Investigating the Use of Interactive Narratives for Changing Health Beliefs:

A Test of the Model of Interactive Narrative Effects

DISSERTATION

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Abstract

The model of interactive narrative effects was developed in order to expand upon and enhance previous theories of interactive narrative effects. This was accomplished by synthesizing Green and Jenkins' (2014) model of interactivity effects with elements of Sundar and colleagues' (2015) theory of interactive media effects, with the aim of expanding Green and Jenkins' definition of interactivity and disentangling the presence of an interactivity feature from the various psychological experiences and perceptions of interactivity. Two studies were then conducted to test the propositions of the newly developed model within the context of skin cancer and the Health Belief Model. The first study examined the impact of source interactivity and sourcefulness, while the other examined the impact of message interactivity and perceived contingency. The studies largely supported the MINE's propositions regarding the relationships between interactivity features, perceptions of interactivity, and narrative mediating variables, such as story engagement. Both studies also saw impacts on health beliefs, with perceived benefits and severity being influenced across both studies. The implications of these results for narrative research, interactive media research, and health communication research are discussed.

Dedication

This dissertation would not have been possible without the help and inspiration of the following people, as well as the many others that I'm sure I've forgotten to mention. It is dedicated to them.

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Fields of Study

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Table of Contents

List of Tables

List of Figures

Chapter 1: Introduction

Although storytelling goes back to the earliest days of human history, the idea of an interactive narrative—a narrative where the audience is given some degree of ability to control the content of the story—is relatively recent as a mass media enterprise. The very earliest forms of interactive fiction took the form of gamebooks, which are books that permit a reader to direct the course of a story by selecting which of several narrative branches they will follow. However, this form of storytelling remained more or less a novelty until the development of personal computers and the internet began to change ideas about the relationship between media content and the viewer. Interactive narratives can now be found in a variety of contexts, from complex video game narratives that may be carried across several installments to alternate reality games (ARGs), a new media format where storytellers communicate with their audience using a variety of channels, including blog posts, videos, and sound clips; these artifacts may contain clues that the audience must then unravel in order to collectively advance the story (see lonelygirl15 and Marble Hornets for examples of ARGs).

Although research on video games has begun to touch on the impact of interactive narratives, most of these studies do not focus on the effect of the narrative but rather the impact of other game features (e.g., violence, avatar appearance, control schemes) in

relative isolation from story. In fact, although interest in interactive narratives seems to be increasing there is still relatively little research exploring their effects, how these effects are produced, and what role various interactive features have in producing these effects. Recently, Green and Jenkins (2014) proposed a theoretical model explaining the effects of interactive narratives; however, many of the model's propositions remain untested and there are some areas in which the model can be meaningfully expanded, most notably in its conceptualization of interactivity. Therefore, the purpose of this project is to review Green and Jenkins's (2014) model and expand it by integrating elements of Sundar and colleagues' (2015) theory of interactive media effects (TIME) model to produce a more comprehensive model of interactive narrative effects. Finally, several of this new model's propositions will be tested.

Chapter 2: The Model of Interactivity Effects

Green and Jenkins's (2014) model of interactivity effects defines an interactive narrative as "a story in which the reader has opportunities to decide the direction of the narrative, often at a key plot point" (p. 481), and was primarily designed for explaining reactions to print stories. The authors argue that the presence of these choice points increases user control while decreasing the impact of narrative structure. These factors then influence a variety of mediating variables, which (in turn) influence story outcomes such as enjoyment and attitude change. The mediating variables in the model of interactivity effects are split into two large conceptual categories: story engagement and role of the self variables.

Story Engagement

The story engagement conceptual category is home to the constructs that are typically examined within traditional narrative persuasion contexts. These constructs can be broadly defined as narrative involvement and character involvement.

Narrative involvement. Narrative involvement refers to a mental process wherein an individual is cognitively and emotionally engaged with a narrative (Green & Brock, 2000; Slater & Rouner, 2002). This process is thought to be intensely engaging, even to the point that the reader temporarily loses awareness of their real-world

surroundings (Green & Brock, 2000; Green & Donahue, 2009). It is believed that any narrative medium can prompt narrative involvement (Green & Donahue, 2009), and research has tended to support this belief, with studies showing that narrative engagement can occur in a variety of contexts including text (Green & Brock, 2000), film (Bilandzic & Busselle, 2011), television (Murphy, Frank, Moran, & Patnoe-Woodley, 2011), radio (Zheng, 2014), and video games (Christy & Fox, 2016; Lu, 2012).

