assessment items included: 'Foodborne illness is a serious threat.' A simple sum was used to combine these items into total raw score ranging from three to 21. The reliability of the underlying measure of perceived severity from the baseline assessment was acceptable for the present study ($\alpha = 0.85$, $M = 14.48$, $SD = 2.99$, $Variance = 8.95$). The reliability of the underlying measure of perceived severity from the post assessment was acceptable for the present study ($\alpha = 0.87$, $M = 15.36$, $SD = 2.66$, *Variance* = 7.09). Three items were used to measure participants' perceived *susceptibility*. For example, the assessment items included: 'It is possible that I will get foodborne illness.' Again, these three items were summed to form a total raw score. The reliability of the underlying measure of perceived susceptibility from the baseline assessment was acceptable for the present study (α = 0.78, *M* = 10.34, *SD* = 3.20, *Variance* = 10.23). The reliability of this underlying measure of perceived susceptibility from the post assessment was acceptable for the present study (α =0.87, *M* = 12.30, *SD* = 3.67, *Variance* = 13.49).

Three items were used to measure participants' perceived *response efficacy*. For example, one item stated: 'Not eating contaminated food works in preventing foodborne illness.' Again a raw score ranging from three to 21 was created. The reliability of this underlying measure of response efficacy from the baseline assessment was acceptable for the present study (α = 0.81, *M* = 12.85, *SD* = 3.40, *Variance* = 11.54). The reliability of this underlying measure of response efficacy from the post assessment was acceptable for the present study (α = 0.81, *M* = 13.70, *SD* = 3.25, *Variance* = 10.64). Three items were used to measure perceived *self-efficacy* of participants. One example of the assessment items was worded: 'I am able to stop eating contaminated food to prevent foodborne illness.' These items were also added to form a total raw score. The reliability of this underlying measure of perceived self-efficacy for the baseline assessment was acceptable for the present study (α = 0.85, *M* = 13.32, *SD* = 3.60, *Variance* = 12.99). The reliability of this underlying measure of perceived self-efficacy for the post assessment was acceptable for the present study (α = 0.82, *M* = 13.93, *SD* = 3.29, *Variance* = 10.85).

An index of *perceived threat* was constructed by calculating the means of the six items for perceived severity and perceived susceptibility. The reliability of this scale for baseline assessment of perceived threat was acceptable for the present study ($\alpha = 0.74$, *M* = 24.82, *SD* = 4.80, *Variance* = 23.08). The reliability of this underlying measure of post assessment of perceived threat was acceptable for the present study ($\alpha = 0.78$, *M* = 27.65, *SD* = 4.99, *Variance* = 24.92). An index of *perceived efficacy* was constructed by calculating the means of the six items for perceived response efficacy and perceived self-efficacy. The reliability of this scale for the baseline assessment of perceived efficacy was acceptable for the present study ($\alpha = 0.83$, *M* = 26.18, *SD* = 5.94, *Variance* = 35.26). The reliability of this scale for the post-assessment of perceived efficacy was acceptable for the present study ($\alpha = 0.83$, *M* = 27.63, *SD* = 5.65, *Variance* = 31.92).

Finally, the index of perceived threat was subtracted from the index of perceived efficacy to form the participants' critical point value that distinguished whether individuals were engaged in danger control or fear control processes prior to message exposure. A discriminating score that was greater than zero indicated that an individual was engaged in danger control regarding the threat of foodborne disease. Those with a critical score greater than zero were categorized as being in a preexisting state of danger control over foodborne disease (coded as 0.5). All others were categorized as not engaged in danger control processes (coded as -0.5). Coding in this manner allowed for the reporting of main effects rather than simple effects when incorporating this individual difference into my conditional process models. That is, main effects parameterization for preexisting state of control was accomplished by strategically coding the categories to differ by a unit of one (-0.5 and 0.5). Had they been categorized as 0 and 1, simple effect parameterization would have been the only reporting option in the tests based on regression analysis.

Mediators

Perceived danger control. The assessment of perceived danger control (M_1) represents the first of six parallel mediators included in the present study's conditional and unconditional models. As described for the baseline assessment, the RBD responses for post assessment items (see Appendix F) were calculated using the traditional approach (additive manner). Rather than creating grouping individuals into one of two categories, the RBD results for the post assessment were retained in their original metric and considered a mediating mechanism. It was presumed that higher scores were in the direction of a more optimal response.

As noted earlier, the reliability of the underlying measure of perceived severity from the post assessment was acceptable for the present study ($\alpha = 0.87$, $M = 15.36$, $SD = 2.66$, *Variance* = 7.09). The reliability of this underlying measure of perceived susceptibility from the post assessment was acceptable for the present study ($\alpha = 0.87$, $M = 12.30$, $SD = 3.67$, *Variance* = 13.49). The reliability of this underlying measure of response efficacy from the post assessment was acceptable for the present study ($\alpha = 0.81$, $M = 13.70$, $SD = 3.25$, *Variance* = 10.64). The reliability of this underlying measure of perceived self-efficacy for the post assessment was acceptable for the present study ($\alpha = 0.82$, $M = 13.93$, $SD = 3.29$, *Variance* = 10.85).

An index of *perceived threat* was constructed by calculating the means of the six items for perceived severity and perceived susceptibility. The reliability of this underlying measure of post assessment of perceived threat was acceptable for the present study ($\alpha = 0.78$, $M = 27.65$, $SD = 4.99$, *Variance* = 24.92). An index of *perceived efficacy* was constructed by calculating the means of the six items for perceived response efficacy and perceived self-efficacy. The reliability of this scale for the post-assessment of perceived efficacy was acceptable for the present study ($\alpha = 0.83$, $M = 27.63$, $SD = 5.65$, *Variance* = 31.92).

Perceived importance in message elements. Eight items developed by T. Sellnow and colleagues were included in the present study to asses receivers' perceived importance in message elements (see Appendix G). The measure of perceived importance is included in my conditional and unconditional models as four parallel mediators (M_2 through M_5). Participants responded to each of the eight items, using a 5-point Likert-type scale ranging from 1 (not at all important) to 5 (extremely important). As examples, the assessment items included: 'How important is it for you to learn that *Escherichia coli* had been discovered in ground beef?' or 'How important is it for you to know the symptoms of *E. coli* poisoning?'

The eight perceived importance items were subjected to PCA to see if they formed a reliable scale. The KMO value (0.88) exceeded Kaiser's (1970, 1974) recommended value of 0.60. From the correlation matrix, seven of the eight items had correlations of 0.3 or higher. The PCA revealed the presence of two components. The first component had an eigenvalue of 4.39 that explained 54.87% of the total variance. The second component had an eigenvalue of 1.015 that explained 1.01% of the total variance. An inspection of the scree plot confirmed a clear break after the second component. The factor loadings for a single component of the eight items ranged from 0.14 to 0.86. The single item ('important to hear a description of what *E. coli* poisoning is') with the low factor loading (0.14) was removed from the analysis.

The remaining seven items were subjected to a subsequent PCA. The results revealed that the items had correlations of 0.30 or higher (see Table 3.1), and the KMO value (0.88) exceeded Kaiser's (1970, 1974) recommended value of 0.60 (see Table 3.2). As can be found in Table 3.3, the PCA revealed the presence of one component with an eigenvalue of 4.38 that explained 62.50% of the total variance. An inspection of the scree plot in Figure 3.1 confirmed a clear break after the second component. As can be seen in Table 3.4, the factor loadings of the single component ranged from 0.66 to 0.86. While five items had high factor loadings (> 0.80), two items appeared to be hanging together (< 0.70): 'Important to hear from the epidemiologist' and 'important to hear about people who died.' Given the PCA results, testing the reliability of a composite scale was justified. Indeed, an index including all seven items revealed a reliable scale for perceived importance in message elements (α= 0.89, M = 23.72, SD = 3.97, *Variance* = 15.77). For this seven-item scale, higher scores were anticipated to reflect a more optimal response.

Table 3.1

Principal Components Analysis Correlation Matrix for Perceived Importance in Message Elements

		1.	2.	3.	4.	5.	6.	7.
Correlation	1. Expert explanation (Epidemiologist)	1.000						
	2. Hear about people who died	.442	1.000					
	3. Description of foodborne illness symptoms	.370	.410	1.000				
	4. Identification of Area(s) impacted	.566	.475	.628	1.000			
	5. Identification of Product(s)	.577	.482	.591	.789	1.000		
	6. General statistics of health impact	.451	.537	.718	.634	.617	1.000	
	7. What to "Do" if Sick	.351	.404	.778	.594	.548	.714	1.000

Table 3.2

KMO and Bartlett's Test for Perceived Importance in Message Elements

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.878
Bartlett's Test of Sphericity	Approx. Chi-Square	2784.082
	df	21
	Sig.	.000

Table 3.3

Total Variance Explained for Perceived Importance in Message Elements

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.375	62.499	62.499	4.375	62.499	62.499
2	.876	12.518	75.017			
3	.624	8.918	83.936			
4	.425	6.064	90.000			
5	.273	3.901	93.901			
6	.220	3.146	97.047			
7	.207	2.953	100.000			

Extraction Method: Principal Component Analysis.

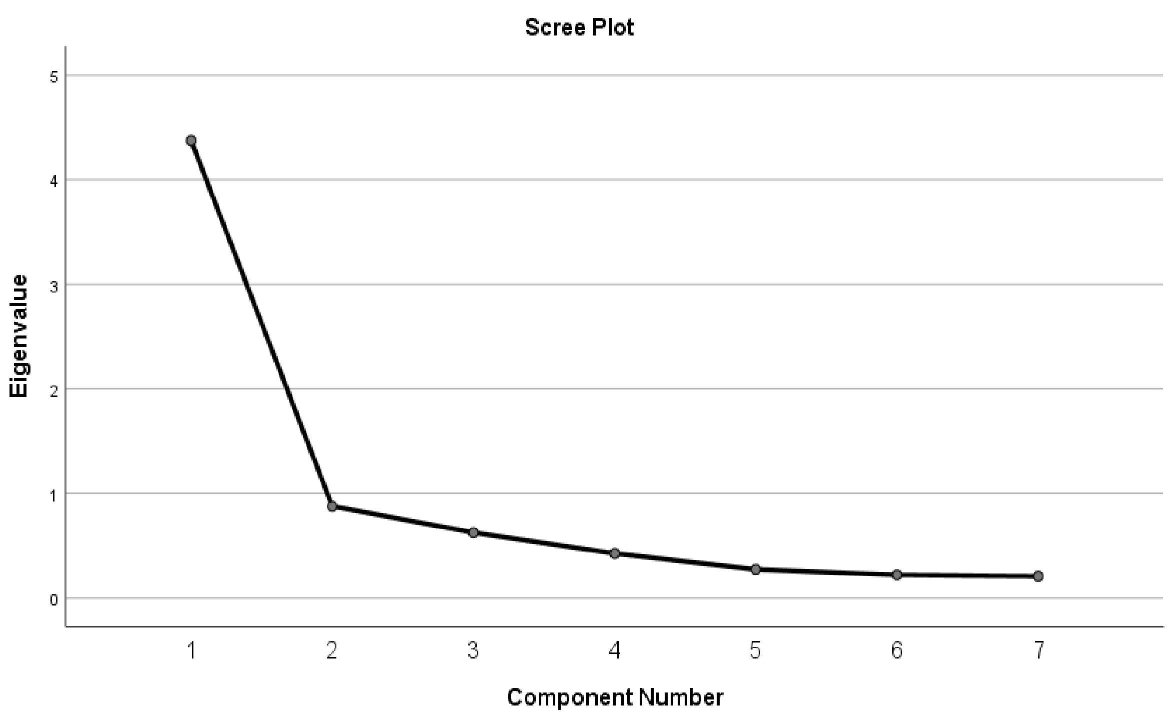

Figure 3.1. Scree plot for perceived importance in message elements.

Table 3.4

Component Matrix for Perceived Importance in Message Elements

	Component 1
Expert explanation (Epidemiologist)	.662
Hear about people who died	.660
Description of foodborne illness symptoms	.827
Identification of Area(s) impacted	.856
Identification of Product(s)	.840
General statistics of health impact	.854
What to "Do" if Sick	.806

Extraction Method: Principal Component Analysis.
1 component extracted.

An objective of the present study was to align the perceived importance items with the IDEA model elements: Internalization, explanation-information, and action. As noted in the literature review (see Chapter Two), T. Sellnow and D. Sellnow's (2013) IDEA learning cycle model components are grounded in D. Kolb's (1984) perspective on experiential learning. Based on D. Sellnow-Richmond et al.'s (2018) coding criteria for the IDEA model, five of the eight perceived importance items align with the IDEA model's element of internalization, and the remaining three items individually align with the model's elements of explanation, information, and action. Although the IDEA model collapses explanation and information into a single model component, the PCA results reflected two distinct factors: Perceived importance in hearing 'from the epidemiologist' (i.e., explanation) and perceived importance in hearing 'a description of what *E. coli* poisoning is' (i.e., information). In order to isolate which elements receivers' perceived to be important for a message to disclose, the PCA results justified regrouping the eight items to correspond with the IDEA model components. These four mediating measures of perceived importance in message elements are described in detail below.

Perceived importance in internalization message elements (M_2) is the second of six parallel mediators included in the present study's conditional and unconditional models. According to T. Sellnow and D. Sellnow's (2013) IDEA model, the element of internalization focuses on proximity, timeliness, and personal impact. The IDEA and status quo message variations equally disclosed the area impacted (i.e., proximity), the suspected association between the foodborne illness outbreak and consumption of ground beef purchased from stores within the area (i.e., proximity), a description of the foodborne illness symptoms and expected onset (i.e., timeliness and personal impact), the severity of illnesses that have occurred, the number of people who have become ill or died (i.e., personal impact). Unique to the IDEA message variation was the breaking news feature story that provided personalized detail about a woman who had become ill and died. The perceived importance items developed by T. Sellnow and colleagues were specific to measuring receivers' perceptions regarding proximity, timeliness, and personal impact. Using a 5-point scale ranging from 1 (not at all important) to 5 (extremely important), participants indicated a level of perceived importance in message features: '*E. coli* had been discovered in ground beef;' '*E. coli* had been discovered in your state;' 'symptoms of *E. coli* poisoning,' 'what can happen to people who get *E. coli* poisoning,' 'about people who died from the *E. coli* poisoning.'

These five assessment items were subjected to PCA. The results revealed that the items had correlations of 0.30 or higher (see Table 3.5). The KMO value (0.82) exceeded Kaiser's (1970, 1974) recommended value of 0.60 (see Table 3.6). As can be found in Table 3.7, the PCA revealed the presence of one component with an eigenvalue of 3.37 that explained 67.44% of the total variance. An inspection of the scree plot in Figure 3.2 confirmed a clear break after the second component. As can be seen in Table 3.8, the factor loadings of the single component ranged from 0.69 to 0.87. Given the PCA results, testing the reliability of a composite scale for perceived importance in internalization message elements was justified. The means of these five items were used to form a scale reflective of perceived importance in internalization message elements. Indeed, an index including all five items revealed a reliable scale that was acceptable for the present study, (α= 0.87, *M* = 17.07, *SD* = 2.93, *Variance* = 8.60).

Table 3.5

Principal Components Analysis Correlation Matrix for Perceived Importance in Internalization Message Elements

		1	2	3	4	5
Correlation	1. Hear about people who died	1.000				
	2. Description of foodborne illness symptoms	.410	1.000			
	3. Identification of area(s) impacted	.475	.628	1.000		
	4. Identification of Product(s)	.482	.591	.789	1.000	
	5. General statistics of health impact	.537	.718	.634	.617	1.000

Table 3.6

KMO and Bartlett's Test for Perceived Importance in Internalization Message Elements

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.818
Bartlett's Test of Sphericity	Approx. Chi-Square	1779.507
	df	10
	Sig.	.000

Table 3.7

Total Variance Explained for Perceived Importance in Internalization Message Elements.

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.372	67.437	67.437	3.372	67.437	67.437
2	.636	12.726	80.163			
3	.519	10.386	90.549			
4	.264	5.282	95.831			
5	.208	4.169	100.000			

Extraction Method: Principal Component Analysis.

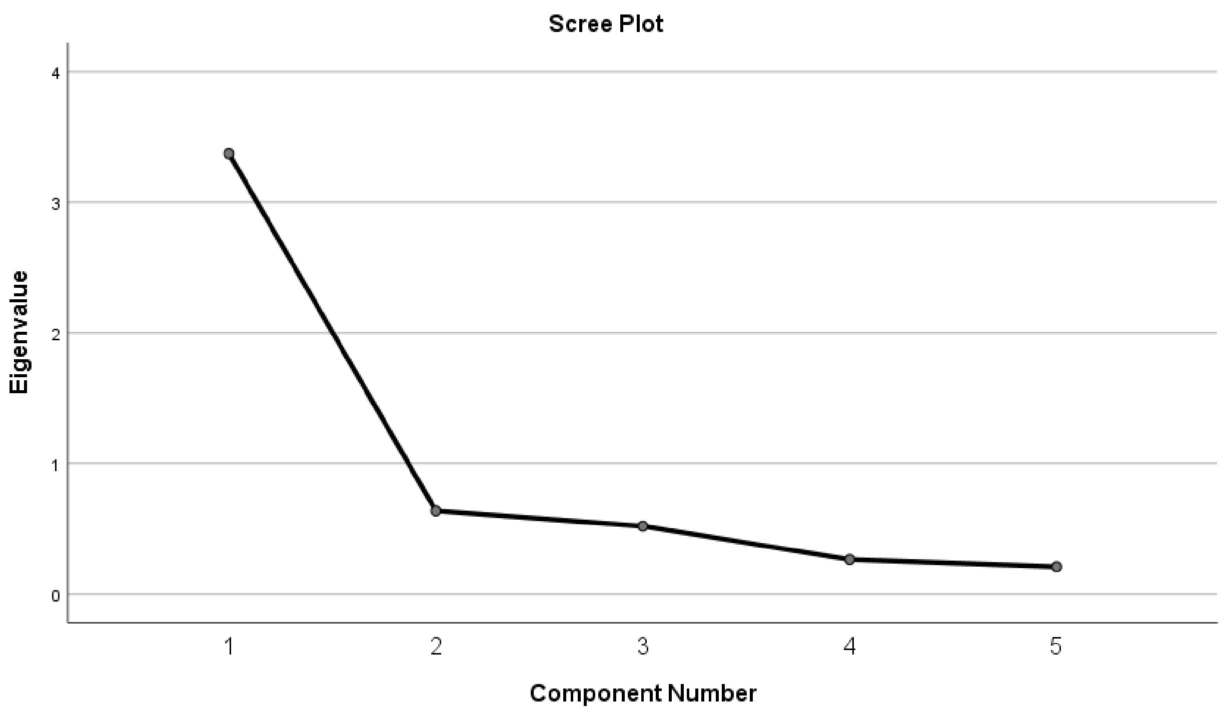

Figure 3.2. Scree plot for perceived importance in internalization message elements.

Table 3.8

Component Matrix for Perceived Importance in Internalization Message Elements.

	Component 1
Hear about people who died	.685
Description of foodborne illness symptoms	.822
Identification of Area(s) impacted	.869
Identification of Product(s)	.857
General statistics of health impact	.859

Extraction Method: Principal Component Analysis.
1 component extracted.

Perceived importance in explanation message elements (M_3) is the third of six parallel mediators included in my conditional and unconditional models. Using a 5-point scale ranging from 1 (not at all important) to 5 (extremely important), participants indicated their perceived importance in 'hearing from the epidemiologist.' Perceived importance in information message elements (M_4) is the fourth of six parallel mediators included in my conditional and unconditional models. Using a Likert-type scale ranging from 0 (not at all important) to 4 (extremely important), participants indicated their perceived importance in hearing a description of 'what *E. coli* poisoning is.' Perceived importance in action elements (M_3) is the fifth of six parallel mediators included in my conditional and unconditional models. Using a 5-point Likert-type scale ranging from 1 (not at all important) to 5 (extremely important), participants indicated a perceived importance in learning 'what to do if you get *E. coli* poisoning.'

Perceived message effectiveness. Nine items were adapted from Harris' (2007) and Noar et al. (2010) to assess receivers' perceived effectiveness in the message viewed. Perceived message effectiveness (M_6) is the sixth of six parallel mediators included in my conditional and unconditional models. Perceived effectiveness is often evaluated in formative research, in advance of campaign implementation and plays a strategic role in message design (Dillard & Ye, 2008, p. 149). D. Sellnow, Lane, Littlefield et al. (2015) computed a unidimensional, 7-item scale with acceptable reliability (α= 0.88 *M* = 26.50, *SD* = 4.96).

For the present study, participants responded to nine statements using a 7-point, Likert-type scale, ranging from 1 (strongly disagree) to 7 (strongly agree) to indicate perceived message effectiveness (see Appendix E). As examples, the assessment items included: 'This video would help convince me to not eat potentially contaminated food,' 'this video is believable,' and 'this video is effective.' I subjected all nine items to PCA to validate a reliable scale for the present study. The KMO value (0.90) exceeded Kaiser's (1970, 1974) recommended value of 0.60. From the correlation matrix, all nine items had correlations of 0.3 or higher. The PCA revealed the presence of one component with an eigenvalue of 5.19 that explained 57.71% of the total variance. An inspection of the scree plot confirmed a clear break after the second component. The factor loadings of the single component ranged from 0.61 to 0.84. The item ('this video is truthful') with the low factor loading (0.61) was removed from the analysis.

The remaining eight items were subjected to a subsequent PCA. The results revealed that the items had correlations of 0.30 or higher (see Table 3.9), and the KMO value (0.90) exceeded Kaiser's (1970, 1974) recommended value of 0.60 (see Table 3.10). As can be found in Table 3.11, the PCA revealed the presence of one component with an eigenvalue of 4.87 that explained 60.92% of the total variance. An inspection of the scree plot in Figure 3.3 confirmed a clear break after the second component. As can be seen in Table 3.12, the factor loadings of the single component ranged from 0.68 to 0.85. An index of PME was constructed by calculating the means of the eight items. The reliability of this unidimensional, 8-item scale was acceptable for the present study (α= 0.91, *M* = 31.50, *SD* = 5.76, *Variance* = 33.18).

Table 3.9

Principal Components Analysis Correlation Matrix for Perceived Message Effectiveness

		1.	2.	3.	4.	5.	6.	7.	8.
Correlation	1.This video would catch my attention.	1.000							
	2. This video is believable.	.534	1.000						
	3. This video would make me more likely to not eat potentially contaminated food.	.539	.442	1.000					
	4. This video is memorable.	.598	.498	.533	1.000				
	5. This video is effective.	.637	.586	.567	.682	1.000			
	6. This video would make people my age more likely to not eat potentially contaminated food.	.465	.366	.459	.536	.556	1.000		
	7. This video would help convince people my age to not eat potentially contaminated food.	.474	.399	.498	.529	.576	.791	1.000	
	9. This video would help convince me to not eat potentially contaminated food.	.613	.503	.675	.603	.646	.538	.587	1.000

Table 3.10

KMO and Bartlett's Test for Perceived Message Effectiveness

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.899
Bartlett's Test of Sphericity	Approx. Chi-Square	3025.622
	df	28
	Sig.	.000

Table 3.11

Total Variance Explained for Perceived Message Effectiveness

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.874	60.921	60.921	4.874	60.921	60.921
2	.856	10.701	71.621			
3	.589	7.362	78.984			
4	.476	5.951	84.935			
5	.399	4.986	89.921			
6	.308	3.849	93.770			
7	.295	3.688	97.458			
8	.203	2.542	100.000			

Extraction Method: Principal Component Analysis.

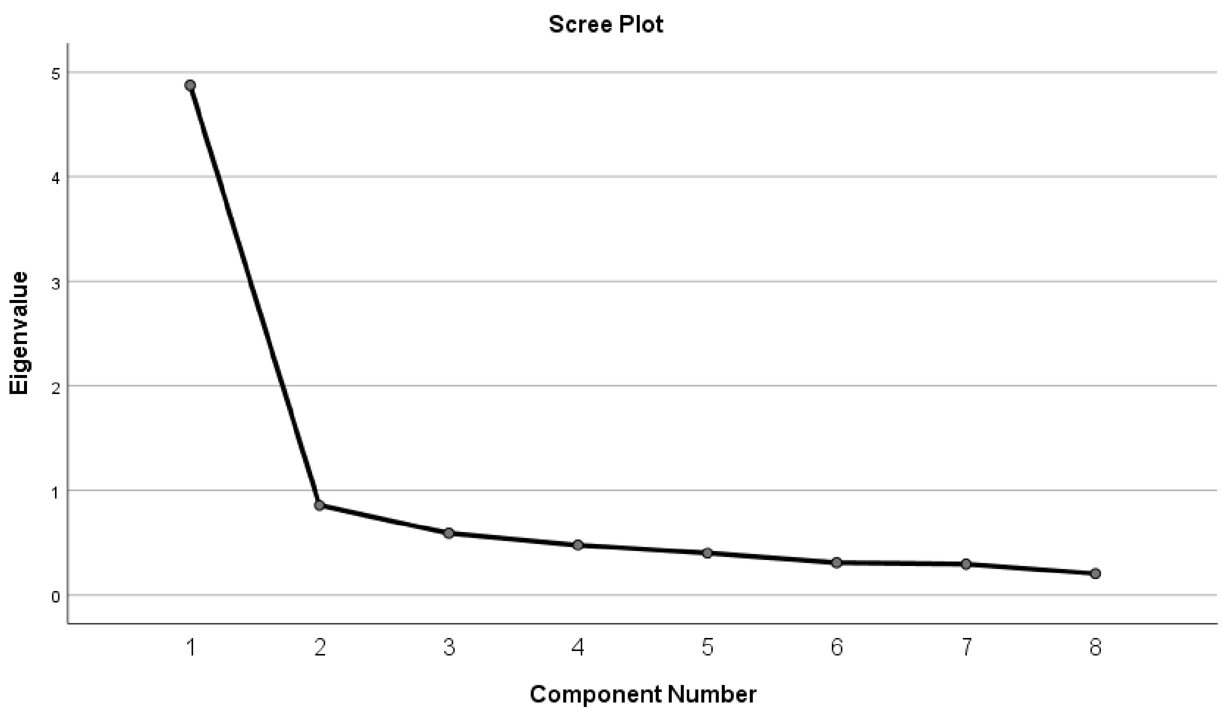

Figure 3.3. Scree plot for perceived message effectiveness.

Table 3.12

Component Matrix for Perceived Message Effectiveness

	Component 1
1. This video would catch my attention.	.780
2. This video is believable.	.684
3. This video would make me more likely to not eat potentially contaminated food.	.755
4. This video is memorable.	.802
5. This video is effective.	.846
6. This video would make people my age more likely to not eat potentially contaminated food.	.755
7. This video would help convince people my age to not eat potentially contaminated food.	.779
8. This video would help convince me to not eat potentially contaminated food.	.832

Extraction Method: Principal Component Analysis.
1 component extracted.

Dependent Variables

Behavioral intentions. T. Sellnow and colleagues developed 12 behavioral intention items for a select group of scholars to use when experimentally testing the IDEA model (see Appendix D). T. Sellnow and colleagues developed the behavioral intention items to assess how receivers will respond to warnings about food contamination. Participants were asked to respond to each item using a 5-point Likert type scale ranging from 1 (very unlikely) to 5 (very likely), as an example, 'How likely would you be to ask for no ground beef when dining out?' As noted in my review of literature, a selection of T. Sellnow and colleagues' behavioral intention items were reported in the publications of Littlefield et al. (2014), D. Sellnow, Johansson et al. (2018), D. Sellnow, Lane, Littlefield et al. (2015), and D. Sellnow, Lane, T. Sellnow et al. (2017). One single-item indicator stood out across all four experiments: 'How likely would you be to return ground beef to the store where you purchased it?'

This single-item indicator was retained in my conditional and unconditional models to compare my result with the results that have been published for this item. Further, I incorporated three additional items from T. Sellnow and colleagues 'questionnaire; 1) 'Based on the video you just saw, when eating out, how likely are you to ask for no ground beef when ordering food that usually contains ground beef?' 2) 'Based on the video you just saw, when eating out, how likely are you be to pick off ground beef that comes on your plate?' and 3) 'Based on the video you just saw, when dining out, how likely are you to send back food that comes with ground beef?' These items were selected because they reflected the generally stated warning recommendation embedded in the IDEA and status quo message variations viewed by study participants. I subjected the items to PCA to see if they formed a valid and reliable scale. The results indicated that items had correlations of 0.30 or higher (see Table 3.13), and the KMO value (0.71) exceeded Kaiser's (1970, 1974) recommended value of 0.60 (see Table 3.14). As can be found in Table 3.15, the PCA revealed the presence of one component with an eigenvalue of 2.14 that explained 71.43% of the total variance. An inspection of the scree plot in Figure 3.4 confirmed a clear break after the second component. As can be seen in Table 3.16, the factor loadings of the single component ranged from 0.83 to 0.87. Given the PCA results, testing the reliability of a composite scale was justified. Indeed, an index including all three items revealed a reliable and unidimensional 3-item scale as a measure of receivers' intentions to avoid eating ground beef when dining out (α= 0.80, M = 10.81, SD = 3.39, *Variance* = 11.46).

Table 3.13

Principal Components Analysis Correlation Matrix for Intentions to Avoid Eating Ground Beef When Dining Out

			1	2	3
Correlation	1.	Request no ground beef	1.000		
	2.	Pick off ground beef	.525	1.000	
	3.	Send back food	.600	.589	1.000

Table 3.14

KMO and Bartlett's Test for Intentions to Avoid Eating Ground Beef When Dining Out

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.705
Bartlett's Test of Sphericity	Approx. Chi-Square	602.687
	df	3
	Sig.	.000

Table 3.15

Total Variance Explained for Intentions to Avoid Eating Ground Beef When Dining Out

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.143	71.429	71.429	2.143	71.429	71.429
2	.475	15.840	87.269			
3	.382	12.731	100.000			

Extraction Method: Principal Component Analysis.

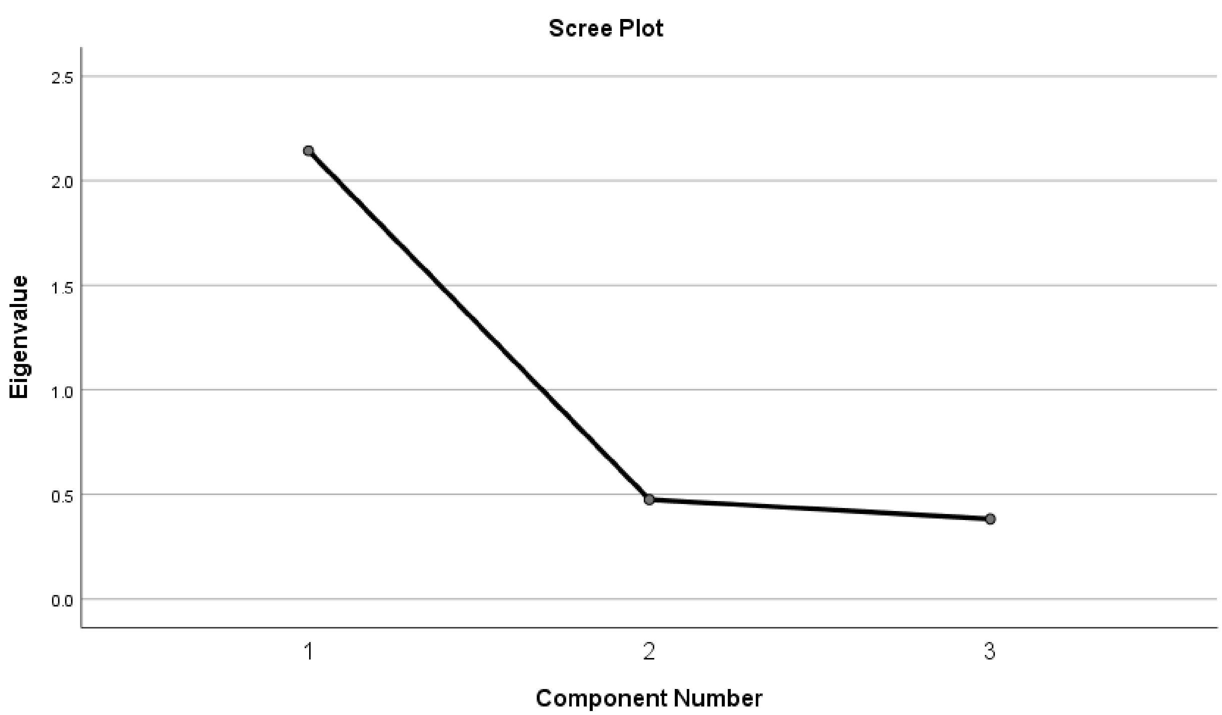

Figure 3.4. Scree plot for intentions to avoid eating ground beef when dining out.

Table 3.16

Component Matrix for Intentions to Avoid Eating Ground Beef When Dining Out

	Component 1
Request no ground beef	.837
Pick off ground beef	.831
Send back food	.867

Extraction Method: Principal Component Analysis.
1 component extracted.

A-Priori Analyses

A minimum of 10 responses for each measure of interest is recommended (DeVellis, 2003; Frey, Botan Friedman, & Kreps, 1991; Worthington & Whitaker, 2006). The a-priori analysis was conducted using G*Power 3.1.9.2 to determine the minimum sample size needed to carry out this study and test the hypotheses. The a-priori analyses revealed that a minimum of 481 participant data samples would be would be needed to conduct multiple regression analyses, assuming an effect size f^2 =0.05, power (1-β) =0.95, α = .05, and up to nine predictor variables. A minimum of 30 participants per cell would also be required (Cohen, 1988). My sample size (n=641) was sufficient to perform my analyses, and maintain cell size integrity when examining three-way interactions between three predictor variables.

Planned Analyses

I selected Hayes' (2018b) PROCESS macro program (Release 3.0) for IBM SPSS Statistics (version 26) as the tool for my analyses. Hayes' (2018b) ordinary least squares (OLS) regression tool accommodated the inclusion of continuous mediating variables as well as categorical and dichotomous moderating variables into one integrated model. Anticipating future publications, I set the bootstrapping criteria to 10,000 samples. Hayes' (2018b) macro program does not have the option to enter two dependent variables into a given mediation model. However the implementation of a random number generator with a common seed for bootstrapping easily overcame this limitation. A common and arbitrarily selected seed number was used each time the PROCESS macro was run, so that bootstrap confidence intervals were derived from the same set of data resamples. For my study, I consistently used a random number generator with a seed value set to 10,235 when assessing the two dependent variables. I selected this arbitrary number because it exceeded my boot sampling criteria that was set to 10,000. The direct and indirect effects of the predictor variables on each separate dependent variable remained the same, as if the two dependent variables had been entered simultaneously into the model (as would have been done with structural equation modeling process).

My complex model included three predictor variables, their interactions, six parallel mediators, and two outcome measures. As such, Hayes' (2018b) PROCESS macro was quite appealing since a single run can produce tremendous detail needed to analyze data, which in turn reduces the potential for Type I and Type II errors. Using 95% percentile confidence intervals drawn from 10,000 bootstrap samples, the intervals were examined for the inclusion or exclusion of zero to identify statistically significant direct and indirect effects of message variation, learning preferences, and preexisting state of control on receiver perceptions (i.e., M_1 through M_6) and receiver outcomes (i.e., Y_3 and Y_4).

A codebook for all variables in statistical models used in this study can be found in Appendix I. Additionally, Appendix J provides all output generated by the PROCESS macro for the conditional and unconditional direct effects of message variation on each of the parallel mediators. Appendix K provides all output generated by the PROCESS macro for the direct and indirect paths leading from message variation to the intention to return ground beef to the store where it was purchased (Y_3). Further, Appendix L provides all output generated by the

PROCESS macro for the direct and indirect paths leading from message variation to the intention to avoid eating ground beef when dining out (Y_4). Appendix M provides my custom syntax that worked in conjunction with the PROCESS macro to generate all model outputs, and Appendix N provides my custom syntax that generated the visual representations of statistically significant conditional direct and indirect effects for the IDEA message (relative to a status quo variation) on the two behavioral intention measures.

Model of Return Ground Beef to the Store

Conditional process analysis. The conditional model for return ground beef to the store where it was purchased (Y_3) included six parallel mediators through which message variation exerted indirect influence. A number of paths involved three-way and two-way interactions between message variation (X), preexisting state of control (W), and learning preference modes (Z). These interactions occurred on the message variation's direct path leading to each mediator and the message variation's indirect paths leading to the behavioral intention. Three-way interactions were examined between message variation, preexisting state of control, and learning preference when testing the hypotheses for the direct interaction effects (H1a) and indirect interaction effects (H3a). Two-way interactions were examined between message variation and preexisting state of control when testing the hypotheses for the direct interaction effects (H1b) and indirect interaction effects (H3b). The conditional effect of the IDEA message variation was compared to that of a status quo variation when testing the hypotheses for the conditional direct effect (H1c) and conditional indirect effects (H3c) of the message variation on receivers' self-reported behavioral intention to return ground beef to the store (Y_3).

Unconditional process analysis. The unconditional model included six parallel mediators through which message variation exerted indirect influence on the behavioral intention to return ground beef to the store where it was purchased (Y_3). Individual difference variables and their interactions were excluded from this statistical model. The unconditional effect of the IDEA message variation was compared to that of a status quo variation when testing the hypotheses for unconditional direct effect (H2) and unconditional indirect effects (H4) of the message variation on receivers' self-reported behavioral intention to return ground beef to the store (Y_3).

Tailoring hypothesis. Finally, the direct (H2) and indirect-effect (H4) results of the unconditional process analysis were compared to the direct-effect results (H1a, H1b, H1c) and indirect-effect results (H3a, H3b, H3c) of the conditional process analysis to confirm the comprehensiveness of an IDEA message (relative to a status quo variation) to directly and indirectly predict appropriate behavioral intentions when individual difference measures are excluded from the statistical model. This examination of communication effects was necessary to test a claim that an unconditional process analysis was more appropriate for testing and demonstrating the comprehensiveness of an IDEA message (relative to a status quo variation) (H5) to directly (H5a) or indirectly (H5b) predict receivers' self-reported behavioral intention to return ground beef to the store (Y_3), compared to an unconditional process analysis.

The data provided no support for the tailoring hypothesis (H5a) predicted by T. Sellnow and D. Sellnow's (2013) IDEA model if the data revealed statistically significant direct interaction effects involving the message variation (H1a, H1b) as well as a statistically significant unconditional direct effect of the message variation (H2) on the receivers' self-reported behavioral intention to return ground beef to the store (Y_3). The data provided support for the tailoring hypothesis (H5a) predicted by the IDEA model if the data revealed a statistically significant unconditional direct effect of the message variation (H2) on the receivers' self-reported behavioral intention to return ground beef to the store (Y_3), *and* provided no evidence of statistically significant direct interaction effects involving the message variation (H1a, H1b) on the behavioral intention.

The data provided no support for the tailoring hypothesis (H5b) predicted by T. Sellnow and D. Sellnow's (2013) IDEA model if the data revealed statistically significant indirect interaction effects involving the message variation (H3a, H3b) as well as a statistically significant unconditional indirect effect of the message variation (H4) on the receivers' self-reported behavioral intention to return ground beef to the store (Y_3). The data provided support for the tailoring hypothesis (H5b) predicted by the IDEA model if the data revealed a statistically significant unconditional indirect effect for the message variation (H4) on the receivers' self-reported behavioral intention to return ground beef to the store (Y_3), *and* provided no evidence of statistically significant indirect interaction effects involving the message variation (H3a, H3b) on the behavioral intention.

Model of Avoid Eating Ground Beef When Dining Out

The conditional model for avoid ground beef when dining out (Y_4) included six parallel mediators through which message variation exerted indirect influence. A number of paths involved three-way and two-way interactions between message variation (X), preexisting state of control (W), and learning preference modes (Z). These interactions occurred on the message variation's direct path leading to each mediator and the message variation's indirect paths leading to the behavioral intention. Three-way interactions were examined between message variation, preexisting state of control, and learning preference when testing the hypotheses for the direct interaction effects (H1a) and indirect interaction effects (H3a). Two-way interactions were examined between message variation and preexisting state of control when testing the hypotheses for the direct interaction effects (H1b) and indirect interaction effects (H3b). The conditional effects of the IDEA message variation was compared to that of a status quo variation when testing the hypotheses for the conditional direct effect (H1c) and the conditional indirect effects (H3c) of the message variation on receivers' self-reported behavioral intention to avoid eating ground beef when dining out (Y_4).

Unconditional process analysis. The unconditional model included six parallel mediators through which message variation exerted indirect influence on the behavioral intention to avoid eating ground beef when dining out (Y_4). Individual difference variables and their interactions were excluded from this statistical model. The unconditional effect of the IDEA message variation was compared to that of a status quo variation when testing the hypotheses for unconditional direct effect (H2) and unconditional indirect effects (H4) of the message variation on receivers' self-reported behavioral intention to avoid eating ground beef when dining out (Y_4).

Tailoring hypothesis. Finally, the direct (H2) and indirect-effect (H4) results of the unconditional process analysis were compared to the direct-effect results (H1a, H1b, H1c) and indirect-effect results (H3a, H3b, H3c) of the conditional process analysis to confirm the comprehensiveness of an IDEA message (relative to a status quo variation) to directly and indirectly predict appropriate behavioral intentions when individual differences are excluded from the statistical model. This examination of communication effects was necessary to test a claim that an unconditional process analysis was more appropriate for testing and demonstrating the comprehensiveness of an IDEA message (relative to a status quo variation) (H5) to directly (H5a) or indirectly (H5b) predict receivers' self-reported behavioral intention to avoid eating ground beef when dining out (Y_4), compared to an unconditional process analysis.

The data provided no support for the tailoring hypothesis (H5a) predicted by T. Sellnow and D. Sellnow's (2013) IDEA model if the data revealed statistically significant direct interaction effects involving the message variation (H1a, H1b) as well as a statistically significant unconditional direct effect of the message variation (H2) on the receivers' self-reported behavioral intention to avoid eating ground beef when dining out (Y_4). The data provided support for the tailoring hypothesis (H5a) predicted by the IDEA model if the data revealed a statistically significant unconditional direct effect of the message variation (H2) on the receivers' self-reported behavioral intention to avoid eating ground beef when dining out (Y_4), *and* provided no evidence of statistically significant direct interaction effects involving the message variation (H1a, H1b) on the behavioral intention.

The data provided no support for the tailoring hypothesis (H5b) predicted by T. Sellnow and D. Sellnow's (2013) IDEA model if the data revealed statistically significant indirect interaction effects involving the message variation (H3a, H3b) as well as a statistically significant unconditional direct effect of the message variation (H4) on the receivers' self-reported behavioral intention to avoid eating ground beef when dining out (Y_4). The data provided support for the tailoring hypothesis (H5b) predicted by the IDEA model if the data revealed a statistically significant unconditional indirect effect for the message variation (H4) on the receivers' self-reported behavioral intention to avoid eating ground beef when dining out (Y_4), *and* provided no evidence of statistically significant indirect interaction effects involving the message variation (H3a, H3b) on the behavioral intention.

Conclusion

This chapter provided an overview of the experimental design, the participants, recruitment strategies, and message-testing stimuli. A description of assessment tools were detailed, as was justification for using a regression-based approach to accommodate moderation and mediation within the same statistical framework.

CHAPTER 4. RESULTS

For the present study, two statistical approaches were employed to examine the impact of an IDEA message (relative to status quo variation) on receiver-based outcomes. The conditional and unconditional models for the present study can be found in Figures 4.1 and 4.2, respectively. Tables 4.1 and 4.2 present the regression coefficients, standard errors and model summary information for the message manipulation's conditional and unconditional effects on six parallel mediators (M_1 through M_6) and two behavioral intentions ($Y_{3,}$ Y_4). As noted earlier, all data were examined using ordinary least squares path analysis. A total of 10,000 bootstrap samples were drawn using a seed value of 10,235. The 95% percentile confidence intervals based on the 10,000 bootstrap samples were analyzed for the inclusion or exclusion of zero to identify statistically significant causal effects. The predictor variables were strategically coded for main effects parameterization and all variables in the statistical models were not mean-centered prior to any of the analyses. The data generated by the PROCESS macro output can be found in Appendix K for the model of intention to return ground beef to the store (Y_3).The data generated by the PROCESS macro output can be found in Appendix L for the model of intention to avoid eating ground beef when dining out (Y_4).

The second section presents the results of the direct and indirect effect analysis for the behavioral intention to return ground beef to the store where it was purchased (Y_3). The third section presents the results of the direct and indirect effect analysis for the behavioral intention to avoid eating ground beef when dining out (Y_4). Finally, the chapter concludes before introducing Chapter Five.

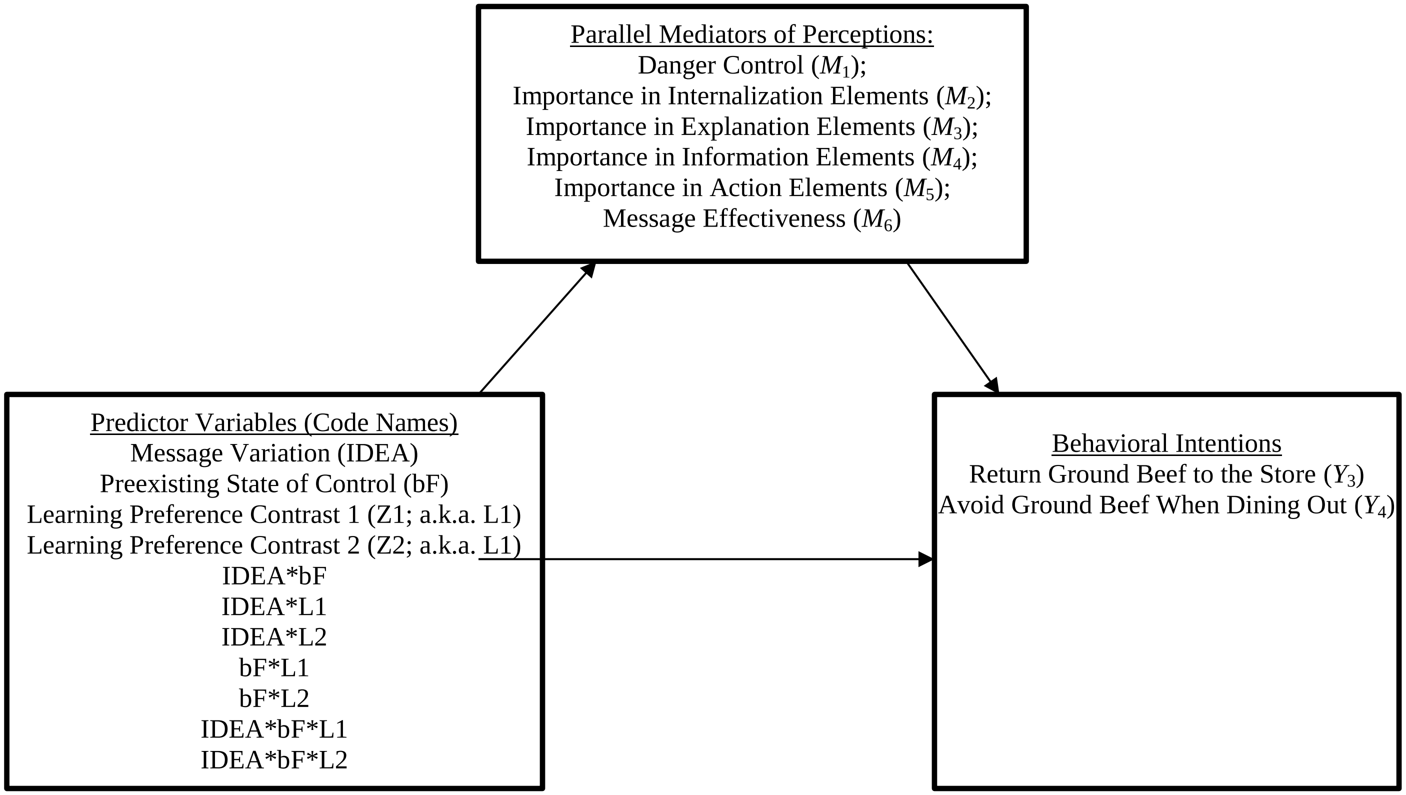

Figure 4.1. Framework for conditional process model.
Note. Message variations: IDEA; status quo. Prexisting State of Control dimensions: Fear; Danger. Learning style preference dimensions: explanation-information; internalization; action. Orthogonal contrast 1 (Z1; a.k.a. L1) and contrast 2 (Z2; a.k.a. L2): learning preferences of explanation and information contrasted with internalization and action; learning preferences of action contrasted with internalization. Predictor variables were coded for mean effects parameterization. Variables were not mean centered prior to the construction of products. From the total sample (n=641), 10,000 bootstrap samples were drawn using a seed value of 10,235.

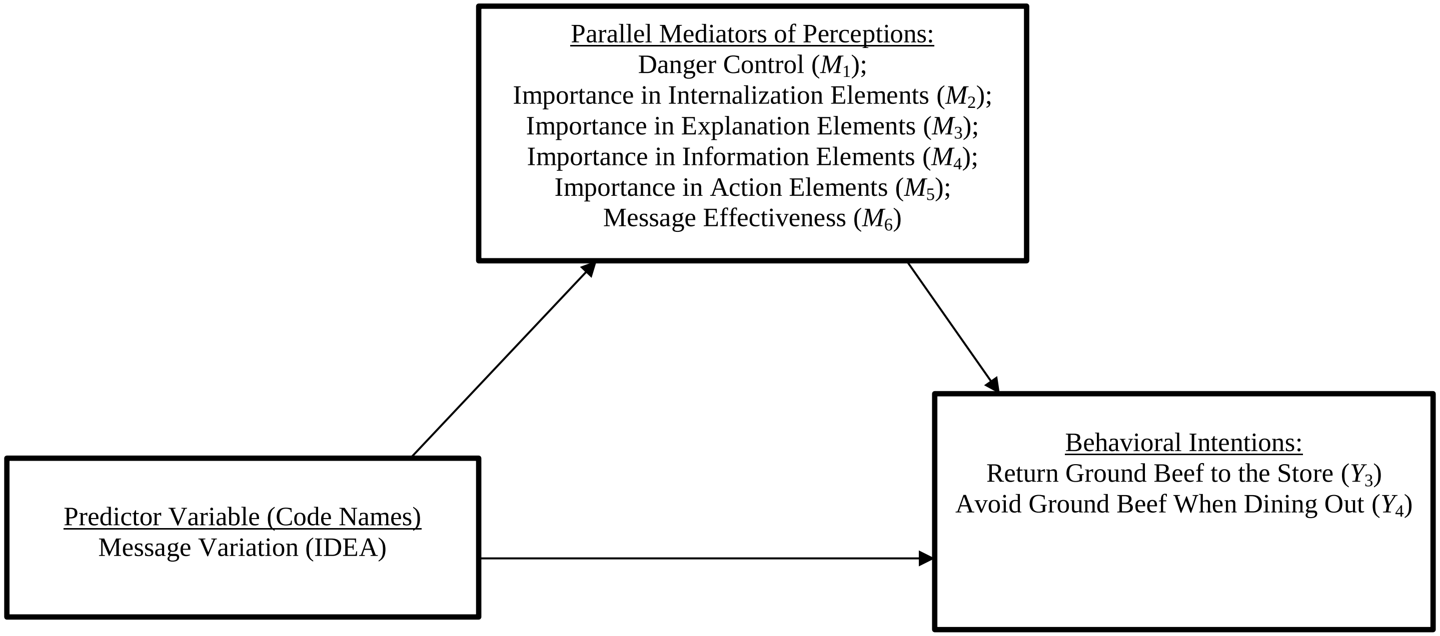

Figure 4.2. Framework for unconditional process model.
Note. Message variations: IDEA; status quo. Message variation was coded for mean effects parameterization. From the total sample (n=641), 10,000 bootstrap samples were drawn using a seed value of 10,235.

Table 4.1

Conditional Process Model Summary Information, Regression Coefficients, and Standard Errors

		Danger Control (M_1)						Importance in Internalization Elements (M_2)				
Antecedent		*Coeff.*	*SE*	*p*	*LLCI*	*ULCI*		*Coeff.*	*SE*	*p*	*LLCI*	*ULCI*
IDEA Message	a_{11}	0.190	0.08	< .05*	0.027	0.353	a_{12}	0.044	0.05	.357	-0.050	0.139
Danger Control		---	---	---	---	---		---	---	---	---	---
Internalization		---	---	---	---	---		---	---	---	---	---
Explanation		---	---	---	---	---		---	---	---	---	---
Information		---	---	---	---	---		---	---	---	---	---
Action		---	---	---	---	---		---	---	---	---	---
Effectiveness		---	---	---	---	---		---	---	---	---	---
Pre-control	a_{31}	-1.018	0.08	< .0001****	-1.181	0.855	a_{32}	-0.058	0.05	.232	-0.153	0.037
L1	a_{51}	-0.064	0.09	.472	-0.239	0.111	a_{52}	0.115	0.05	< .05*	0.014	0.217
L2	a_{71}	0.147	0.06	.012	0.032	0.262	a_{72}	0.076	0.05	.158	-0.030	0.182
IDEA*Pre-control	a_{91}	0.155	0.16	.350	-0.171	0.482	a_{92}	0.223	0.10	< .05*	-0.033	0.412
IDEA* L1	a_{111}	0.219	0.18	.219	-0.131	0.569	a_{112}	-0.113	0.10	.276	-0.316	0.091
IDEA*L2	a_{131}	0.109	0.20	.590	-0.287	0.504	a_{132}	0.043	0.12	.714	-0.186	0.272
Pre-control*L1	a_{151}	-0.089	0.18	.616	-0.439	0.261	a_{152}	-0.078	0.10	.451	-0.125	0.282
Pre-control*L2	a_{171}	0.093	0.20	.645	-0.488	0.302	a_{172}	0.081	0.12	.488	-0.310	0.148
IDEA*Pre-control*L1	a_{191}	-0.028	0.36	.938	-0.728	0.672	a_{192}	-0.090	0.21	.663	-0.497	0.316
IDEA*Pre-control*L2	a_{211}	0.198	0.40	.623	-0.592	0.988	a_{212}	-0.034	0.23	.886	-0.492	0.425
Constant	i_{M1}	-0.112	0.04	.007	-0.193	-0.030	i_{M2}	3.422	0.02	< .0001****	3.348	3.470
		R^2=0.205						R^2=0.034				
		$F(11,629) = 14.82$, $p < .0001$****						$F(11,629) = 1.84$, $p < .05$*				

Table 4.1. *Conditional Process Model Summary Information, Regression Coefficients, and Standard Errors* (continued)

		Importance in Explanation Elements (M_3)						Importance in Information Elements (M_4)				
Antecedent		*Coeff.*	*SE*	*p*	*LLCI*	*ULCI*		*Coeff.*	*SE*	*p*	*LLCI*	*ULCI*
IDEA Message	a_{13}	0.098	0.07	.174	-0.043	0.239	a_{14}	0.116	0.06	.066	-0.008	0.241
Danger Control		---	---	---	---	---		---	---	---	---	---
Internalization		---	---	---	---	---		---	---	---	---	---
Explanation		---	---	---	---	---		---	---	---	---	---
Information		---	---	---	---	---		---	---	---	---	---
Action		---	---	---	---	---		---	---	---	---	---
Effectiveness		---	---	---	---	---		---	---	---	---	---
Pre-control	a_{33}	-0.138	0.07	.055	-0.279	0.003	a_{34}	-0.065	0.06	.305	-0.189	0.059
L1	a_{53}	0.115	0.08	.059	-0.011	0.553	a_{54}	0.001	0.06	.993	-0.126	0.127
L2	a_{73}	0.143	0.09	.107	-0.031	0.317	a_{74}	0.228	0.08	< .01**	0.071	0.386
IDEA*Pre-control	a_{93}	0.271	0.14	.059	-0.011	0.553	a_{94}	-0.026	0.13	.839	-0.274	0.223
IDEA* L1	a_{113}	-0.234	0.15	.122	-0.530	0.063	a_{114}	-0.224	0.13	.083	-0.478	0.029
IDEA*L2	a_{133}	0.128	0.18	.470	-0.220	0.476	a_{134}	-0.050	0.16	.754	-0.366	0.265
Pre-control*L1	a_{153}	-0.013	0.15	.930	-0.309	0.283	a_{154}	-0.116	0.13	.370	-0.369	0.138
Pre-control*L2	a_{173}	-0.101	0.18	.570	-0.449	0.247	a_{174}	0.019	0.16	.908	-0.297	0.334
IDEA*Pre-control*L1	a_{193}	-0.744	0.30	.014	-1.336	-0.151	a_{194}	0.077	0.26	.765	-0.430	0.584
IDEA*Pre-control*L2	a_{213}	0.203	0.35	.567	-0.493	0.900	a_{214}	-0.105	0.32	.745	-0.735	0.526
Constant	i_{M3}	3.060	0.04	<**** .0001	2.989	3.130	i_{M4}	3.328	0.03	< .0001****	3.266	3.390
		R^2=0.036						R^2=0.026				
		F(11,629) = 2.50, p < .05*						F(11,629) = 1.692, p = .071				

Table 4.1. *Conditional Process Model Summary Information, Regression Coefficients, and Standard Errors* (continued)

		Importance in Action Elements (M_5)						Message Effectiveness (M_6)				
Antecedent		*Coeff.*	*SE*	*p*	*LLCI*	*ULCI*		*Coeff.*	*SE*	*p*	*LLCI*	*ULCI*
IDEA Message	a_{15}	-0.030	0.05	.558	-0.129	0.070	a_{16}	0.127	0.06	< .05*	0.012	0.243
Danger Control		---	---	---	---	---		---	---	---	---	---
Internalization		---	---	---	---	---		---	---	---	---	---
Explanation		---	---	---	---	---		---	---	---	---	---
Information		---	---	---	---	---		---	---	---	---	---
Action		---	---	---	---	---		---	---	---	---	---
Effectiveness		---	---	---	---	---		---	---	---	---	---
Pre-control	a_{35}	-0.072	0.05	.155	-0.172	0.028	a_{36}	-0.245	0.06	< .0001****	-0.360	-0.129
L1	a_{55}	0.132	0.06	< .05*	0.020	0.245	a_{56}	0.029	0.06	.637	-0.090	0.147
L2	a_{75}	0.067	0.06	.248	-0.047	0.181	a_{76}	0.009	0.07	.905	-0.137	0.155
IDEA*Pre-control	a_{95}	0.046	0.10	.653	-0.154	0.245	a_{96}	0.270	0.12	< .05*	0.039	0.501
IDEA* L1	a_{115}	-0.091	0.11	.429	-0.315	0.134	a_{116}	-0.009	0.12	.943	-0.246	0.229
IDEA*L2	a_{135}	0.066	0.12	.570	-0.162	0.294	a_{136}	-0.096	0.15	.521	-0.387	0.196
Pre-control*L1	a_{155}	0.035	0.11	.757	-0.189	0.260	a_{156}	0.070	0.12	.560	-0.167	0.308
Pre-control*L2	a_{175}	-0.065	0.12	.575	-0.293	0.163	a_{176}	-0.195	0.15	.191	-0.487	0.097
IDEA*Pre-control*L1	a_{195}	-0.219	0.23	.338	-0.668	0.230	a_{196}	-0.118	0.24	.625	-0.593	0.356
IDEA*Pre-control*L2	a_{215}	-0.394	0.23	.091	-0.850	0.063	a_{216}	-0.102	0.30	.732	-0.686	0.482
Constant	i_{M5}	3.600	0.03	<**** .0001	3.550	3.649	i_{M6}	3.916	0.03	< .0001****	3.858	3.974
		R^2=0.024						R^2=0.045				
		F(11,629) = 1.37, p = .183						F(11,629) = 2.61, p < .05*				

Table 4.1. *Conditional Process Model Summary Information, Regression Coefficients, and Standard Errors* (continued)

		Return Ground Beef to the Store (Y_3)						Avoid Eating Ground Beef When Dining Out (Y_4)				
Antecedent		*Coeff.*	*SE*	*p*	*LLCI*	*ULCI*		*Coeff.*	*SE*	*p*	*LLCI*	*ULCI*
IDEA Message	c'_{13}	0.473	0.11	< .0001****	0.257	0.688	c'_{14}	0.031	0.09	.730	-0.143	0.204
Danger Control	b_{13}	0.016	0.06	.775	-0.095	0.127	b_{14}	0.087	0.46	.061	-0.004	0.178
Internalization	b_{33}	0.223	0.16	.160	-0.089	0.536	b_{34}	0.316	0.13	< .05*	0.062	0.570
Explanation	b_{53}	0.201	0.08	< .05*	0.036	0.365	b_{54}	-0.023	0.06	.712	-0.147	-0.100
Information	b_{73}	-0.030	0.07	.645	-0.160	0.099	b_{74}	-0.084	0.05	.109	-0.187	0.189
Action	b_{93}	-0.084	0.12	.494	-0.325	0.157	b_{94}	0.027	0.11	.800	-0.184	0.238
Effectiveness	b_{113}	0.455	0.09	< .0001****	0.279	0.632	b_{114}	0.452	0.07	<.0001****	0.311	0.594
Pre-control	c'_{33}	0.101	0.12	.415	-0.142	0.344	c'_{34}	0.008	0.10	.939	-0.188	0.204
L1	c'_{53}	-0.041	0.12	.723	-0.267	0.185	c'_{54}	0.062	0.10	.520	-0.128	0.252
L2	c'_{73}	-0.169	0.14	.232	-0.447	0.109	c'_{74}	-0.2637	0.11	< .05*	-0.470	-0.056
IDEA*Pre-control	c'_{93}	0.145	0.22	.517	-0.293	0.582	c'_{94}	-0.027	0.18	.881	-0.377	0.324
IDEA* L1	c'_{113}	0.228	0.23	.319	-0.222	0.678	c'_{114}	-0.127	0.19	.505	-0.499	0.246
IDEA*L2	c'_{133}	-0.376	0.28	.176	-0.921	0.169	c'_{134}	0.009	0.21	.966	-0.408	0.426
Pre-control*L1	c'_{153}	0.373	0.23	.102	-0.074	0.820	c'_{154}	-0.306	0.19	.111	-0.070	0.682
Pre-control*L2	c'_{173}	-0.300	0.28	.277	-0.841	0.242	c'_{174}	-0.183	0.21	.390	-0.560	0.235
IDEA*Pre-control*L1	c'_{193}	-0.357	0.46	.440	-1.265	0.551	c'_{194}	0.137	0.39	.724	-0.896	0.623
IDEA*Pre-control*L2	c'_{213}	0.459	0.55	.407	-0.627	1.545	c'_{214}	-0.121	0.43	.775	-0.956	0.713
Constant	i_{Y3}	0.850	0.42	< .05*	0.028	1.673	i_{Y4}	0.985	0.36	< .05*	0.283	1.687
		R^2=0.170						R^2=0.173				
		$F(17,623) = 7.52$, $p < .0001$****						$F(17,623) = 8.27$, $p < .0001$****				

Note. CI = confidence interval; *LL* = lower limit, *UL* = upper limit. All regression coefficients are unstandardized. Message variations: IDEA (.5); status quo (-.5). Pre-control categories: preexisting state of fear control (.5); preexisting state of danger control (-.5). Orthogonal contrasts using Helmert coding system for learning preferences: L1(contrast 1; a.k.a. Z1); L2 (contrast 2; a.k.a. Z2). Contrast 1 categories: learning preference of internalization or action (.333); learning preference of explanation or information (-.667). Contrast 2 categories: learing preference of action (.5); learning preference of internalization (-.5). Data reflect *Mean* effects parameterizations, rather than simple effects. From the total sample (n=641), 10,000 bootstrap samples were drawn using a seed value of 10,235.
**p* < .05, one-tailed. ***p* <.01, one-tailed. ****p* <.001, one-tailed. *****p*<.0001, one-tailed.

Table 4.2

Unconditional Process Model Summary Information, Regression Coefficients, and Standard Errors

		Danger Control (M_1)						Importance in Internalization Elements (M_2)				
Antecedent		*Coeff.*	*SE*	*p*	*LLCI*	*ULCI*		*Coeff.*	*SE*	*p*	*LLCI*	*ULCI*
IDEA Message	a_{11}	0.147	0.09	.094	-0.025	0.319	a_{12}	0.025	0.05	.589	-0.066	0.116
Danger Control		---	---	---	---	---		---	---	---	---	---
Internalization		---	---	---	---	---		---	---	---	---	---
Explanation		---	---	---	---	---		---	---	---	---	---
Information		---	---	---	---	---		---	---	---	---	---
Action		---	---	---	---	---		---	---	---	---	---
Effectiveness		---	---	---	---	---		---	---	---	---	---
Constant	i_{M1}	-0.003	0.04	.949	-0.089	0.083	i_{M2}	3.414	0.02	< .0001****	3.368	3.459
				R^2=0.004						R^2=0.001		
				F(1,639) = 2.82, p = .094						F(1,639) = 0.29, p = .588		

		Importance in Explanation Elements (M_3)						Importance in Information Elements (M_4)				
Antecedent		*Coeff.*	*SE*	*p*	*LLCI*	*ULCI*		*Coeff.*	*SE*	*p*	*LLCI*	*ULCI*
IDEA Message	a_{13}	0.073	0.07	.290	-0.062	0.207	a_{14}	0.120	0.06	.051	-0.001	0.241
Danger Control		---	---	---	---	---		---	---	---	---	---
Internalization		---	---	---	---	---		---	---	---	---	---
Explanation		---	---	---	---	---		---	---	---	---	---
Information		---	---	---	---	---		---	---	---	---	---
Action		---	---	---	---	---		---	---	---	---	---
Effectiveness		---	---	---	---	---		---	---	---	---	---
Constant	i_{M3}	3.058	0.03	<**** .0001	2.991	3.125	i_{M4}	3.314	0.03	< .0001****	3.254	3.375
				R^2=0.002						R^2=0.006		
				F(1,639) = 1.12, p = .290						F(1,639) = 3.82, p = .051		

Table 4.2. *Unconditional Process Model Summary Information, Regression Coefficients, and Standard Errors* (continued)

		Importance in Action Elements (M_5)						Message Effectiveness (M_6)				
Antecedent		*Coeff.*	*SE*	*p*	*LLCI*	*ULCI*		*Coeff.*	*SE*	*p*	*LLCI*	*ULCI*
IDEA Message	a_{15}	-0.038	0.05	.446	-0.134	0.059	a_{16}	0.101	0.06	.077	-0.011	0.213
Danger Control		---	---	---	---	---		---	---	---	---	---
Internalization		---	---	---	---	---		---	---	---	---	---
Explanation		---	---	---	---	---		---	---	---	---	---
Information		---	---	---	---	---		---	---	---	---	---
Action		---	---	---	---	---		---	---	---	---	---
Effectiveness		---	---	---	---	---		---	---	---	---	---
Constant	i_{M5}	3.597	0.02	< .0001****	3.549	3.646	i_{M6}	3.937	0.03	< .0001****	3.882	3.993
		R^2=0.001						R^2=0.005				
		$F(1,639) = 0.58, p = .446$						$F(1,639) = 3.14, p = .077$				

		Return Ground Beef to the Store (Y_3)						Avoid Eating Ground Beef When Dining Out (Y_4)				
Antecedent		*Coeff.*	*SE*	*p*	*LLCI*	*ULCI*		*Coeff.*	*SE*	*p*	*LLCI*	*ULCI*
IDEA Message	c'_{13}	0.494	0.10	< .0001****	0.290	0.699	c'_{14}	0.038	0.08	.649	-0.126	0.202
Danger Control	b_{13}	-0.003	0.05	.956	-0.102	0.096	b_{14}	0.082	0.04	< .05*	0.001	0.163
Internalization	b_{33}	0.228	0.16	.151	-0.084	0.539	b_{34}	0.296	0.13	< .05*	0.047	0.545
Explanation	b_{53}	0.196	0.08	< .05*	0.033	0.359	b_{54}	-0.023	0.06	.715	-0.144	0.099
Information	b_{73}	-0.051	0.07	.435	-0.181	0.078	b_{74}	-0.100	0.05	.056	-0.202	0.002
Action	b_{93}	-0.105	0.12	.388	0.342	0.133	b_{94}	0.045	0.11	.671	-0.162	0.252
Effectiveness	b_{113}	0.469	0.09	< .0001****	0.297	0.640	b_{114}	0.460	0.07	< .0001****	0.325	0.596
Constant	i_{Y3}	0.941	0.40	< .05*	0.147	1.735	i_{Y4}	1.022	0.35	< .05*	0.343	1.701
		R^2=0.151						R^2=0.159				
		$F(7,633) = 16.26, p < .0001$****						$F(7,633) = 17.94, p < .0001$****				

Note. *CI* = confidence interval; *LL* = lower limit, *UL* = upper limit. All regression coefficients are unstandardized. Message variations: IDEA (.5); status quo (-.5). From the total sample (n=641), 10,000 bootstrap samples were drawn using a seed value of 10,235.
**p* < .05, one-tailed. ***p* <.01, one-tailed. ****p* <.001, one-tailed. *****p*<.0001, one-tailed.
Note. *CI* = confidence interval; *LL* = lower limit, *UL* = upper limit. All regression coefficients are unstandardized. Message variations: IDEA (.5); status quo (-.5). From the total sample (n=641), 10,000 bootstrap samples were drawn using a seed value of 10,235.

Return Ground Beef to Store

Direct Effects

Two indices of moderated-moderation quantified the extent that an IDEA message (relative to a status quo variation) variation had a direct impact on the intention to return ground beef to the store where it was purchased (Y_3), when the effect was moderated by receivers' preexisting state of control (W) as a function of learning preference (Z). This conditional and specific direct effect is represented with Equation 4.1:

$$\omega = \theta_{X \rightarrow Y3} = (i_{Y3} + c'_{13}X + c'_{33}W + c'_{53}Z_1 + c'_{73}Z_2 + c'_{93}XW + c'_{113}XZ_1 + c'_{133}XZ_2 + c'_{153}WZ_1 + c'_{173}WZ_2 + c'_{193}XWZ_1 + c'_{213}XWZ_2 + b_{13} + b_{33} + b_{53} + b_{73} + b_{93} + b_{113} + e_{Y3}) \quad (4.1)$$

As a test of hypothesis 1a, ordinary least squares path analysis was used to examine this specific direct effect independent of all indirect effects in the statistical model of Y_3 (i.e., return ground beef to the store). A Helmert coding scheme accommodated the three learning preference categories and provided two planned orthogonal contrasts that would be most meaningful for testing hypothesis 1a. In the conditional model (see Figure 4.1), message variation, preexisting state of control, learning preference, their interactions, and the direct effects of the six parallel mediators ($M_{1\text{-}6}$) accounted for approximately 17% of the total variance in receivers' intention to return ground beef to the store where it was purchased (Y_3), $\Delta R^2 = 0.170$, $F(17,623) = 7.52$, $p < .0001$. The corresponding regression coefficients, standard errors, p-values, and model summary information for this conditional direct effect can be found in Table 4.1.

When learning preferences of internalization and action were contrasted with preferences of explanation and information, the 95% bootstrap confidence interval for the 2 (message variation) x 2 (preexisting state of control) x 2 (learning preference) direct effect ($c'_{193\,|}$

$_{\text{contrast 1}}$ = -0.357, *Boot SE* = 0.46) was not entirely above or below zero (-1.265 to 0.551). When a learning preference of action was contrasted with a preference of internalization, the confidence interval for the 2 (message variation) x 2 (preexisting state of control) x 2 (learning preference) effect ($c'_{213 \mid \text{contrast 2}}$ = 0.459, *Boot SE* = 0.55) was not entirely above or below zero (-0.627 to 1.545). Taken together, the confidence intervals for the indices of moderated-moderation provided evidence to support for a claim (H3a) that an IDEA message (relative to a status quo variation) will have a significantly more positive direct impact on the intention to return ground beef to the store where it was purchased (Y_3), when the effect is moderated by receivers' preexisting state of control as a function of learning preference.

An index of partial moderation quantified the extent that an IDEA message (relative to a status quo variation) had a direct impact on the intention to return ground beef to the store (Y_3), when the effect was moderated by receivers' preexisting state of control (*W*) as learning preference was held constant (*Z*). As a test of hypothesis 1b, ordinary least squares path analysis was used to examine this specific direct effect independent of all indirect effects in the statistical model of Y_3 (i.e., return ground beef to the store). The 95% bootstrap confidence interval for the 2 (message variation) x 2 (preexisting state of control) direct effect (c'_{93} = 0.145, *Boot SE* = 0.22) was not entirely above or below zero (-0.293 to 0.582). The confidence interval for partial moderation provided no evidence to support a claim (H1b) that an IDEA message (relative to a status quo variation) will have a significantly more positive direct impact on the intention to return ground beef to the store where it was purchased (Y_3), when the effect is moderated by receivers' preexisting state of control (*W*) as learning preference is held constant (*Z*).

An index of conditional direct effect quantified the extent that an IDEA message (relative to status quo variation) had a direct impact on the intention to return ground beef to the store (Y_3)

when receivers' preexisting state of control and learning preference were held constant. As a test of hypothesis 1c, ordinary least squares path analysis was used to examine this specific direct effect independent of all indirect effects in the statistical model of Y_3 (i.e., return ground beef to the store). The 95% bootstrap confidence interval for the conditional direct effect ($c'_{13} = 0.473$, *Boot SE* = 0.11) was entirely above zero (0.257 to 0.688). This finding confirmed that the intention to return ground beef to the store (Y_3) differed to a statistically significant degree between IDEA message receivers ($M = 3.85$, $n = 318$) and status quo message receivers ($M = 3.38$, $n = 323$) when individual differences were held constant (i.e., receivers' preexisting state of control and learning preference). More specifically, IDEA message receivers expressed a greater likelihood to return ground beef to the store where it was purchased, compared to status quo message receivers. The confidence interval for the conditional direct effect provided evidence to support a claim (H1c) that an IDEA message (relative to a status quo variation) will have a significantly more positive direct impact on the intention to return ground beef to the store where it was purchased (Y_3), when individual differences are held constant (i.e., receivers' preexisting state of control, learning preference).

An index of unconditional direct effect quantified the extent that an IDEA message (relative to status quo variation) had a direct impact on the intention to return ground beef to the store (Y_3), regardless of receivers' individual differences. In the unconditional model (see Figure 4.2), message variation and six parallel mediators ($M_{1\text{-}6}$) accounted for approximately 15% of the total variance in receivers' intention to return ground beef to the store (Y_3), $\Delta R^2 = 0.151$, $F(7,633) = 16.26$, $p < .0001$. As a test of hypothesis 2, ordinary least squares path analysis was used to examine this specific direct effect independent of all indirect effects in the statistical model of Y_3 (i.e., return ground beef to the store). The corresponding regression coefficients, standard errors, p-values, and model summary information for message variation's unconditional direct effect can be found in Table 4.2.

The 95% bootstrap confidence interval for the unconditional direct effect (c'_{13}= 0.494, *Boot SE* = 0.10, t = 4.75, $p < .0001$) was entirely above zero (0.290 to 0.699). This finding confirmed that the intention to return ground beef to the store (Y_3) differed to a statistically significant degree between IDEA message receivers (M = 3.86, n = 318) and status quo message receivers (M = 3.37, n = 323) when individual differences were not accounted for in the statistical model. The confidence interval for the unconditional direct effect provided evidence to support a claim (H2) that an IDEA message (relative to a status quo variation) will have a significantly more positive direct impact on the intention to return ground beef to the store where it was purchased (Y_3), regardless of receivers' individual differences.

Tailoring hypothesis. This direct-effect result of the unconditional process analysis (H2) was compared to the direct-effect results of the conditional process analysis (H1a, H1b, H1c). The data revealed that unconditionally (H2), the IDEA message variation's direct effect on receivers' intention to return ground beef to the store (Y_3) differed to a statistically significant degree from that of a status quo message variation. The data provided no evidence of statistically significant interaction effects involving the message variation on receivers' intention to return ground beef to the store (Y_3). Taken together, the data provided evidence to support for a claim (H5a) that an unconditional process analysis was more appropriate for testing and demonstrating the comprehensiveness of an IDEA message (relative to a status quo variation) to directly predict receivers' self-reported behavioral intention to return ground beef to the store (Y_3), compared to a conditional process analysis.

Indirect Effects

Danger control. Two indices of moderated-moderated mediation quantified the extent that an IDEA message (relative to a status quo variation) had an indirect impact on the intention to return ground beef to the store (Y_3), when the effect was moderated by receivers' preexisting state of control (W) as a function of learning preference (Z). This conditional and specific indirect effect operating through receivers' perceived danger control (M_1) is represented with Equation 4.2:

$$\omega = \theta_{X \rightarrow M1} b_{13} = (i_{M1} + a_{11}X + a_{31}W + a_{51}Z_1 + a_{71}Z_2 + a_{91}XW + a_{111}XZ_1 + a_{131}XZ_2 + a_{151}WZ_1 + a_{171}WZ_2 + a_{191}XWZ_1 + a_{211}XWZ_2 + e_{M1})b_{13} \quad (4.2)$$

As a test of hypothesis 3a, ordinary least squares path analysis was used to examine this specific indirect effect operating through perceived danger control (M_1) while controlling for all other mediators in the statistical model of Y_3 (i.e., return ground beef to the store). A Helmert coding scheme accommodated the three learning preference categories and provided two planned orthogonal contrasts that would be most meaningful for testing hypothesis 3a. The corresponding regression coefficients, standard errors, *p*-values, and model summary information for this conditional indirect effect can be found in Table 4.1.

When learning preferences of internalization and action were contrasted with preferences of explanation and information, the 95% bootstrap confidence interval for the 2 (message variation) x 2 (preexisting state of control) x 2 (learning preference) indirect effect ($a_{191}b_{13 \mid \text{contrast 1}} = 0.000$, *Boot SE* = 0.02) was not entirely above or below zero (-0.054 to 0.039). When a learning preference of action was contrasted with a preference of internalization, the confidence interval for the 2 (message variation) x 2 (preexisting state of control) x 2 (learning preference) indirect effect ($a_{211}b_{13 \mid \text{contrast 2}} = 0.003$, *Boot SE* = 0.02) was not entirely above or below zero

(-0.053 to 0.056). Taken together, the confidence intervals for the indices of moderated-moderated mediation provided no evidence to support a claim (H3a) that an IDEA message (relative to a status quo variation) will have a significantly more positive indirect impact on the intention to return ground beef to the store where it was purchased (Y_3) while the effect is operating through perceived danger control (M_1), and the effect is moderated by receivers' preexisting state of control as a function of learning preference.

An index of partial moderated mediation quantified the extent that an IDEA message (relative to a status quo variation) had an indirect impact on the intention to return ground beef to the store (Y_3), when the effect was moderated by receivers' preexisting state of control (W) as learning preference was held constant (Z). As a test of hypothesis 3b, ordinary least squares path analysis was used to examine this conditional and specific indirect effect operating through receivers' perceived danger control (M_1), while controlling for all other mediators in the statistical model of Y_3 (i.e., return ground beef to the store). The 95% bootstrap confidence interval for the 2 (message variation) x 2 (preexisting state of control) indirect effect ($a_{91}b_{13}$ = 0.003, *Boot SE* = 0.01) was not entirely above or below zero (-0.023 to 0.033). The confidence interval for the index of moderated mediation provided no evidence to support a claim (H3b) that an IDEA message (relative to a status quo variation) will have a significantly more positive indirect impact on the intention to return ground beef to the store where it was purchased (Y_3) while the effect is operating through perceived danger control (M_1), and the effect is moderated by receivers' preexisting state of control (W) as learning preference is held constant (Z).

An index of conditional mediation quantified the extent that an IDEA message (relative to status quo variation) had an indirect impact on the intention to return ground beef to the store (Y_3) when receivers' preexisting state of control and learning preference were held constant. As a test of hypothesis 3c, ordinary least squares path analysis was used to examine this conditional and specific indirect effect operating through receivers' perceived danger control (M_1) while controlling for all other mediators in the statistical model of Y_3 (i.e., return ground beef to the store). The 95% bootstrap confidence interval for the conditional indirect effect operating through perceived danger control ($a_{11}b_{13}$ = 0.003, *Boot SE* = 0.01) was not entirely above or below zero (-0.021 to 0.027). The confidence interval for the conditional indirect effect provided no evidence to support a claim (H3c) that an IDEA message (relative to a status quo variation) will have a significantly more positive indirect impact on the intention to return ground beef to the store where it was purchased (Y_3) while the effect is operating through perceived danger control (M_1), and individual differences are held constant (i.e., receivers' preexisting state of control, learning preference).

An index of unconditional mediation quantified the extent that an IDEA message (relative to status quo variation) had an indirect impact on the intention to return ground beef to the store (Y_3) regardless of receivers' individual differences. This unconditional and specific indirect effect operating through receivers' perceived danger control (M_1) is represented with Equation 4.3:

$$_{X \rightarrow M1}b_{13} = (i_{M1} + a_{11}X + \mathrm{e}_{M1})b_{13} \quad (4.3)$$

As a test of hypothesis 4, ordinary least squares path analysis was used to examine this specific indirect effect operating through perceived danger control (M_1) while controlling for all other mediators in the statistical model of Y_3 (i.e., return ground beef to the store). The corresponding regression coefficients, standard errors, *p*-values, and model summary information for this unconditional indirect effect can be found in Table 4.2.The 95% bootstrap confidence interval for the unconditional indirect effect operating through perceived danger control ($a_{11}b_{13}$ = 0.000, *Boot SE* = 0.01) was not entirely above or below zero (-0.019 to 0.017). The confidence interval for the unconditional indirect effect provided no evidence to support a claim (H4) that an IDEA message (relative to a status quo variation) will have a significantly more positive indirect impact on the intention to return ground beef to the store where it was purchased (Y_3) while the effect is operating through perceived danger control (M_1), regardless of receivers' individual differences.

Tailoring hypothesis. This indirect-effect result of the unconditional process analysis (H4) was compared to the indirect-effect results of the conditional process analysis (H3a, H3b, H3c). The data provided no evidence that unconditionally (H4) the IDEA message variation's indirect effect on receivers' intention to return ground beef to the store (Y_3) differed to a statistically significant degree from that of a status quo message variation, while exerting influence through perceived danger control (M_1). The data provided no evidence of statistically significant interaction effects involving the message variation on receivers' intention to return ground beef to the store (Y_3), while exerting influence through perceived danger control (M_1). Taken together, the data provided no evidence to support a claim (H5b) that an unconditional process analysis was more appropriate for testing and demonstrating the comprehensiveness of an IDEA message (relative to a status quo variation) to indirectly predict receivers' self-reported behavioral intention to return ground beef to the store (Y_3), compared to a conditional process analysis.