The primary effect of narrative involvement on persuasion seems to be the reduction of counterarguing. Counterarguing is the creation of thoughts that are critical of or inconsistent with a persuasive message (Slater & Rouner, 2002). Decreased counterarguing is associated with successful attitude and behavior change (Petty, Cacioppo, Strathman, & Priester, 2005). It is thought that involvement in a narrative requires extensive narrative processing, which consumes a large proportion of cognitive resources (Slater & Rouner, 2002). As a result, the amount of cognitive resources available for the production of counterarguments is limited, resulting in a reduced rate of counterarguing (Kreuter et al., 2007), and there is a fairly extensive body of literature demonstrating the relationship between increased narrative involvement and decreased counterarguing (for a brief review see Green, 2006, and Slater & Rouner, 2002).

Some researchers suspect that narrative involvement may also discourage counterarguing for more hedonistic reasons. These authors argue that the experience of being absorbed in a story is inherently pleasurable, and that those consuming a message are not likely to be motivated to counterargue, as that would disrupt the pleasurable experience of narrative involvement (Escalas, 2004; Green, 2006; Kreuter et al., 2007;

Slater & Rouner, 2002). Indeed, research has demonstrated that higher levels of narrative involvement lead to greater enjoyment of narrative media (Bilandzic & Busselle, 2011; Busselle & Bilandzic, 2009; Green & Brock, 2000; Green, Brock, & Kaufman, 2004) and that disruption of narrative involvement tends to cause individuals to react negatively to the intrusion (Durkin & Wakefield, 2008; Wang & Calder, 2006, 2009).

This may be because individuals tend to accept all information they take in as true unless they have both the desire and cognitive resources available to produce counterarguments (Gilbert, 1991), and—as just discussed—narrative involvement may interfere with both. For example, research has demonstrated that even stories clearly labelled as fiction (i.e., the arguments contained in those stories do not have high credibility) are equally effective at producing persuasive effects as stories labelled as fact (Appel and Malečkar, 2012; Green & Brock, 2000) and that false assertions within stories (e.g., chocolate helps you lose weight) actually interfere with retrieval of accurate information after reading (Gerrig and Prentice, 1991). Thus, the impact of narrative involvement on persuasive outcomes may be the result of both a reduction in ability to counterargue and a reduction in motivation to counterargue.

Green and Jenkins (2014) suggest that adding interactivity to a story should make a story even more likely to engage the reader, as the reader will be more personally involved with the story. Initial research on interactive narratives seems to support this argument, with the majority of the research on the topic taking place within an audio/visual context. For example, Vorderer, Knobloch, and Schramm (2001) had participants watch one of three film versions: one with high interactivity (3 decision

points), one with low interactivity (1 decision point), and one with no interactivity (i.e., linear). In the interactive film the choices affected only a few moments of the film, which then returned to its base story line, a pattern Hand and Varan (2009) refer to as the yo-yo structure. The use of the yo-yo format helped to determine whether effects obtained were in fact connected to the opportunity to interact as opposed to the experience of significantly different stories. The researchers found that those in the interactive conditions were more absorbed in the film; however, this was true only for those with "higher cognitive capacity" (operationalized as high school graduates as opposed to non-graduates). Interestingly, there were no significant differences between the high and low interactivity conditions, suggesting that even very minor inclusions of interactivity may be able to influence story involvement.

Although Vorderer and colleagues' study would suggest that interactive narratives are only effective for certain individuals, two experiments by Hand and Varan (2009) found different results. In the first study, the authors had participants watch an animated drama with either five choice points (interactive) or no choice points (linear). Participants who viewed the interactive narrative reported significantly higher levels of narrative involvement and enjoyment than those who had watched the linear film. Due to Vorderer and colleagues' (2001) earlier findings, Hand and Varan also measured participants' perceptions of how hard it was to understand the narrative; however, there was no difference in participants' perceptions of narrative difficulty between the two conditions. Given that these participants were drawn from a panel of adult members of the public (Hand & Varan, 2009), these results suggest that the average individual may have little

difficulty in comprehending interactive narratives and, again, supports the idea that adding interactivity to a story can result in increases in narrative involvement. Hand and Varan's (2008) second study focused on short interactive television ads that followed the yo-yo structure. Participants viewed either the interactive (2 choice points) or linear (no choice points) versions of the ads. Again, participants who viewed the interactive ads reported greater narrative involvement.