Internalization elements. Two indices of moderated-moderated mediation quantified the extent that an IDEA message (relative to a status quo variation) had an indirect impact on the intention to return ground beef to the store (Y_3), when the effect was moderated by receivers' preexisting state of control (*W*) as a function of learning preference (*Z*). This conditional and specific indirect effect operating through receivers' perceived importance in the internalization message elements (M_2) is represented with Equation 4.4:

$$\omega = \theta_{X \rightarrow M2} b_{33} = (i_{M2} + a_{12}X + a_{32}W + a_{52}Z_1 + a_{72}Z_2 + a_{92}XW + a_{112}XZ_1 + a_{132}XZ_2 + a_{152}WZ_1 + a_{172}WZ_2 + a_{192}XWZ_1 + a_{212}XWZ_2 + e_{M2})b_{33} \quad (4.4)$$

As a test of hypothesis 3a, ordinary least squares path analysis was used to examine this specific indirect effect operating through perceived importance in the internalization message elements (M_2) while controlling for all other mediators in the statistical model of Y_3 (i.e., return ground beef to the store). A Helmert coding scheme accommodated the three learning preference categories and provided two planned orthogonal contrasts that would be most meaningful for testing hypothesis 3a. The corresponding regression coefficients, standard errors, *p*-values, and model summary information for this conditional indirect effect can be found in Table 4.1.

When learning preferences of internalization and action were contrasted with preferences of explanation and information, the 95% bootstrap confidence interval for the 2 (message variation) x 2 (preexisting state of control) x 2 (learning preference) indirect effect ($a_{192}b_{33 \mid \text{contrast 1}} = -0.020$, *Boot SE* = 0.06) was not entirely above or below zero (-0.152 to 0.088). When a learning preference of action was contrasted with a preference of internalization, the confidence interval for the 2 (message variation) x 2 (preexisting state of control) x 2 (learning preference) indirect effect ($a_{212}b_{33 \mid \text{contrast 2}} = -0.008$, *Boot SE* = 0.06) was not entirely above or below zero (-0.150 to 0.117). Taken together, the confidence intervals for the indices of moderated-moderated mediation provided no evidence to support a claim (H3a) that an IDEA message (relative to a status quo variation) will have a significantly more positive indirect impact on the intention to return ground beef to the store where it was purchased (Y_3) while the effect is operating through perceived importance in the internalization message elements (M_2), and the effect is moderated by receivers' preexisting state of control as a function of learning preference.

An index of partial moderated mediation quantified the extent that an IDEA message (relative to a status quo variation) had an indirect impact on the intention to return ground beef to the store (Y_3), when the effect was moderated by receivers' preexisting state of control (W) as learning preference was held constant (Z). As a test of hypothesis 3b, ordinary least squares path analysis was used to examine this conditional and specific indirect effect operating through receivers' perceived importance in the internalization message elements (M_2), while controlling for all other mediators in the statistical model of Y_3 (i.e., return ground beef to the store). The 95% bootstrap confidence interval for the 2 (message variation) x 2 (preexisting state of control) indirect effect ($a_{92}b_{33}$ = 0.050, *Boot SE* = 0.04) was not entirely above or below zero (-0.022 to 0.142). The confidence interval for the index of moderated mediation provided no evidence to support a claim (H3b) that an IDEA message (relative to a status quo variation) will have a significantly more positive indirect impact on the intention to return ground beef to the store where it was purchased (Y_3) while the effect is operating through perceived importance in the internalization message elements (M_2), and the effect is moderated by receivers' preexisting state of control (W) as learning preference is held constant (Z).

An index of conditional mediation quantified the extent that an IDEA message (relative to status quo variation) had an indirect impact on the intention to return ground beef to the store (Y_3) when receivers' preexisting state of control and learning preference were held constant. As a test of hypothesis 3c, ordinary least squares path analysis was used to examine this conditional and specific indirect effect operating through receivers' perceived importance in the internalization message elements (M_2) while controlling for all other mediators in the statistical model of Y_3 (i.e., return ground beef to the store). The 95% bootstrap confidence interval for the conditional indirect effect operating through perceived importance in internalization message elements ($a_{12}b_{33}$ = 0.010, *Boot SE* = 0.02) was not entirely above or below zero (-0.014 to 0.046). The confidence interval for the conditional indirect effect provided no evidence to support a claim (H3c) that an IDEA message (relative to a status quo variation) will have a significantly more positive indirect impact on the intention to return ground beef to the store where it was purchased (Y_3) while the effect is operating through perceived importance in the internalization message elements (M_2), and individual differences are held constant (i.e., receivers' preexisting state of control, learning preference).

An index of unconditional mediation quantified the extent that an IDEA message (relative to status quo variation) had an indirect impact on the intention to return ground beef to the store (Y_3) regardless of receivers' individual differences. This unconditional and specific indirect effect operating through receivers' perceived importance in the internalization message elements (M_2) is represented with Equation 4.5:

$$ {}_{X \rightarrow M2}b_{33} = (i_{M2} + a_{12}X + e_{M2})b_{33} \quad (4.5) $$

As a test of hypothesis 4, ordinary least squares path analysis was used to examine this specific indirect effect operating through perceived importance in the internalization message elements (M_2) while controlling for all other mediators in the statistical model of Y_3 (i.e., return ground beef to the store). The corresponding regression coefficients, standard errors, *p*-values, and model summary information for this unconditional indirect effect can be found in Table 4.2. The 95% bootstrap confidence interval for the unconditional indirect effect operating through perceived importance in internalization message elements ($a_{12}b_{33}$ = 0.006, *Boot SE* = 0.01) was not entirely above or below zero (-0.019 to 0.038). The confidence interval for the unconditional indirect effect provided no evidence to support a claim (H4) that an IDEA message (relative to a status quo variation) will have a significantly more positive indirect impact on the intention to return ground beef to the store where it was purchased (Y_3) while the effect is operating through perceived importance in the internalization message elements (M_2), regardless of receivers' individual differences.

Tailoring hypothesis. This indirect-effect result of the unconditional process analysis (H4) was compared to the indirect-effect results of the conditional process analysis (H3a, H3b, H3c). The data provided no evidence that unconditionally (H4) the IDEA message variation's indirect effect on receivers' intention to return ground beef to the store (Y_3) differed to a statistically significant degree from that of a status quo message variation, while exerting influence through perceived importance in internalization message elements (M_2). The data provided no evidence of statistically significant interaction effects involving the message variation on receivers' intention to return ground beef to the store (Y_3), while exerting influence through perceived importance in internalization message elements (M_2). Taken together, the data provided no evidence to support a claim (H5b) that an unconditional process analysis was more appropriate for testing and demonstrating the comprehensiveness of an IDEA message (relative to a status quo variation) to indirectly predict receivers' self-reported behavioral intention to return ground beef to the store (Y_3), compared to a conditional process analysis.

Explanation elements. Two indices of moderated-moderated mediation quantified the extent that an IDEA message (relative to a status quo variation) had an indirect impact on the intention to return ground beef to the store (Y_3), when the effect was moderated by receivers' preexisting state of control (W) as a function of learning preference (Z). This conditional and specific indirect effect operating through receivers' perceived importance in the explanation message elements (M_3) is represented with Equation 4.6:

$$\omega = \theta_{X \rightarrow M3} b_{53} = (i_{M3} + a_{13}X + a_{33}W + a_{53}Z_1 + a_{73}Z_2 + a_{93}XW + a_{113}XZ_1 + a_{133}XZ_2 + a_{153}WZ_1 + a_{173}WZ_2 + a_{193}XWZ_1 + a_{213}XWZ_2 + e_{M3})b_{53} \quad (4.6)$$

As a test of hypothesis 3a, ordinary least squares path analysis was used to examine this specific indirect effect operating through perceived importance in the explanation message elements (M_3) while controlling for all other mediators in the statistical model of Y_3 (i.e., return ground beef to the store). A Helmert coding scheme accommodated the three learning preference categories and provided two planned orthogonal contrasts that would be most meaningful for testing hypothesis 3a. The corresponding regression coefficients, standard errors, *p*-values, and model summary information for this conditional indirect effect can be found in Table 4.1.

When learning preferences of internalization and action were contrasted with preferences of explanation and information, the 95% bootstrap confidence interval for the 2 (message variation) x 2 (preexisting state of control) x 2 (learning preference) indirect effect ($a_{193}b_{53\ |\ \text{contrast 1}} = -0.149$, *Boot SE* = 0.09) was entirely below zero (-0.344 to -0.012). When a learning preference of action was contrasted with a preference of internalization, the confidence interval for the 2 (message variation) x 2 (preexisting state of control) x 2 (learning preference) indirect effect ($a_{213}b_{53\ |\ \text{contrast 2}} = 0.041$, *Boot SE* = 0.08) was not entirely above or below zero (-0.103 to 0.224). As an interaction probe, an index of conditional moderated mediation quantified the extent that an IDEA message (relative to a status quo variation) had an indirect impact on the intention to return ground beef to the store (Y_3), when the effect was moderated by receivers' preexisting state of control (W) at given values of learning preference (Z). Among those with a learning preference of explanation or information, the 2 (message variation) x 2 (preexisting state of control) indirect effect ($a_{193}b_{53} |_{Z= \text{Expl\_Info}}$ = 0.154, *Boot SE* = 0.08) was entirely above zero (0.024 to 0.325). This result confirmed that the interacting effect of message variation and receivers' preexisting state of control was dependent on a learning preference of explanation or information. More specifically, among individuals with a learning preference of explanation or information, IDEA message receivers (relative to status quo receivers) with a preexisting state of fear control were significantly more likely to return ground beef to the store (Y_3), $a_{193}b_{53} |_{W = \text{Fear}, Z = \text{Expl\_Info}}$ = 0.128, *Boot SE* = 0.06, 95% *Boot CI* = [0.021, 0.268], compared to IDEA receivers (relative to status quo receivers) with a preexisting state of danger control, $a_{193}b_{53} |_{W = \text{Danger}, Z = \text{Expl\_Info}}$ = -0.026, *Boot SE* = 0.03, 95% *Boot CI* = [-0.101, 0.038].

Among those with a learning preference of internalization, the 2 (message variation) x 2 (preexisting state of control) indirect effect ($a_{193}b_{53} |_{Z = \text{Intern}}$ = -0.016, *Boot SE* = 0.05) was not entirely above or below zero (-0.132 to 0.084). This result confirmed that the interacting effect of message variation and receivers' preexisting state of control was not dependent on a learning preference of internalization. Among those with a learning preference of action, the 2 (message variation) x 2 (preexisting state of control) indirect effect ($a_{193}b_{53} |_{Z = \text{Action}}$ = -0.025, *Boot SE* = 0.06) was not entirely above or below zero (-0.082 to 0.155). This result confirmed that the interacting effect of message variation and receivers' preexisting state of control was not dependent on a learning preference of action. Taken together, the confidence intervals for the indices of moderated-moderated mediation provided evidence of conditional support for a claim (H3a) that an IDEA message (relative to a status quo variation) will have a significantly more positive indirect impact on the intention to return ground beef to the store (Y_3) while the effect is operating through perceived importance in the explanation message elements (M_3), among individuals in a preexisting state of fear control (relative to danger control) with a learning preference of explanation or information.

An index of partial moderated mediation quantified the extent that an IDEA message (relative to a status quo variation) had an indirect impact on the intention to return ground beef to the store (Y_3), when the effect was moderated by receivers' preexisting state of control (W) as learning preference was held constant (Z). As a test of hypothesis 3b, ordinary least squares path analysis was used to examine this conditional and specific indirect effect operating through receivers' perceived importance in the explanation message elements (M_3), while controlling for all other mediators in the statistical model of Y_3 (i.e., return ground beef to the store). The 95% bootstrap confidence interval for the 2 (message variation) x 2 (preexisting state of control) indirect effect ($a_{93}b_{53} = 0.054$, *Boot SE* = 0.04) was not entirely above or below zero (-0.003 to 0.139). The confidence interval for the index of moderated mediation provided no evidence to support a claim (H3b) that an IDEA message (relative to a status quo variation) will have a significantly more positive indirect impact on the intention to return ground beef to the store where it was purchased (Y_3) while the effect is operating through perceived importance in the explanation message elements (M_3), and the effect is moderated by receivers' preexisting state of control (W) as learning preference is held constant (Z).

An index of conditional mediation quantified the extent that an IDEA message (relative to status quo variation) had an indirect impact on the intention to return ground beef to the store (Y_3) when receivers' preexisting state of control and learning preference were held constant. As a test of hypothesis 3c, ordinary least squares path analysis was used to examine this conditional and specific indirect effect operating through receivers' perceived importance in the explanation message elements (M_3) while controlling for all other mediators in the statistical model of Y_3

(i.e., return ground beef to the store). The 95% bootstrap confidence interval for the conditional indirect effect operating through perceived importance in explanation message elements ($a_{13}b_{53}$ = 0.020, *Boot SE* = 0.02) was not entirely above or below zero (-0.008 to 0.060). The confidence interval for the conditional indirect effect provided no evidence to support a claim (H3c) that an IDEA message (relative to a status quo variation) will have a significantly more positive indirect impact on the intention to return ground beef to the store where it was purchased (Y_3) while the effect is operating through perceived importance in the explanation message elements (M_3), and individual differences are held constant (i.e., receivers' preexisting state of control; learning preference).

An index of unconditional mediation quantified the extent that an IDEA message (relative to status quo variation) had an indirect impact on the intention to return ground beef to the store (Y_3) regardless of receivers' individual differences. This unconditional and specific indirect effect operating through receivers' perceived importance in the explanation message elements (M_3) is represented with Equation 4.7:

$$_{X \rightarrow M3}b_{53} = (i_{M3} + a_{13}X + \mathrm{e}_{M3})b_{53} \qquad (4.7)$$

As a test of hypothesis 4, ordinary least squares path analysis was used to examine this specific indirect effect operating through perceived importance in the explanation message elements (M_3) while controlling for all other mediators in the statistical model of Y_3 (i.e., return ground beef to the store). The corresponding regression coefficients, standard errors, *p*-values, and model summary information for this unconditional indirect effect can be found in Table 4.2.The 95% bootstrap confidence interval for the unconditional indirect effect operating through perceived importance in explanation message elements ($a_{13}b_{53}$ = 0.014, *Boot SE* = 0.02) was not entirely above or below zero (-0.012 to 0.051). The confidence interval for the unconditional indirect effect provided no evidence to support a claim (H4) that an IDEA message (relative to a status quo variation) will have a significantly more positive indirect impact on the intention to return ground beef to the store where it was purchased (Y_3) while operating through perceived importance in the explanation message elements (M_3), regardless of receivers' individual differences.

Tailoring hypothesis. This indirect-effect result of the unconditional process analysis (H4) was compared to the indirect-effect results of the conditional process analysis (H3a, H3b, H3c). The data provided no evidence that unconditionally (H4) the IDEA message variation's indirect effect on receivers' intention to return ground beef to the store (Y_3) differed to a statistically significant degree from that of a status quo message variation, while exerting influence through perceived importance in explanation message elements (M_3). The data revealed a statistically significant three-way interaction (H3c) effect involving the message variation, preexisting state of control, and learning preference on receivers' intention to return ground beef to the store (Y_3), while exerting influence through perceived importance in explanation message elements (M_3). Taken together, the data provided evidence of contradictory support for hypothesis 5b, suggesting that the IDEA message (relative to a status quo variation) was not comprehensive enough to address the diversity in receivers' preexisting state of control or learning preference. A conditional process analysis was more appropriate for testing and demonstrating the extent that an IDEA message (relative to a status quo variation) indirectly predicted receivers' self-reported behavioral intention to return ground beef to the store (Y_3), compared to an unconditional process analysis. Thus, tailoring a warning to address receivers' preexisting state of control and learning preference would be necessary.

Information elements. Two indices of moderated-moderated mediation quantified the extent that an IDEA message (relative to a status quo variation) had an indirect impact on the intention to return ground beef to the store (Y_3), when the effect was moderated by receivers' preexisting state of control (W) as a function of learning preference (Z). This conditional and specific indirect effect operating through receivers' perceived importance in the information message elements (M_4) is represented with Equation 4.8:

$$\omega = \theta_{X \rightarrow M4} b_{73} = (i_{M4} + a_{14}X + a_{34}W + a_{54}Z_1 + a_{74}Z_2 + a_{94}XW + a_{114}XZ_1 + a_{134}XZ_2 + a_{154}WZ_1 + a_{174}WZ_2 + a_{194}XWZ_1 + a_{214}XWZ_2 + e_{M4})b_{73} \quad (4.8)$$

As a test of hypothesis 3a, ordinary least squares path analysis was used to examine this specific indirect effect operating through perceived importance in the information message elements (M_4) while controlling for all other mediators in the statistical model of Y_3 (i.e., return ground beef to the store). A Helmert coding scheme accommodated the three learning preference categories and provided two planned orthogonal contrasts that would be most meaningful for testing hypothesis 3a. The corresponding regression coefficients, standard errors, *p*-values, and model summary information for this conditional indirect effect can be found in Table 4.1.

When learning preferences of internalization and action were contrasted with preferences of explanation and information, the 95% bootstrap confidence interval for the 2 (message variation) x 2 (preexisting state of control) x 2 (learning preference) indirect effect ($a_{194}b_{73 \mid \text{contrast 1}} = -0.002$, *Boot SE* = 0.02) was not entirely above or below zero (-0.049 to 0.034). When a learning preference of action was contrasted with a preference of internalization, the confidence interval for the 2 (message variation) x 2 (preexisting state of control) x 2 (learning preference) indirect effect ($a_{214}b_{73 \mid \text{contrast 2}} = 0.003$, *Boot SE* = 0.02) was not entirely above or below zero

(-0.047 to 0.054). Taken together, the confidence intervals for the indices of moderated-moderated mediation provided no evidence to support a claim (H3a) that an IDEA message (relative to a status quo variation) will have a significantly more positive indirect impact on the intention to return ground beef to the store where it was purchased (Y_3) while the effect is operating through perceived importance in the information message elements (M_4), and the effect is moderated by receivers' preexisting state of control as a function of learning preference.

An index of partial moderated mediation quantified the extent that an IDEA message (relative to a status quo variation) had an indirect impact on the intention to return ground beef to the store (Y_3), when the effect was moderated by receivers' preexisting state of control (W) as learning preference was held constant (Z). As a test of hypothesis 3b, ordinary least squares path analysis was used to examine this conditional and specific indirect effect operating through receivers' perceived importance in the information message elements (M_4), while controlling for all other mediators in the statistical model of Y_3 (i.e., return ground beef to the store). The 95% bootstrap confidence interval for the 2 (message variation) x 2 (preexisting state of control) indirect effect ($a_{94}b_{73}$ = 0.001, *Boot SE* = 0.01) was not entirely above or below zero (-0.020 to 0.019). The confidence interval for the index of moderated mediation provided no evidence to support a claim (H3b) that an IDEA message (relative to a status quo variation) will have a significantly more positive indirect impact on the intention to return ground beef to the store where it was purchased (Y_3) while the effect is operating through perceived importance in the information message elements (M_4), and the effect is moderated by receivers' preexisting state of control (W) as learning preference is held constant (Z).

An index of conditional mediation quantified the extent that an IDEA message (relative to status quo variation) had an indirect impact on the intention to return ground beef to the store

(Y_3) when receivers' preexisting state of control and learning preference were held constant. As a test of hypothesis 3c, ordinary least squares path analysis was used to examine this conditional and specific indirect effect operating through receivers' perceived importance in the information message elements (M_4) while controlling for all other mediators in the statistical model of Y_3 (i.e., return ground beef to the store). The 95% bootstrap confidence interval for the conditional indirect effect operating through perceived importance in information message elements ($a_{14}b_{73}$= -0.004, *Boot SE* = 0.01) was not entirely above or below zero (-0.024 to 0.012). The confidence interval for the conditional indirect effect provided evidence to support a claim (H3c) could not be made that an IDEA message (relative to a status quo variation) will have a significantly more positive indirect impact on the intention to return ground beef to the store where it was purchased (Y_3) while the effect is operating through perceived importance in the information message elements (M_4), and individual differences are held constant (i.e., receivers' preexisting state of control, learning preference).

An index of unconditional mediation quantified the extent that an IDEA message (relative to status quo variation) had an indirect impact on the intention to return ground beef to the store (Y_3) regardless of receivers' individual differences. This unconditional and specific indirect effect operating through receivers' perceived importance in the information message elements (M_4) is represented with Equation 4.9:

$$_{X\rightarrow M4}b_{73} = (i_{M4} + a_{14}X + \mathrm{e}_{M4})b_{73} \qquad (4.9)$$

As a test of hypothesis 4, ordinary least squares path analysis was used to examine this specific indirect effect operating through perceived importance in the information message elements (M_4) while controlling for all other mediators in the statistical model of Y_3 (i.e., return ground beef to the store). The corresponding regression coefficients, standard errors, *p*-values, and model summary information for this unconditional indirect effect can be found in Table 4.2. The 95% bootstrap confidence interval for the unconditional indirect effect operating through perceived importance in information message elements ($a_{14}b_{73}$ = -0.006, *Boot SE* = 0.01) was not entirely above or below zero (-0.028 to 0.010). The confidence interval for the unconditional indirect effect provided no evidence to support a claim (H4) that an IDEA message (relative to a status quo variation) will have a significantly more positive indirect impact on the intention to return ground beef to the store where it was purchased (Y_3) while the effect is operating through perceived importance in the information message elements (M_4), regardless of receivers' individual differences.

Tailoring hypothesis. This indirect-effect result of the unconditional process analysis (H4) was compared to the indirect-effect results of the conditional process analysis (H3a, H3b, H3c). The data provided no evidence that unconditionally (H4) the IDEA message variation's indirect effect on receivers' intention to return ground beef to the store (Y_3) differed to a statistically significant degree from that of a status quo message variation, while exerting influence through perceived importance in information message elements (M_4). The data provided no evidence of statistically significant interaction effects involving the message variation on receivers' intention to return ground beef to the store (Y_3), while exerting influence through perceived importance in information message elements (M_4). Taken together, the data provided no evidence to support a claim (H5b) that an unconditional process analysis was more appropriate for testing and demonstrating the comprehensiveness of an IDEA message (relative to a status quo variation) to indirectly predict receivers' self-reported behavioral intention to return ground beef to the store (Y_3), compared to a conditional process analysis.

Action elements. Two indices of moderated-moderated mediation quantified the extent that an IDEA message (relative to a status quo variation) had an indirect impact on the intention to return ground beef to the store (Y_3), when the effect was moderated by receivers' preexisting state of control (W) as a function of learning preference (Z). This conditional and specific indirect effect operating through receivers' perceived importance in the action message elements (M_5) is represented with Equation 4.10:

$$\omega = \theta_{X \rightarrow M5} b_{93} = (i_{M5} + a_{15}X + a_{35}W + a_{55}Z_1 + a_{75}Z_2 + a_{95}XW + a_{115}XZ_1 + a_{135}XZ_2 + a_{155}WZ_1 + a_{175}WZ_2 + a_{195}XWZ_1 + a_{215}XWZ_2 + e_{M5})b_{93} \quad (4.10)$$

As a test of hypothesis 3a, ordinary least squares path analysis was used to examine this specific indirect effect operating through perceived importance in the action message elements (M_5) while controlling for all other mediators in the statistical model of Y_3 (i.e., return ground beef to the store). A Helmert coding scheme accommodated the three learning preference categories and provided two planned orthogonal contrasts that would be most meaningful for testing hypothesis 3a. The corresponding regression coefficients, standard errors, *p*-values, and model summary information for this conditional indirect effect can be found in Table 4.1.

When learning preferences of internalization and action were contrasted with preferences of explanation and information, the 95% bootstrap confidence interval for the 2 (message variation) x 2 (preexisting state of control) x 2 (learning preference) indirect effect ($a_{195}b_{93\ |\ \text{contrast 1}} = 0.018$, *Boot SE* = 0.04) was not entirely above or below zero (-0.049 to 0.127). When a learning preference of action was contrasted with a preference of internalization, the confidence interval for the 2 (message variation) x 2 (preexisting state of control) x 2 (learning preference) indirect effect ($a_{215}b_{93\ |\ \text{contrast 2}} = 0.033$, *Boot SE* = 0.06) was not entirely above or below zero

(-0.075 to 0.166). Taken together, the confidence intervals for the indices of moderated-moderated mediation provided evidence to support a claim (H3a) that an IDEA message (relative to a status quo variation) will have a significantly more positive indirect impact on the intention to return ground beef to the store where it was purchased (Y_3) while the effect is operating through perceived importance in the action message elements (M_5), and the effect is moderated by receivers' preexisting state of control as a function of learning preference.

An index of partial moderated mediation quantified the extent that an IDEA message (relative to a status quo variation) had an indirect impact on the intention to return ground beef to the store (Y_3), when the effect was moderated by receivers' preexisting state of control (W) as learning preference was held constant (Z). As a test of hypothesis 3b, ordinary least squares path analysis was used to examine this conditional and specific indirect effect operating through receivers' perceived importance in the action message elements (M_5), while controlling for all other mediators in the statistical model of Y_3 (i.e., return ground beef to the store). The 95% bootstrap confidence interval for the 2 (message variation) x 2 (preexisting state of control) indirect effect ($a_{95}b_{93}$ = -0.004, *Boot SE* = 0.02) was not entirely above or below zero (-0.043 to 0.024). The confidence interval for the index of moderated mediation provided no evidence to support a claim (H3b) that an IDEA message (relative to a status quo variation) will have a significantly more positive indirect impact on the intention to return ground beef to the store where it was purchased (Y_3) while the effect is operating through perceived importance in the action message elements (M_5), and the effect is moderated by receivers' preexisting state of control (W) as learning preference is held constant (Z).

An index of conditional mediation quantified the extent that an IDEA message (relative to status quo variation) had an indirect impact on the intention to return ground beef to the store where it was purchased (Y_3) when receivers' preexisting state of control and learning preference were held constant. As a test of hypothesis 3c, ordinary least squares path analysis was used to examine this conditional and specific indirect effect operating through receivers' perceived importance in the action message elements (M_5) while controlling for all other mediators in the statistical model of Y_3 (i.e., return ground beef to the store). The 95% bootstrap confidence interval for the conditional indirect effect operating through perceived importance in action message elements ($a_{15}b_{93}$ = 0.003, *Boot SE* = 0.01) was not entirely above or below zero (-0.013 to 0.023). The confidence interval for the conditional indirect effect provided no evidence to support a claim (H3c) that an IDEA message (relative to a status quo variation) will have a significantly more positive indirect impact on the intention to return ground beef to the store where it was purchased (Y_3) while the effect is operating through perceived importance in the action message elements (M_5), and individual differences are held constant (i.e., receivers' preexisting state of control, learning preference).

An index of unconditional mediation quantified the extent that an IDEA message (relative to status quo variation) had an indirect impact on the intention to return ground beef to the store (Y_3) regardless of receivers' individual differences. This unconditional and specific indirect effect operating through receivers' perceived importance in the action message elements (M_5) is represented with Equation 4.11:

$$_{X \rightarrow M5}b_{93} = (i_{M5} + a_{15}X + \mathrm{e}_{M5})b_{93} \quad (4.11)$$

As a test of hypothesis 4, ordinary least squares path analysis was used to examine this specific indirect effect operating through perceived importance in the action message elements (M_5) while controlling for all other mediators in the statistical model of Y_3 (i.e., return ground beef to the store). The corresponding regression coefficients, standard errors, *p*-values, and model summary information for this unconditional indirect effect can be found in Table 4.2.The 95% bootstrap confidence interval for the unconditional indirect effect operating through perceived importance in the action message elements ($a_{15}b_{93}$ = 0.004, *Boot SE* = 0.01) was not entirely above or below zero (-0.012 to 0.025). The confidence interval for the unconditional indirect effect provided no evidence to support a claim (H4) that an IDEA message (relative to a status quo variation) will have a significantly more positive indirect impact on the intention to return ground beef to the store where it was purchased (Y_3) while the effect is operating through perceived importance in the action message elements (M_5), regardless of receivers' individual differences.

Tailoring hypothesis. This indirect-effect result of the unconditional process analysis (H4) was compared to the indirect-effect results of the conditional process analysis (H3a, H3b, H3c). The data provided no evidence that unconditionally (H4) the IDEA message variation's indirect effect on receivers' intention to return ground beef to the store (Y_3) differed to a statistically significant degree from that of a status quo message variation, while exerting influence through perceived importance in action message elements (M_5). The data provided no evidence of statistically significant interaction effects involving the message variation on receivers' intention to return ground beef to the store (Y_3), while exerting influence through perceived importance in action message elements (M_5). Taken together, the data provided no evidence to support a claim (H5b) that an unconditional process analysis was more appropriate for testing and demonstrating the comprehensiveness of an IDEA message (relative to a status quo variation) to indirectly predict receivers' self-reported behavioral intention to return ground beef to the store (Y_3), compared to a conditional process analysis.

Message effectiveness. Two indices of moderated-moderated mediation quantified the extent that an IDEA message (relative to a status quo variation) had an indirect impact on the intention to return ground beef to the store (Y_3), when the effect was moderated by receivers' preexisting state of control (W) as a function of learning preference (Z). This conditional and specific indirect effect operating through receivers' perceived effectiveness in the message viewed (M_6) is represented with Equation 4.12:

$$\omega = \theta_{X \rightarrow M6} b_{113} = (i_{M6} + a_{16}X + a_{36}W + a_{56}Z_1 + a_{76}Z_2 + a_{96}XW + a_{116}XZ_1 + a_{136}XZ_2 + a_{156}WZ_1 + a_{176}WZ_2 + a_{196}XWZ_1 + a_{216}XWZ_2 + e_{M6})b_{113} \quad (4.12)$$

As a test of hypothesis 3a, ordinary least squares path analysis was used to examine this specific indirect effect operating through perceived importance in perceived message effectiveness (M_6) while controlling for all other mediators in the statistical model of Y_3 (i.e., return ground beef to the store). A Helmert coding scheme accommodated the three learning preference categories and provided two planned orthogonal contrasts that would be most meaningful for testing hypothesis 3a. The corresponding regression coefficients, standard errors, *p*-values, and model summary information for this conditional indirect effect can be found in Table 4.1.

When learning preferences of internalization and action were contrasted with preferences of explanation and information, the 95% bootstrap confidence interval for the 2 (message variation) x 2 (preexisting state of control) x 2 (learning preference) indirect effect ($a_{196}b_{113\,|\,\text{contrast 1}} = -0.054$, *Boot SE* = 0.11) was not entirely above or below zero (-0.273 to 0.167). When a learning preference of action was contrasted with a preference of internalization, the confidence interval for the 2 (message variation) x 2 (preexisting state of control) x 2 (learning preference) indirect effect ($a_{216}b_{113\,|\,\text{contrast 2}} = -0.046$, *Boot SE* = 0.13) was not entirely above or below zero (-0.318 to 0.228). Taken together, the confidence intervals for the indices of moderated-

moderated mediation provided no evidence to support a claim (H3a) that an IDEA message (relative to a status quo variation) will have a significantly more positive indirect impact on the intention to return ground beef to the store where it was purchased (Y_3) while the effect is operating through perceived message effectiveness (M_6), and the effect is moderated by receivers' preexisting state of control as a function of learning preference.

An index of partial moderated mediation quantified the extent that an IDEA message (relative to a status quo variation) had an indirect impact on the intention to return ground beef to the store (Y_3), when the effect was moderated by receivers' preexisting state of control (W) as learning preference was held constant (Z). As a test of hypothesis 3b, ordinary least squares path analysis was used to examine this conditional and specific indirect effect operating through receivers' perceived message effectiveness (M_6), while controlling for all other mediators in the statistical model of Y_3 (i.e., return ground beef to the store). The 95% bootstrap confidence interval for the 2 (message variation) x 2 (preexisting state of control) indirect effect ($a_{96}b_{113}$ = 0.123, *Boot SE* = 0.06) was entirely above zero (0.016 to 0.253).

As can be seen in Figure 4.3, IDEA message receivers (relative to status quo receivers) with a preexisting state of fear control were significantly more likely to return ground beef to the store (Y_3), $a_{96}b_{113}\,|_{W = \text{Fear}}$ = 0.119, *Boot SE* = 0.05, 95% *Boot CI* = [0.037, 0.218], compared to IDEA receivers (relative to status quo receivers) with a preexisting state of danger control, $a_{96}b_{113}\,|_{W = \text{Danger}}$ = -0.004, *Boot SE* = 0.04, 95% *Boot CI* = [-0.079, 0.063] when learning preference was held constant. The confidence interval for the index of moderated mediation provided evidence to support a claim (H3b) that an IDEA message (relative to a status quo variation) will have a significantly more positive indirect impact on the intention to return ground beef to the store where it was purchased (Y_3) while the effect is operating through perceived message effectiveness (M_6) among individuals with preexisting state of fear control (relative to danger control) when learning preference is held constant.

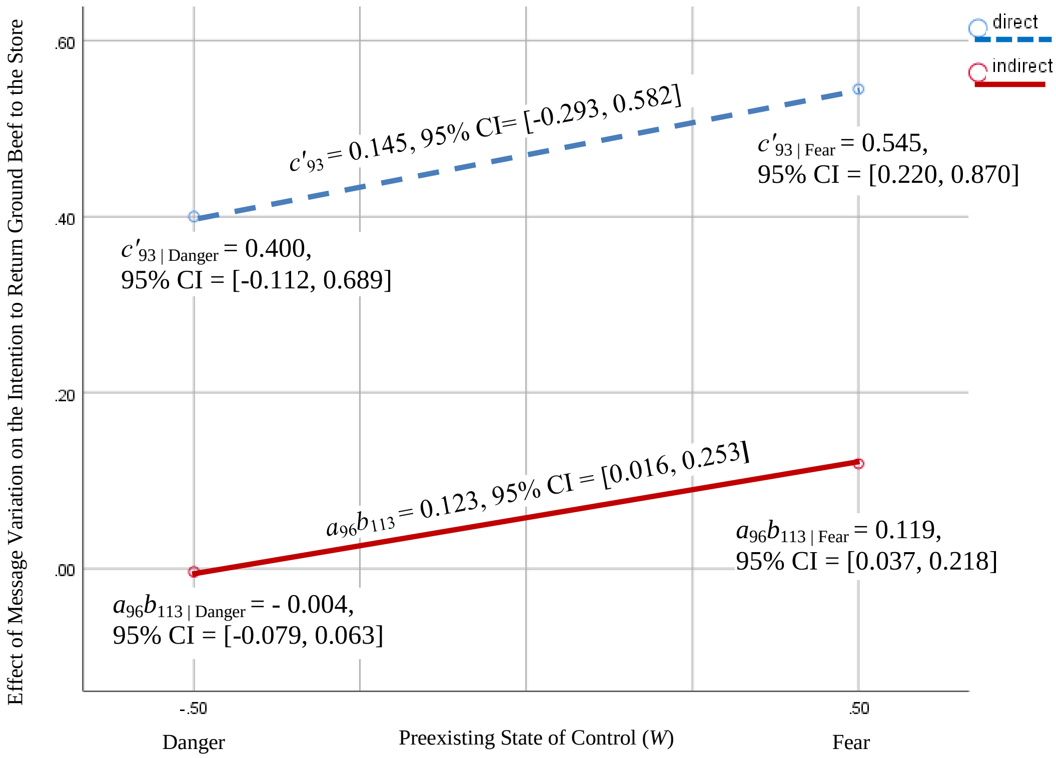

Figure 4.3. Conditional direct and indirect effect of message variation on the intention to return ground beef to the store, mediated by perceived message effectiveness, moderated by preexisting state of control when learning preference is held constant.

An index of conditional mediation quantified the extent that an IDEA message (relative to status quo variation) had an indirect impact on the intention to return ground beef to the store (Y_3) when receivers' preexisting state of control and learning preference were held constant. As a test of hypothesis 3c, ordinary least squares path analysis was used to examine this conditional and specific indirect effect operating through receivers' perceived message effectiveness (M_6) while controlling for all other mediators in the statistical model of Y_3 (i.e., return ground beef to the store). The 95% bootstrap confidence interval for the conditional indirect effect operating through perceived message effectiveness ($a_{16}b_{113}$ = 0.058, *Boot SE* = 0.03) was entirely above zero (0.005 to 0.116). The confidence interval for the conditional indirect effect provided evidence to support a claim (H3c) that and IDEA message (relative to a status quo variation) will have a significantly more positive indirect impact on the intention to return ground beef to the store where it was purchased (Y_3) while the effect is operating through perceived message effectiveness (M_6), and individual differences are held constant (i.e., receivers' preexisting state of control, learning preference).

An index of unconditional mediation quantified the extent that an IDEA message (relative to status quo variation) had an indirect impact on the intention to return ground beef to the store (Y_3) regardless of receivers' individual differences. This unconditional and specific indirect effect operating through receivers' perceived message effectiveness (M_6) is represented with Equation 4.13:

$$_{X \rightarrow M6}b_{113} = (i_{M6} + a_{16}X + \mathrm{e}_{M6})b_{113} \tag{4.13}$$

As a test of hypothesis 4, ordinary least squares path analysis was used to examine this specific indirect effect operating through perceived message effectiveness (M_6) while controlling for all other mediators in the statistical model of Y_3 (i.e., return ground beef to the store). The corresponding regression coefficients, standard errors, *p*-values, and model summary information for this unconditional indirect effect can be found in Table 4.2. The 95% bootstrap confidence interval for the unconditional indirect effect operating through perceived message effectiveness ($a_{16}b_{113}$ = 0.047, *Boot SE* = 0.03) was not entirely above or below zero (-0.006 to 0.103). The confidence interval for the unconditional indirect effect provided no evidence to support a claim (H4) that an IDEA message (relative to a status quo variation) will have a significantly more positive indirect impact on the intention to return ground beef to the store where it was purchased (Y_3) while the effect is operating through perceived message effectiveness (M_6), regardless of receivers' individual differences.

Tailoring hypothesis. This indirect-effect result of the unconditional process analysis (H4) was compared to the indirect-effect results of the conditional process analysis (H3a, H3b, H3c). The data provided no evidence that unconditionally (H4) the IDEA message variation's indirect effect on receivers' intention to return ground beef to the store (Y_3) differed to a statistically significant degree from that of a status quo message variation, while exerting influence through perceived message effectiveness (M_6). The data revealed a statistically significant two-way interaction (H3b) effect involving the message variation and preexisting state of control on receivers' intention to return ground beef to the store (Y_3), while exerting influence through perceived message effectiveness (M_6). Taken together, the data provided evidence of contradictory support for hypothesis 5b, suggesting that the IDEA message (relative to a status quo variation) was not comprehensive enough to address the diversity in receivers' preexisting state of control. A conditional process analysis was more appropriate for testing and demonstrating the extent that an IDEA message (relative to a status quo variation) indirectly predicted receivers' self-reported behavioral intention to return ground beef to the store (Y_3), compared to an unconditional process analysis. Thus, tailoring a warning to address receivers' preexisting state of control would be necessary.

Avoid Eating Ground Beef When Dining Out

Direct Effects

Two indices of moderated-moderation quantified the extent that an IDEA message (relative to a status quo variation) had a direct impact on the intention to avoid eating ground beef when dining out (Y_4), when the effect was moderated by receivers' preexisting state of control (W) as a function of learning preference (Z). This conditional and specific direct effect is represented with Equation 4.14:

$$\omega = \theta_{X \rightarrow Y4} = (i_{Y4} + c'_{14}X + c'_{34}W + c'_{54}Z_1 + c'_{74}Z_2 + c'_{94}XW + c'_{114}XZ_1 + c'_{134}XZ_2 + c'_{154}WZ_1 + c'_{174}WZ_2 + c'_{194}XWZ_1 + c'_{214}XWZ_2 + b_{14} + b_{34} + b_{54} + b_{74} + b_{94} + b_{114} + e_{Y4}) \quad (4.14)$$

As a test of hypothesis 1a, ordinary least squares path analysis was used to examine this specific direct effect independent of all indirect effects in the statistical model of Y_4 (i.e., avoid eating ground beef). A Helmert coding scheme accommodated the three learning preference categories and provided two planned orthogonal contrasts that would be most meaningful for testing hypothesis 1a. In the conditional model (see Figure 4.1), message variation, preexisting state of control, learning preference, their interactions, and the direct effects of the six parallel mediators ($M_{1\text{-}6}$) accounted for approximately 17% of the total variance in receivers' intention to avoid eating ground beef (Y_4), $\Delta R^2 = 0.173$, $F(17{,}623) = 8.27$, $p < .0001$. The corresponding regression coefficients, standard errors, *p*-values, and model summary information for this conditional direct effect can be found in Table 4.1.

When learning preferences of internalization and action were contrasted with preferences of explanation and information, the 95% bootstrap confidence interval for the 2 (message variation) x 2 (preexisting state of control) x 2 (learning preference) direct effect ($c'_{194\,|\,\text{contrast 1}} = -0.137$, *Boot SE* = 0.39) was not entirely above or below zero (-0.896 to 0.623). When a learning preference of action was contrasted with a preference of internalization, the confidence interval for the 2 (message variation) x 2 (preexisting state of control) x 2 (learning preference) effect ($c'_{214\,|\,\text{contrast 2}} = -0.121$, *Boot SE* = 0.43) was not entirely above or below zero (-0.956 to 0.713). Taken together, the confidence intervals for the indices of moderated-moderation provided no evidence to support a claim (H1a) that an IDEA message (relative to a status quo variation) will have a significantly more positive direct impact on the intention to avoid eating ground beef (Y_4), when the effect is moderated by receivers' preexisting state of control as a function of learning preference.

An index of partial moderation quantified the extent that an IDEA message (relative to a status quo variation) had a direct impact on the intention to avoid eating ground beef (Y_4), when the effect was moderated by receivers' preexisting state of control (W) as learning preference was held constant (Z). As a test of hypothesis 1b, ordinary least squares path analysis was used to examine this specific direct effect independent of all indirect effects in the statistical model of Y_4 (i.e., avoid eating ground beef). The 95% bootstrap confidence interval for the 2 (message variation) x 2 (preexisting state of control) direct effect (c'_{94} = -0.027, *Boot SE* = 0.18) was not entirely above or below zero (-0.377 to 0.324). The confidence interval for partial moderation provided no evidence to support a claim (H1b) that an IDEA message (relative to a status quo variation) will have a significantly more positive direct impact on the intention to avoid eating ground beef (Y_4), when the effect is moderated by receivers' preexisting state of control (W) as learning preference is held constant (Z).

An index of conditional direct effect quantified the extent that an IDEA message (relative to status quo variation) had a direct impact on the intention to avoid eating ground beef (Y_4) when receivers' preexisting state of control and learning preference were held constant. As a test of hypothesis 1c, ordinary least squares path analysis was used to examine this specific direct effect independent of all indirect effects in the statistical model of Y_4 (i.e., avoid eating ground beef). The 95% bootstrap confidence interval for the conditional direct effect (c'_{14} = 0.031, *Boot SE* = 0.09) was not entirely above or below zero (-0.143 to 0.204). The confidence interval for the conditional direct effect provided no evidence to support a claim (H1c) that an IDEA message (relative to a status quo variation) will have a significantly more positive direct impact on the intention to avoid eating ground beef (Y_4), when individual differences are held constant (i.e., receivers' preexisting state of control, learning preference).

An index of unconditional direct effect quantified the extent that an IDEA message (relative to status quo variation) had a direct impact on the intention to avoid eating ground beef (Y_4), regardless of receivers' individual differences. In the unconditional model (see Figure 4.2), message variation and six parallel mediators ($M_{1\text{-}6}$) accounted for approximately 16% of the total variance in receivers' intention to avoid eating ground beef Y_4), $\Delta R^2 = 0.159$, $F(7{,}633) = 17.94$, $p < .0001$. As a test of hypothesis 2, ordinary least squares path analysis was used to examine this specific direct effect independent of all indirect effects in the statistical model of Y_4 (i.e., avoid ground beef consumption). The corresponding regression coefficients, standard errors, *p*-values, and model summary information for message variation's unconditional direct effect can be found in Table 4.2.The 95% bootstrap confidence interval for the unconditional direct effect ($c'_{14}= 0.038$, *Boot SE* = 0.08, $t = 0.46$, $p = .649$) was not entirely above or below zero (-0.126 to 0.202). The confidence interval for the unconditional direct effect provided no evidence to support a claim (H2) that an IDEA message (relative to a status quo variation) will have a significantly more positive direct impact on the intention to avoid eating ground beef (Y_4), regardless of receivers' individual differences.

Tailoring hypothesis. This direct-effect result of the unconditional process analysis (H2) was compared to the direct-effect results of the conditional process analysis (H1a, H1b, H1c). The data provided no evidence that unconditionally (H2) the IDEA message variation's indirect effect on receivers' intention to avoid eating ground beef when dining out (Y_4) differed to a statistically significant degree from that of a status quo message variation. The data provided no evidence of statistically significant interaction effects involving the message variation on receivers' intention to avoid eating ground beef when dining out (Y_4). Taken together, the data provided no evidence to support a claim (H51) that an unconditional process analysis was more appropriate for testing and demonstrating the comprehensiveness of an IDEA message (relative to a status quo variation) to directly predict receivers' self-reported behavioral intention to avoid ground beef when dining out (Y_4), compared to a conditional process analysis.

Indirect Effects

Danger control. Two indices of moderated-moderated mediation quantified the extent that an IDEA message (relative to a status quo variation) had an indirect impact on the intention to avoid eating ground beef (Y_4), when the effect was moderated by receivers' preexisting state of control (W) as a function of learning preference (Z). This conditional and specific indirect effect operating through receivers' perceived danger control (M_1) is represented with Equation 4.15:

$$\omega = \theta_{X \rightarrow M1} b_{14} = (i_{M1} + a_{11}X + a_{31}W + a_{51}Z_1 + a_{71}Z_2 + a_{91}XW + a_{111}XZ_1 + a_{131}XZ_2 + a_{151}WZ_1 + a_{171}WZ_2 + a_{191}XWZ_1 + a_{211}XWZ_2 + e_{M1})b_{14} \tag{4.15}$$

As a test of hypothesis 3a, ordinary least squares path analysis was used to examine this specific indirect effect operating through perceived danger control (M_1) while controlling for all other mediators in the statistical model of Y_4 (i.e., avoid eating ground beef). A Helmert coding scheme accommodated the three learning preference categories and provided two planned orthogonal contrasts that would be most meaningful for testing hypothesis 3a. The corresponding regression coefficients, standard errors, *p*-values, and model summary information for this conditional indirect effect can be found in Table 4.1.

When learning preferences of internalization and action were contrasted with preferences of explanation and information, the 95% bootstrap confidence interval for the 2 (message variation) x 2 (preexisting state of control) x 2 (learning preference) indirect effect ($a_{191}b_{14\,|\,\text{contrast 1}}$ = -0.002, *Boot SE* = 0.04) was not entirely above or below zero (-0.080 to 0.067). When a learning preference of action was contrasted with a preference of internalization, the confidence interval for the 2 (message variation) x 2 (preexisting state of control) x 2 (learning preference) indirect effect ($a_{211}b_{14\,|\,\text{contrast 2}}$ = 0.017, *Boot SE* = 0.04) was not entirely above or below zero (-0.061 to 0.103). Taken together, the confidence intervals for the indices of moderated-moderated mediation provided no evidence to support a claim (H3a) that an IDEA message (relative to a status quo variation) will have a significantly more positive indirect impact on the intention to avoid eating ground beef when dining out (Y_4) while the effect is operating through perceived danger control (M_1), and the effect is moderated by receivers' preexisting state of control as a function of learning preference.

An index of partial moderated mediation quantified the extent that an IDEA message (relative to a status quo variation) had an indirect impact on the intention to avoid eating ground beef when dining out (Y_4), when the effect was moderated by receivers' preexisting state of control (W) as learning preference was held constant (Z). As a test of hypothesis 3b, ordinary least squares path analysis was used to examine this conditional and specific indirect effect operating through receivers' perceived danger control (M_1), while controlling for all other mediators in the statistical model of Y_4 (i.e., avoid eating ground beef). The 95% bootstrap confidence interval for the 2 (message variation) x 2 (preexisting state of control) indirect effect ($a_{91}b_{14}$ = 0.014, *Boot SE* = 0.02) was not entirely above or below zero (-0.016 to 0.055). The confidence interval for the index of moderated mediation provided no evidence to support a claim (H3b) that an IDEA message (relative to a status quo variation) will have a significantly more positive indirect impact on the intention to avoid eating ground beef when dining out (Y_4)

while the effect is operating through perceived danger control (M_1), and the effect is moderated by receivers' preexisting state of control (W) as learning preference is held constant (Z).

An index of conditional mediation quantified the extent that an IDEA message (relative to status quo variation) had an indirect impact on the intention to avoid eating ground beef (Y_4) when receivers' preexisting state of control and learning preference were held constant. As a test of hypothesis 3c, ordinary least squares path analysis was used to examine this conditional and specific indirect effect operating through receivers' perceived danger control (M_1) while controlling for all other mediators in the statistical model of Y_4 (i.e., avoid eating ground beef). The 95% bootstrap confidence interval for the conditional indirect effect operating through perceived danger control ($a_{11}b_{14}$ = 0.017, *Boot SE* = 0.01) was not entirely above or below zero (0.000 to 0.045). The confidence interval for the conditional indirect effect provided no evidence to support a claim (H3c) that an IDEA message (relative to a status quo variation) will have a significantly more positive indirect impact on the intention to avoid eating ground beef (Y_4) while the effect is operating through perceived danger control (M_1), and the individual differences are held constant (i.e., receivers' preexisting state of control, learning preference).

An index of unconditional mediation quantified the extent that an IDEA message (relative to status quo variation) had an indirect impact on the intention to avoid eating ground beef when dining out (Y_4) regardless of receivers' individual differences. This unconditional and specific indirect effect operating through receivers' perceived danger control (M_1) is represented with Equation 4.16:

$$ {}_{X\rightarrow M1}b_{14} = (i_{M1} + a_{11}X + \mathrm{e}_{M1})b_{14} \tag{4.16}$$

As a test of hypothesis 4, ordinary least squares path analysis was used to examine this specific indirect effect operating through perceived danger control (M_1) while controlling for all other mediators in the statistical model of Y_4 (i.e., avoid eating ground beef). The corresponding regression coefficients, standard errors, *p*-values, and model summary information for this unconditional indirect effect can be found in Table 4.2. The 95% bootstrap confidence interval for the unconditional indirect effect operating through perceived danger control ($a_{11}b_{14}$ = 0.012, *Boot SE* = 0.01) was not entirely above or below zero (-0.002 to 0.038). The confidence interval for the unconditional indirect effect provided evidence to support a claim (H4) that an IDEA message (relative to a status quo variation) will have a significantly more positive indirect impact on the intention to avoid eating ground beef when dining out (Y_4) while the effect is operating through perceived danger control (M_1), regardless of receivers' individual differences.

Tailoring hypothesis. This indirect-effect result of the unconditional process analysis (H4) was compared to the indirect-effect results of the conditional process analysis (H3a, H3b, H3c). The data provided no evidence that unconditionally (H4) the IDEA message variation's indirect effect on receivers' intention to avoid eating ground beef when dining out (Y_4) differed to a statistically significant degree from that of a status quo message variation, while exerting influence through perceived danger control (M_1). The data provided no evidence of statistically significant interaction effects involving the message variation on receivers' intention to avoid eating ground beef when dining out (Y_4), while exerting influence through perceived danger control (M_1). Taken together, the data provided no evidence to support a claim (H5b) that an unconditional process analysis was more appropriate for testing and demonstrating the comprehensiveness of an IDEA message (relative to a status quo variation) to indirectly predict receivers' self-reported behavioral intention to return ground beef to the store (Y_3), compared to a conditional process analysis.

Internalization elements. Two indices of moderated-moderated mediation quantified the extent that an IDEA message (relative to a status quo variation) had an indirect impact on the intention to avoid eating ground beef when dining out (Y_4), when the effect was moderated by receivers' preexisting state of control (W) as a function of learning preference (Z). This conditional and specific indirect effect operating through receivers' perceived importance in the internalization message elements (M_2) is represented with Equation 4.17:

$$\omega = \theta_{X \rightarrow M2} b_{34} = (i_{M2} + a_{12}X + a_{32}W + a_{52}Z_1 + a_{72}Z_2 + a_{92}XW + a_{112}XZ_1$$

$$+ a_{132}XZ_2 + a_{152}WZ_1 + a_{172}WZ_2 + a_{192}XWZ_1 + a_{212}XWZ_2 + e_{M2})b_{34} \quad (4.17)$$

As a test of hypothesis 3a, ordinary least squares path analysis was used to examine this specific indirect effect operating through perceived importance in the internalization message elements (M_2) while controlling for all other mediators in the statistical model of Y_4 (i.e., avoid eating ground beef). A Helmert coding scheme accommodated the three learning preference categories and provided two planned orthogonal contrasts that would be most meaningful for testing hypothesis 3a. The corresponding regression coefficients, standard errors, *p*-values, and model summary information for this conditional indirect effect can be found in Table 4.1.

When learning preferences of internalization and action were contrasted with preferences of explanation and information, the 95% bootstrap confidence interval for the 2 (message variation) x 2 (preexisting state of control) x 2 (learning preference) indirect effect ($a_{192}b_{34\,|\,\text{contrast 1}} = -0.029$, *Boot SE* = 0.07) was not entirely above or below zero (-0.189 to 0.107). When a learning preference of action was contrasted with a preference of internalization, the confidence interval for the 2 (message variation) x 2 (preexisting state of control) x 2 (learning preference) indirect effect ($a_{212}b_{34\,|\,\text{contrast 2}} = -0.011$, *Boot SE* = 0.08) was not entirely above or below zero (-0.172 to 0.147). Taken together, the confidence intervals for the indices of moderated-

moderated mediation provided no evidence to support a claim (H3a) that an IDEA message (relative to a status quo variation) will have a significantly more positive indirect impact on the intention to avoid eating ground beef when dining out (Y_4) while the effect is operating through perceived importance in the internalization message elements (M_2), and the effect is moderated by receivers' preexisting state of control as a function of learning preference.

An index of partial moderated mediation quantified the extent that an IDEA message (relative to a status quo variation) message variation had an indirect impact on the intention to avoid eating ground beef when dining out (Y_4), when the effect was moderated by receivers' preexisting state of control (*W*) as learning preference was held constant (*Z*). As a test of hypothesis 3b, ordinary least squares path analysis was used to examine this conditional and specific indirect effect operating through receivers' perceived importance in the internalization message elements (M_2), while controlling for all other mediators in the statistical model of Y_4 (i.e., avoid eating ground beef). The 95% bootstrap confidence interval for the 2 (message variation) x 2 (preexisting state of control) indirect effect ($a_{92}b_{34}$ = 0.070, *Boot SE* = 0.04) was not entirely above or below zero (-0.004 to 0.167). The confidence interval for the index of moderated mediation provided no evidence to support a claim (H3b) that an IDEA message (relative to a status quo variation) will have a significantly more positive indirect impact on the intention to avoid eating ground beef when dining out (Y_4) while the effect is operating through perceived importance in the internalization message elements (M_2), and the effect is moderated by receivers' preexisting state of control (*W*) as learning preference is held constant (*Z*).

An index of conditional mediation quantified the extent that an IDEA message (relative to status quo variation) had an indirect impact on the intention to avoid eating ground beef when dining out (Y_4) when receivers' preexisting state of control and learning preference were held constant. As a test of hypothesis 3c, ordinary least squares path analysis was used to examine this conditional and specific indirect effect operating through receivers' perceived importance in the internalization message elements (M_2) while controlling for all other mediators in the statistical model of Y_4 (i.e., avoid eating ground beef). The 95% bootstrap confidence interval for the conditional indirect effect operating through perceived importance in internalization message elements ($a_{12}b_{34}$ = 0.014, *Boot SE* = 0.02) was not entirely above or below zero (-0.017 to 0.054). The confidence interval for the conditional indirect effect provided no evidence to support a claim (H3c) that an IDEA message (relative to a status quo variation) will have a significantly more positive indirect impact on the intention to avoid eating ground beef when dining out (Y_4) while the effect is operating through perceived importance in the internalization message elements (M_2), and individual differences are held constant (i.e., receivers' preexisting state of control, learning preference).

An index of unconditional mediation quantified the extent that an IDEA message (relative to status quo variation) had an indirect impact on the intention to avoid eating ground beef (Y_4) regardless of receivers' individual differences. This unconditional and specific indirect effect operating through receivers' perceived importance in the internalization message elements (M_2) is represented with Equation 4.18:

$$_{X\rightarrow M2}b_{34} = (i_{M2} + a_{12}X + e_{M2})b_{34} \quad (4.18)$$

As a test of hypothesis 4, ordinary least squares path analysis was used to examine this specific indirect effect operating through perceived importance in the internalization message elements (M_2) while controlling for all other mediators in the statistical model of Y_4 (i.e., avoid eating ground beef). The corresponding regression coefficients, standard errors, *p*-values, and model summary information for this unconditional indirect effect can be found in Table 4.2. The 95%

bootstrap confidence interval for the unconditional indirect effect operating through perceived importance in internalization message elements ($a_{12}b_{34}$ = 0.007, *Boot SE* = 0.01) was not entirely above or below zero (-0.021 to 0.042). The confidence interval for the unconditional indirect effect provided no evidence to support a claim (H4) that an IDEA message (relative to a status quo variation) will have a significantly more positive indirect impact on the intention to avoid eating ground beef (Y_4) while the effect is operating through perceived importance in the internalization message elements (M_2), regardless of receivers' individual differences.

Tailoring hypothesis. This indirect-effect result of the unconditional process analysis (H4) was compared to the indirect-effect results of the conditional process analysis (H3a, H3b, H3c). The data provided no evidence that unconditionally (H4) the IDEA message variation's indirect effect on receivers' intention to avoid eating ground beef when dining out (Y_4) differed to a statistically significant degree from that of a status quo message variation, while exerting influence through perceived importance in internalization message elements (M_2). The data provided no evidence of statistically significant interaction effects involving the message variation on receivers' intention to avoid eating ground beef when dining out (Y_4), while exerting influence through perceived importance in internalization message elements (M_2). Taken together, the data provided no evidence to support a claim (H5b) that an unconditional process analysis was more appropriate for testing and demonstrating the comprehensiveness of an IDEA message (relative to a status quo variation) to indirectly predict receivers' self-reported behavioral intention to avoid eating ground beef when dining out (Y_4), compared to a conditional process analysis.

Explanation elements. Two indices of moderated-moderated mediation quantified the extent that an IDEA message (relative to a status quo variation) had an indirect impact on the intention to avoid eating ground beef (Y_4), when the effect was moderated by receivers' preexisting state of control (W) as a function of learning preference (Z). This conditional and specific indirect effect operating through receivers' perceived importance in the explanation message elements (M_3) is represented with Equation 4.19:

$$\omega = \theta_{X \rightarrow M3} b_{54} = (i_{M3} + a_{13}X + a_{33}W + a_{53}Z_1 + a_{73}Z_2 + a_{93}XW + a_{113}XZ_1 + a_{133}XZ_2 + a_{153}WZ_1 + a_{173}WZ_2 + a_{193}XWZ_1 + a_{213}XWZ_2 + e_{M3})b_{54} \quad (4.19)$$

As a test of hypothesis 3a, ordinary least squares path analysis was used to examine this specific indirect effect operating through perceived importance in the explanation message elements (M_3) while controlling for all other mediators in the statistical model of Y_4 (i.e., avoid eating ground beef). A Helmert coding scheme accommodated the three learning preference categories and provided two planned orthogonal contrasts that would be most meaningful for testing hypothesis 3a. The corresponding regression coefficients, standard errors, *p*-values, and model summary information for this conditional indirect effect can be found in Table 4.1.

When learning preferences of internalization and action were contrasted with preferences of explanation and information, the 95% bootstrap confidence interval for the 2 (message variation) x 2 (preexisting state of control) x 2 (learning preference) indirect effect ($a_{193}b_{54 \mid \text{contrast 1}} = 0.017$, *Boot SE* = 0.09) was not entirely above or below zero (-0.083 to 0.118). When a learning preference of action was contrasted with a preference of internalization, the confidence interval for the 2 (message variation) x 2 (preexisting state of control) x 2 (learning preference) indirect effect ($a_{213}b_{54 \mid \text{contrast 2}} = -0.005$, *Boot SE* = 0.03) was not entirely above or below zero (-0.065 to 0.049). Taken together, the confidence intervals for the indices of moderated-moderated mediation provided no evidence to support a claim (H3a) that an IDEA message (relative to a status quo variation) will have a significantly more positive indirect impact on the intention to avoid eating ground beef when dining out (Y_4) while the effect is operating through perceived importance in the explanation message elements (M_3), and the effect is moderated by receivers' preexisting state of control as a function of learning preference.

An index of partial moderated mediation quantified the extent that an IDEA message (relative to a status quo variation) had an indirect impact on the intention to avoid eating ground Beef when dining out (Y_4), when the effect was moderated by receivers' preexisting state of control (W) as learning preference was held constant (Z). As a test of hypothesis 3b, ordinary least squares path analysis was used to examine this conditional and specific indirect effect operating through receivers' perceived importance in the explanation message elements (M_3), while controlling for all other mediators in the statistical model of Y_4 (i.e., avoid eating ground beef). The 95% bootstrap confidence interval for the 2 (message variation) x 2 (preexisting state of control) indirect effect ($a_{93}b_{54}$ = -0.006, *Boot SE* = 0.02) was not entirely above or below zero (-0.049 to 0.031). The confidence interval for the index of moderated mediation provided no evidence to support a claim (H3b) that an IDEA message (relative to a status quo variation) will have a significantly more positive indirect impact on the intention to avoid eating ground beef when dining out (Y_4) while the effect is operating through perceived importance in the explanation message elements (M_3), and the effect is moderated by receivers' preexisting state of control (W) as learning preference is held constant (Z).

An index of conditional mediation quantified the extent that an IDEA message (relative to status quo variation) had an indirect impact on the intention to avoid eating ground beef when dining out (Y_4) when receivers' preexisting state of control and learning preference were held constant. As a test of hypothesis 3c, ordinary least squares path analysis was used to examine this conditional and specific indirect effect operating through receivers' perceived importance in the the explanation message elements (M_3) while controlling for all other mediators in the statistical model of Y_4 (i.e., avoid eating ground beef). The 95% bootstrap confidence interval for the conditional indirect effect operating through perceived importance in explanation message elements ($a_{13}b_{54}$ = -0.002, *Boot SE* = 0.01) was not entirely above or below zero (-0.020 to 0.012). The confidence interval for the conditional indirect effect provided no evidence to support a claim (H3c) that an IDEA message (relative to a status quo variation) will have a significantly more positive indirect impact on the intention to avoid eating ground beef when dining out (Y_4) while the effect is operating through perceived importance in the explanation message elements (M_3), and individual differences are held constant (i.e., receivers' preexisting state of control, learning preference).

An index of unconditional mediation quantified the extent that an IDEA message (relative to status quo variation) had an indirect impact on the intention to avoid eating ground beef when dining out (Y_4) regardless of receivers' individual differences. This unconditional and specific indirect effect operating through receivers' perceived importance in the explanation message elements (M_3) is represented with Equation 4.20:

$$_{X\rightarrow M3}b_{54} = (i_{M3} + a_{13}X + \mathrm{e}_{M3})b_{54} \tag{4.20}$$

As a test of hypothesis 4, ordinary least squares path analysis was used to examine this specific indirect effect operating through perceived importance in the explanation message elements (M_3) while controlling for all other mediators in the statistical model of Y_4 (i.e., avoid eating ground beef). The corresponding regression coefficients, standard errors, *p*-values, and model summary information for this unconditional indirect effect can be found in Table 4.2. The 95% bootstrap confidence interval for the unconditional indirect effect operating through perceived importance in explanation message elements ($a_{13}b_{54}$ = -0.002, *Boot SE* = 0.01) was not entirely above or below zero (-0.017 to 0.010). The confidence interval for the unconditional indirect effect provided no evidence to support a claim (H4) that an IDEA message (relative to a status quo variation) will have a significantly more positive indirect impact on the intention to avoid eating ground beef when dining out (Y_4) while the effect is operating through perceived importance in the explanation message elements (M_3), regardless of receivers' individual differences.

Tailoring hypothesis. This indirect-effect result of the unconditional process analysis (H4) was compared to the indirect-effect results of the conditional process analysis (H3a, H3b, H3c). The data provided no evidence that unconditionally (H4) the IDEA message variation's indirect effect on receivers' intention to avoid eating ground beef when dining out (Y_4) differed to a statistically significant degree from that of a status quo message variation, while exerting influence through perceived importance in explanation message elements (M_3). The data provided no evidence of statistically significant interaction effects involving the message variation on receivers' intention to avoid eating ground beef when dining out (Y_4), while exerting influence through perceived importance in explanation message elements (M_3). Taken together, the data provided no evidence to support a claim (H5b) that an unconditional process analysis was more appropriate for testing and demonstrating the comprehensiveness of an IDEA message (relative to a status quo variation) to indirectly predict receivers' self-reported behavioral intention to avoid eating ground beef when dining out (Y_4), compared to a conditional process analysis.

Information elements. Two indices of moderated-moderated mediation quantified the extent that an IDEA message (relative to a status quo variation) had an indirect impact on the intention to avoid eating ground beef when dining out (Y_4), when the effect was moderated by receivers' preexisting state of control (W) as a function of learning preference (Z). This conditional and specific indirect effect operating through receivers' perceived importance in the information message elements (M_4) is represented with Equation 4.21:

$$\omega = \theta_{X \rightarrow M4} b_{74} = (i_{M4} + a_{14}X + a_{34}W + a_{54}Z_1 + a_{74}Z_2 + a_{94}XW + a_{114}XZ_1 + a_{134}XZ_2 + a_{154}WZ_1 + a_{174}WZ_2 + a_{194}XWZ_1 + a_{214}XWZ_2 + e_{M4})b_{74} \quad (4.21)$$

As a test of hypothesis 3a, ordinary least squares path analysis was used to examine this specific indirect effect operating through perceived importance in the information message elements (M_4) while controlling for all other mediators in the statistical model of Y_4 (i.e., avoid eating ground beef). A Helmert coding scheme accommodated the three learning preference categories and provided two planned orthogonal contrasts that would be most meaningful for testing hypothesis 3a. The corresponding regression coefficients, standard errors, *p*-values, and model summary information for this conditional indirect effect can be found in Table 4.1.

When learning preferences of internalization and action were contrasted with preferences of explanation and information, the 95% bootstrap confidence interval for the 2 (message variation) x 2 (preexisting state of control) x 2 (learning preference) indirect effect ($a_{194}b_{74\ |\ \text{contrast 1}}$ = -0.007, *Boot SE* = 0.03) was not entirely above or below zero (-0.066 to 0.044). When a learning preference of action was contrasted with a preference of internalization, the confidence interval for the 2 (message variation) x 2 (preexisting state of control) x 2 (learning preference) indirect effect ($a_{214}b_{74\ |\ \text{contrast 2}}$ = 0.009, *Boot SE* = 0.03) was not entirely above or below zero (-0.059 to 0.073). Taken together, the confidence intervals for the indices of moderated-moderated mediation provided no evidence to support a claim (H3a) that an IDEA message (relative to a status quo variation) will have a significantly more positive indirect impact on the intention to avoid eating ground beef when dining out (Y_4) while the effect is operating through perceived importance in the information message elements (M_4), and the effect is moderated by receivers' preexisting state of control as a function of learning preference.

An index of partial moderated mediation quantified the extent that an IDEA message (relative to a status quo variation) had an indirect impact on the intention to avoid eating ground beef when dining out (Y_4), when the effect was moderated by receivers' preexisting state of control (W) as learning preference was held constant (Z). As a test of hypothesis 3b, ordinary least squares path analysis was used to examine this conditional and specific indirect effect operating through receivers' perceived importance in the information message elements (M_4), while controlling for all other mediators in the statistical model of Y_4 (i.e., avoid eating ground beef). The 95% bootstrap confidence interval for the 2 (message variation) x 2 (preexisting state of control) indirect effect ($a_{94}b_{74} = 0.002$, *Boot SE* = 0.01) was not entirely above or below zero (-0.024 to 0.028). The confidence interval for the index of moderated mediation provided no evidence to support a claim (H3b) that an IDEA message (relative to a status quo variation) will have a significantly more positive indirect impact on the intention to avoid eating ground beef when dining out (Y_4) while the effect is operating through perceived importance in the information message elements (M_4), and the effect is moderated by receivers' preexisting state of control (W) as learning preference is held constant (Z).

An index of conditional mediation quantified the extent that an IDEA message (relative to status quo variation) had an indirect impact on the intention to avoid eating ground beef when dining out (Y_4) when receivers' preexisting state of control and learning preference were held constant. As a test of hypothesis 3c, ordinary least squares path analysis was used to examine this conditional and specific indirect effect operating through receivers' perceived importance in the information message elements (M_4) while controlling for all other mediators in the statistical model of Y_4 (i.e., avoid eating ground beef). The 95% bootstrap confidence interval for the conditional indirect effect operating through perceived importance in information message elements ($a_{14}b_{74}$= -0.010, *Boot SE* = 0.01) was not entirely above or below zero (-0.029 to 0.002). The confidence interval for the conditional indirect effect provided no evidence to support a claim (H3c) that an IDEA message (relative to a status quo variation) will have a significantly more positive indirect impact on the intention to avoid eating ground beef when dining out (Y_4) while operating through perceived importance in the information message elements (M_4), when individual differences are held constant (i.e., receivers' preexisting state of control, learning preference).

An index of unconditional mediation quantified the extent that an IDEA message (relative to status quo variation) had an indirect impact on the intention to avoid eating ground beef when dining out (Y_4) regardless of receivers' individual differences. This unconditional and specific indirect effect operating through receivers' perceived importance in the information message elements (M_4) is represented with Equation 4.22:

$$_{X\rightarrow M4}b_{74} = (i_{M4} + a_{14}X + e_{M4})b_{74} \tag{4.22}$$

As a test of hypothesis 4, ordinary least squares path analysis was used to examine this specific indirect effect operating through perceived importance in the information message elements (M_4) while controlling for all other mediators in the statistical model of Y_4 (i.e., avoid eating ground beef). The corresponding regression coefficients, standard errors, *p*-values, and model summary information for this unconditional indirect effect can be found in Table 4.2.The 95% bootstrap confidence interval for the unconditional indirect effect operating through perceived importance in information message elements ($a_{14}b_{74}$ = -0.012, *Boot SE* = 0.01) was not entirely above or below zero (-0.033 to 0.001). The confidence interval for the unconditional indirect effect provided no evidence to support a claim (H4) that an IDEA message (relative to a status quo variation) will have a significantly more positive indirect impact on the intention to avoid eating ground beef when dining out (Y_4) while the effect is operating through perceived importance in the information message elements (M_4), regardless of receivers' individual differences.

Tailoring hypothesis. This indirect-effect result of the unconditional process analysis (H4) was compared to the indirect-effect results of the conditional process analysis (H3a, H3b, H3c). The data provided no evidence that unconditionally (H4) the IDEA message variation's indirect effect on receivers' intention to avoid eating ground beef when dining out (Y_4) differed to a statistically significant degree from that of a status quo message variation, while exerting influence through perceived importance in information message elements (M_4). The data provided no evidence of statistically significant interaction effects involving the message variation on receivers' intention to avoid eating ground beef when dining out (Y_4), while exerting influence through perceived importance in information message elements (M_4). Taken together, the data provided no evidence to support a claim (H5b) that an unconditional process analysis was more appropriate for testing and demonstrating the comprehensiveness of an IDEA message (relative to a status quo variation) to indirectly predict receivers' self-reported behavioral intention to avoid eating ground beef when dining out (Y_4), compared to a conditional process analysis.

Action elements. Two indices of moderated-moderated mediation quantified the extent that an IDEA message (relative to a status quo variation) had an indirect impact on the intention to avoid eating ground beef when dining out (Y_4), when the effect was moderated by receivers' preexisting state of control (W) as a function of learning preference (Z). This conditional and specific indirect effect operating through receivers' perceived importance in the action message elements (M_5) is represented with Equation 4.23:

$$\omega = \theta_{X \rightarrow M5} b_{94} = (i_{M5} + a_{15}X + a_{35}W + a_{55}Z_1 + a_{75}Z_2 + a_{95}XW + a_{115}XZ_1 + a_{135}XZ_2 + a_{155}WZ_1 + a_{175}WZ_2 + a_{195}XWZ_1 + a_{215}XWZ_2 + e_{M5})b_{94} \quad (4.23)$$

As a test of hypothesis 3a, ordinary least squares path analysis was used to examine this specific indirect effect operating through perceived importance in the action message elements (M_5) while controlling for all other mediators in the statistical model of Y_4 (i.e., avoid eating ground beef). A Helmert coding scheme accommodated the three learning preference categories and provided two planned orthogonal contrasts that would be most meaningful for testing hypothesis 3a. The corresponding regression coefficients, standard errors, *p*-values, and model summary information for this conditional indirect effect can be found in Table 4.1.

When learning preferences of internalization and action were contrasted with preferences of explanation and information, the 95% bootstrap confidence interval for the 2 (message variation) x 2 (preexisting state of control) x 2 (learning preference) indirect effect ($a_{195}b_{94 \mid \text{contrast 1}} = -0.006$, *Boot SE* = 0.03) was not entirely above or below zero (-0.079 to 0.064). When a learning preference of action was contrasted with a preference of internalization, the confidence interval for the 2 (message variation) x 2 (preexisting state of control) x 2 (learning preference) indirect effect ($a_{215}b_{94 \mid \text{contrast 2}} = -0.011$, *Boot SE* = 0.05) was not entirely above or below zero (-0.120 to 0.084). Taken together, the confidence intervals for the indices of moderated-moderated mediation provided no evidence to support a claim (H3a) that an IDEA message (relative to a status quo variation) will have a significantly more positive indirect impact on the intention to avoid eating ground beef when dining out (Y_4) while the effect is operating through perceived importance in the action message elements (M_5), and the effect is moderated by receivers' preexisting state of control as a function of learning preference.

An index of partial moderated mediation quantified the extent that an IDEA message (relative to a status quo variation) had an indirect impact on the intention to avoid eating ground beef when dining out (Y_4), when the effect was moderated by receivers' preexisting state of control (W) as learning preference was held constant (Z). As a test of hypothesis 3b, ordinary least squares path analysis was used to examine this conditional and specific indirect effect operating through receivers' perceived importance in the action message elements (M_5), while controlling for all other mediators in the statistical model of Y_4 (i.e., avoid eating ground beef). The 95% bootstrap confidence interval for the 2 (message variation) x 2 (preexisting state of control) indirect effect ($a_{95}b_{94}$ = 0.001, *Boot SE* = 0.01) was not entirely above or below zero (-0.026 to 0.026). The confidence interval for the index of moderated mediation provided no evidence to support a claim that an IDEA message (relative to a status quo variation) will have a significantly more positive indirect impact on the intention to avoid eating ground beef when dining out (Y_4) while the effect is operating through perceived importance in the action message elements (M_5), and the effect is moderated by receivers' preexisting state of control (W) as learning preference is held constant (Z).

An index of conditional mediation quantified the extent that an IDEA message (relative to status quo variation) had an indirect impact on the intention to avoid eating ground beef when dining out (Y_4) when receivers' preexisting state of control and learning preference were held constant. As a test of hypothesis 3c, ordinary least squares path analysis was used to examine this conditional and specific indirect effect operating through receivers' perceived importance in the action message elements (M_5) while controlling for all other mediators in the statistical model of

Y_4 (i.e., avoid eating ground beef). The 95% bootstrap confidence interval for the conditional indirect effect operating through perceived importance in action message elements ($a_{15}b_{94}$ = -0.001, *Boot SE* = 0.01) was not entirely above or below zero (-0.016 to 0.012). The confidence interval for the conditional indirect effect provided no evidence to support a claim (H3c) that an IDEA message (relative to a status quo variation) will have a significantly more positive indirect impact on the intention to avoid eating ground beef when dining out (Y_4) while the effect is operating through perceived importance in the action message elements (M_5), and individual differences are held constant (i.e., receivers' preexisting state of control, learning preference).

An index of unconditional mediation quantified the extent that an IDEA message (relative to status quo variation) had an indirect impact on the intention to avoid eating ground beef when dining out (Y_4) regardless of receivers' individual differences. This unconditional and specific indirect effect operating through receivers' perceived importance in the action message elements (M_5) is represented with Equation 4.24:

$$_{X\rightarrow M5}b_{94} = (i_{M5} + a_{15}X + \mathrm{e}_{M5})b_{94} \tag{4.24}$$

As a test of hypothesis 4, ordinary least squares path analysis was used to examine this specific indirect effect operating through perceived importance in the action message elements (M_5) while controlling for all other mediators in the statistical model of Y_4 (i.e., avoid eating ground beef). The corresponding regression coefficients, standard errors, *p*-values, and model summary information for this unconditional indirect effect can be found in Table 4.2. The 95% bootstrap confidence interval for the unconditional indirect effect operating through perceived importance in the action message elements ($a_{15}b_{94}$ = -0.002, *Boot SE* = 0.01) was not entirely above or below zero (-0.018 to 0.012). The confidence interval for the unconditional indirect effect provided no evidence to support a claim (H4) that an IDEA message (relative to a status quo variation) will have a significantly more positive indirect impact on the intention to avoid eating ground beef when dining out (Y_4) while the effect is operating through perceived importance in the action message elements (M_5), regardless of receivers' individual differences.

Tailoring hypothesis. This indirect-effect result of the unconditional process analysis (H4) was compared to the indirect-effect results of the conditional process analysis (H3a, H3b, H3c). The data provided no evidence that unconditionally (H4) the IDEA message variation's indirect effect on receivers' intention to avoid eating ground beef when dining out (Y_4) differed to a statistically significant degree from that of a status quo message variation, while exerting influence through perceived importance in action message elements (M_5). The data provided no evidence of statistically significant interaction effects involving the message variation on receivers' intention to avoid eating ground beef when dining out (Y_4), while exerting influence through perceived importance in action message elements (M_4). Taken together, the data provided no evidence to support a claim (H5b) that an unconditional process analysis was more appropriate for testing and demonstrating the comprehensiveness of an IDEA message (relative to a status quo variation) to indirectly predict receivers' self-reported behavioral intention to return ground beef to the store (Y_3), compared to a conditional process analysis.

Message effectiveness. Two indices of moderated-moderated mediation quantified the extent that an IDEA message (relative to a status quo variation) had an indirect impact on the intention to avoid eating ground beef when dining out (Y_4), when the effect was moderated by receivers' preexisting state of control (W) as a function of learning preference (Z). This conditional and specific indirect effect operating through receivers' perceived effectiveness in the message viewed (M_6) is represented with Equation 4.25:

$$\omega = \theta_{X \rightarrow M6} b_{114} = (i_{M6} + a_{16}X + a_{36}W + a_{56}Z_1 + a_{76}Z_2 + a_{96}XW + a_{116}XZ_1$$

$$+ a_{136}XZ_2 + a_{156}WZ_1 + a_{176}WZ_2 + a_{196}XWZ_1 + a_{216}XWZ_2 + e_{M6})b_{114} \tag{4.25}$$

As a test of hypothesis 3a, ordinary least squares path analysis was used to examine this specific indirect effect operating through perceived importance in perceived message effectiveness (M_6) while controlling for all other mediators in the statistical model of Y_4 (i.e., avoid eating ground beef). A Helmert coding scheme accommodated the three learning preference categories and provided two planned orthogonal contrasts that would be most meaningful for testing hypothesis 3a. The corresponding regression coefficients, standard errors, *p*-values, and model summary information for this conditional indirect effect can be found in Table 4.1.

When learning preferences of internalization and action were contrasted with preferences of explanation and information, the 95% bootstrap confidence interval for the 2 (message variation) x 2 (preexisting state of control) x 2 (learning preference) indirect effect ($a_{196}b_{114 \mid \text{contrast 1}}$ = -0.054, *Boot SE* = 0.11) was not entirely above or below zero (-0.265 to 0.164). When a learning preference of action was contrasted with a preference of internalization, the confidence interval for the 2 (message variation) x 2 (preexisting state of control) x 2 (learning preference) indirect effect ($a_{216}b_{114 \mid \text{contrast 2}}$ = -0.046, *Boot SE* = 0.14) was not entirely above or below zero (-0.309 to 0.222). Taken together, the confidence intervals for the indices of moderated-moderated mediation provided no evidence to support a claim (H3a) that an IDEA message (relative to a status quo variation) will have a significantly more positive indirect impact on the intention to avoid eating ground beef when dining out (Y_4) while the effect is operating through perceived message effectiveness (M_6), and the effect is moderated by receivers' preexisting state of control as a function of learning preference.

An index of partial moderated mediation quantified the extent that an IDEA message (relative to a status quo variation) had an indirect impact on the intention to avoid eating ground beef when dining out (Y_4), when the effect was moderated by receivers' preexisting state of control (W) as learning preference was held constant (Z). As a test of hypothesis 3b, ordinary least squares path analysis was used to examine this conditional and specific indirect effect operating through receivers' perceived message effectiveness (M_6), while controlling for all other mediators in the statistical model of Y_4 (i.e., avoid eating ground beef). The 95% bootstrap confidence interval for the 2 (message variation) x 2 (preexisting state of control) indirect effect ($a_{96}b_{114}$ = 0.122, *Boot SE* = 0.06) was entirely above zero (0.018 to 0.243). This result confirmed that the message variation's indirect effect operating through perceived message effectiveness (M_6) was dependent on receivers' preexisting state of control when learning preference was held constant.

As can be seen in Figure 4.4, IDEA receivers (relative to status quo receivers) with a preexisting state of fear control were significantly more likely to avoid eating ground beef (Y_4), $a_{96}b_{114} |_{W = \text{Fear}}$ = 0.119, *Boot SE* = 0.04, 95% *Boot CI* = [0.037, 0.211], compared to IDEA receivers (relative to status quo receivers) with a preexisting state of danger control, $a_{96}b_{114} |_{W = \text{Danger}}$ = -0.004, *Boot SE* = 0.04, 95% *Boot CI* = [-0.075, 0.065] when learning preference was held constant. The confidence interval for the index of moderated mediation provided evidence to support a claim (H3b) that an IDEA message (relative to a status quo variation) will have a significantly more positive indirect impact on the intention to avoid eating ground beef when dining out (Y_4) while the effect is operating through perceived message effectiveness (M_6) among individuals in fear (relative to danger) control as learning preference is held constant.