Yin, Ring, and Bickmore (2012) also found a connection between interactivity and narrative involvement; indeed, their study suggests that interactive narratives may be influential only to the extent that they result in narrative involvement. Yin and colleagues (2012) designed an interactive visual novel (a written narrative with choice points that is supplemented by character illustrations and animations) to help improve hospital patients' feelings of self-efficacy regarding the decisions and situations they may face while recovering in the hospital. The study participants were exposed to one of three texts: the visual novel (interactive), a text-only version of the visual novel with no choice points (linear narrative), or a patient rights pamphlet (linear non-narrative). The authors found that individuals who both used the interactive visual novel *and* were engaged in the narrative (i.e., experienced a high amount of flow) had significantly higher post-test self-efficacy scores than those who read one of the other texts.

Finally, Green and Jenkins (2014) report that experiments in their own lab have demonstrated that interactive narratives tend to be more involving than linear narratives. However, they note that this relationship does not always reach statistical significance. As there is no description of the studies themselves, it is not possible to speculate on why

certain experiments may have shown this link while others did not. Given the overall body of research, it is safe to say that increasing a narrative's interactivity should result in an increase in narrative involvement.

Character involvement. Character involvement is best thought of as an umbrella term referring to a wide range of related constructs, all of which pertain to emotional or cognitive reactions to a story's characters, including concepts such empathy, sympathy, parasocial interaction, character liking, identification, and perceived similarity (Moyer-Gusé, 2008; Slater & Rouner, 2002). In general, greater involvement with a story's characters results in an increased likelihood of achieving the desired persuasive outcomes (Moyer-Gusé & Nabi, 2010; Moyer-Gusé, Chung, & Jain, 2011; Murphy et al., 2011; Slater & Rouner, 2002). There is evidence that character involvement directly influences counterarguing just as narrative involvement does. That is, character involvement requires the use of cognitive resources and thus results in a reduced ability to counterargue (Moyer-Gusé & Nabi, 2010; Moyer-Gusé et al., 2011). However, other research has suggested that character involvement's primary influence comes from mediating or moderating the effect of narrative involvement (Caputo & Rouner, 2011; Murphy et al., 2011) or simply by increasing empathy with and sympathy for the story characters (e.g., Chang, 2008). Although many constructs are used to operationalize character interaction, there is one that deserves special attention, as it is the one most frequently assessed in studies of narrative persuasion: identification.

Identification is a phenomenon that occurs when a reader temporarily takes on the identity of a story character, adopting their feelings, and perspective (Cohen, 2001).

When a reader identifies with a character, they engage in perspective taking and empathy. As a result, it is possible that identification with a character results in a kind of vicarious experience, which may influence the reader's own attitudes and feelings (Cohen, 2001; Kreuter et al., 2007; Moyer Gusé, 2008; Moyer-Gusé et al., 2011; Moyer-Gusé & Nabi, 2010). This adoption of the character's identity is especially important within health communication contexts, where perceiving oneself as being vulnerable is often the first step toward adopting healthy behaviors (Becker, 1974; Champion & Skinner, 2008; Rosenstock, 1974). Identification with a character facing a given health challenge may provide a vicarious experience of vulnerability, which may then impact the reader's own perceived vulnerability (Kreuter et al., 2007; Moyer Gusé, 2008; Moyer-Gusé et al., 2011; Moyer-Gusé & Nabi, 2010). Indeed, research has demonstrated a link between character identification and health beliefs and behaviors (e.g., Caputo & Rouner, 2011; de Graaf, Hoeken, Sanders, & Beentjes, 2012; Kreuter et al., 2007).

Research suggests that interactive narratives can have an influence on a variety of character involvement dimensions. Vorderer and colleagues' (2001) experiment on interactive television showed a link between interactivity and increased empathy with characters, although (as with narrative involvement) this relationship was mediated by participants' education levels, with an opposite pattern of results occurring in non-graduate participants. Both of Hand and Varan's studies (2008, 2009) found a similar pattern of results, with interactivity being linked to increased empathy for characters. However, more research on these relationships is needed.