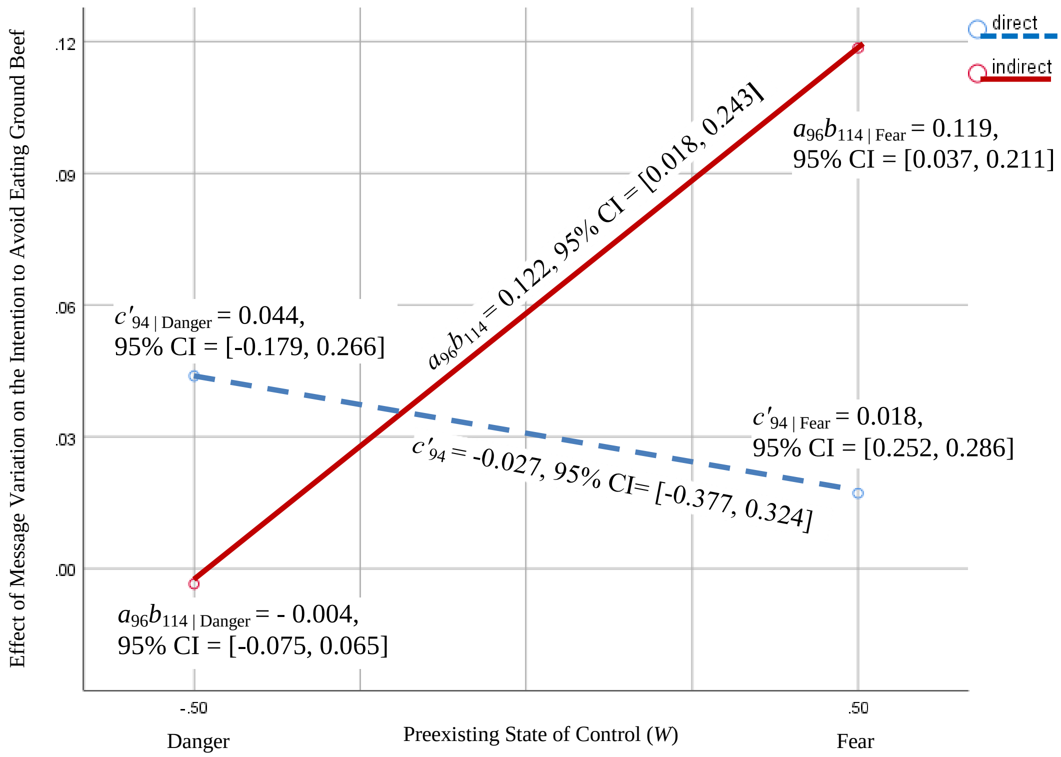

Figure 4.4. Conditional direct and indirect effect of message variation on the intention to avoid eating ground beef when dining out, mediated by perceived message effectiveness, moderated by preexisting state of control when learning preference is held constant.

An index of conditional mediation quantified the extent that an IDEA message (relative to status quo variation) had an indirect impact on the intention to avoid eating ground beef when dining out (Y_4) when receivers' preexisting state of control and learning preference were held constant. As a test of hypothesis 3c, ordinary least squares path analysis was used to examine this conditional and specific indirect effect operating through receivers' perceived message effectiveness (M_6) while controlling for all other mediators in the statistical model of Y_4 (i.e., avoid eating ground beef). The 95% bootstrap confidence interval for the conditional indirect effect operating through perceived message effectiveness ($a_{16}b_{114}$ = 0.058, *Boot SE* = 0.03) was entirely above zero (0.005 to 0.116), suggesting that IDEA receivers (relative to status quo receivers) were significantly more likely to avoid eating ground beef when dining out (Y_4), under the condition that receivers preexisting state of danger control and learning preference were held constant. The confidence interval for the conditional indirect effect provided evidence to support a claim (H3c) that an IDEA message (relative to a status quo variation) will have a significantly more positive indirect impact on the intention to avoid eating ground beef when dining out (Y_4) while the effect is operating through perceived message effectiveness (M_6), and individual differences are held constant (i.e., receivers' preexisting state of control, learning preference).

An index of unconditional mediation quantified the extent that an IDEA message (relative to status quo variation) had an indirect impact on the intention to avoid eating ground beef when dining out (Y_4), regardless of receivers' individual differences. This unconditional and specific indirect effect operating through receivers' perceived message effectiveness (M_6) is represented with Equation 4.26:

$$_{X \rightarrow M6}b_{114} = (i_{M6} + a_{16}X + e_{M6})b_{114} \tag{4.26}$$

As a test of hypothesis 4, ordinary least squares path analysis was used to examine this specific indirect effect operating through perceived message effectiveness (M_6) while controlling for all other mediators in the statistical model of Y_4 (i.e., avoid eating ground beef). The corresponding regression coefficients, standard errors, *p*-values, and model summary information for this unconditional indirect effect can be found in Table 4.2.

The 95% bootstrap confidence interval for the unconditional indirect effect operating through perceived message effectiveness ($a_{16}b_{114} = 0.046$, *Boot SE* = 0.03) was not entirely above or below zero (-0.005 to 0.102). The confidence interval for the unconditional indirect effect provided no evidence to support a claim (H4) that an IDEA message (relative to a status quo variation) will have a significantly more positive indirect impact on the intention to avoid eating ground beef when dining out (Y_4) while the effect is operating through perceived message effectiveness (M_6), regardless of receivers' individual differences.

Tailoring hypothesis. This indirect-effect result of the unconditional process analysis (H4) was compared to the indirect-effect results of the conditional process analysis (H3a, H3b, H3c). The data provided no evidence that unconditionally (H4) the IDEA message variation's indirect effect on receivers' intention to avoid eating ground beef when dining out (Y_4) differed to a statistically significant degree from that of a status quo message variation, while exerting influence through perceived message effectiveness (M_6). The data revealed a statistically significant two-way interaction (H3b) effect involving the message variation and preexisting state of control on receivers' intention to avoid eating ground beef when dining out (Y_4), while exerting influence through perceived message effectiveness (M_6). Taken together, the data provided evidence of contradictory support for hypothesis 5b, suggesting that the IDEA message (relative to a status quo variation) was not comprehensive enough to address the diversity in receivers' preexisting state of control. A conditional process analysis was more appropriate for testing and demonstrating the extent that an IDEA message (relative to a status quo variation) indirectly predicted receivers' self-reported behavioral intention to avoid eating ground beef when dining out (Y_4), compared to an unconditional process analysis. Thus, tailoring a warning to address receivers' preexisting state of control would be necessary.

Conclusion

This Chapter was organized into four main sections. In the first section, two visually-friendly conceptual models were introduced that corresponded to the conditional and unconditional analyses employed in this study. Table 4.1 presented the regression coefficients, standard errors and model summary information pertaining to the conditional direct and conditional indirect effects of the message variation on six parallel mediators (M_1 through M_6) and two behavioral intentions (Y_3 and Y_4). Table 4.2 presented the regression coefficients, standard errors and model summary information pertaining to the conditional direct and conditional indirect effects of the message variation on six parallel mediators (M_1 through M_6) and two behavioral intentions (Y_3 and Y_4). In the second section, the results were presented for the message variation's direct and indirect effects on receivers' self-reported behavioral intention to return ground beef to the store where it was purchased (Y_3). In the third section, the results were presented for the message variation's direct and indirect effects on receivers' self-reported behavioral intention to avoid eating ground beef when dining out (Y_4). The data revealed that the unconditional statistical model oversimplified the complex dynamics through which the IDEA message (relative to status quo variation) predicted receivers' self-reported intention to return ground beef to the store (Y_3), particularly when the indirect effects were operating through perceived importance in explanation message elements (M_3) and perceived message effectiveness (M_6). The data revealed that the unconditional statistical model oversimplified the complex dynamics through which the IDEA message (relative to status quo variation) predicted receivers' self-reported intention to avoid eating ground beef when dining out (Y_4), particularly when the indirect effect was operating through perceived message effectiveness (M_6). Chapter Five will provide a discussion of these results, before describing the limitations of this study and calls for future research.

CHAPTER 5. CONCLUSIONS, LIMITATIONS, CALLS FOR FUTURE RESEARCH

T. Sellnow and D. Sellnow (2013) introduced the IDEA model as an effective protocol for instructing individuals to self-protect during high-risk crisis events. The present study evaluated, tested, and validated T. Sellnow and D. Sellnow's (2013) IDEA model. A new tool was introduced as an improved method for testing the IDEA model hypotheses. T. Sellnow and colleagues developed a survey questionnaire and two message variations for a select group of scholars (including the present) to use when experimentally testing the utility of the IDEA model. One message variation was intended to reflect features that operationalized the IDEA model elements of internalization, action, explanation. The second variation was intended to reflect features that operationalized only the explanation element, and to a much greater extent. The messages were varied to reflect a hypothetical media report of a food-recall and illness outbreak warning.

As described earlier, four experiments have been published as formal tests of the IDEA model, using the questionnaires and message script variations developed by T. Sellnow and colleagues. Based on their findings, Littlefield et al. (2014) claimed that a message should be designed to address all elements of the IDEA model, and that future research should examine individual differences in ethnicity. In their study, D. Sellnow, Lane, Littlefield et al. (2015), claimed that a message should be designed address all elements of the IDEA model and that future research should explore a "range of audience variables" (p. 157). Based on their results, D. Sellnow, Lane, T. Sellnow et al. (2017) claimed that a message should be designed to address all elements of the IDEA model but "need not be tailored for sex or race" (p. 560). In a separate study, D. Sellnow, Johansson et al. (2018) claimed that a message should be designed to address all elements of the IDEA model but need not be tailored for sex, age, or location.

In light of these experiments, T. Sellnow and D. Sellnow (2019) reported that the IDEA model has been amply and empirically tested to demonstrate its effectiveness "across a wide array of disasters, risk situations, and crisis types" (p. 76). My review of the published experiments revealed that IDEA model has not been adequately tested, despite arguments to the contrary. In reality, there are key requirements that must be met when determining the relative effectiveness of an IDEA message variation on behavioral intentions. An IDEA message (relative to a status quo variation) must directly and indirectly predict more positive self-reported behavioral intentions. These indirect effects are predicted to operate through receiver perceptions (i.e., affect, cognition) in the form of parallel mediators. A single message that addresses all elements of the IDEA model must eliminate the time consuming and resource draining practice of tailoring multiple message variations needed to reach all audience segments within a larger target population. More specifically, the data should reveal no statistically significant moderation of the message variation's direct and indirect effects on the behavioral intention outcomes. In order to test these assumptions simultaneously, a tool is required that integrates moderation and mediation into the same these statistical framework.

In their studies, Littlefield et al. (2014), D. Sellnow, Lane, Littlefield et al. (2015), D. Sellnow, Lane, T. Sellnow et al. (2017), and D. Sellnow, Johansson et al. (2018) examined the moderated and unmoderated direct effects of an IDEA message (relative to a status quo variation) on receivers' behavioral intentions, and the moderated and unmoderated direct effects of an IDEA message (relative to a status quo variation) on receivers' perceptions. In all cases, the scholars relied upon tests based on analysis of variance to test hypotheses and address research questions. This selection of tools made it impossible for these scholars to incorporate moderation and mediation into the same statistical framework. Without the moderated-mediation components, Littlefield et al. (2014), D. Sellnow, Lane, Littlefield et al. (2015), D. Sellnow, Lane, T. Sellnow et al. (2017), and D. Sellnow, Johansson et al. (2018) neglected the opportunity to test indirect interaction effects of the message variation on behavioral intentions that are predicted in theory by the IDEA model. Thus, the present study proposed a more appropriate and rigorous approach for testing IDEA messages and alternative messages. More specifically, the present study was the first to test the comprehensiveness and effectiveness of an IDEA message (relative to a status quo variation) using a conditional process approach and comparative unconditional process approach.

The conditional process analysis efficiently integrated moderation and mediation into a single statistical framework, while the unconditional process analysis eliminated all aspects of moderation and covariates from the statistical framework. The conditional and unconditional models included six parallel mediators as potential mechanisms through which the IDEA message (relative to a status quo variation), could potentially exert significant influence on behavioral intentions. Of my six parallel mediators, one was grounded in Witte's (1992a) EPPM as a measure of receivers' perceived danger control. Four parallel mediators were grounded in T. Sellnow and D. Sellnow's (2013) IDEA model, as measures of receivers' perceived importance in IDEA message elements (i.e., internalization, explanation, information, action). The sixth parallel mediator reflected a measure of receivers' perceived effectiveness in the message viewed, as adapted from the 9-item perceived message effectiveness scale developed by Harris (2007) and Noar et al. (2010).

The present study introduced a deductive statistical approach for testing the tailoring hypotheses. For my conditional process analyses, two individual difference variables were included in the statistical model to examine the extent that an IDEA message (relative to a status quo variation) directly and indirectly predicted more appropriate receivers' self-reported behavioral intentions when the effects were: (1) moderated by a preexisting state of control, as a function of learning preference, (2) moderated by a preexisting state of control, as learning preference was held constant, and (3) conditional as individual differences were held constant.

My predictor variables (i.e., message variation, preexisting state of control, learning preference) were strategically coded for main effects parameterization in the conditional process model. The direct effect results produced through my conditional process analyses were comparative to the direct effect results produced through tests based on analysis of variance in the studies of D. Sellnow, Johansson et al. (2018), D. Sellnow, Lane, Littlefield et al. (2015) and D. Sellnow, Lane, T. Sellnow et al. (2017). The conditional process analysis included a method for unpacking the three-way and two-way interaction effects between the individual difference variables and message variation in order to isolate the extent that the IDEA message (relative to a status quo variation) had addressed audience diversity and eliminated the need to tailor multiple messages to multiple audience segments. The unconditional process model excluded all individual difference variables and their interactions, and focused primarily on unmoderated direct and unmoderated indirect effects of the IDEA message (relative to a status quo variation) on receivers' self-reported behavioral intentions. With these statistical models in mind, the message variation's direct effect results are discussed below, before discussing the message variation's indirect effects on receivers' self-reported behavioral intentions.

Direct Effects

Return ground beef. The data provided no evidence of statistically significant interaction effects involving the message variation, preexisting state of control, and learning preference on receivers' intention to return ground beef to the store (Y_3). When individual difference variables and their interactions were completely excluded from the statistical model, the data revealed that the IDEA message's direct effect on receivers' intention to return ground beef to the store (Y_3) differed to a statistically significant degree from that of a status quo variation. Because no statistically significant interactions emerged from the conditional process analysis, the results of this unconditional process analysis confirmed that IDEA receivers (relative to status quo receivers) reported significantly higher intentions to return ground beef to the store (Y_3), regardless of individual differences. This finding was not surprising since the instruction to return ground beef was specifically stated in the IDEA message and excluded from the status quo message. The statistically significant result was in line with the results reported in the studies of Littlefield et al. (2014), D. Sellnow, Johansson et al. (2018), D. Sellnow, Lane, Littlefield et al. (2015) and D. Sellnow, Lane, T. Sellnow et al. (2017). However, without an indirect-effect analysis, this finding stopped short of providing a definitive explanation about why receivers' indicated an intention to return ground beef to the store (Y_3). At best, this statistically significant finding highlighted the importance of including an actionable instruction in a message, rather than excluding it.

Avoid eating ground beef. The data provided no evidence of statistically significant interaction effects involving the message variation, preexisting state of control, and learning preference on receivers' intention to avoid eating ground beef when dining out (Y_4). When individual difference variables and their interactions were completely excluded from the statistical model, the data provided no evidence that the IDEA message variation's indirect effect on receivers' intention to avoid eating ground beef when dining out (Y_4) differed to a statistically significant degree from that of a status quo message variation. Although no statistically significant interactions emerged from the conditional process analysis, the results of this unconditional process analysis suggested that the IDEA and status quo variations were equally effective at indirectly predicting receivers' self-reported behavioral intention to avoid eating ground beef when dining out (Y_4). This finding was not surprising since the IDEA and status quo messages included the identically worded instruction for receivers to avoid eating ground beef products at any locations including fast food restaurants, grocery store delis, or at home, in order to prevent becoming infected with the foodborne disease.

Indirect Effects

Danger control. The data provided no evidence of statistically significant interaction effects between the message variation, preexisting state of control, and learning preference on receivers' intention to return ground beef to the store (Y_3), or the intention to avoid eating ground beef when dining out (Y_4), while the effects operated through perceived danger control (M_1). When individual difference variables and their interactions were completely excluded from the statistical model, the data provided no evidence that the IDEA message variation's indirect effect on receivers' intention to return ground beef to the store (Y_3) or the intention to avoid eating ground beef when dining out (Y_4) differed to a statistically significant degree from that of a status quo message variation, while exerting influence through perceived danger control (M_1). Although no statistically significant interactions emerged from the conditional process analysis, the results of the unconditional process analysis suggested that the IDEA and status quo variations may have been equally effective at indirectly predicting both of the receivers' self-reported behavioral intentions, while the effects operated through perceived danger control (M_1), regardless of receivers' individual differences. This finding was not surprising since the IDEA and status quo messages described the number of people sickened, hospitalized, and a potential death from the consumption of contaminated meat products (i.e., threat) and provided the instruction to avoid eating ground beef at any locations to avoid becoming infected (i.e., efficacy).

Internalization. The data provided no evidence of statistically significant interaction effects between the message variation, preexisting state of control, and learning preference on receivers' intention to return ground beef to the store (Y_3), or the intention to avoid eating ground beef when dining out (Y_4), while the effects operated through perceived importance in internalization message elements (M_2). When individual difference variables and their interactions were completely excluded from the statistical model, the data provided no evidence that the IDEA message variation's indirect effect on receivers' intention to return ground beef to the store (Y_3) or the intention to avoid eating ground beef when dining out (Y_4) differed to a statistically significant degree from that of a status quo message variation, while exerting influence through perceived importance in internalization message elements (M_2). Although no statistically significant interactions emerged from the conditional process analysis, the results of the unconditional process analysis suggested that the IDEA and status quo variations may have been equally effective at indirectly predicting both of the receivers' self-reported behavioral intentions, while the effects operated through perceived importance in internalization message elements (M_2), regardless of receivers' individual differences. This finding was not surprising since the IDEA and status quo messages included features characteristic of internalization elements (i.e., proximity, timeliness, personal impact). For example, both message variations situated the illness outbreak and ground beef contamination within a particular state (i.e., proximity). Both message variations described the symptoms that would emerge within 12 to 72 hours of eating the contaminated meat (i.e., timeliness). The IDEA and status quo variations referenced the number of people confirmed sickened, hospitalized, and a death under investigation following the consumption of ground beef products contaminated by *S. typhimurium* (i.e., personal impact).

Explanation. The data provided no evidence of statistically significant interaction effects between the message variation, preexisting state of control, and learning preference on receivers' intention to avoid eating ground beef when dining out (Y_4), while the effects operated through perceived importance in explanation message elements (M_3). When individual difference variables and their interactions were completely excluded from the statistical model, the data provided no evidence that the IDEA message variation's indirect effect on receivers' intention to avoid eating ground beef when dining out (Y_4) differed to a statistically significant degree from that of a status quo message variation, while exerting influence through perceived importance in explanation message elements (M_3). Although no statistically significant interactions emerged from the conditional process analysis, the results of the unconditional process analysis suggested that the IDEA and status quo variations may have been equally effective at indirectly predicting receivers' self-reported behavioral intention to avoid eating ground beef when dining out (Y_4), while the effect operated through perceived importance in explanation message elements (M_3), regardless of receivers' individual differences.

The data revealed a statistically significant three-way interaction effect between the message variation, preexisting state of control, and learning preference on receivers' intention to return ground beef to the store (Y_3), while the effects operated through perceived importance in explanation message elements (M_3). The 95% bootstrap confidence interval for conditional moderated mediation confirmed that among individuals with a learning preference of explanation or information, IDEA receivers (relative to status quo receivers) with a preexisting state of fear control were significantly more likely to return ground beef to the store (Y_3), compared to IDEA receivers (relative to status quo receivers) with a preexisting state of danger control.

By design, the IDEA message variation presented a higher degree of threat as a message feature compared to the status quo variation. In this case, the IDEA variation did not backfire among individuals predisposed to fear control regarding foodborne illness and food contamination. Witte (1992a) cautions that developing an effective risk message can be a challenge when individuals are already in fear control regarding a threat. Typically, individuals in fear control ignore recommendations if they become more frightened. Witte (1992a) explains that the risk message must move those in fear control in the direction of danger control in order to be effective. The recommendation to return beef to the store was a feature unique to the IDEA message variation. The statistically significant finding is encouraging for designing messages according to the IDEA protocol since individuals in fear control typically ignore recommendations.

When isolating the two-way interaction from the three-way interaction, the data provided no evidence of a statistically significant interaction effect between the message variation and preexisting state of control on receivers' intention to return ground beef to the (Y_3), while the effect operated through perceived importance in explanation message elements (M_3), and learning preference was held constant. When individual difference variables and their interactions were completely excluded from the statistical model, the data provided no evidence that the IDEA message variation's indirect effect on receivers' intention to return ground beef to the store (Y_3) differed to a statistically significant degree from that of a status quo message variation, while exerting influence through perceived importance in explanation message elements (M_3).

Because a statistically significant interaction emerged from the conditional process analysis, it was not possible to confirm that the IDEA message (relative to a status quo variation) was comprehensive and eliminated the need to tailor message features to preexisting state of control and learning preference. The statistically significant three-way interacting effect illuminated the importance of examining individual difference variables and their interactions to determine the extent that the IDEA message variation has adequately addressed audience diversity. Taken together, these findings reinforced Hayes' (2013; 2018a) argument that in mediation analysis, we lose important information when complex responses that differ from person to person are reduced into a single number or estimate.

Information. The data provided no evidence of statistically significant interaction effects between the message variation, preexisting state of control, and learning preference on receivers' intention to return ground beef to the store (Y_3), or the intention to avoid eating ground beef when dining out (Y_4), while the effects operated through perceived importance in information message elements (M_4).When individual difference variables and their interactions were completely excluded from the statistical model, the data provided no evidence that the IDEA message variation's indirect effect on receivers' intention to return ground beef to the store (Y_3) or the intention to avoid eating ground beef when dining out (Y_4) differed to a statistically significant degree from that of a status quo message variation, while exerting influence through perceived importance in information message elements (M_4). Although no statistically significant interactions emerged from the conditional process analysis, the results of the unconditional process analysis suggested that the IDEA and status quo variations may have been equally effective at indirectly predicting both of the receivers' self-reported behavioral intentions, while the effects operated through perceived importance in information message elements (M_4).

Perceived importance in information message elements was assessed as a single-item indicator. Participants indicated perceived importance by responding to the question: 'How important was it for you hear a description of what *E. coli* is?' Perhaps individuals in both message groups would find the scientific information about foodborne disease important to know.

Action. The data provided no evidence of statistically significant interaction effects between the message variation, preexisting state of control, and learning preference on receivers' intention to return ground beef to the store (Y_3), or the intention to avoid eating ground beef when dining out (Y_4), while the effects operated through perceived importance in action message elements (M_5). When individual difference variables and their interactions were completely excluded from the statistical model, the data provided no evidence that the IDEA message variation's indirect effect on receivers' intention to return ground beef to the store (Y_3) or the intention to avoid eating ground beef when dining out (Y_4) differed to a statistically significant degree from that of a status quo message variation, while exerting influence through perceived importance in action message elements (M_5). Although no statistically significant interactions emerged from the conditional process analysis, the results of the unconditional process analysis suggested that the IDEA and status quo variations may have been equally effective at indirectly predicting both of the receivers' self-reported behavioral intentions, while the effects operated through perceived importance in action message elements (M_5).

Perceived importance in action message elements was assessed as a single-item indicator. Participants indicated perceived importance by responding to the question: 'How important is it for you learn what you should do if you get *E. coli* poisoning?' Perhaps individuals in both message groups would find it important to know what to do if sickened.

Effectiveness. The data provided no evidence of statistically significant three-way interaction effect between the message variation, preexisting state of control, and learning preference on receivers' intention to return ground beef to the store (Y_3) or the intention to avoid eating ground beef when dining out (Y_4) while the effects operated through perceived message effectiveness (M_6). However, the data revealed a statistically significant two-way interaction effects between message variation and preexisting state of control on receivers' intention to return ground beef to the store (Y_3) and the intention to avoid eating ground beef when dining out (Y_4) while the effect operated through perceived message effectiveness (M_6) and learning preference was held constant. The results indicated that when learning preference was held constant, IDEA receivers (relative to status quo receivers) with a preexisting state of fear control were higher in perceived message effectiveness, which in turn translated into a greater likelihood to return ground beef to the store (Y_3; H3c) and greater likelihood to avoid ground beef when dining out (Y_4; H3c), compared to IDEA receivers (relative to status quo receivers) with a preexisting state of danger control. In this case, the IDEA variation did not backfire among individuals predisposed to fear control regarding foodborne illness and food contamination, considered the increased level of threat that was emphasized in the IDEA message features.

The conditional indirect effect of IDEA message (relative to the status quo) was also significant when operating through perceived message effectiveness on receivers' self-reported intention to return ground beef to the store (Y_3; H3c) and intention to avoid eating ground beef when dining out (Y_4; H3b). Taken together, these results confirmed that IDEA receivers were more likely than status quo receivers to perceive higher effectiveness in the message viewed, which in turn translated into more appropriate intentions to return ground beef to the store (Y_3;

H3b) and more appropriate intentions to avoid eating ground beef when dining out (Y_4; H3b), under the condition that the individual difference variables were held constant.

When individual difference variables and their interactions were completely excluded from the statistical model, the data provided no evidence that the IDEA message variation's indirect effect on receivers' intention to return ground beef to the store (Y_3) or the intention to avoid eating ground beef when dining out (Y_4) differed to a statistically significant degree from that of a status quo message variation, while exerting influence through perceived message effectiveness (M_6). Given the statistically significant two-way interactions that emerged in the conditional process analysis, it was not possible to confirm that the IDEA message (relative to a status quo variation) was comprehensive and eliminated the need to tailor message features to preexisting state of control and learning preference when the effect was operating through perceived message effectiveness on either behavioral intention. Taken together, these findings reinforced Hayes' (2013; 2018a) argument that in mediation analysis, we lose important information when complex responses that differ from person to person are reduced into a single number or estimate.

An interesting discovery was that the IDEA message (relative to the status quo variation) had a more positive impact on behavioral intentions among individuals predisposed to fear control because these individuals perceived effectiveness in the message viewed. The data suggest that these individuals were more likely to follow an explicitly-stated instruction (i.e. return ground beef), and these individuals were also more likely follow a generally-stated instruction (i.e., avoid eating ground beef at any location). These statistically significant results provided plausible explanations regarding how and under what condition individuals will respond favorably to a food recall warning.

Of the six possible parallel mediators through which the IDEA message (relative to a status quo variation) could exert influence, the conditional process analysis illuminated statistically significant indirect interaction effects operating through perceived importance in explanation message elements (M_3) and perceived message effectiveness (M_6). Taken together, these findings suggested that a message should comprise an optimal balance between features that operationalize internalization, explanation, and action in order to predict appropriate behavioral intentions and prevent the message from backfiring, particularly among individuals predisposed to fear control regarding food contamination and foodborne disease. The conditional and unconditional indirect effects for the IDEA message (relative to a status quo variation) on either behavioral intention were never statistically significant when the effects were operating through perceived danger control, perceived importance in internalization message elements, perceived importance in information message elements, or perceived importance action message elements. The common message features placed in the IDEA and status quo message variations may offer a plausible explanation regarding why the data provided no evidence of statistically significant findings for these four indirect effects.

From a risk messaging standpoint, T. Sellnow and D. Sellnow's (2013) concepts of internalization and action in the IDEA model aligned easily with Witte's (1992a) concepts of threat and efficacy in the EPPM. Taken together, the IDEA and EPPM models provide guidance for structuring specific message features to: (a) explain a threat and (b) demonstrate feasible protective actions that can be easily completed, such that information receivers (c) will perceive the threat to be significant and personally relevant rather than trivial or manipulative; (d) will perceive the recommended steps to be effective and within their means to perform; (e) will engage in danger control responses (i.e., appropriate behavioral intentions) rather than fear control responses (i.e., defensive avoidance, inappropriate behavioral intentions), and (f) will perform the recommended actions, as directed. Although the present study was designed as a test T. Sellnow and D. Sellnow's (2013) IDEA model, the tool introduced in this study also served to advance the EPPM research. My tool provided a new method for testing the effectiveness of health-risk messages fashioned as fear appeals, in addition to those characterized as IDEA-modeled messages. This study demonstrated how to use two different forms of Witte et al.'s (1996) RBD as a baseline measure (i.e., dichotomy) and a post-assessment measure (i.e., continuous).

The results of this study demonstrated how regression-based models that incorporate moderation, mediation, moderated-mediation, or moderated-moderated mediation do far more than establish associations between variables. Experimentalists commonly rely on analysis of variance when attempting to identify cause-effect relationships (Hayes, 2013, 2018a). A drawback to the reliance on this approach is that there is no comfortable place for continuous predictor variables in the statistical model unless the measures are treated as covariates (O'Keefe, 2003). Entering continuous measures of perception (e.g., affective, cognitive) as covariates in a statistical model would disrupt the true nature of the IDEA model's predicted causal chain. A reliance on tests based on analysis of variance ignores the examination of an indirect effect. Mediation analyses illuminate the important complexities of underlying psychological, cognitive, or biological processes that are often overlooked when relying on tests based on analysis of variance (O'Keefe, 2016).

The results of this study demonstrated that important information was lost in the unconditional mediation analysis when complex responses that differed from person to person were reduced into a single estimate. As Hayes (2018a) points out, we cannot simply assume that an effect is not moderated, simply because it has not been modeled as such. A statistical model and analysis that excludes possible moderators of potential indirect effects “may result in a description of a phenomenon that is incomplete, if not also wrong [should the effects actually be moderated]” (Hayes, 2018a, p. 394). The comparison between my conditional and unconditional analyses identified that there were cases when moderation was occurring. This moderation was overlooked in the unconditional model because the variables were excluded.

Scholars forma a better understanding of the processes at work when they can identify how or for whom or in what context a communication-related event or phenomenon may affect an outcome, if at all (Hayes, 2016). The conditional process analysis overcame limitations common to tests based on analysis of variance, and provided an option for retaining information that was lost in the unconditional process analysis (a.k.a. mediation analysis). A major goal of scientific inquiry is to grasp the processes and boundary conditions by which effects operate. With good theory and a rigorous research design, conditional process models can quantify the boundary conditions of effects that might be causal and test hypotheses about potentially causal relationships (Hayes, 2013, 2018a).

This dissertation advanced the IDEA model by presenting: 1) a rigorous tool that more appropriately tested hypotheses, 2) a visually-friendly conceptual diagram friendly for depicting a path-analytic framework, 3) important guidelines that scholars should employ to examine the IDEA model’s utility, and 4) justification for theoretical grounding in Witte’s (1992a) EPPM in addition to D. Kolb’s (1984) learning cycle model. When the IDEA model predictions were examined as theorized, my results demonstrated that the IDEA message was not consistently superior to an alternative message. My results suggest that an IDEA-modeled message should be thoughtfully designed to prevent inappropriate outcomes among target audience members.

Limitations

The current study contributed to the literature in a number of ways. The study provided a test of T. Sellnow and D. Sellnow's (2013) IDEA model. An improved protocol for testing the IDEA model emerged from this study. Witte et al.'s (1996) assessment was tested in a new context. Despite the results, a number of limitations exist that may hamper the ability to generalize the findings.

The two video messages developed by T. Sellnow and colleagues were used as the stimuli for this study. As described earlier, the message scripts included features that operationalized the IDEA model elements of internalization, action, and explanation. Although the status quo message was expected to be completely void of features that reflect internalization and action, this was not the case for the messages tested in the present study or for the messages tested in previous studies (namely, Littlefield et al., 2014; D. Sellnow, Johansson et al., 2018; D. Sellnow, Lane, Littlefield et al., 2015; D. Sellnow, Lane, T. Sellnow et al., 2017).

As anticipated by the funding agencies, the target population of the study was adult individuals of the general population who rely on the U.S. food supply, and would be responsible for making decisions pertaining to a food-recall warning. The study planned to draw a sample representative of the general population, from communities across four regional locations in the continental U.S. As a whole, the four samples may not represent the greater U.S. population. The ethnic groups sampled in multiple locations, may have views unique that are specific to their area in which they live. Variations in viewpoints among ethnic groups may have influenced the results.

Four samples drawn for this study varied greatly in size. The largest sample was drawn from students enrolled in courses at a university at one of the study site locations, and comprised

58% of the total sample. The majority of the participants were between the ages of 18 and 21 years (65%). Student responses are considered uncharacteristic of general population responses and may have confounded the results.

The study involved a single measurement timeframe, which did not allow for changes in perception of behavior over time. Participants' responses were self-reported rather than measures of actual behavior. Participants responded to a simulated food-recall warning, rather than responding to a real food-recall event experience. Responses on computer may have had an effect on their responses, especially if participants were technologically challenged. The largest portion of participants responded in a computer lab, which may have influenced their responses.

The intention items for the current study were adapted from 12 items created by T. Sellnow and colleagues. These items were not pilot tested for reliability and validity prior to the current study. Some of the single-item measures included more than one dimension. It is possible that interpretation of the intention items varied among participants. The video messages identified *S. typhimurium* as the foodborne illness in the outbreak scenario. Eight items in participant questionnaire referenced *E. coli* rather than *Salmonella*. These assessment items were included in the present study to form the four perceived importance measures. It is possible that participants interpreted the IDEA message differently than intended.

The survey instrument was quite long, with a total of 168 questions and likely resulted in viewer fatigue. Scrutiny of the data revealed that individuals became less engaged as they continued to complete the survey. Although a significant portion of participants were removed from the data set after identifying unengaged individuals, it is possible that the remaining participants experienced fatigue, became disinterested, or became distracted as they completed the lengthy survey. In turn, this may have influenced their responses.

Calls for Future Research

The findings and limitations of this study inform the direction for future message testing research in the area of food-recall warnings. First, study designs should employ rigorous experimental designs that are carefully planned with the best tools in mind. Rigorous designs and tools have a direct impact on the quality of research claims that may be drawn from the conclusions. Message designs should be well thought out and account for the relationship between structure, style, and extra-message variables.

Instruments need to be carefully planned so that they incorporate an appropriate balance of assessment items that will inform the research without necessarily overwhelming participants. Assessment items should be pilot-tested and evaluated for validity and reliability prior to conducting the main studies. This will allow for refinements to the instrument as necessary. Measures of receivers' perceptions are critical to message-testing studies because they provide the receiver's feedback to protocols that have been designed from the senders' perspective. It is important to use measures that maintain control of data collection to ensure that meaningful data are being gathered.

Once data have been collected, rigorous tests should be employed to thoroughly evaluate the effectiveness of messages being evaluated for persuasive effect. Rather than relying heavily on tests based on analysis of variance, regression based approaches should be explored. Conditional process analysis incorporates moderation and mediation into a single framework. A conditional process approach provides a powerful and valid approach for testing causation and should be considered. This approach provides a way to include continuous measures in their original metric, rather than collapsing or dichotomizing data using median splits.

Studies should strive to obtain appropriate samples that are representative. Without a representative sample, it will be difficult to generalize the results. Finally, when planning the study, the end-users should be kept in mind, namely the beneficiaries of the findings. Message testing is of great value to practitioners because the findings provide direction for evaluating, refining, and identifying new approaches for effective communication. Future research should continue to explore how to design and thoroughly evaluate effective warning messages.

In general, message-testing studies are important because they provide a way to evaluate, refine, and identify communication strategies that will have the greatest persuasive appeal. Studies that test communication approaches are vital to federal agencies, such as the U.S. DHS and the FSIS. These agencies have a tremendous need for effective protocols that can guide public communication efforts during major events, including food-recall warnings. Because organizations depend on the findings provided through message-testing research, it is imperative that the most rigorous study designs are employed, the best tools are applied, and the conceptual frameworks remain sound. Improvements to food-recall warnings are of great importance to practitioners who need to design messages quickly to alert the public. Saving lives needs to remain a number one priority. The goal of a food recall warning should be to reduce the public health threat of foodborne illness. For the most part, foodborne illness is preventable. If the main point of the message design is to reduce foodborne illness threat, the recommendations for people to follow should clearly explain how the actions can reduce the threat. Message-testing research needs to continue to identify the most effective messages that will persuade people to respond in a manner that aligns with food-recall warning recommendations.

Conclusion

In this final chapter, the findings and hypotheses were discussed as conclusions were drawn. Limitations were addressed, and directions for future research were presented. Improvements to food-recall warnings are of great importance to practitioners who need to design messages quickly to alert the public. During a food recall, the priority is to reduce public health threat for foodborne illness and save lives. The purpose of this dissertation was to thoroughly test two communication approaches in the context of a food-related, public health crisis. A new tool was employed to analyze data and provide a more informative method for evaluating the persuasive influence of message strategies. Alternative message designs approaches should be explored for motivating and empowering affected audiences to self-protect against foodborne disease during food contamination events.

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APPENDIX A. LEARNING STYLES QUIZ

(D. Sellnow, 2005)

Baseline Assessment

For each question, check the response that is MOST like you. Record your first thought.

1. I tend to:

    A. Trust my feeling and intuition.

    B. Observe and Reflect

    C. Analyze and Evaluate.

    D. Actively Experiment

2. When I learn:

    A. I am receptive and open-minded.

    B. I am careful and reflective.

    C. I am rational and analytical.

    D. I am practical and active.

3. I enjoy learning when I focus on:

    A. Concrete experiences.

    B. Reflective observations.

    C. Abstract examples.

    D. Active experimentation.

4. I tend to:

A. Real life examples.

B. Visual aids.

C. Abstract examples.

D. Opportunities for active experimentation.

5. I tend to learn best when:

A. I am presented with actual examples from experiences of people.

B. I have time to reflect.

C. I can examine facts and statistics.

D. I can try to actively solve a problem.

6. If I were asked to choose only one, I'd say I generally act based on:

A. My intuition.

B. Careful observations.

C. Logical reasoning.

D. My actual experiences.

7. When I learn, I:

A. Feel personally involved in things.

B. Take time to reflect.

C. Examine theories.

D. See results from my work.

8. I prefer working in an environment where I can:

A. Interact with others.

B. Take time to process things.

C. Critique things.

D. Try things out myself.

9. I especially like workshops that encourage me to learn about concepts by:

A. Having fun with others.

B. Reflecting privately.

C. Analyzing and critiquing.

D. Actively experimenting/applying.

10. When discussing ideas with others, I am best at:

A. Considering a variety of points of view.

B. Taking time to reflect before responding.

C. Using logic to analyze and evaluate.

D. Getting things done and accomplishing goals.

11. When learning an entirely new procedure, I am most likely to begin by:

A. Asking about the experiences of people who've done it before.

B. Reading through the directions and pondering them carefully.

C. Researching all I can about its origins, pros, cons, etc.

D. Trying it out and moving forward based on trial and error.

12. I learn best when I:

A. Have an opportunity to hear actual personal stories about the topic.

B. Can take time to think about the material.

C. Can rationally evaluate theories.

D. Am fully involved in the experience.

13. When I am learning something new, I am typically:

A. Accepting and open-minded to it.

B. Reserved and take time to think reflectively about it.

C. Critical and want to evaluate it based on logical reasoning.

D. Wanting to try it out for myself.

14. If I were to describe myself, I would say I prefer to learn by:

A. Lots of experiences from others.

B. Reflecting quietly about my observations.

C. Evaluating and critiquing concepts and theories.

D. Experimentation and application of concepts and theories.

15. If I were to describe myself when I am learning something new to me, I would say I enjoy:

A. Being receptive to lots of new ideas.

B. Being careful as I proceed.

C. Analyzing and critiquing new ideas.

D. Experimenting with new ideas for myself.

APPENDIX B. IDEA MESSAGE SCRIPT

Anchor Intro:

A new outbreak of a potentially deadly food contamination involving ground beef is touching the entire state of Kentucky today. That word comes from the U.S. Food Safety and Inspection Service. Correspondent Ron Blome has details:

Script:

The recall is based on an outbreak of food borne illness that appears to be associated with ground beef. Meat sold in a number of regional chains and locally owned grocery stores throughout the state from Paducah to Pikeville and from Louisville to Lexington. Experts believe a rare form of *Salmonella* is to blame. So far 27 people are officially confirmed as sickened by *Salmonella typhimurium* – and at least three of those have life threatening conditions. There is also one death that is under investigation. Nineteen of those infected reported consuming ground beef purchased from a Kentucky store over the past month.

The product recall includes any size package of ground beef that have sell-by-dates of October 15, or earlier. Consumers who have purchased ground beef with sell-by dates of October 15th or earlier should return the meat to the store for a full refund.

One infected individual was 54-year old Winona Richards, a deli cook at a local grocery. She became ill two nights ago with cramps and diarrhea and believed it would pass. But when her husband discovered her unconscious the next morning, he called 911 and she was rushed to the emergency room. Just hours later she died at the hospital. he wife and mother of three was loved by family, friends and co-workers:

[Friend] – *"Winona was the best friend I ever had. She was so good to her family and friends, and even to strangers. It's just not fair to lose her this way."*

The symptoms of salmonellosis include diarrhea, abominable cramps and fever within 12 to 72 hours of eating the contaminated meat. Other symptoms are chills, headaches, nausea and vomiting that can last for up to 7 days. Left untreated, salmonellosis can cause bleeding in the brain or kidneys and death.

If you or someone you know has eaten beef over the past 3-days and is experiencing ANY of the symptoms, you should contact your physician, go to the nearest emergency room or call 911. Do not use over-the-counter anti-diarrhea drugs as these could keep the deadly bacteria in your system longer.

Officials from the Food Safety and Inspection Service and the CDC are directing the investigation and say their work is urgent. They say the tainted meat can be found in many food products containing ground beef and the exposure can go beyond the home to restaurants and other prepared foods.

In the meantime, health officials are warning the public to: Use a food thermometer to cook all fresh or frozen ground beef to an internal temperature of at least 160-degrees and to wash hands often with soapy water.

STANDUP CLOSE:

Health officials are also warning the public to refrain from eating ground beef at any locations – including fast food, restaurants, grocery store delis as well as at home.

They do not want anyone else to become infected. Ron Blome reporting.

APPENDIX C. STATUS QUO MESSAGE SCRIPT

Anchor Intro:

A new outbreak of a potentially deadly food contamination involving ground beef is touching the entire state of Kentucky today. That word comes from the U.S. Food Safety and Inspection Service. Correspondent Ron Blome has details:

Script:

The recall is based on an outbreak of food borne illness that appears to be associated with ground beef. Meat sold in a number of regional chains and locally owned grocery stores throughout the state. Experts believe a rare form of *Salmonella* is to blame. So far 27 people are officially confirmed as sickened by *Salmonella typhimurium*—and at least three of those have life threatening conditions. There is also one death that is under investigation. 19 of those infected reported consuming ground beef purchased from a Kentucky store over the last month. No other product descriptions are available at this time.

The product recall includes any size packages of ground beef that have sell-by dates of October 15th or earlier. Officials are concerned that some of the beef sold in Kentucky has already been consumed and that more could be in people's freezers. But they say they have no way of knowing how much of the suspect meat has already reached consumers.

Salmonella is a microscopic bacterium that causes infections. It is most commonly present in undercooked food, including beef, chicken, turkey, and eggs. But it has also been linked to tainted fruits and vegetables and sometimes ties to processed foods like pot pies or frozen pizzas. Making this outbreak more dangerous is that this strain of *Salmonella* is resistant to three common classes of antibiotics.

The symptoms of salmonellosis include diarrhea, abdominal cramps, and fever within 12 to 72 hours of eating the contaminated meat. Other symptoms are chills, headache, nausea, and vomiting that can last for up to seven days. Left untreated, salmonellosis can cause bleeding in the brain or kidneys and death.

Officials from the Food Safety and Inspection Service and the CDC are directing the investigation and say their work is urgent. [CDC expert] *"We're putting every available resource that we have to track this dangerous bacteria down, to identify where it's coming from, and to stop this product from getting to the general public."*

The tainted meat can be found in many food products containing ground beef and the exposure can go beyond the home to restaurants and other prepared foods such as frozen pizzas and pot pies. The Food Safety Service says they will continue to provide information as it becomes available.

Standup Close:

Health officials are also warning the public to refrain from eating ground beef at any locations—including fast food, restaurants, grocery store deli's, as well as at home. They do not want anyone else to become infected. Ron Blome reporting.

APPENDIX D. BEHAVIORAL INTENTIONS

Developed by T. Sellnow and colleagues

Post Assessment Measures

A 5-point scale was used to evaluate participants' response for each item:

Very Unlikely 1 2 3 4 5 Very Likely

Intention to return ground beef to the store

1. How likely would you be to return your ground beef to the store where you purchased it?

Intention to avoid eating ground beef when dining out (three-item scale)

2. When eating out, how likely are you to ask for no ground beef when ordering food that usually contains ground beef?
3. When eating out, how likely are you to pick off ground beef that comes on your plate?
4. When eating out, how likely are you to send back food that comes with ground beef?

APPENDIX E. PERCEIVED MESSAGE EFFECTIVENESS

Adapted from Harris (2007) and Noar et al. (2010)

Post Assessment Measure

A 5-point Likert-type scale was used to evaluate participants' response for each item:

Strongly Disagree 1 2 3 4 5 Strongly Agree

1. This video would catch my attention.
2. This video is believable.
3. This video would make me more likely to not eat potentially contaminated food.
4. This video is memorable.
5. This video is effective.
6. This video would make people my age more likely to not eat potentially contaminated food.
7. This video would help convince people my age to not eat potentially contaminated food.
8. This video would help convince me to not eat potentially contaminated food.

APPENDIX F. RISK BEHAVIOR DIAGNOSIS

Adapted from Witte et al. (1996)

Baseline Assessment and Post Assessment Measures

A 7-point Likert-type scale was used to evaluate participants' response for each item:

Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

Perceived threat: severity

1. Foodborne illness is a serious threat.
2. Foodborne illness is harmful.
3. Foodborne illness is a severe threat.

Perceived threat: susceptibility

1. I am at risk for foodborne illness.
2. It is possible that I will get foodborne illness.
3. I am likely to get foodborne illness.

Perceived efficacy: response efficacy

1. Not eating contaminated food prevents foodborne illness.
2. Not eating contaminated food works in preventing foodborne illness.
3. Not eating contaminated food is effective in removing the threat of foodborne illness.

Perceived efficacy: self-efficacy

1. I am able to stop eating contaminated food to prevent foodborne illness.
2. It is easy to stop eating contaminated food to prevent foodborne illness.
3. I can stop eating contaminated food to prevent foodborne illness.

APPENDIX G. PERCEIVED IMPORTANCE IN MESSAGE ELEMENTS

Developed by T. Sellnow and colleagues

Post Assessment Measure

A 5-point scale was used to evaluate participants' response for each item:

Not At All Important 1 2 3 4 5 Extremely Important

Perceived importance in internalization message elements (feeling)

1. How important is it for you to learn that *E. coli* had been discovered in ground beef?
2. How important is it for you to learn that *E. coli* had been discovered in your state?
3. How important is it for you to hear what can happen to people who get *E. coli* poisoning?
4. How important is it for you to know the symptoms of *E. coli* poisoning?
5. How important is it for you to learn about people who died from *E. coli* poisoning?

Perceived importance in explanation message elements (watching)

6. How important is it for you to hear from the epidemiologist?

Perceived importance in information message elements (thinking)

7. How important is it for you to hear a description of what *E. coli* is?

Perceived importance in action message elements (doing)

8. How important is it for you to learn what you should do if you get *E. coli* poisoning?

APPENDIX H. GENERAL QUESTIONS AND DEMOGRAPHICS

Developed by T. Sellnow and colleagues

Post Assessment Measures

Salience (Self)

1. How many times have you had food poisoning?

   0　　1-3　　3-5　　5+

   [Note: This measure was dichotomized as 0 (no experience) and 1 (at least one experience)]

Relevance

1. How often do you eat ground beef?

   Often　　Occasionally　　Never

Demographics

1. What is your sex?

   Male　　Female

2. What is your age?

   18-21　　22-25　　26-29　　30-33　　34+

3. What is your approximate yearly income?

   low income　　low middle income　　middle income

   upper middle income　　high income

APPENDIX I. CODEBOOK FOR PROCESS OUTPUT VARIABLES

******************* PROCESS Procedure for SPSS Version 3.00 *******************

Macro Written by Andrew F. Hayes, Ph.D.   www.afhayes.com

Documentation available in Hayes (2018a). www.guilford.com/p/hayes3

****

Custom Syntax Written by Kimberly A. Beauchamp

****

Y_3 : Return (intention to return ground beef to the store; 1 item)

Y_4 : OutRefrn (intention to avoid eating ground beef when dining out; 3-item scale)

X : IDEA (message variation dichotomy: IDEA(.50); status quo (-.50)

M_1 : DngrCtrl (perceived danger control; continuous measure; efficacy (6-item scale) minus threat (6-item scale)

M_2 : IDEAintz (perceived importance in internalization elements; continuous measure; 5-item scale)

M_3 : IDEAexp (perceived importance in explanation elements; continuous measure; single-item indicator)

M_4 : IDEAinfo (perceived importance in information elements; continuous measure; single-item indicator)

M_5 : IDEAactn (perceived importance in action elements; continuous measure; single-item indicator)

M_6 : Effectiv (perceived message effectiveness; continuous measure; 7-item scale)

W : bF (preexisting state of control; dichotomy coded as: danger control (.5); fear control (-.5)

Z : LPmode (learning preference mode; categorical; see Helmert coding scheme for contrasts L1 and L2)

LPmode categories:

LPmode 1 (explanation learning preference mode);

LPmode 2 (internalization learning preference mode);

LPmode 3 (action learning preference mode)

Helmert coding scheme of categorical Z variable for the two planned orthogonal contrasts:

LPmode	L1	L2
1.000	-.667	.000
2.000	.333	-.500
3.000	.333	.500

Key Codes for interactions:

IDEAxbF (IDEA x Preexisting State of control)

IDEAxL1 (IDEA x LPmode (contrast 1)

IDEAxL2 (IDEA x LPmode (contrast 2)

bFxL1 (Preexisting Control x LPmode; contrast 1)

bFxL2 (Preexisting control x LPmode; contrast 2)

IDxbFxL1 (IDEA x Preexisting Control x LPmode; contrast 1)

IDxLSxD2 (IDEA x Preexisting Control x Learning Preference; contrast 2)

APPENDIX J. MODEL FOR SIX PARALLEL MEDIATORS

******************* PROCESS Procedure for SPSS Version 3.00 ********************

Macro Written by Andrew F. Hayes, Ph.D. www.afhayes.com

Documentation available in Hayes (2018a). www.guilford.com/p/hayes3

****

Custom Syntax Written by Kimberly A. Beauchamp

****

Model: CUSTOM (three-way interactions for conditional direct effect)

X : IDEA (message variation dichotomy: IDEA(.50); status quo (-.50)

M_1 : DngrCtrl (perceived danger control; continuous measure; efficacy (6-item scale) minus threat (6-item scale)

M_2 : IDEAintz (perceived importance in internalization elements; continuous measure; 5-item scale)

M_3 : IDEAexp (perceived importance in explanation elements; continuous measure; single-item indicator)

M_4 : IDEAinfo (perceived importance in information elements; continuous measure; single-item indicator)

M_5 : IDEAactn (perceived importance in action elements; continuous measure; single-item indicator)

M_6 : Effectiv (perceived message effectiveness; continuous measure; 7-item scale)

W : bF (preexisting state of control; dichotomy coded as: danger control (.5); fear control (-.5)

Z : LPmode (learning preference mode; categorical; see Helmert coding scheme for contrasts L1 and L2)

Helmert coding scheme of categorical Z variable for analysis:

LPmode	L1	L2
1.000	-.667	.000
2.000	.333	-.500
3.000	.333	.500

There are no covariates in this statistical model.

See Appendix C for a detailed code book of PROCESS output variables.

Sample Size: 641 Custom Seed: 10,235

```
**************************************************************************
OUTCOME VARIABLE: DngrCtrl
Model Summary
          R       R-sq        MSE      F(HC3)        df1        df2          p
      .4532      .2054      .9964     14.8207    11.0000   629.0000      .0000
Model
              coeff    se(HC3)          t          p       LLCI       ULCI
constant     -.1115      .0415    -2.6855      .0074     -.1931     -.0300
IDEA          .1903      .0831     2.2906      .0223      .0272      .3534
bF          -1.0180      .0831   -12.2542      .0000    -1.1811     -.8548
L1           -.0642      .0891     -.7202      .4717     -.2391      .1108
L2            .0335      .1006      .3326      .7396     -.1641      .2310
```

```
IDEAxbF        .1554       .1661       .9355       .3499      -.1708       .4817
IDEAxL1        .2194       .1782      1.2315       .2186      -.1305       .5693
IDEAxL2        .1086       .2012       .5397       .5896      -.2865       .5037
bFxL1         -.0894       .1782      -.5019       .6159      -.4393       .2605
bFxL2         -.0927       .2012      -.4605       .6453      -.4878       .3024
IDxbFxL1      -.0277       .3564      -.0778       .9380      -.7275       .6721
IDxbFxL2       .1980       .4024       .4921       .6228      -.5922       .9882

Test(s) of highest order unconditional interaction(s):
        R2-chng     F(HC3)        df1        df2          p
X*W*Z      .0003      .1294     2.0000   629.0000      .8786
----------
    Focal predict: IDEA     (X)
          Mod var: bF       (W)
          Mod var: LPmode   (Z)

Test of conditional X*W interaction at value(s) of Z:
     LPmode     Effect     F(HC3)        df1        df2          p
     1.0000      .1739      .3496     1.0000   629.0000      .5545
     2.0000      .0472      .0336     1.0000   629.0000      .8545
     3.0000      .2452      .6281     1.0000   629.0000      .4284

Conditional effects of the focal predictor at values of the moderator(s):

         bF     LPmode     Effect    se(HC3)          t          p       LLCI       ULCI
     -.5000     1.0000     -.0430      .1850     -.2327      .8161     -.4063      .3202
     -.5000     2.0000      .1855      .1562     1.1876      .2355     -.1212      .4922
     -.5000     3.0000      .1950      .1989      .9807      .3271     -.1955      .5856
      .5000     1.0000      .1309      .2287      .5723      .5673     -.3182      .5800
      .5000     2.0000      .2327      .2044     1.1380      .2555     -.1688      .6341
      .5000     3.0000      .4402      .2370     1.8573      .0637     -.0252      .9057

Data for visualizing the conditional effect of the focal predictor:
Paste text below into a SPSS syntax window and execute to produce plot.

DATA LIST FREE/
       IDEA       bF         LPmode     DngrCtrl.
BEGIN DATA.
     -.5000     -.5000     1.0000      .4319
      .5000     -.5000     1.0000      .3889
     -.5000     -.5000     2.0000      .2583
      .5000     -.5000     2.0000      .4438
     -.5000     -.5000     3.0000      .3333
      .5000     -.5000     3.0000      .5284
     -.5000      .5000     1.0000     -.6133
      .5000      .5000     1.0000     -.4825
     -.5000      .5000     2.0000     -.7667
      .5000      .5000     2.0000     -.5340
     -.5000      .5000     3.0000     -.8833
      .5000      .5000     3.0000     -.4431
END DATA.GRAPH/SCATTERPLOT= IDEA WITH DngrCtrl BY bF/PANEL ROWVAR=LPmode.
**************************************************************************
OUTCOME VARIABLE: IDEAintz

Model Summary
          R       R-sq        MSE     F(HC3)        df1        df2          p
      .1845      .0340      .3380     1.8375    11.0000   629.0000      .0448
```

Model

	coeff	se(HC3)	t	p	LLCI	ULCI
constant	3.4223	.0241	141.8975	.0000	3.3750	3.4697
IDEA	.0444	.0482	.9204	.3577	-.0503	.1391
bF	-.0577	.0482	-1.1962	.2321	-.1524	.0370
L1	.1153	.0518	2.2267	.0263	.0136	.2169
L2	.1468	.0584	2.5153	.0121	.0322	.2615
IDEAxbF	.2226	.0965	2.3072	.0214	.0331	.4120
IDEAxL1	-.1128	.1035	-1.0895	.2763	-.3161	.0905
IDEAxL2	.0428	.1168	.3670	.7137	-.1864	.2721
bFxL1	.0782	.1035	.7551	.4505	-.1251	.2815
bFxL2	-.0810	.1168	-.6936	.4882	-.3103	.1483
IDxbFxL1	-.0904	.2071	-.4364	.6627	-.4969	.3162
IDxbFxL2	-.0336	.2335	-.1441	.8855	-.4922	.4249

Test(s) of highest order unconditional interaction(s):

	R2-chng	F(HC3)	df1	df2	p
X*W*Z	.0003	.1022	2.0000	629.0000	.9029

```
    Focal predict: IDEA      (X)
          Mod var: bF        (W)
          Mod var: LPmode    (Z)
```

Test of conditional X*W interaction at value(s) of Z:

LPmode	Effect	F(HC3)	df1	df2	p
1.0000	.2828	2.7363	1.0000	629.0000	.0986
2.0000	.2093	1.7983	1.0000	629.0000	.1804
3.0000	.1757	1.0230	1.0000	629.0000	.3122

Conditional effects of the focal predictor at values of the moderator(s):

bF	LPmode	Effect	se(HC3)	t	p	LLCI	ULCI
-.5000	1.0000	-.0218	.0991	-.2198	.8261	-.2165	.1729
-.5000	2.0000	-.1192	.0895	-1.3321	.1833	-.2950	.0565
-.5000	3.0000	-.0596	.1145	-.5202	.6031	-.2845	.1653
.5000	1.0000	.2611	.1393	1.8738	.0614	-.0125	.5346
.5000	2.0000	.0901	.1279	.7044	.4814	-.1610	.3412
.5000	3.0000	.1161	.1306	.8891	.3743	-.1403	.3725

Data for visualizing the conditional effect of the focal predictor:
Paste text below into a SPSS syntax window and execute to produce plot.

```
DATA LIST FREE/
        IDEA        bF       LPmode     IDEAintz.
BEGIN DATA.
     -.5000     -.5000     1.0000     3.4113
      .5000     -.5000     1.0000     3.3895
     -.5000     -.5000     2.0000     3.4425
      .5000     -.5000     2.0000     3.3233
     -.5000     -.5000     3.0000     3.6000
      .5000     -.5000     3.0000     3.5404
     -.5000      .5000     1.0000     3.1600
      .5000      .5000     1.0000     3.4211
     -.5000      .5000     2.0000     3.3467
      .5000      .5000     2.0000     3.4367
     -.5000      .5000     3.0000     3.4400
      .5000      .5000     3.0000     3.5561
END DATA.GRAPH/SCATTERPLOT= IDEA WITH IDEAintz BY bF/PANEL ROWVAR=LPmode.
```

****

OUTCOME VARIABLE: IDEAexp

```
Model Summary
          R       R-sq        MSE     F(HC3)        df1        df2          p
      .1909      .0364      .7366     2.4999    11.0000   629.0000      .0044

Model
              coeff    se(HC3)          t          p       LLCI       ULCI
constant     3.0597      .0359    85.2900      .0000     2.9893     3.1302
IDEA          .0975      .0717     1.3591      .1746     -.0434      .2384
bF           -.1379      .0717    -1.9226      .0550     -.2788      .0030
L1            .1150      .0754     1.5249      .1278     -.0331      .2631
L2            .1431      .0886     1.6145      .1069     -.0310      .3172
IDEAxbF       .2711      .1435     1.8889      .0594     -.0107      .5528
IDEAxL1      -.2336      .1508    -1.5485      .1220     -.5298      .0626
IDEAxL2       .1281      .1773      .7228      .4701     -.2200      .4763
bFxL1        -.0132      .1508     -.0874      .9303     -.3094      .2830
bFxL2        -.1009      .1773     -.5691      .5695     -.4491      .2473
IDxbFxL1     -.7436      .3017    -2.4650      .0140    -1.3361     -.1512
IDxbFxL2      .2033      .3546      .5733      .5667     -.4931      .8996

Test(s) of highest order unconditional interaction(s):
         R2-chng     F(HC3)        df1        df2          p
X*W*Z      .0108     3.3026     2.0000   629.0000      .0374
----------
      Focal predict: IDEA     (X)
          Mod var: bF       (W)
          Mod var: LPmode   (Z)

Test of conditional X*W interaction at value(s) of Z:
     LPmode     Effect     F(HC3)        df1        df2          p
     1.0000      .7671     9.8762     1.0000   629.0000      .0018
     2.0000     -.0782      .1088     1.0000   629.0000      .7417
     3.0000      .1251      .2251     1.0000   629.0000      .6354

Conditional effects of the focal predictor at values of the moderator(s):

         bF     LPmode     Effect    se(HC3)          t          p       LLCI       ULCI
     -.5000     1.0000     -.1302      .1546     -.8422      .4000     -.4338      .1734
     -.5000     2.0000     -.0052      .1297     -.0403      .9678     -.2600      .2495
     -.5000     3.0000      .0213      .1689      .1260      .8998     -.3103      .3529
      .5000     1.0000      .6368      .1889     3.3719      .0008      .2660     1.0077
      .5000     2.0000     -.0834      .1985     -.4203      .6744     -.4733      .3064
      .5000     3.0000      .1463      .2024      .7229      .4700     -.2512      .5439

Data for visualizing the conditional effect of the focal predictor:
Paste text below into a SPSS syntax window and execute to produce plot.

DATA LIST FREE/
      IDEA         bF     LPmode     IDEAexp.
BEGIN DATA.
     -.5000     -.5000     1.0000     3.1127
      .5000     -.5000     1.0000     2.9825
     -.5000     -.5000     2.0000     3.0750
      .5000     -.5000     2.0000     3.0698
     -.5000     -.5000     3.0000     3.2553
      .5000     -.5000     3.0000     3.2766
     -.5000      .5000     1.0000     2.6000
      .5000      .5000     1.0000     3.2368
     -.5000      .5000     2.0000     3.0222
```

```
     .5000      .5000     2.0000     2.9388
    -.5000      .5000     3.0000     3.0000
     .5000      .5000     3.0000     3.1463
```
END DATA.GRAPH/SCATTERPLOT= IDEA WITH IDEAexp BY bF/PANEL ROWVAR=LPmode.

```
**********************************************************************

OUTCOME VARIABLE: IDEAinfo
Model Summary
          R       R-sq        MSE     F(HC3)        df1        df2          p
      .1623      .0263      .6037     1.6921    11.0000   629.0000      .0712
Model
              coeff    se(HC3)          t          p       LLCI       ULCI
constant     3.3279      .0316   105.2229      .0000     3.2658     3.3900
IDEA          .1163      .0633     1.8393      .0663    -.0079      .2406
bF           -.0649      .0633    -1.0264      .3051    -.1891      .0593
L1            .0006      .0645      .0092      .9927    -.1261      .1273
L2            .2283      .0803     2.8424      .0046     .0706      .3860
IDEAxbF      -.0258      .1265     -.2036      .8388    -.2742      .2227
IDEAxL1      -.2244      .1291    -1.7387      .0826    -.4778      .0290
IDEAxL2      -.0504      .1606     -.3140      .7536    -.3658      .2650
bFxL1        -.1158      .1291     -.8975      .3698    -.3693      .1376
bFxL2         .0185      .1606      .1153      .9083    -.2969      .3339
IDxbFxL1      .0773      .2581      .2994      .7647    -.4296      .5842
IDxbFxL2     -.1046      .3212     -.3256      .7449    -.7354      .5262

Test(s) of highest order unconditional interaction(s):
       R2-chng     F(HC3)        df1        df2          p
X*W*Z      .0003      .1014     2.0000   629.0000      .9036
----------
    Focal predict: IDEA     (X)
          Mod var: bF       (W)
          Mod var: LPmode   (Z)

Test of conditional X*W interaction at value(s) of Z:
     LPmode     Effect     F(HC3)        df1        df2          p
     1.0000     -.0773      .1464     1.0000   629.0000      .7022
     2.0000      .0523      .0561     1.0000   629.0000      .8128
     3.0000     -.0523      .0502     1.0000   629.0000      .8228

Conditional effects of the focal predictor at values of the moderator(s):

         bF     LPmode     Effect    se(HC3)          t          p       LLCI       ULCI
     -.5000     1.0000      .3047      .1290     2.3616      .0185      .0513      .5580
     -.5000     2.0000      .0407      .1264      .3220      .7475     -.2075      .2889
     -.5000     3.0000      .0426      .1466      .2904      .7716     -.2452      .3303
      .5000     1.0000      .2274      .1555     1.4620      .1442     -.0780      .5328
      .5000     2.0000      .0930      .1808      .5142      .6073     -.2621      .4481
      .5000     3.0000     -.0098      .1818     -.0537      .9572     -.3667      .3472

Data for visualizing the conditional effect of the focal predictor:
Paste text below into a SPSS syntax window and execute to produce plot.
```
DATA LIST FREE/

```
       IDEA         bF     LPmode   IDEAinfo.
```
BEGIN DATA.

```
     -.5000     -.5000     1.0000     3.1690
      .5000     -.5000     1.0000     3.4737
     -.5000     -.5000     2.0000     3.2500
      .5000     -.5000     2.0000     3.2907
```

```
    -.5000     -.5000     3.0000     3.4681
     .5000     -.5000     3.0000     3.5106
    -.5000      .5000     1.0000     3.2200
     .5000      .5000     1.0000     3.4474
    -.5000      .5000     2.0000     3.1111
     .5000      .5000     2.0000     3.2041
    -.5000      .5000     3.0000     3.4000
     .5000      .5000     3.0000     3.3902
```
END DATA.GRAPH/SCATTERPLOT= IDEA WITH IDEAinfo BY bF/PANEL ROWVAR=LPmode.

```
**************************************************************************

OUTCOME VARIABLE: IDEAactn

Model Summary
          R       R-sq        MSE     F(HC3)        df1        df2          p
      .1543      .0238      .3820     1.3690    11.0000   629.0000      .1831

Model
              coeff    se(HC3)          t          p       LLCI       ULCI
constant     3.5993      .0254   141.9140      .0000     3.5495     3.6491
IDEA         -.0298      .0507     -.5875      .5571     -.1294      .0698
bF           -.0721      .0507    -1.4222      .1555     -.1718      .0275
L1            .1323      .0571     2.3169      .0208      .0202      .2445
L2            .0671      .0581     1.1563      .2480     -.0469      .1812
IDEAxbF       .0456      .1015      .4490      .6536     -.1537      .2448
IDEAxL1      -.0905      .1142     -.7920      .4287     -.3148      .1339
IDEAxL2       .0659      .1161      .5677      .5704     -.1621      .2940
bFxL1         .0354      .1142      .3102      .7565     -.1889      .2598
bFxL2        -.0651      .1161     -.5610      .5750     -.2932      .1629
IDxbFxL1     -.2189      .2285     -.9581      .3384     -.6675      .2298
IDxbFxL2     -.3936      .2323    -1.6946      .0906     -.8497      .0625

Test(s) of highest order unconditional interaction(s):
        R2-chng     F(HC3)        df1        df2          p
X*W*Z      .0049     1.7796     2.0000   629.0000      .1696
----------
    Focal predict: IDEA      (X)
          Mod var: bF        (W)
          Mod var: LPmode    (Z)

Test of conditional X*W interaction at value(s) of Z:
     LPmode     Effect     F(HC3)        df1        df2          p
     1.0000      .1915      .9479     1.0000   629.0000      .3306
     2.0000      .1695     1.2562     1.0000   629.0000      .2628
     3.0000     -.2241     1.6160     1.0000   629.0000      .2041

Conditional effects of the focal predictor at values of the moderator(s):
         bF     LPmode     Effect    se(HC3)          t          p       LLCI       ULCI
     -.5000     1.0000     -.0652      .1187     -.5498      .5827     -.2982      .1678
     -.5000     2.0000     -.1776      .0883    -2.0109      .0448     -.3511     -.0042
     -.5000     3.0000      .0851      .1163      .7316      .4647     -.1433      .3136
      .5000     1.0000      .1263      .1569      .8049      .4212     -.1819      .4345
      .5000     2.0000     -.0082      .1227     -.0665      .9470     -.2491      .2328
      .5000     3.0000     -.1390      .1325    -1.0494      .2944     -.3992      .1211
Data for visualizing the conditional effect of the focal predictor:
Paste text below into a SPSS syntax window and execute to produce plot.
```

```
DATA LIST FREE/
       IDEA       bF       LPmode    IDEAactn.
BEGIN DATA.
     -.5000     -.5000     1.0000     3.5915
      .5000     -.5000     1.0000     3.5263
     -.5000     -.5000     2.0000     3.7125
      .5000     -.5000     2.0000     3.5349
     -.5000     -.5000     3.0000     3.6809
      .5000     -.5000     3.0000     3.7660
     -.5000      .5000     1.0000     3.4000
      .5000      .5000     1.0000     3.5263
     -.5000      .5000     2.0000     3.6000
      .5000      .5000     2.0000     3.5918
     -.5000      .5000     3.0000     3.7000
      .5000      .5000     3.0000     3.5610
END DATA.GRAPH/SCATTERPLOT= IDEA WITH IDEAactn BY bF/PANEL ROWVAR=LPmode.
***************************************************************************
OUTCOME VARIABLE:  Effectiv

Model Summary
          R       R-sq        MSE     F(HC3)        df1        df2          p
      .2115      .0447      .5039     2.6117    11.0000   629.0000      .0029

Model
              coeff    se(HC3)          t          p       LLCI       ULCI
constant     3.9159      .0294   133.0930      .0000     3.8581     3.9737
IDEA          .1271      .0588     2.1593      .0312      .0115      .2426
bF           -.2446      .0588    -4.1571      .0000     -.3602     -.1291
L1            .0285      .0604      .4726      .6367     -.0901      .1471
L2            .0089      .0743      .1195      .9049     -.1371      .1548
IDEAxbF       .2697      .1177     2.2915      .0223      .0386      .5008
IDEAxL1      -.0086      .1208     -.0715      .9430     -.2458      .2285
IDEAxL2      -.0955      .1486     -.6426      .5207     -.3874      .1964
bFxL1         .0704      .1208      .5831      .5600     -.1668      .3076
bFxL2        -.1947      .1486    -1.3098      .1907     -.4866      .0972
IDxbFxL1     -.1182      .2416     -.4895      .6247     -.5926      .3561
IDxbFxL2     -.1017      .2973     -.3421      .7324     -.6855      .4821

Test(s) of highest order unconditional interaction(s):
       R2-chng     F(HC3)        df1        df2          p
X*W*Z      .0005      .1552     2.0000   629.0000      .8563
----------
    Focal predict: IDEA      (X)
          Mod var: bF        (W)
          Mod var: LPmode    (Z)

Test of conditional X*W interaction at value(s) of Z:
     LPmode     Effect     F(HC3)        df1        df2          p
     1.0000      .3486     3.3506     1.0000   629.0000      .0677
     2.0000      .2812     2.4333     1.0000   629.0000      .1193
     3.0000      .1795      .5762     1.0000   629.0000      .4481

Conditional effects of the focal predictor at values of the moderator(s):

         bF     LPmode     Effect    se(HC3)          t          p       LLCI       ULCI
     -.5000     1.0000     -.0415      .1036     -.4002      .6892     -.2449      .1620
     -.5000     2.0000      .0314      .1132      .2771      .7818     -.1909      .2536
     -.5000     3.0000     -.0133      .1733     -.0767      .9389     -.3536      .3270
```

```
     .5000     1.0000      .3071      .1598     1.9221      .0550     -.0067      .6209
     .5000     2.0000      .3125      .1403     2.2278      .0262      .0370      .5880
     .5000     3.0000      .1662      .1608     1.0333      .3019     -.1496      .4819

Data for visualizing the conditional effect of the focal predictor:
Paste text below into a SPSS syntax window and execute to produce plot.

DATA LIST FREE/
       IDEA        bF      LPmode     Effectiv.
BEGIN DATA.
     -.5000     -.5000     1.0000     4.0634
      .5000     -.5000     1.0000     4.0219
     -.5000     -.5000     2.0000     3.9672
      .5000     -.5000     2.0000     3.9985
     -.5000     -.5000     3.0000     4.0957
      .5000     -.5000     3.0000     4.0824
     -.5000      .5000     1.0000     3.5975
      .5000      .5000     1.0000     3.9046
     -.5000      .5000     2.0000     3.7028
      .5000      .5000     2.0000     4.0153
     -.5000      .5000     3.0000     3.6875
      .5000      .5000     3.0000     3.8537
END DATA.GRAPH/SCATTERPLOT= IDEA WITH Effectiv BY bF/PANEL ROWVAR=LPmode.
```

****

Model: CUSTOM (two-way interactions for conditional direct effect)

X : IDEA (message variation dichotomy: IDEA(.50); status quo (-.50)

M_1 : DngrCtrl (perceived danger control; continuous measure; efficacy (6-item scale) minus threat (6-item scale)

M_2 : IDEAintz (perceived importance in internalization elements; continuous measure; 5-item scale)

M_3 : IDEAexp (perceived importance in explanation elements; continuous measure; single-item indicator)

M_4 : IDEAinfo (perceived importance in information elements; continuous measure; single-item indicator)

M_5 : IDEAactn (perceived importance in action elements; continuous measure; single-item indicator)

M_6 : Effectiv (perceived message effectiveness; continuous measure; 7-item scale)

W : bF (preexisting state of control; dichotomy coded as: danger control (.5); fear control (-.5)

Z : LPmode (learning preference mode; categorical; see Helmert coding scheme for contrasts L1 and L2)

Helmert coding scheme of categorical *Z* variable for analysis:

LPmode	L1	L2
1.000	-.667	.000
2.000	.333	-.500
3.000	.333	.500

There are eight covariates in this statistical model: L1 L2 IDEAxL1 IDEAxL2 bFxL1 bFxL2 IDxbFxL1 IDxbFxL2

See Appendix C for a detailed code book of the PROCESS output variables.

Sample Size: 641 Custom Seed: 10,235

****

```
OUTCOME VARIABLE:  DngrCtrl
Model Summary
          R       R-sq        MSE     F(HC3)        df1        df2          p
      .4532      .2054      .9964    14.8207    11.0000   629.0000      .0000

Model

              coeff    se(HC3)          t          p       LLCI       ULCI
constant     -.1115      .0415    -2.6855      .0074     -.1931     -.0300
IDEA          .1903      .0831     2.2906      .0223      .0272      .3534
bF          -1.0180      .0831   -12.2542      .0000    -1.1811     -.8548
L1           -.0642      .0891     -.7202      .4717     -.2391      .1108
L2            .0335      .1006      .3326      .7396     -.1641      .2310
IDEAxbF       .1554      .1661      .9355      .3499     -.1708      .4817
IDEAxL1       .2194      .1782     1.2315      .2186     -.1305      .5693
IDEAxL2       .1086      .2012      .5397      .5896     -.2865      .5037
bFxL1        -.0894      .1782     -.5019      .6159     -.4393      .2605
bFxL2        -.0927      .2012     -.4605      .6453     -.4878      .3024
IDxbFxL1     -.0277      .3564     -.0778      .9380     -.7275      .6721
IDxbFxL2      .1980      .4024      .4921      .6228     -.5922      .9882

Test(s) of highest order unconditional interaction(s):
       R2-chng     F(HC3)        df1        df2          p
X*W      .0011      .8752     1.0000   629.0000      .3499
----------
    Focal predict: IDEA     (X)
          Mod var: bF       (W)

Conditional effects of the focal predictor at values of the moderator(s):
         bF     Effect    se(HC3)          t          p       LLCI       ULCI
     -.5000      .1126      .1044     1.0779      .2815     -.0925      .3176
      .5000      .2680      .1292     2.0740      .0385      .0142      .5217

Data for visualizing the conditional effect of the focal predictor:
Paste text below into a SPSS syntax window and execute to produce plot.

DATA LIST FREE/
       IDEA         bF        DngrCtrl.
BEGIN DATA.
     -.5000     -.5000      .3422
      .5000     -.5000      .4548
     -.5000      .5000     -.7535
      .5000      .5000     -.4855
END DATA.GRAPH/SCATTERPLOT= IDEA WITH DngrCtrl BY bF.

***************************************************************************
OUTCOME VARIABLE:  IDEAintz

Model Summary
          R       R-sq        MSE     F(HC3)        df1        df2          p
      .1845      .0340      .3380     1.8375    11.0000   629.0000      .0448

Model
              coeff    se(HC3)          t          p       LLCI       ULCI
constant     3.4223      .0241   141.8975      .0000     3.3750     3.4697
IDEA          .0444      .0482      .9204      .3577     -.0503      .1391
bF           -.0577      .0482    -1.1962      .2321     -.1524      .0370
```

```
L1             .1153      .0518     2.2267      .0263      .0136      .2169
L2             .1468      .0584     2.5153      .0121      .0322      .2615
IDEAxbF        .2226      .0965     2.3072      .0214      .0331      .4120
IDEAxL1       -.1128      .1035    -1.0895      .2763     -.3161      .0905
IDEAxL2        .0428      .1168      .3670      .7137     -.1864      .2721
bFxL1          .0782      .1035      .7551      .4505     -.1251      .2815
bFxL2         -.0810      .1168     -.6936      .4882     -.3103      .1483
IDxbFxL1      -.0904      .2071     -.4364      .6627     -.4969      .3162
IDxbFxL2      -.0336      .2335     -.1441      .8855     -.4922      .4249

Test(s) of highest order unconditional interaction(s):
       R2-chng     F(HC3)        df1        df2          p
X*W      .0083     5.3230     1.0000   629.0000      .0214
----------
    Focal predict: IDEA      (X)
          Mod var: bF        (W)

Conditional effects of the focal predictor at values of the moderator(s):

        bF     Effect    se(HC3)          t          p       LLCI       ULCI
     -.5000     -.0669      .0587    -1.1405      .2545     -.1821      .0483
      .5000      .1557      .0766     2.0325      .0425      .0053      .3061

Data for visualizing the conditional effect of the focal predictor:
Paste text below into a SPSS syntax window and execute to produce plot.

DATA LIST FREE/
       IDEA       bF         IDEAintz.
BEGIN DATA.
     -.5000     -.5000     3.4692
      .5000     -.5000     3.4023
     -.5000      .5000     3.3002
      .5000      .5000     3.4559
END DATA.GRAPH/SCATTERPLOT= IDEA WITH IDEAintz BY bF.
***************************************************************************

OUTCOME VARIABLE:  IDEAexp

Model Summary
          R       R-sq        MSE     F(HC3)        df1        df2          p
      .1909      .0364      .7366     2.4999    11.0000   629.0000      .0044

Model
              coeff    se(HC3)          t          p       LLCI       ULCI
constant     3.0597      .0359    85.2900      .0000     2.9893     3.1302
IDEA          .0975      .0717     1.3591      .1746     -.0434      .2384
bF           -.1379      .0717    -1.9226      .0550     -.2788      .0030
L1            .1150      .0754     1.5249      .1278     -.0331      .2631
L2            .1431      .0886     1.6145      .1069     -.0310      .3172
IDEAxbF       .2711      .1435     1.8889      .0594     -.0107      .5528
IDEAxL1      -.2336      .1508    -1.5485      .1220     -.5298      .0626
IDEAxL2       .1281      .1773      .7228      .4701     -.2200      .4763
bFxL1        -.0132      .1508     -.0874      .9303     -.3094      .2830
bFxL2        -.1009      .1773     -.5691      .5695     -.4491      .2473
IDxbFxL1     -.7436      .3017    -2.4650      .0140    -1.3361     -.1512
IDxbFxL2      .2033      .3546      .5733      .5667     -.4931      .8996
```

```
Test(s) of highest order unconditional interaction(s):
       R2-chng     F(HC3)        df1        df2          p
X*W      .0056     3.5681     1.0000   629.0000      .0594
----------
    Focal predict: IDEA      (X)
          Mod var: bF        (W)

Conditional effects of the focal predictor at values of the moderator(s):
         bF     Effect    se(HC3)          t          p       LLCI       ULCI
     -.5000     -.0380      .0877     -.4334      .6649     -.2103      .1342
      .5000      .2330      .1136     2.0520      .0406      .0100      .4561
Data for visualizing the conditional effect of the focal predictor:
Paste text below into a SPSS syntax window and execute to produce plot.
DATA LIST FREE/
       IDEA       bF        IDEAexp.
BEGIN DATA.
     -.5000     -.5000     3.1304
      .5000     -.5000     3.0924
     -.5000      .5000     2.8569
      .5000      .5000     3.0900
END DATA.GRAPH/SCATTERPLOT= IDEA WITH IDEAexp BY bF.
**************************************************************************
OUTCOME VARIABLE:  IDEAinfo

Model Summary
          R       R-sq        MSE     F(HC3)        df1        df2          p
      .1623      .0263      .6037     1.6921    11.0000   629.0000      .0712
Model
              coeff    se(HC3)          t          p       LLCI       ULCI
constant     3.3279      .0316   105.2229      .0000     3.2658     3.3900
IDEA          .1163      .0633     1.8393      .0663     -.0079      .2406
bF           -.0649      .0633    -1.0264      .3051     -.1891      .0593
L1            .0006      .0645      .0092      .9927     -.1261      .1273
L2            .2283      .0803     2.8424      .0046      .0706      .3860
IDEAxbF      -.0258      .1265     -.2036      .8388     -.2742      .2227
IDEAxL1      -.2244      .1291    -1.7387      .0826     -.4778      .0290
IDEAxL2      -.0504      .1606     -.3140      .7536     -.3658      .2650
bFxL1        -.1158      .1291     -.8975      .3698     -.3693      .1376
bFxL2         .0185      .1606      .1153      .9083     -.2969      .3339
IDxbFxL1      .0773      .2581      .2994      .7647     -.4296      .5842
IDxbFxL2     -.1046      .3212     -.3256      .7449     -.7354      .5262

Test(s) of highest order unconditional interaction(s):
       R2-chng     F(HC3)        df1        df2          p
X*W      .0001      .0414     1.0000   629.0000      .8388
----------
    Focal predict: IDEA      (X)
          Mod var: bF        (W)

Conditional effects of the focal predictor at values of the moderator(s):
         bF     Effect    se(HC3)          t          p       LLCI       ULCI
     -.5000      .1292      .0775     1.6667      .0961     -.0230      .2815
      .5000      .1035      .1000     1.0350      .3011     -.0928      .2998
Data for visualizing the conditional effect of the focal predictor:
Paste text below into a SPSS syntax window and execute to produce plot.
```

```
DATA LIST FREE/
      IDEA        bF      IDEAinfo.
BEGIN DATA.
     -.5000     -.5000     3.2752
      .5000     -.5000     3.4044
     -.5000      .5000     3.2231
      .5000      .5000     3.3266
END DATA.GRAPH/SCATTERPLOT= IDEA WITH IDEAinfo BY bF.

**************************************************************************
OUTCOME VARIABLE:  IDEAactn

Model Summary
          R       R-sq        MSE     F(HC3)        df1        df2          p
      .1543      .0238      .3820     1.3690    11.0000   629.0000      .1831

Model
              coeff    se(HC3)          t          p       LLCI       ULCI
constant     3.5993      .0254   141.9140      .0000     3.5495     3.6491
IDEA         -.0298      .0507     -.5875      .5571     -.1294      .0698
bF           -.0721      .0507    -1.4222      .1555     -.1718      .0275
L1            .1323      .0571     2.3169      .0208      .0202      .2445
L2            .0671      .0581     1.1563      .2480     -.0469      .1812
IDEAxbF       .0456      .1015      .4490      .6536     -.1537      .2448
IDEAxL1      -.0905      .1142     -.7920      .4287     -.3148      .1339
IDEAxL2       .0659      .1161      .5677      .5704     -.1621      .2940
bFxL1         .0354      .1142      .3102      .7565     -.1889      .2598
bFxL2        -.0651      .1161     -.5610      .5750     -.2932      .1629
IDxbFxL1     -.2189      .2285     -.9581      .3384     -.6675      .2298
IDxbFxL2     -.3936      .2323    -1.6946      .0906     -.8497      .0625

Test(s) of highest order unconditional interaction(s):
       R2-chng     F(HC3)        df1        df2          p
X*W      .0003      .2016     1.0000   629.0000      .6536
----------

    Focal predict: IDEA      (X)
          Mod var: bF        (W)

Conditional effects of the focal predictor at values of the moderator(s):

         bF     Effect    se(HC3)          t          p       LLCI       ULCI
     -.5000     -.0526      .0627     -.8382      .4022     -.1757      .0706
      .5000     -.0070      .0797     -.0881      .9298     -.1636      .1496
Data for visualizing the conditional effect of the focal predictor:
Paste text below into a SPSS syntax window and execute to produce plot.

DATA LIST FREE/
      IDEA        bF      IDEAactn.
BEGIN DATA.
     -.5000     -.5000     3.6520
      .5000     -.5000     3.5994
     -.5000      .5000     3.5570
      .5000      .5000     3.5500
END DATA.GRAPH/SCATTERPLOT= IDEA WITH IDEAactn BY bF.
```

```
**************************************************************************
OUTCOME VARIABLE:  Effectiv

Model Summary
          R       R-sq        MSE     F(HC3)        df1        df2          p
      .2115      .0447      .5039     2.6117    11.0000   629.0000      .0029

Model
              coeff    se(HC3)          t          p       LLCI       ULCI
constant     3.9159      .0294   133.0930      .0000     3.8581     3.9737
IDEA          .1271      .0588     2.1593      .0312      .0115      .2426
bF           -.2446      .0588    -4.1571      .0000     -.3602     -.1291
L1            .0285      .0604      .4726      .6367     -.0901      .1471
L2            .0089      .0743      .1195      .9049     -.1371      .1548
IDEAxbF       .2697      .1177     2.2915      .0223      .0386      .5008
IDEAxL1      -.0086      .1208     -.0715      .9430     -.2458      .2285
IDEAxL2      -.0955      .1486     -.6426      .5207     -.3874      .1964
bFxL1         .0704      .1208      .5831      .5600     -.1668      .3076
bFxL2        -.1947      .1486    -1.3098      .1907     -.4866      .0972
IDxbFxL1     -.1182      .2416     -.4895      .6247     -.5926      .3561
IDxbFxL2     -.1017      .2973     -.3421      .7324     -.6855      .4821

Test(s) of highest order unconditional interaction(s):
       R2-chng     F(HC3)        df1        df2          p
X*W      .0081     5.2511     1.0000   629.0000      .0223
----------
    Focal predict: IDEA      (X)
          Mod var: bF        (W)

Conditional effects of the focal predictor at values of the moderator(s):
         bF     Effect    se(HC3)          t          p       LLCI       ULCI
     -.5000     -.0078      .0772     -.1008      .9197     -.1593      .1438
      .5000      .2619      .0889     2.9474      .0033      .0874      .4364

Data for visualizing the conditional effect of the focal predictor:
Paste text below into a SPSS syntax window and execute to produce plot.

DATA LIST FREE/
       IDEA         bF     LPmode     Effectiv.
BEGIN DATA.
     -.5000     -.5000     4.0368
      .5000     -.5000     4.0290
     -.5000      .5000     3.6573
      .5000      .5000     3.9192
END DATA.GRAPH/SCATTERPLOT= IDEA WITH Effectiv BY bF.

**************************************************************************
```

Model: CUSTOM (conditional direct effect)

X : IDEA (message variation dichotomy: IDEA(.50); status quo (-.50)

M_1 : DngrCtrl (perceived danger control; continuous measure; efficacy (6-item scale) minus threat (6-item scale)

M_2 : IDEAintz (perceived importance in internalization elements; continuous measure; 5-item scale)

M_3 : IDEAexp (perceived importance in explanation elements; continuous measure; single-item indicator)

M_4 : IDEAinfo (perceived importance in information elements; continuous measure; single-item indicator)

M_5 : IDEAactn (perceived importance in action elements; continuous measure; single-item indicator)

M_6 : Effectiv (perceived message effectiveness; continuous measure; 7-item scale)

W : bF (preexisting state of control; dichotomy coded as: danger control (.5); fear control (-.5)

Z : LPmode (learning preference mode; categorical; see Helmert coding scheme for contrasts L1 and L2)

Helmert coding scheme of categorical *Z* variable for analysis:

LPmode	L1	L2
1.000	-.667	.000
2.000	.333	-.500
3.000	.333	.500

There are ten covariates in this statistical model: bF IDEAxbF L1 L2 IDEAxL1 IDEAxL2 bFxL1 bFxL2 IDxbFxL1 IDxbFxL2

See Appendix C for a detailed code book of PROCESS output variables.

Sample Size: 641 Custom Seed: 10,235

```
**************************************************************************

OUTCOME VARIABLE:  DngrCtrl

Model Summary
          R       R-sq        MSE     F(HC3)        df1        df2          p
      .4532      .2054      .9964    14.8207    11.0000   629.0000      .0000


Model
              coeff    se(HC3)          t          p       LLCI       ULCI
constant     -.1115      .0415    -2.6855      .0074     -.1931     -.0300
IDEA          .1903      .0831     2.2906      .0223      .0272      .3534
bF          -1.0180      .0831   -12.2542      .0000    -1.1811     -.8548
L1           -.0642      .0891     -.7202      .4717     -.2391      .1108
L2            .0335      .1006      .3326      .7396     -.1641      .2310
IDEAxbF       .1554      .1661      .9355      .3499     -.1708      .4817
IDEAxL1       .2194      .1782     1.2315      .2186     -.1305      .5693
IDEAxL2       .1086      .2012      .5397      .5896     -.2865      .5037
bFxL1        -.0894      .1782     -.5019      .6159     -.4393      .2605
bFxL2        -.0927      .2012     -.4605      .6453     -.4878      .3024
IDxbFxL1     -.0277      .3564     -.0778      .9380     -.7275      .6721
IDxbFxL2      .1980      .4024      .4921      .6228     -.5922      .9882

**************************************************************************

OUTCOME VARIABLE:  IDEAintz

Model Summary
          R       R-sq        MSE     F(HC3)        df1        df2          p
      .1845      .0340      .3380     1.8375    11.0000   629.0000      .0448
Model
              coeff    se(HC3)          t          p       LLCI       ULCI
constant     3.4223      .0241   141.8975      .0000     3.3750     3.4697
IDEA          .0444      .0482      .9204      .3577     -.0503      .1391
bF           -.0577      .0482    -1.1962      .2321     -.1524      .0370
L1            .1153      .0518     2.2267      .0263      .0136      .2169
```

L2	.1468	.0584	2.5153	.0121	.0322	.2615
IDEAxbF	.2226	.0965	2.3072	.0214	.0331	.4120
IDEAxL1	-.1128	.1035	-1.0895	.2763	-.3161	.0905
IDEAxL2	.0428	.1168	.3670	.7137	-.1864	.2721
bFxL1	.0782	.1035	.7551	.4505	-.1251	.2815
bFxL2	-.0810	.1168	-.6936	.4882	-.3103	.1483
IDxbFxL1	-.0904	.2071	-.4364	.6627	-.4969	.3162
IDxbFxL2	-.0336	.2335	-.1441	.8855	-.4922	.4249

****

OUTCOME VARIABLE: IDEAexp

Model Summary

R	R-sq	MSE	F(HC3)	df1	df2	p
.1909	.0364	.7366	2.4999	11.0000	629.0000	.0044

Model

	coeff	se(HC3)	t	p	LLCI	ULCI
constant	3.0597	.0359	85.2900	.0000	2.9893	3.1302
IDEA	.0975	.0717	1.3591	.1746	-.0434	.2384
bF	-.1379	.0717	-1.9226	.0550	-.2788	.0030
L1	.1150	.0754	1.5249	.1278	-.0331	.2631
L2	.1431	.0886	1.6145	.1069	-.0310	.3172
IDEAxbF	.2711	.1435	1.8889	.0594	-.0107	.5528
IDEAxL1	-.2336	.1508	-1.5485	.1220	-.5298	.0626
IDEAxL2	.1281	.1773	.7228	.4701	-.2200	.4763
bFxL1	-.0132	.1508	-.0874	.9303	-.3094	.2830
bFxL2	-.1009	.1773	-.5691	.5695	-.4491	.2473
IDxbFxL1	-.7436	.3017	-2.4650	.0140	-1.3361	-.1512
IDxbFxL2	.2033	.3546	.5733	.5667	-.4931	.8996

****

OUTCOME VARIABLE: IDEAinfo

Model Summary

R	R-sq	MSE	F(HC3)	df1	df2	p
.1623	.0263	.6037	1.6921	11.0000	629.0000	.0712

Model

	coeff	se(HC3)	t	p	LLCI	ULCI
constant	3.3279	.0316	105.2229	.0000	3.2658	3.3900
IDEA	.1163	.0633	1.8393	.0663	-.0079	.2406
bF	-.0649	.0633	-1.0264	.3051	-.1891	.0593
L1	.0006	.0645	.0092	.9927	-.1261	.1273
L2	.2283	.0803	2.8424	.0046	.0706	.3860
IDEAxbF	-.0258	.1265	-.2036	.8388	-.2742	.2227
IDEAxL1	-.2244	.1291	-1.7387	.0826	-.4778	.0290
IDEAxL2	-.0504	.1606	-.3140	.7536	-.3658	.2650
bFxL1	-.1158	.1291	-.8975	.3698	-.3693	.1376
bFxL2	.0185	.1606	.1153	.9083	-.2969	.3339
IDxbFxL1	.0773	.2581	.2994	.7647	-.4296	.5842
IDxbFxL2	-.1046	.3212	-.3256	.7449	-.7354	.5262

****

OUTCOME VARIABLE: IDEAactn

Model Summary

R	R-sq	MSE	F(HC3)	df1	df2	p
.1543	.0238	.3820	1.3690	11.0000	629.0000	.1831

Model

	coeff	se(HC3)	t	p	LLCI	ULCI
constant	3.5993	.0254	141.9140	.0000	3.5495	3.6491
IDEA	-.0298	.0507	-.5875	.5571	-.1294	.0698
bF	-.0721	.0507	-1.4222	.1555	-.1718	.0275
L1	.1323	.0571	2.3169	.0208	.0202	.2445
L2	.0671	.0581	1.1563	.2480	-.0469	.1812
IDEAxbF	.0456	.1015	.4490	.6536	-.1537	.2448
IDEAxL1	-.0905	.1142	-.7920	.4287	-.3148	.1339
IDEAxL2	.0659	.1161	.5677	.5704	-.1621	.2940
bFxL1	.0354	.1142	.3102	.7565	-.1889	.2598
bFxL2	-.0651	.1161	-.5610	.5750	-.2932	.1629
IDxbFxL1	-.2189	.2285	-.9581	.3384	-.6675	.2298
IDxbFxL2	-.3936	.2323	-1.6946	.0906	-.8497	.0625

****

OUTCOME VARIABLE: Effectiv

Model Summary

R	R-sq	MSE	F(HC3)	df1	df2	p
.2115	.0447	.5039	2.6117	11.0000	629.0000	.0029

Model

	coeff	se(HC3)	t	p	LLCI	ULCI
constant	3.9159	.0294	133.0930	.0000	3.8581	3.9737
IDEA	.1271	.0588	2.1593	.0312	.0115	.2426
bF	-.2446	.0588	-4.1571	.0000	-.3602	-.1291
L1	.0285	.0604	.4726	.6367	-.0901	.1471
L2	.0089	.0743	.1195	.9049	-.1371	.1548
IDEAxbF	.2697	.1177	2.2915	.0223	.0386	.5008
IDEAxL1	-.0086	.1208	-.0715	.9430	-.2458	.2285
IDEAxL2	-.0955	.1486	-.6426	.5207	-.3874	.1964
bFxL1	.0704	.1208	.5831	.5600	-.1668	.3076
bFxL2	-.1947	.1486	-1.3098	.1907	-.4866	.0972
IDxbFxL1	-.1182	.2416	-.4895	.6247	-.5926	.3561
IDxbFxL2	-.1017	.2973	-.3421	.7324	-.6855	.4821

****

Model: CUSTOM (unconditional direct effect)

X : IDEA (message variation dichotomy: IDEA(.50); status quo (-.50)

M_1 : DngrCtrl (perceived danger control; continuous measure; efficacy (6-item scale) minus threat (6-item scale)

M_2 : IDEAintz (perceived importance in internalization elements; continuous measure; 5-item scale)

M_3 : IDEAexp (perceived importance in explanation elements; continuous measure; single-item indicator)

M_4 : IDEAinfo (perceived importance in information elements; continuous measure; single-item indicator)

M_5 : IDEAactn (perceived importance in action elements; continuous measure; single-item indicator)

M_6 : Effectiv (perceived message effectiveness; continuous measure; 7-item scale)

There are no covariates in this statistical model.

See Appendix C for a detailed code book of PROCESS output variables.

Sample Size: 641 Custom Seed: 10,235

```
**************************************************************************
OUTCOME VARIABLE: DngrCtrl

Model Summary
          R       R-sq        MSE     F(HC3)        df1        df2          p
      .0663      .0044     1.2289     2.8193     1.0000   639.0000      .0936

Model
              coeff    se(HC3)          t          p       LLCI       ULCI
constant     -.0028      .0438     -.0641      .9489     -.0888      .0832
IDEA          .1471      .0876     1.6791      .0936     -.0249      .3192

**************************************************************************
OUTCOME VARIABLE: IDEAintz

Model Summary
          R       R-sq        MSE     F(HC3)        df1        df2          p
      .0215      .0005      .3443      .2941     1.0000   639.0000      .5878



Model
              coeff    se(HC3)          t          p       LLCI       ULCI
constant     3.4138      .0232   147.0679      .0000     3.3682     3.4594
IDEA          .0252      .0464      .5423      .5878     -.0660      .1163
**************************************************************************

OUTCOME VARIABLE: IDEAexp

Model Summary
          R       R-sq        MSE     F(HC3)        df1        df2          p
      .0419      .0018      .7512     1.1217     1.0000   639.0000      .2900

Model
              coeff    se(HC3)          t          p       LLCI       ULCI
constant     3.0580      .0343    89.1366      .0000     2.9906     3.1254
IDEA          .0727      .0686     1.0591      .2900     -.0621      .2074

**************************************************************************
OUTCOME VARIABLE: IDEAinfo

Model Summary
          R       R-sq        MSE     F(HC3)        df1        df2          p
      .0771      .0060      .6067     3.8221     1.0000   639.0000      .0510

Model
              coeff    se(HC3)          t          p       LLCI       ULCI
constant     3.3140      .0308   107.6747      .0000     3.2536     3.3745
IDEA          .1203      .0616     1.9550      .0510     -.0005      .2412

**************************************************************************
```

OUTCOME VARIABLE: IDEAactn

Model Summary

R	R-sq	MSE	F(HC3)	df1	df2	p
.0302	.0009	.3849	.5823	1.0000	639.0000	.4457

Model

	coeff	se(HC3)	t	p	LLCI	ULCI
constant	3.5974	.0246	146.4692	.0000	3.5491	3.6456
IDEA	-.0375	.0491	-.7631	.4457	-.1339	.0590

****
OUTCOME VARIABLE: Effectiv

Model Summary

R	R-sq	MSE	F(HC3)	df1	df2	p
.0701	.0049	.5167	3.1429	1.0000	639.0000	.0767

Model

	coeff	se(HC3)	t	p	LLCI	ULCI
constant	3.9374	.0284	138.4754	.0000	3.8816	3.9932
IDEA	.1008	.0569	1.7728	.0767	-.0109	.2125

********************** ANALYSIS NOTES AND ERRORS ************************

Level of confidence for all confidence intervals in output: 95.0000

Number of bootstrap samples for percentile bootstrap confidence intervals: 10000

NOTE: A heteroscedasticity consistent standard error and covariance matrix estimator was used.

------ END MATRIX -----

APPENDIX K. MODEL FOR RETURN GROUND BEEF TO THE STORE

****************** PROCESS Procedure for SPSS Version 3.00 ****************

Macro Written by Andrew F. Hayes, Ph.D. www.afhayes.com

Documentation available in Hayes (2018a). www.guilford.com/p/hayes3

****

Custom Syntax Written by Kimberly A. Beauchamp

****

Model: CUSTOM (three-way interactions for H1a and H3a)

Y_3 : Return (return ground beef to the store where it was purchased from)

X : IDEA (message variation dichotomy: IDEA(.50); status quo (-.50)

M_1 : DngrCtrl (perceived danger control; continuous measure; efficacy (6-item scale) minus threat (6-item scale)

M_2 : IDEAintz (perceived importance in internalization elements; continuous measure; 5-item scale)

M_3 : IDEAexp (perceived importance in explanation elements; continuous measure; single-item indicator)

M_4 : IDEAinfo (perceived importance in information elements; continuous measure; single-item indicator)

M_5 : IDEAactn (perceived importance in action elements; continuous measure; single-item indicator)

M_6 : Effectiv (perceived message effectiveness; continuous measure; 7-item scale)

W : bF (preexisting state of control; dichotomy coded as: danger control (.5); fear control (-.5)

Z : LPmode (learning preference mode; categorical; see Helmert coding scheme for contrasts L1 and L2)

Helmert coding scheme of categorical Z variable for analysis:

LPmode	L1	L2
1.000	-.667	.000
2.000	.333	-.500
3.000	.333	.500

There are no covariates in this statistical model.

See Appendix C for a detailed code book of PROCESS output variables.

Sample Size: 641 Custom Seed: 10,235

****

OUTCOME VARIABLE: Return

Model Summary

R	R-sq	MSE	F(HC3)	df1	df2	p
.4117	.1695	1.7141	7.5197	17.0000	623.0000	.0000

Model

	coeff	se(HC3)	t	p	LLCI	ULCI
constant	.8503	.4188	2.0306	.0427	.0280	1.6727

```
IDEA           .4726      .1099     4.2985      .0000      .2567      .6885
DngrCtrl       .0161      .0563      .2859      .7750     -.0945      .1267
IDEAintz       .2234      .1589     1.4060      .1602     -.0886      .5355
IDEAexp        .2006      .0836     2.3981      .0168      .0363      .3648
IDEAinfo      -.0304      .0661     -.4604      .6454     -.1602      .0994
IDEAactn      -.0839      .1226     -.6844      .4940     -.3247      .1569
Effectiv       .4553      .0900     5.0571      .0000      .2785      .6320
bF             .1012      .1238      .8176      .4139     -.1419      .3443
L1            -.0408      .1150     -.3550      .7227     -.2666      .1850
L2            -.1692      .1414    -1.1964      .2320     -.4468      .1085
IDEAxbF        .1445      .2228      .6484      .5170     -.2930      .5819
IDEAxL1        .2283      .2292      .9965      .3194     -.2217      .6783
IDEAxL2       -.3759      .2774    -1.3551      .1759     -.9207      .1688
bFxL1          .3731      .2278     1.6382      .1019     -.0742      .8204
bFxL2         -.2999      .2757    -1.0877      .2771     -.8414      .2415
IDxbFxL1      -.3572      .4624     -.7724      .4402    -1.2652      .5509
IDxbFxL2       .4591      .5529      .8304      .4066     -.6266     1.5448

Test(s) of highest order unconditional interaction(s):
         R2-chng     F(HC3)        df1        df2          p
X*W*Z      .0020      .7971     2.0000   623.0000      .4511
----------
    Focal predict: IDEA     (X)
          Mod var: bF       (W)
          Mod var: LPmode   (Z)

Test of conditional X*W interaction at value(s) of Z:
     LPmode     Effect     F(HC3)        df1        df2          p
     1.0000      .3827     1.0772     1.0000   623.0000      .2997
     2.0000     -.2040      .4000     1.0000   623.0000      .5273
     3.0000      .2551      .3186     1.0000   623.0000      .5727

Conditional effects of the focal predictor at values of the moderator(s):
         bF     LPmode     Effect   se(HC3)          t          p       LLCI       ULCI
     -.5000     1.0000      .1290      .2261      .5704      .5686     -.3150      .5730
     -.5000     2.0000      .8386      .2151     3.8988      .0001      .4162     1.2610
     -.5000     3.0000      .2332      .3142      .7421      .4583     -.3838      .8501
      .5000     1.0000      .5116      .2904     1.7621      .0785     -.0585     1.0818
      .5000     2.0000      .6346      .2407     2.6364      .0086      .1619     1.1073
      .5000     3.0000      .4882      .3214     1.5192      .1292     -.1429     1.1193

Data for visualizing the conditional effect of the focal predictor:
Paste text below into a SPSS syntax window and execute to produce plot.
DATA LIST FREE/
       IDEA         bF      LPmode     Return.
BEGIN DATA.
     -.5000     -.5000     1.0000     3.6525
      .5000     -.5000     1.0000     3.7815
     -.5000     -.5000     2.0000     3.0799
      .5000     -.5000     2.0000     3.9185
     -.5000     -.5000     3.0000     3.3634
      .5000     -.5000     3.0000     3.5966
     -.5000      .5000     1.0000     3.3135
      .5000      .5000     1.0000     3.8251
     -.5000      .5000     2.0000     3.5573
      .5000      .5000     2.0000     4.1919
     -.5000      .5000     3.0000     3.3114
      .5000      .5000     3.0000     3.7996
```

END DATA.GRAPH/SCATTERPLOT= IDEA WITH Return BY bF/PANEL ROWVAR=LPmode.

```
****************** DIRECT AND INDIRECT EFFECTS OF X ON Y *****************

Conditional direct effect(s) of X on Y:
        bF     LPmode     Effect    se(HC3)          t          p       LLCI       ULCI
    -.5000     1.0000      .1290      .2261      .5704      .5686     -.3150      .5730
    -.5000     2.0000      .8386      .2151     3.8988      .0001      .4162     1.2610
    -.5000     3.0000      .2332      .3142      .7421      .4583     -.3838      .8501
     .5000     1.0000      .5116      .2904     1.7621      .0785     -.0585     1.0818
     .5000     2.0000      .6346      .2407     2.6364      .0086      .1619     1.1073
     .5000     3.0000      .4882      .3214     1.5192      .1292     -.1429     1.1193

Conditional indirect effects of X on Y:

INDIRECT EFFECT: IDEA        ->    DngrCtrl    ->    Return

        bF     LPmode     Effect     BootSE   BootLLCI   BootULCI
    -.5000     1.0000     -.0007      .0109     -.0285      .0191
    -.5000     2.0000      .0030      .0135     -.0239      .0346
    -.5000     3.0000      .0031      .0158     -.0279      .0415
     .5000     1.0000      .0021      .0154     -.0271      .0390
     .5000     2.0000      .0037      .0174     -.0285      .0454
     .5000     3.0000      .0071      .0273     -.0520      .0631

 Indices of moderated moderated mediation
       Index     BootSE   BootLLCI   BootULCI
L1     -.0004      .0212     -.0537      .0391
L2      .0032      .0247     -.0530      .0562

Indices of conditional moderated mediation by W
    LPmode      Index     BootSE   BootLLCI   BootULCI
    1.0000      .0028      .0200     -.0324      .0531
    2.0000      .0008      .0149     -.0288      .0361
    3.0000      .0039      .0218     -.0441      .0518
---

INDIRECT EFFECT: IDEA        ->    IDEAintz    ->    Return

        bF     LPmode     Effect     BootSE   BootLLCI   BootULCI
    -.5000     1.0000     -.0049      .0266     -.0649      .0510
    -.5000     2.0000     -.0266      .0296     -.0974      .0199
    -.5000     3.0000     -.0133      .0313     -.0881      .0428
     .5000     1.0000      .0583      .0540     -.0289      .1813
     .5000     2.0000      .0201      .0375     -.0472      .1080
     .5000     3.0000      .0259      .0388     -.0413      .1174

     Indices of moderated moderated mediation
       Index     BootSE   BootLLCI   BootULCI
L1     -.0202      .0569     -.1516      .0884
L2     -.0075      .0624     -.1503      .1166

     Indices of conditional moderated mediation by W
    LPmode      Index     BootSE   BootLLCI   BootULCI
    1.0000      .0632      .0618     -.0347      .2081
    2.0000      .0468      .0528     -.0339      .1701
    3.0000      .0392      .0523     -.0468      .1629
---
```

INDIRECT EFFECT: IDEA -> IDEAexp -> Return

bF	LPmode	Effect	BootSE	BootLLCI	BootULCI
-.5000	1.0000	-.0261	.0342	-.1009	.0378
-.5000	2.0000	-.0010	.0274	-.0564	.0585
-.5000	3.0000	.0043	.0363	-.0701	.0818
.5000	1.0000	.1277	.0637	.0212	.2684
.5000	2.0000	-.0167	.0432	-.1109	.0649
.5000	3.0000	.0294	.0457	-.0512	.1363

Indices of moderated moderated mediation

	Index	BootSE	BootLLCI	BootULCI
L1	-.1492	.0859	-.3437	-.0115
L2	.0408	.0798	-.1027	.2237

Indices of conditional moderated mediation by W

LPmode	Index	BootSE	BootLLCI	BootULCI
1.0000	.1539	.0780	.0242	.3254
2.0000	-.0157	.0515	-.1324	.0843
3.0000	.0251	.0582	-.0821	.1553

INDIRECT EFFECT: IDEA -> IDEAinfo -> Return

bF	LPmode	Effect	BootSE	BootLLCI	BootULCI
-.5000	1.0000	-.0093	.0218	-.0580	.0315
-.5000	2.0000	-.0012	.0093	-.0212	.0195
-.5000	3.0000	-.0013	.0109	-.0272	.0200
.5000	1.0000	-.0069	.0184	-.0513	.0247
.5000	2.0000	-.0028	.0136	-.0347	.0253
.5000	3.0000	.0003	.0126	-.0318	.0237

Indices of moderated moderated mediation

	Index	BootSE	BootLLCI	BootULCI
L1	-.0024	.0191	-.0486	.0339
L2	.0032	.0236	-.0474	.0540

Indices of conditional moderated mediation by W

LPmode	Index	BootSE	BootLLCI	BootULCI
1.0000	.0024	.0154	-.0286	.0381
2.0000	-.0016	.0157	-.0384	.0303
3.0000	.0016	.0167	-.0373	.0355

INDIRECT EFFECT: IDEA -> IDEAactn -> Return

bF	LPmode	Effect	BootSE	BootLLCI	BootULCI
-.5000	1.0000	.0055	.0189	-.0280	.0513
-.5000	2.0000	.0149	.0247	-.0308	.0705
-.5000	3.0000	-.0071	.0204	-.0574	.0282
.5000	1.0000	-.0106	.0276	-.0834	.0322
.5000	2.0000	.0007	.0176	-.0368	.0396
.5000	3.0000	.0117	.0252	-.0338	.0718

```
      Indices of moderated moderated mediation
        Index     BootSE   BootLLCI   BootULCI
L1      .0184      .0430     -.0488      .1272
L2      .0330      .0584     -.0754      .1657
      Indices of conditional moderated mediation by W
     LPmode      Index     BootSE   BootLLCI   BootULCI
     1.0000     -.0161      .0375     -.1133      .0411
     2.0000     -.0142      .0298     -.0850      .0383
     3.0000      .0188      .0373     -.0478      .1067
---

INDIRECT EFFECT: IDEA        ->    Effectiv    ->    Return

         bF     LPmode     Effect     BootSE   BootLLCI   BootULCI
     -.5000     1.0000     -.0189      .0479     -.1145      .0758
     -.5000     2.0000      .0143      .0520     -.0897      .1178
     -.5000     3.0000     -.0061      .0806     -.1779      .1435
      .5000     1.0000      .1398      .0783      .0000      .3080
      .5000     2.0000      .1423      .0689      .0145      .2889
      .5000     3.0000      .0756      .0741     -.0700      .2273

      Indices of moderated moderated mediation
        Index     BootSE   BootLLCI   BootULCI
L1     -.0538      .1106     -.2733      .1669
L2     -.0463      .1370     -.3184      .2281

      Indices of conditional moderated mediation by W
     LPmode      Index     BootSE   BootLLCI   BootULCI
     1.0000      .1587      .0916     -.0062      .3579
     2.0000      .1280      .0869     -.0305      .3128
     3.0000      .0817      .1109     -.1255      .3160

***************************************************************************
```

Model: CUSTOM (two-way interactions for H1b and H3b)

Y_3 : Return (return ground beef to the store where it was purchased from)

X : IDEA (message variation dichotomy: IDEA(.50); status quo (-.50)

M_1 : DngrCtrl (perceived danger control; continuous measure; efficacy (6-item scale) minus threat (6-item scale)

M_2 : IDEAintz (perceived importance in internalization elements; continuous measure; 5-item scale)

M_3 : IDEAexp (perceived importance in explanation elements; continuous measure; single-item indicator)

M_4 : IDEAinfo (perceived importance in information elements; continuous measure; single-item indicator)

M_5 : IDEAactn (perceived importance in action elements; continuous measure; single-item indicator)

M_6 : Effectiv (perceived message effectiveness; continuous measure; 7-item scale)

W : bF (preexisting state of control; dichotomy coded as: danger control (.5); fear control (-.5)

Z : LPmode (learning preference mode; categorical; see Helmert coding scheme for contrasts L1 and L2)

Helmert coding scheme of categorical Z variable for analysis:

LPmode	L1	L2
1.000	-.667	.000
2.000	.333	-.500
3.000	.333	.500

There are eight covariates in this statistical model: L1 L2 IDEAxL1 IDEAxL2 bFxL1 bFxL2 IDxbFxL1 IDxbFxL2

See Appendix C for a detailed code book of PROCESS output variables.

Sample Size: 641 Custom Seed: 10,235

```
***************************************************************************
OUTCOME VARIABLE: Return

Model Summary
          R       R-sq        MSE     F(HC3)        df1        df2          p
      .4117      .1695     1.7141     7.5197    17.0000   623.0000      .0000
Model
              coeff    se(HC3)          t          p       LLCI       ULCI
constant      .8503      .4188     2.0306      .0427      .0280     1.6727
IDEA          .4726      .1099     4.2985      .0000      .2567      .6885
DngrCtrl      .0161      .0563      .2859      .7750     -.0945      .1267
IDEAintz      .2234      .1589     1.4060      .1602     -.0886      .5355
IDEAexp       .2006      .0836     2.3981      .0168      .0363      .3648
IDEAinfo     -.0304      .0661     -.4604      .6454     -.1602      .0994
IDEAactn     -.0839      .1226     -.6844      .4940     -.3247      .1569
Effectiv      .4553      .0900     5.0571      .0000      .2785      .6320
bF            .1012      .1238      .8176      .4139     -.1419      .3443
L1           -.0408      .1150     -.3550      .7227     -.2666      .1850
L2           -.1692      .1414    -1.1964      .2320     -.4468      .1085
IDEAxbF       .1445      .2228      .6484      .5170     -.2930      .5819
IDEAxL1       .2283      .2292      .9965      .3194     -.2217      .6783
IDEAxL2      -.3759      .2774    -1.3551      .1759     -.9207      .1688
bFxL1         .3731      .2278     1.6382      .1019     -.0742      .8204
bFxL2        -.2999      .2757    -1.0877      .2771     -.8414      .2415
IDxbFxL1     -.3572      .4624     -.7724      .4402    -1.2652      .5509
IDxbFxL2      .4591      .5529      .8304      .4066     -.6266     1.5448
Test(s) of highest order unconditional interaction(s):
       R2-chng     F(HC3)        df1        df2          p
X*W      .0006      .4204     1.0000   623.0000      .5170
----------

    Focal predict: IDEA     (X)
          Mod var: bF       (W)

Conditional effects of the focal predictor at values of the moderator(s):

         bF     Effect    se(HC3)          t          p       LLCI       ULCI
     -.5000      .4004      .1469     2.7257      .0066      .1119      .6889
      .5000      .5448      .1656     3.2906      .0011      .2197      .8700

Data for visualizing the conditional effect of the focal predictor:
Paste text below into a SPSS syntax window and execute to produce plot.
DATA LIST FREE/
       IDEA        bF        Return.
BEGIN DATA.
     -.5000     -.5000     3.3758
      .5000     -.5000     3.7761
     -.5000      .5000     3.4047
      .5000      .5000     3.9496
END DATA.GRAPH/SCATTERPLOT= IDEA WITH Return BY bF.
```

****************** DIRECT AND INDIRECT EFFECTS OF X ON Y *****************

Conditional direct effect(s) of X on Y:

bF	Effect	se(HC3)	t	p	LLCI	ULCI
-.5000	.4004	.1469	2.7257	.0066	.1119	.6889
.5000	.5448	.1656	3.2906	.0011	.2197	.8700

Conditional indirect effects of X on Y:

INDIRECT EFFECT: IDEA -> DngrCtrl -> Return

bF	Effect	BootSE	BootLLCI	BootULCI
-.5000	.0018	.0087	-.0162	.0218
.5000	.0043	.0165	-.0292	.0400

Index of moderated mediation (difference between conditional indirect effects):

	Index	BootSE	BootLLCI	BootULCI
bF	.0025	.0128	-.0227	.0327

INDIRECT EFFECT: IDEA -> IDEAintz -> Return

bF	Effect	BootSE	BootLLCI	BootULCI
-.5000	-.0149	.0182	-.0577	.0150
.5000	.0348	.0312	-.0154	.1078

Index of moderated mediation (difference between conditional indirect effects):

	Index	BootSE	BootLLCI	BootULCI
bF	.0497	.0418	-.0217	.1424

INDIRECT EFFECT: IDEA -> IDEAexp -> Return

bF	Effect	BootSE	BootLLCI	BootULCI
-.5000	-.0076	.0185	-.0473	.0282
.5000	.0467	.0305	-.0006	.1173

Index of moderated mediation (difference between conditional indirect effects):

	Index	BootSE	BootLLCI	BootULCI
bF	.0544	.0366	-.0034	.1393

INDIRECT EFFECT: IDEA -> IDEAinfo -> Return

bF	Effect	BootSE	BootLLCI	BootULCI
-.5000	-.0039	.0099	-.0269	.0147
.5000	-.0031	.0097	-.0281	.0129

Index of moderated mediation (difference between conditional indirect effects):

	Index	BootSE	BootLLCI	BootULCI
bF	.0008	.0090	-.0200	.0188

```
INDIRECT EFFECT: IDEA        ->    IDEAactn    ->    Return

         bF     Effect     BootSE   BootLLCI   BootULCI
     -.5000      .0044      .0111     -.0148      .0307
      .5000      .0006      .0115     -.0258      .0243

Index of moderated mediation (difference between conditional indirect
effects):
        Index     BootSE   BootLLCI   BootULCI
bF     -.0038      .0158     -.0431      .0239
---
INDIRECT EFFECT: IDEA        ->    Effectiv    ->    Return

         bF     Effect     BootSE   BootLLCI   BootULCI
     -.5000     -.0035      .0357     -.0788      .0633
      .5000      .1192      .0458      .0368      .2178

Index of moderated mediation (difference between conditional indirect
effects):
        Index     BootSE   BootLLCI   BootULCI
bF      .1228      .0597      .0159      .2528

**************************************************************************
```

Model: CUSTOM (conditional direct and indirect effects for H1c and H3c)

Y_3	: Return	(return ground beef to the store where it was purchased from)
X	: IDEA	(message variation dichotomy: IDEA (.50); status quo (-.50)
M_1	: DngrCtrl	(perceived danger control; continuous measure; efficacy (6-item scale) minus threat (6-item scale)
M_2	: IDEAintz	(perceived importance in internalization elements; continuous measure; 5-item scale)
M_3	: IDEAexp	(perceived importance in explanation elements; continuous measure; single-item indicator)
M_4	: IDEAinfo	(perceived importance in information elements; continuous measure; single-item indicator)
M_5	: IDEAactn	(perceived importance in action elements; continuous measure; single-item indicator)
M_6	: Effectiv	(perceived message effectiveness; continuous measure; 7-item scale)
W	: bF	(preexisting state of control; dichotomy coded as: danger control (.5); fear control (-.5)
Z	: LPmode	(learning preference mode; categorical; see Helmert coding scheme for contrasts L1 and L2)

Helmert coding scheme of categorical Z variable for analysis:

LPmode	L1	L2
1.000	-.667	.000
2.000	.333	-.500
3.000	.333	.500

There are ten covariates in this statistical model: bF IDEAxbF L1 L2 IDEAxL1 IDEAxL2 bFxL1 bFxL2 IDxbFxL1 IDxbFxL2

See Appendix C for a detailed code book of the PROCESS output variables.

Sample Size: 641 Custom Seed: 10,235

****

OUTCOME VARIABLE: Return

Model Summary

R	R-sq	MSE	F(HC3)	df1	df2	p
.4117	.1695	1.7141	7.5197	17.0000	623.0000	.0000

Model

	coeff	se(HC3)	t	p	LLCI	ULCI
constant	.8503	.4188	2.0306	.0427	.0280	1.6727
IDEA	.4726	.1099	4.2985	.0000	.2567	.6885
DngrCtrl	.0161	.0563	.2859	.7750	-.0945	.1267
IDEAintz	.2234	.1589	1.4060	.1602	-.0886	.5355
IDEAexp	.2006	.0836	2.3981	.0168	.0363	.3648
IDEAinfo	-.0304	.0661	-.4604	.6454	-.1602	.0994
IDEAactn	-.0839	.1226	-.6844	.4940	-.3247	.1569
Effectiv	.4553	.0900	5.0571	.0000	.2785	.6320
bF	.1012	.1238	.8176	.4139	-.1419	.3443
L1	-.0408	.1150	-.3550	.7227	-.2666	.1850
L2	-.1692	.1414	-1.1964	.2320	-.4468	.1085
IDEAxbF	.1445	.2228	.6484	.5170	-.2930	.5819
IDEAxL1	.2283	.2292	.9965	.3194	-.2217	.6783
IDEAxL2	-.3759	.2774	-1.3551	.1759	-.9207	.1688
bFxL1	.3731	.2278	1.6382	.1019	-.0742	.8204
bFxL2	-.2999	.2757	-1.0877	.2771	-.8414	.2415
IDxbFxL1	-.3572	.4624	-.7724	.4402	-1.2652	.5509
IDxbFxL2	.4591	.5529	.8304	.4066	-.6266	1.5448

************** DIRECT, AND INDIRECT EFFECTS OF X ON Y **************

Direct effect of X on Y

Effect	se(HC3)	t	p	LLCI	ULCI	c'_ps
.4726	.1099	4.2985	.0000	.2567	.6885	.3334

Indirect effect(s) of X on Y:

	Effect	BootSE	BootLLCI	BootULCI
TOTAL	.0893	.0429	.0036	.1734
DngrCtrl	.0031	.0115	-.0207	.0274
IDEAintz	.0099	.0147	-.0143	.0455
IDEAexp	.0196	.0173	-.0076	.0602
IDEAinfo	-.0035	.0087	-.0235	.0123
IDEAactn	.0025	.0081	-.0129	.0216
Effectiv	.0578	.0282	.0046	.1159

****

Model: CUSTOM (conditional direct and indirect effects for H2 and H4)

Y_3 : Return (return ground beef to the store where it was purchased from)

X : IDEA (message variation dichotomy: IDEA(.50); status quo (-.50)

M_1 : DngrCtrl (perceived danger control; continuous measure; efficacy (6-item scale) minus threat (6-item scale)

M_2 : IDEAintz (perceived importance in internalization elements; continuous measure; 5-item scale)

M_3 : IDEAexp (perceived importance in explanation elements; continuous measure; single-item indicator)

M_4 : IDEAinfo (perceived importance in information elements; continuous measure; single-item indicator)

M_5 : IDEAactn (perceived importance in action elements; continuous measure; single-item indicator)

M_6 : Effectiv (perceived message effectiveness; continuous measure; 7-item scale)

There are no covariates in this statistical model.

See Appendix C for a detailed code book of the PROCESS output variables.

Sample Size: 641 Custom Seed: 10,235

```
**************************************************************************

OUTCOME VARIABLE: Return

Model Summary
          R       R-sq        MSE     F(HC3)        df1        df2          p
      .3891      .1514     1.7237    16.2567     7.0000   633.0000      .0000

Model
              coeff    se(HC3)          t          p       LLCI       ULCI
constant      .9408      .4042     2.3276      .0202      .1471     1.7345
IDEA          .4942      .1041     4.7457      .0000      .2897      .6987
DngrCtrl     -.0028      .0502     -.0554      .9558     -.1015      .0959
IDEAintz      .2279      .1587     1.4363      .1514     -.0837      .5394
IDEAexp       .1961      .0831     2.3610      .0185      .0330      .3592
IDEAinfo     -.0514      .0658     -.7820      .4345     -.1806      .0778
IDEAactn     -.1045      .1211     -.8633      .3883     -.3422      .1332
Effectiv      .4685      .0875     5.3557      .0000      .2967      .6403

************************** TOTAL EFFECT MODEL ****************************
OUTCOME VARIABLE: Return
Model Summary
          R       R-sq        MSE     F(HC3)        df1        df2          p
      .1973      .0389     1.9339    25.8551     1.0000   639.0000      .0000

Model
              coeff    se(HC3)          t          p       LLCI       ULCI
constant     3.6168      .0549    65.8269      .0000     3.5089     3.7247
IDEA          .5588      .1099     5.0848      .0000      .3430      .7746

************** TOTAL, DIRECT, AND INDIRECT EFFECTS OF X ON Y **************
Total effect of X on Y
     Effect    se(HC3)          t          p       LLCI       ULCI       c_ps
      .5588      .1099     5.0848      .0000      .3430      .7746      .3942

Direct effect of X on Y
     Effect    se(HC3)          t          p       LLCI       ULCI      c'_ps
      .4942      .1041     4.7457      .0000      .2897      .6987      .3487

Indirect effect(s) of X on Y:
             Effect     BootSE   BootLLCI   BootULCI
TOTAL         .0645      .0410     -.0175      .1445
DngrCtrl     -.0004      .0086     -.0192      .0169
IDEAintz      .0057      .0135     -.0186      .0376
IDEAexp       .0143      .0157     -.0117      .0508
IDEAinfo     -.0062      .0093     -.0276      .0096
IDEAactn      .0039      .0088     -.0121      .0245
Effectiv      .0472      .0277     -.0055      .1029
```

********************** ANALYSIS NOTES AND ERRORS ***********************

Level of confidence for all confidence intervals in output: 95.0000

Number of bootstrap samples for percentile bootstrap confidence intervals: 10000

NOTE: A heteroscedasticity consistent standard error and covariance matrix estimator was used.

------ END MATRIX -----

APPENDIX L. MODEL FOR AVOID EATING GROUND BEEF WHEN DINING OUT

****************** PROCESS Procedure for SPSS Version 3.00 ****************

Macro Written by Andrew F. Hayes, Ph.D.   www.afhayes.com

Documentation available in Hayes (2018a). www.guilford.com/p/hayes3

****

Custom Syntax Written by Kimberly A. Beauchamp

****

Model: CUSTOM (three-way interactions for H1b and H3b)

Y_4 : OutRefrn (avoid eating ground beef when dining out)

X : IDEA (message variation dichotomy: IDEA(.50); status quo (-.50)

M_1 : DngrCtrl (perceived danger control; continuous measure; efficacy (6-item scale) minus threat (6-item scale)

M_2 : IDEAintz (perceived importance in internalization elements; continuous measure; 5-item scale)

M_3 : IDEAexp (perceived importance in explanation elements; continuous measure; single-item indicator)

M_4 : IDEAinfo (perceived importance in information elements; continuous measure; single-item indicator)

M_5 : IDEAactn (perceived importance in action elements; continuous measure; single-item indicator)

M_6 : Effectiv (perceived message effectiveness; continuous measure; 7-item scale)

W : bF (preexisting state of control; dichotomy coded as: danger control (.5); fear control (-.5)

Z : LPmode (learning preference mode; categorical; see Helmert coding scheme for contrasts L1 and L2)

Helmert coding scheme of categorical *Z* variable for analysis:

LPmode	L1	L2
1.000	-.667	.000
2.000	.333	-.500
3.000	.333	.500

There are no covariates in this statistical model.

See Appendix C for a detailed code book of PROCESS output variables.

Sample Size: 641   Custom Seed: 10,235

****

```
OUTCOME VARIABLE: OutRefrn

Model Summary
          R       R-sq        MSE     F(HC3)        df1        df2          p
      .4158      .1729     1.0818     8.2676    17.0000   623.0000      .0000
```

```
Model
                 coeff    se(HC3)          t          p       LLCI       ULCI
constant         .9853      .3575     2.7563      .0060      .2833     1.6872
IDEA             .0305      .0885      .3448      .7304     -.1432      .2042
DngrCtrl         .0870      .0464     1.8754      .0612     -.0041      .1780
IDEAintz         .3161      .1292     2.4460      .0147      .0623      .5699
IDEAexp         -.0232      .0629     -.3688      .7124     -.1468      .1004
IDEAinfo        -.0840      .0523    -1.6073      .1085     -.1866      .0186
IDEAactn         .0272      .1073      .2534      .8001     -.1836      .2380
Effectiv         .4524      .0720     6.2864      .0000      .3111      .5937
bF               .0077      .0998      .0774      .9383     -.1883      .2037
L1               .0623      .0966      .6443      .5196     -.1275      .2521
L2              -.2630      .1055    -2.4930      .0129     -.4702     -.0558
IDEAxbF         -.0268      .1784     -.1500      .8808     -.3772      .3236
IDEAxL1         -.1266      .1898     -.6669      .5051     -.4994      .2462
IDEAxL2          .0090      .2125      .0423      .9663     -.4083      .4263
bFxL1            .3056      .1915     1.5962      .1109     -.0704      .6816
bFxL2           -.1825      .2123     -.8595      .3904     -.5995      .2345
IDxbFxL1        -.1365      .3866     -.3532      .7241     -.8957      .6226
IDxbFxL2        -.1213      .4250     -.2855      .7754     -.9559      .7132

Test(s) of highest order unconditional interaction(s):
         R2-chng     F(HC3)        df1        df2          p
X*W*Z      .0003      .0877     2.0000   623.0000      .9161
----------
    Focal predict: IDEA      (X)
          Mod var: bF        (W)
          Mod var: LPmode    (Z)

Test of conditional X*W interaction at value(s) of Z:
     LPmode     Effect     F(HC3)        df1        df2          p
     1.0000      .0643      .0401     1.0000   623.0000      .8413
     2.0000     -.0116      .0022     1.0000   623.0000      .9629
     3.0000     -.1329      .1465     1.0000   623.0000      .7021

Conditional effects of the focal predictor at values of the moderator(s):
         bF     LPmode     Effect    se(HC3)          t          p       LLCI       ULCI
     -.5000     1.0000      .0828      .1803      .4593      .6462     -.2712      .4368
     -.5000     2.0000     -.0104      .1633     -.0635      .9494     -.3311      .3103
     -.5000     3.0000      .0593      .2355      .2518      .8013     -.4031      .5217
      .5000     1.0000      .1471      .2646      .5560      .5784     -.3725      .6667
      .5000     2.0000     -.0219      .1874     -.1171      .9069     -.3899      .3460
      .5000     3.0000     -.0736      .2514     -.2928      .7698     -.5672      .4200

Data for visualizing the conditional effect of the focal predictor:
Paste text below into a SPSS syntax window and execute to produce plot.
DATA LIST FREE/
       IDEA         bF        LPmode      OutRefrn.
BEGIN DATA.
     -.5000     -.5000     1.0000     3.6087
      .5000     -.5000     1.0000     3.6915
     -.5000     -.5000     2.0000     3.6506
      .5000     -.5000     2.0000     3.6402
     -.5000     -.5000     3.0000     3.4440
      .5000     -.5000     3.0000     3.5033
     -.5000      .5000     1.0000     3.3804
      .5000      .5000     1.0000     3.5275
     -.5000      .5000     2.0000     3.8571
```

```
      .5000      .5000     2.0000     3.8352
     -.5000      .5000     3.0000     3.5287
      .5000      .5000     3.0000     3.4551
```
END DATA.GRAPH/SCATTERPLOT= IDEA WITH OutRefrn BY bF/PANEL ROWVAR=LPmode.

```
****************** DIRECT AND INDIRECT EFFECTS OF X ON Y *****************

Conditional direct effect(s) of X on Y:
         bF     LPmode     Effect    se(HC3)          t          p       LLCI       ULCI
     -.5000     1.0000      .0828      .1803      .4593      .6462     -.2712      .4368
     -.5000     2.0000     -.0104      .1633     -.0635      .9494     -.3311      .3103
     -.5000     3.0000      .0593      .2355      .2518      .8013     -.4031      .5217
      .5000     1.0000      .1471      .2646      .5560      .5784     -.3725      .6667
      .5000     2.0000     -.0219      .1874     -.1171      .9069     -.3899      .3460
      .5000     3.0000     -.0736      .2514     -.2928      .7698     -.5672      .4200

Conditional indirect effects of X on Y:

INDIRECT EFFECT:  IDEA        ->    DngrCtrl    ->    OutRefrn

         bF     LPmode     Effect     BootSE   BootLLCI   BootULCI
     -.5000     1.0000     -.0037      .0182     -.0441      .0323
     -.5000     2.0000      .0161      .0173     -.0111      .0577
     -.5000     3.0000      .0170      .0215     -.0171      .0682
      .5000     1.0000      .0114      .0233     -.0287      .0655
      .5000     2.0000      .0202      .0228     -.0136      .0772
      .5000     3.0000      .0383      .0291     -.0039      .1082
      Indices of moderated moderated mediation
        Index     BootSE   BootLLCI   BootULCI
L1     -.0024      .0351     -.0798      .0673
L2      .0172      .0394     -.0608      .1028

      Indices of conditional moderated mediation by W
     LPmode      Index     BootSE   BootLLCI   BootULCI
     1.0000      .0151      .0304     -.0380      .0874
     2.0000      .0041      .0254     -.0452      .0613
     3.0000      .0213      .0312     -.0345      .0926
---

INDIRECT EFFECT:  IDEA        ->    IDEAintz    ->    OutRefrn

         bF     LPmode     Effect     BootSE   BootLLCI   BootULCI
     -.5000     1.0000     -.0069      .0336     -.0807      .0594
     -.5000     2.0000     -.0377      .0327     -.1119      .0169
     -.5000     3.0000     -.0188      .0391     -.1071      .0550
      .5000     1.0000      .0825      .0578     -.0060      .2161
      .5000     2.0000      .0285      .0440     -.0541      .1255
      .5000     3.0000      .0367      .0463     -.0467      .1407

      Indices of moderated moderated mediation
        Index     BootSE   BootLLCI   BootULCI
L1     -.0286      .0714     -.1878      .1071
L2     -.0106      .0776     -.1716      .1469
      Indices of conditional moderated mediation by W
     LPmode      Index     BootSE   BootLLCI   BootULCI
     1.0000      .0894      .0686     -.0167      .2521
     2.0000      .0662      .0576     -.0292      .1968
     3.0000      .0555      .0614     -.0503      .1973
```

```
---

INDIRECT EFFECT:  IDEA        ->    IDEAexp     ->    OutRefrn

          bF     LPmode     Effect     BootSE   BootLLCI   BootULCI
     -.5000     1.0000      .0030      .0127     -.0203      .0343
     -.5000     2.0000      .0001      .0084     -.0185      .0184
     -.5000     3.0000     -.0005      .0111     -.0264      .0221
      .5000     1.0000     -.0148      .0406     -.0968      .0676
      .5000     2.0000      .0019      .0137     -.0278      .0319
      .5000     3.0000     -.0034      .0159     -.0419      .0267

      Indices of moderated moderated mediation
        Index     BootSE   BootLLCI   BootULCI
L1      .0173      .0488     -.0831      .1176
L2     -.0047      .0259     -.0647      .0488

      Indices of conditional moderated mediation by W
     LPmode      Index     BootSE   BootLLCI   BootULCI
     1.0000     -.0178      .0492     -.1188      .0799
     2.0000      .0018      .0160     -.0334      .0362
     3.0000     -.0029      .0185     -.0464      .0341
---

INDIRECT EFFECT: IDEA        ->    IDEAinfo    ->    OutRefrn

          bF     LPmode     Effect     BootSE   BootLLCI   BootULCI
     -.5000     1.0000     -.0256      .0193     -.0705      .0047
     -.5000     2.0000     -.0034      .0128     -.0326      .0212
     -.5000     3.0000     -.0036      .0144     -.0351      .0264
      .5000     1.0000     -.0191      .0192     -.0654      .0087
      .5000     2.0000     -.0078      .0176     -.0473      .0274
      .5000     3.0000      .0008      .0176     -.0398      .0351

      Indices of moderated moderated mediation
        Index     BootSE   BootLLCI   BootULCI
L1     -.0065      .0259     -.0656      .0444
L2      .0088      .0310     -.0592      .0728

      Indices of conditional moderated mediation by W
     LPmode      Index     BootSE   BootLLCI   BootULCI
     1.0000      .0065      .0203     -.0348      .0528
     2.0000     -.0044      .0214     -.0508      .0401
     3.0000      .0044      .0224     -.0459      .0495
---

INDIRECT EFFECT: IDEA        ->    IDEAactn    ->    OutRefrn

          bF     LPmode     Effect     BootSE   BootLLCI   BootULCI
     -.5000     1.0000     -.0018      .0145     -.0330      .0313
     -.5000     2.0000     -.0048      .0206     -.0500      .0362
     -.5000     3.0000      .0023      .0152     -.0281      .0374
      .5000     1.0000      .0034      .0208     -.0391      .0521
      .5000     2.0000     -.0002      .0131     -.0304      .0266
      .5000     3.0000     -.0038      .0206     -.0546      .0348

      Indices of moderated moderated mediation
```

```
        Index     BootSE   BootLLCI   BootULCI
L1     -.0060      .0329     -.0791      .0637
L2     -.0107      .0483     -.1196      .0841

      Indices of conditional moderated mediation by W
     LPmode      Index     BootSE   BootLLCI   BootULCI
     1.0000      .0052      .0283     -.0568      .0677
     2.0000      .0046      .0240     -.0438      .0590
     3.0000     -.0061      .0303     -.0774      .0521
---

INDIRECT EFFECT:  IDEA        ->    Effectiv    ->    OutRefrn

         bF     LPmode     Effect     BootSE   BootLLCI   BootULCI
     -.5000     1.0000     -.0188      .0471     -.1136      .0716
     -.5000     2.0000      .0142      .0513     -.0850      .1168
     -.5000     3.0000     -.0060      .0792     -.1679      .1467
      .5000     1.0000      .1389      .0738      .0000      .2924
      .5000     2.0000      .1414      .0677      .0151      .2800
      .5000     3.0000      .0752      .0741     -.0690      .2272

      Indices of moderated moderated mediation
        Index     BootSE   BootLLCI   BootULCI
L1     -.0535      .1083     -.2649      .1641
L2     -.0460      .1347     -.3088      .2215

      Indices of conditional moderated mediation by W
     LPmode      Index     BootSE   BootLLCI   BootULCI
     1.0000      .1577      .0876     -.0057      .3396
     2.0000      .1272      .0844     -.0310      .3017
     3.0000      .0812      .1090     -.1244      .3076

***************************************************************************
```

Model: CUSTOM (two-way interactions for H1b and H3b)

Y_4 : OutRefrn (avoid eating ground beef when dining out)

X : IDEA (message variation dichotomy: IDEA(.50); status quo (-.50)

M_1 : DngrCtrl (perceived danger control; continuous measure; efficacy (6-item scale) minus threat (6-item scale)

M_2 : IDEAintz (perceived importance in internalization elements; continuous measure; 5-item scale)

M_3 : IDEAexp (perceived importance in explanation elements; continuous measure; single-item indicator)

M_4 : IDEAinfo (perceived importance in information elements; continuous measure; single-item indicator)

M_5 : IDEAactn (perceived importance in action elements; continuous measure; single-item indicator)

M_6 : Effectiv (perceived message effectiveness; continuous measure; 7-item scale)

W : bF (preexisting state of control; dichotomy coded as: danger control (.5); fear control (-.5)

Z : LPmode (learning preference mode; categorical; see Helmert coding scheme for contrasts L1 and L2)

Helmert coding scheme of categorical *Z* variable for analysis:

LPmode	L1	L2
1.000	-.667	.000
2.000	.333	-.500
3.000	.333	.500

There are eight covariates in this statistical model: L1 L2 IDEAxL1 IDEAxL2 bFxL1 bFxL2 IDxbFxL1 IDxbFxL2

See Appendix C for a detailed code book of PROCESS output variables.

Sample Size: 641 Custom Seed: 10,235

```
**************************************************************************
OUTCOME VARIABLE: OutRefrn

Model Summary
          R       R-sq        MSE     F(HC3)        df1        df2          p
      .4158      .1729     1.0818     8.2676    17.0000   623.0000      .0000

Model
              coeff    se(HC3)          t          p       LLCI       ULCI
constant      .9853      .3575     2.7563      .0060      .2833     1.6872
IDEA          .0305      .0885      .3448      .7304     -.1432      .2042
DngrCtrl      .0870      .0464     1.8754      .0612     -.0041      .1780
IDEAintz      .3161      .1292     2.4460      .0147      .0623      .5699
IDEAexp      -.0232      .0629     -.3688      .7124     -.1468      .1004
IDEAinfo     -.0840      .0523    -1.6073      .1085     -.1866      .0186
IDEAactn      .0272      .1073      .2534      .8001     -.1836      .2380
Effectiv      .4524      .0720     6.2864      .0000      .3111      .5937
bF            .0077      .0998      .0774      .9383     -.1883      .2037
L1            .0623      .0966      .6443      .5196     -.1275      .2521
L2           -.2630      .1055    -2.4930      .0129     -.4702     -.0558
IDEAxbF      -.0268      .1784     -.1500      .8808     -.3772      .3236
IDEAxL1      -.1266      .1898     -.6669      .5051     -.4994      .2462
IDEAxL2       .0090      .2125      .0423      .9663     -.4083      .4263
bFxL1         .3056      .1915     1.5962      .1109     -.0704      .6816
bFxL2        -.1825      .2123     -.8595      .3904     -.5995      .2345
IDxbFxL1     -.1365      .3866     -.3532      .7241     -.8957      .6226
IDxbFxL2     -.1213      .4250     -.2855      .7754     -.9559      .7132
Product terms key:
 Int_1    :        IDEA     x        bF

Test(s) of highest order unconditional interaction(s):
       R2-chng     F(HC3)        df1        df2          p
X*W      .0000      .0225     1.0000   623.0000      .8808
----------
    Focal predict: IDEA     (X)
          Mod var: bF       (W)
Conditional effects of the focal predictor at values of the moderator(s):

         bF     Effect    se(HC3)          t          p       LLCI       ULCI
     -.5000      .0439      .1132      .3876      .6985     -.1785      .2662
      .5000      .0171      .1369      .1250      .9005     -.2518      .2860

Data for visualizing the conditional effect of the focal predictor:
Paste text below into a SPSS syntax window and execute to produce plot.
DATA LIST FREE/
       IDEA         bF     OutRefrn.
BEGIN DATA.
     -.5000     -.5000     3.5795
      .5000     -.5000     3.6234
     -.5000      .5000     3.6006
      .5000      .5000     3.6177
```

END DATA.GRAPH/SCATTERPLOT= IDEA WITH OutRefrn BY bF.

```
****************** DIRECT AND INDIRECT EFFECTS OF X ON Y *****************

Conditional direct effect(s) of X on Y:
         bF     Effect    se(HC3)          t          p       LLCI       ULCI
     -.5000      .0439      .1132      .3876      .6985     -.1785      .2662
      .5000      .0171      .1369      .1250      .9005     -.2518      .2860

Conditional indirect effects of X on Y:

INDIRECT EFFECT:  IDEA        ->    DngrCtrl    ->    OutRefrn

         bF     Effect     BootSE   BootLLCI   BootULCI
     -.5000      .0098      .0116     -.0080      .0381
      .5000      .0233      .0175     -.0013      .0647

Index of moderated mediation (difference between conditional indirect
effects):
        Index     BootSE   BootLLCI   BootULCI
bF      .0135      .0177     -.0158      .0551
---

INDIRECT EFFECT:  IDEA        ->    IDEAintz    ->    OutRefrn

 bF     Effect     BootSE   BootLLCI   BootULCI
     -.5000     -.0211      .0210     -.0687      .0143
      .5000      .0492      .0323     -.0012      .1236

Index of moderated mediation (difference between conditional indirect
effects):
        Index     BootSE   BootLLCI   BootULCI
bF      .0704      .0424      .0039      .1667
---

INDIRECT EFFECT:  IDEA        ->    IDEAexp     ->    OutRefrn

         bF     Effect     BootSE   BootLLCI   BootULCI
     -.5000      .0009      .0061     -.0112      .0151
      .5000     -.0054      .0161     -.0421      .0253

Index of moderated mediation (difference between conditional indirect
effects):
        Index     BootSE   BootLLCI   BootULCI
bF     -.0063      .0191     -.0493      .0305
---

INDIRECT EFFECT:  IDEA        ->    IDEAinfo    ->    OutRefrn

         bF     Effect     BootSE   BootLLCI   BootULCI
     -.5000     -.0109      .0096     -.0332      .0037
      .5000     -.0087      .0111     -.0358      .0082

Index of moderated mediation (difference between conditional indirect
effects):
        Index     BootSE   BootLLCI   BootULCI
bF      .0022      .0122     -.0241      .0277
```

```
---

INDIRECT EFFECT:  IDEA        ->    IDEAactn    ->    OutRefrn

         bF     Effect     BootSE   BootLLCI   BootULCI
     -.5000     -.0014      .0087     -.0206      .0174
      .5000     -.0002      .0085     -.0207      .0167

Index of moderated mediation (difference between conditional indirect
effects):
        Index     BootSE   BootLLCI   BootULCI
bF      .0012      .0116     -.0257      .0262
---

INDIRECT EFFECT: IDEA        ->    Effectiv    ->    OutRefrn

         bF     Effect     BootSE   BootLLCI   BootULCI
     -.5000     -.0035      .0352     -.0748      .0652
      .5000      .1185      .0442      .0367      .2113
Index of moderated mediation (difference between conditional indirect
effects):
        Index     BootSE   BootLLCI   BootULCI
bF      .1220      .0571      .0176      .2428
---

**************************************************************************
```

Model: CUSTOM (conditional direct and indirect effects for H2 and H4)

Y_4 : OutRefrn (avoid eating ground beef when dining out)

X : IDEA (message variation dichotomy: IDEA(.50); status quo (-.50)

M_1 : DngrCtrl (perceived danger control; continuous measure; efficacy (6-item scale) minus threat (6-item scale)

M_2 : IDEAintz (perceived importance in internalization elements; continuous measure; 5-item scale)

M_3 : IDEAexp (perceived importance in explanation elements; continuous measure; single-item indicator)

M_4 : IDEAinfo (perceived importance in information elements; continuous measure; single-item indicator)

M_5 : IDEAactn (perceived importance in action elements; continuous measure; single-item indicator)

M_6 : Effectiv (perceived message effectiveness; continuous measure; 7-item scale)

W : bF (preexisting state of control; dichotomy coded as: danger control (.5); fear control (-.5)

Z : LPmode (learning preference mode; categorical; see Helmert coding scheme for contrasts L1 and L2)

Helmert coding scheme of categorical Z variable for analysis:

LPmode	L1	L2
1.000	-.667	.000
2.000	.333	-.500
3.000	.333	.500

There are ten covariates in this statistical model: bF IDEAxbF L1 L2 IDEAxL1 IDEAxL2 bFxL1 bFxL2 IDxbFxL1 IDxbFxL2

See Appendix C for a detailed code book of the PROCESS output variables.

Sample Size: 641 Custom Seed: 10,235

```
**************************************************************************
OUTCOME VARIABLE:  OutRefrn

Model Summary
          R       R-sq        MSE     F(HC3)        df1        df2          p
      .4158      .1729     1.0818     8.2676    17.0000   623.0000      .0000

Model
              coeff    se(HC3)          t          p       LLCI       ULCI
constant      .9853      .3575     2.7563      .0060      .2833     1.6872
IDEA          .0305      .0885      .3448      .7304     -.1432      .2042
DngrCtrl      .0870      .0464     1.8754      .0612     -.0041      .1780
IDEAintz      .3161      .1292     2.4460      .0147      .0623      .5699
IDEAexp      -.0232      .0629     -.3688      .7124     -.1468      .1004
IDEAinfo     -.0840      .0523    -1.6073      .1085     -.1866      .0186
IDEAactn      .0272      .1073      .2534      .8001     -.1836      .2380
Effectiv      .4524      .0720     6.2864      .0000      .3111      .5937
bF            .0077      .0998      .0774      .9383     -.1883      .2037
L1            .0623      .0966      .6443      .5196     -.1275      .2521
L2           -.2630      .1055    -2.4930      .0129     -.4702     -.0558
IDEAxbF      -.0268      .1784     -.1500      .8808     -.3772      .3236
IDEAxL1      -.1266      .1898     -.6669      .5051     -.4994      .2462
IDEAxL2       .0090      .2125      .0423      .9663     -.4083      .4263
bFxL1         .3056      .1915     1.5962      .1109     -.0704      .6816
bFxL2        -.1825      .2123     -.8595      .3904     -.5995      .2345
IDxbFxL1     -.1365      .3866     -.3532      .7241     -.8957      .6226
IDxbFxL2     -.1213      .4250     -.2855      .7754     -.9559      .7132

************** TOTAL, DIRECT, AND INDIRECT EFFECTS OF X ON Y **************

Total effect of X on Y
     Effect    se(HC3)          t          p       LLCI       ULCI       c_ps
      .1057      .0945     1.1187      .2637     -.0799      .2913      .0937

Direct effect of X on Y
     Effect    se(HC3)          t          p       LLCI       ULCI      c'_ps
      .0305      .0885      .3448      .7304     -.1432      .2042      .0270

Indirect effect(s) of X on Y:
             Effect     BootSE   BootLLCI   BootULCI
TOTAL         .0752      .0399     -.0026      .1539
DngrCtrl      .0165      .0119     -.0003      .0452
IDEAintz      .0140      .0171     -.0167      .0536
IDEAexp      -.0023      .0076     -.0202      .0119
IDEAinfo     -.0098      .0084     -.0294      .0023
IDEAactn     -.0008      .0063     -.0158      .0117
Effectiv      .0575      .0279      .0045      .1157

**************************************************************************
```

Model: CUSTOM (unconditional direct and indirect effects for H2 and H4)

Y_4 : OutRefrn (avoid eating ground beef when dining out; continuous measure; 3-item scale)

X : IDEA (message variation dichotomy: IDEA(.50); status quo (-.50)

M_1 : DngrCtrl (perceived danger control; continuous measure; efficacy (6-item scale) minus threat (6-item scale)

M_2 : IDEAintz (perceived importance in internalization elements; continuous measure; 5-item scale)

M_3 : IDEAexp (perceived importance in explanation elements; continuous measure; single-item indicator)

M_4 : IDEAinfo (perceived importance in information elements; continuous measure; single-item indicator)

M_5 : IDEAactn (perceived importance in action elements; continuous measure; single-item indicator)

M_6 : Effectiv (perceived message effectiveness; continuous measure; 7-item scale)

There are no covariates in this statistical model.

See Appendix C for a detailed code book of the PROCESS output variables.

Sample Size: 641 Custom Seed: 10,235

```
**************************************************************************

OUTCOME VARIABLE: OutRefrn

Model Summary
          R       R-sq        MSE     F(HC3)        df1        df2          p
      .3987      .1590     1.0827    17.9411     7.0000   633.0000      .0000

Model
              coeff    se(HC3)          t          p       LLCI       ULCI
constant     1.0217      .3456     2.9559      .0032      .3429     1.7005
IDEA          .0379      .0833      .4549      .6493     -.1258      .2016
DngrCtrl      .0820      .0411     1.9964      .0463      .0013      .1627
IDEAintz      .2958      .1270     2.3297      .0201      .0465      .5451
IDEAexp      -.0225      .0616     -.3657      .7147     -.1435      .0985
IDEAinfo     -.0999      .0521    -1.9172      .0557     -.2023      .0024
IDEAactn      .0449      .1056      .4255      .6706     -.1624      .2522
Effectiv      .4602      .0691     6.6601      .0000      .3245      .5959

************************** TOTAL EFFECT MODEL ****************************
OUTCOME VARIABLE:  OutRefrn
Model Summary
          R       R-sq        MSE     F(HC3)        df1        df2          p
      .0392      .0015     1.2732      .9826     1.0000   639.0000      .3219

Model
              coeff    se(HC3)          t          p       LLCI       ULCI
constant     3.6046      .0446    80.7712      .0000     3.5170     3.6922
IDEA          .0885      .0893      .9913      .3219     -.0868      .2637

************** TOTAL, DIRECT, AND INDIRECT EFFECTS OF X ON Y **************

Total effect of X on Y
     Effect    se(HC3)          t          p       LLCI       ULCI       c_ps
      .0885      .0893      .9913      .3219     -.0868      .2637      .0784

Direct effect of X on Y
     Effect    se(HC3)          t          p       LLCI       ULCI      c'_ps
      .0379      .0833      .4549      .6493     -.1258      .2016      .0336

Indirect effect(s) of X on Y:
             Effect     BootSE   BootLLCI   BootULCI
TOTAL          .0506      .0385     -.0235      .1284
DngrCtrl       .0121      .0103     -.0019      .0379
IDEAintz       .0074      .0150     -.0209      .0419
IDEAexp       -.0016      .0062     -.0169      .0100
```

IDEAinfo	-.0120	.0090	-.0330	.0010
IDEAactn	-.0017	.0067	-.0177	.0120
Effectiv	.0464	.0272	-.0052	.1015

********************** ANALYSIS NOTES AND ERRORS ***********************

Level of confidence for all confidence intervals in output: 95.0000

Number of bootstrap samples for percentile bootstrap confidence intervals: 10000

NOTE: A heteroscedasticity consistent standard error and covariance matrix estimator was used.

------ END MATRIX -----

APPENDIX M. CUSTOM SYNTAXES FOR PRODUCING PROCESS MODELS

******************** PROCESS Procedure for SPSS Version 3.00 ********************

Macro Written by Andrew F. Hayes, Ph.D. www.afhayes.com

Documentation available in Hayes (2018a). www.guilford.com/p/hayes3

****

Custom Syntaxes Written by Kimberly A. Beauchamp

****

Custom syntax for the three-way interacting conditional direct and indirect effects:

```
process y=Return/x=IDEA/m=DngrCtrl IDEAintz IDEAexp IDEAinfo IDEAactn Effective/

bmatrix=

1,

1,0,

1,0,0,

1,0,0,0,

1,0,0,0,0,

1,0,0,0,0,0,

1,1,1,1,1,1,1/

w=bF/

wmatrix=

1,

1,0,

1,0,0,

1,0,0,0,

1,0,0,0,0,
```

1,0,0,0,0,0,

1,0,0,0,0,0,0/

z=LPmode/

zmatrix=

1,

1,0,

1,0,0,

1,0,0,0,

1,0,0,0,0,

1,0,0,0,0,0,

1,0,0,0,0,0,0/

wzmatrix=

1,

1,0,

1,0,0,

1,0,0,0,

1,0,0,0,0,

1,0,0,0,0,0,

1,0,0,0,0,0,0/

hc=3/boot=10000/conf=95/effsize=1/total=1/plot=1/intprobe=1/modelbt=1/matrices=1/jn=1/mcz

=3/seed=10235.

****

Custom syntax for the two-way interacting conditional direct and indirect effects:

```
process y=Return/x=IDEA/m=DngrCtrl IDEAintz IDEAexp IDEAinfo IDEAactn Effective/
cov=L1 L2 IDEAxL1 IDEAxL2 bFxL1 bFxL2 IDxbFxL1 IDxbFxL2/
cmatrix=
1,1,1,1,1,1,1,1,
1,1,1,1,1,1,1,1,
1,1,1,1,1,1,1,1,
1,1,1,1,1,1,1,1,
1,1,1,1,1,1,1,1,
1,1,1,1,1,1,1,1,
1,1,1,1,1,1,1,1/
bmatrix=
1,
1,0,
1,0,0,
1,0,0,0,
1,0,0,0,0,
1,0,0,0,0,0,
1,1,1,1,1,1,1/
w=bF/
wmatrix=
1,
1,0,
```

1,0,0,

1,0,0,0,

1,0,0,0,0,

1,0,0,0,0,0,

1,0,0,0,0,0,0/

hc=3/boot=10000/conf=95/effsize=1/total=1/plot=1/intprobe=1/modelbt=1/matrices=1/jn=1/seed

=10235.

****

Custom syntax for the conditional direct and indirect effects:

process y=Return/x=IDEA/m=DngrCtrl IDEAintz IDEAexp IDEAinfo IDEAactn Effective/

cov=bF L1 L2 IDEAxbF IDEAxL1 IDEAxL2 bFxL1 bFxL2 IDxbFxL1 IDxbFxL2/

cmatrix=

1,1,1,1,1,1,1,1,1,1,

1,1,1,1,1,1,1,1,1,1,

1,1,1,1,1,1,1,1,1,1,

1,1,1,1,1,1,1,1,1,1,

1,1,1,1,1,1,1,1,1,1,

1,1,1,1,1,1,1,1,1,1,

1,1,1,1,1,1,1,1,1,1/

bmatrix=

1,

1,0,

1,0,0,

1,0,0,0,

1,0,0,0,0,

1,0,0,0,0,0,

1,1,1,1,1,1,1/

hc=3/boot=10000/conf=95/effsize=1/total=1/plot=1/intprobe=1/modelbt=1/matrices=1/contrast=2/seed=10235.

****

Custom syntax for the unconditional direct and indirect effects:

process y=Return/x=IDEA/m=DngrCtrl IDEAintz IDEAexp IDEAinfo IDEAactn Effective/

bmatrix=

1,

1,0,

1,0,0,

1,0,0,0,

1,0,0,0,0,

1,0,0,0,0,0,

1,1,1,1,1,1,1/

hc=3/boot=10000/conf=95/effsize=1/total=1/plot=1/intprobe=1/modelbt=1/matrices=1/contrast=2/seed=10235.

****

Custom syntax for the three-way interacting conditional direct and indirect effects:

process y=OutRefrn/x=IDEA/m=DngrCtrl IDEAintz IDEAexp IDEAinfo IDEAactn Effective/

bmatrix=

```
1,
1,0,
1,0,0,
1,0,0,0,
1,0,0,0,0,
1,0,0,0,0,0,
1,1,1,1,1,1,1/
w=bF/
wmatrix=
1,
1,0,
1,0,0,
1,0,0,0,
1,0,0,0,0,
1,0,0,0,0,0,
1,0,0,0,0,0,0/
z=LPmode/
zmatrix=
1,
1,0,
1,0,0,
1,0,0,0,
1,0,0,0,0,
```

```
1,0,0,0,0,0,
1,0,0,0,0,0,0/
wzmatrix=
1,
1,0,
1,0,0,
1,0,0,0,
1,0,0,0,0,
1,0,0,0,0,0,
1,0,0,0,0,0,0/
hc=3/boot=10000/conf=95/effsize=1/total=1/plot=1/intprobe=1/modelbt=1/matrices=1/jn=1/mcz
=3/seed=10235.
```

****

Custom syntax for the two-way interacting conditional direct and indirect effects:

```
process y=OutRefrn/x=IDEA/m=DngrCtrl IDEAintz IDEAexp IDEAinfo IDEAactn Effective/
cov=L1 L2 IDEAxL1 IDEAxL2 bFxL1 bFxL2 IDxbFxL1 IDxbFxL2/
cmatrix=
1,1,1,1,1,1,1,1,
1,1,1,1,1,1,1,1,
1,1,1,1,1,1,1,1,
1,1,1,1,1,1,1,1,
1,1,1,1,1,1,1,1,
1,1,1,1,1,1,1,1,
```

```
1,1,1,1,1,1,1,1/
bmatrix=
1,
1,0,
1,0,0,
1,0,0,0,
1,0,0,0,0,
1,0,0,0,0,0,
1,1,1,1,1,1,1/
w=bF/
wmatrix=
1,
1,0,
1,0,0,
1,0,0,0,
1,0,0,0,0,
1,0,0,0,0,0,
1,0,0,0,0,0,0/
hc=3/boot=10000/conf=95/effsize=1/total=1/plot=1/intprobe=1/modelbt=1/matrices=1/jn=1/seed
=10235.
*****************************************************************************
```

Custom syntax for the unconditional direct and indirect effects:

```
process y=OutRefrn/x=IDEA/m=DngrCtrl IDEAintz IDEAexp IDEAinfo IDEAactn Effective/
```

```
cov=bF L1 L2 IDEAxbF IDEAxL1 IDEAxL2 bFxL1 bFxL2 IDxbFxL1 IDxbFxL2/
cmatrix=
1,1,1,1,1,1,1,1,1,1,
1,1,1,1,1,1,1,1,1,1,
1,1,1,1,1,1,1,1,1,1,
1,1,1,1,1,1,1,1,1,1,
1,1,1,1,1,1,1,1,1,1,
1,1,1,1,1,1,1,1,1,1,
1,1,1,1,1,1,1,1,1,1/
bmatrix=
1,
1,0,
1,0,0,
1,0,0,0,
1,0,0,0,0,
1,0,0,0,0,0,
1,1,1,1,1,1,1/
hc=3/boot=10000/conf=95/effsize=1/total=1/plot=1/intprobe=1/modelbt=1/matrices=1/contrast=
2/contrast=2/seed=10235.
```

****

Custom syntax for the unconditional direct and indirect effects:

```
process y=OutRefrn/x=IDEA/m=DngrCtrl IDEAintz IDEAexp IDEAinfo IDEAactn Effective/
bmatrix=
```

1,

1,0,

1,0,0,

1,0,0,0,

1,0,0,0,0,

1,0,0,0,0,0,

1,1,1,1,1,1,1/

hc=3/boot=10000/conf=95/effsize=1/total=1/plot=1/intprobe=1/modelbt=1/matrices=1/contrast=

2/seed=10235.

APPENDIX N. SYNTAXES FOR GENERATING VISUAL REPRESENTATIONS

******************** PROCESS Procedure for SPSS Version 3.00 ********************

Macro Written by Andrew F. Hayes, Ph.D. www.afhayes.com

Documentation available in Hayes (2018a). www.guilford.com/p/hayes3

****

Custom Syntaxes Written by Kimberly A. Beauchamp

****

Custom syntax for producing Figure 4.3:

```
data list free/bF.

begin data.

-.50 .5 end data. compute direct = .4725+.1446*bF.

compute indirect = (.1271+.2697*bF)*(.4553).

graph/scatter(overlay) = bF bF WITH direct indirect (pair).
```

Custom syntax for producing Figure 4.4:

```
data list free/bF.

begin data.

-.50 .5 end data. compute direct = .0305+-.0267*bF.

compute indirect = (.1271+.2697*bF)*(.4524).

graph/scatter(overlay) = bF bF WITH direct indirect (pair).
```

APPENDIX O. NDSU IRB APPROVAL LETTER

NDSU NORTH DAKOTA STATE UNIVERSITY

Institutional Review Board

Office of the Vice President for Research, Creative Activities and Technology Transfer
NDSU Dept. 4000
1735 NDSU Research Park Drive
Research 1, P.O. Box 6050
Fargo, ND 58108-6050

701.231.8995
Fax 701.231.8098

Federalwide Assurance #FWA00002439

IRB Certification of Exempt Human Research Project **February 13, 2012**

Protocol **#HS11295**
"Refining and Enhancing Risk Message Testing for Use with Vulnerable Populations and the General Public"

Robert Littlefield
Dept. of Communication, 202 Ehly

Co-investigator(s) and research team: **Kimberly Beauchamp, Laura Farrell, Shalindra Rathnasinghe**

Study site(s): **Fort Yates, ND; Lexington, KY; Hattiesburg, MS**
Funding: **U of Minn/Dept of Homeland Security**

It has been determined that this human subjects research project qualifies for exempt status (category # 2b) in accordance with federal regulations (Code of Federal Regulations, Title 45, Part 46, *Protection of Human Subjects*). This determination is based on the revised protocol application received 2/9/2012 and consent/information sheet received 10/21/2011.

Please also note the following:

- This determination of exemption expires 3 years from this date. If you wish to continue the research after 2/12/2015, the IRB must re-certify the protocol prior to this date.
- The project must be conducted as described in the approved protocol. If you wish to make changes, pre-approval is to be obtained from the IRB, unless the changes are necessary to eliminate an apparent immediate hazard to subjects. A *Protocol Amendment Request Form* is available on the IRB website.
- Prompt, written notification must be made to the IRB of any adverse events, complaints, or unanticipated problems involving risks to subjects or others related to this project.
- Any significant new findings that may affect the risks and benefits to participation will be reported in writing to the participants and the IRB.
- Research records may be subject to a random or directed audit at any time to verify compliance with IRB policies.

Thank you for complying with NDSU IRB procedures; best wishes for success with your project.

Sincerely,

Teryl Grosz, MS, CIP
Manager, Human Research Protections Program