Green and Jenkins (2014) suggest that interactive narratives may produce an even more intense version of identification than traditional narratives; indeed, some of their work suggests that the vast majority of readers make their story choices based on what they, themselves, would do in the situation. Interestingly, this behavior does not reduce identification; instead, there was a positive correlation between readers making the decisions they themselves would make and identification. There was no correlation between approaching the story as a role-playing game (i.e., act as the character would act or act to produce the best story) and identification or involvement. This may be of note for the design of interactive narrative interventions, as it suggests that presenting an interactive narrative as a game or a role-playing exercise may act to reduce its persuasive efficacy.

Role of the Self

The other major component in Green and Jenkins's (2014) model of interactivity effects is the role of the self variables, which are the various feelings and cognitions about the self that may arise from becoming involved in a narrative. Although Green and Jenkins (2014) mention several constructs, such as responsibility, message self-relevance, possible selves (Djikic, Oatley, Zoeterman, & Peterson, 2009; Murru & Martin Ginis, 2010), and participatory responses (Allbritton & Gerrig, 1991; Polichak & Gerrig, 2002), very little research has demonstrated a connection between these self-related variables and narrative outcomes, even within the context of linear narratives. Research has, however, demonstrated a significant relationship between self-referencing and narrative outcomes; therefore, self-referencing merits a somewhat more comprehensive discussion.

Self-referencing occurs when a reader relates the people and events of a story to the people and events in their own lives (Burnkrant & Unnava, 1989, 1995). This process is near-automatic and does not seem to disrupt the process of narrative involvement; indeed, some research suggests that self-referencing is often experienced when reading a narrative (Burnkrant & Unnava, 1989, 1995; Dunlop, Wakefield, & Kashima, 2010; Mar, Oatley, Djikic, & Mullin, 2011; McDonald, Sarge, Lin, Collier, & Potocki, 2015). For example, Cupchik, Oatley, and Vorderer (1998) had participants read excerpts from a James Joyce story and record how often they experienced emotions triggered by a memory of their own lives as spurred by the text (referred to as emotional memories) and how often they experienced emotions as a result of the text only (fresh emotions). They found that although fresh emotions were significantly more common than emotional memories, participants did frequently experience emotional memories (Cupchik et al., 1998).

Self-referencing has been demonstrated to have a direct influence on several persuasive outcomes, including behavior change, attitude change, and purchasing intentions (Dunlop, Wakefield, & Kashima, 2010; Escalas, 2007; Merchant & Rose, 2013). Recent research has suggested that self-referencing may be enhanced when perceived similarity is high (de Graaf, 2014; Jensen et al., 2014). For example, in one study, participants read one of two stories about a female student being diagnosed with intestinal cancer: one where the main character lived off campus with her family or one where she lived in student housing with roommates (de Graaf, 2014). De Graaf found that

self-referencing mediated the impact of perceived similarity (as manipulated by including or not including actual similarity) on participants' perceived risk and self-efficacy.

Self-referencing may impact beliefs and behaviors because it increases the likelihood of successful modeling. Modeling is when observing the experiences and reactions of other individuals (real or mediated) helps shape or create behaviors and beliefs (Bandura, 2009). As Bandura (2009) states, we can learn to "fear the things that [frighten] models, dislike what repulse[s] them, and to like what [gratifies] them" (p. 102). Successful modeling is especially likely to occur when a model is similar to ourselves, a perception that self-referencing may help to create. Thus, when a reader observes a person who is similar to themselves experiencing, for example, a negative health outcome, they may begin to believe that they, too, are at risk for experiencing a similar negative health outcome. This relationship between similarity and successful modeling also holds true for risks that result from causal behaviors. When a similar model is shown engaging in a behavior that later harms them, the observer learns that they may experience similar consequences as a result of that behavior (Bandura, 2009). For example, if Joe, a student at OSU, reads a news story about another OSU student who died in a car crash as a result of not wearing a seatbelt, Joe may begin to believe that he, too, is at risk if he does not wear a seatbelt.

Unfortunately, no research to date has specifically examined links between interactive narratives and self-referencing. However, it is extremely likely that making choices at decision points will result in self-referencing, as Green and Jenkins (2014)

have suggested that the choices readers make are based upon what they themselves would do in the situation, a behavior that would require some degree of self-referencing.

Moderating Variables

Green and Jenkins (2014) identify several variables that may influence the relationship between user control and story engagement and role of self variables. Primary among these are transportability, need for cognition, need for control, and affinity for technology.

Transportability. Transportability is a fairly stable trait and refers to an individual's likelihood of becoming involved with stories in general (Dal Cin, Zanna, & Fong, 2002). Past research has shown that transportability is highly predictive of the degree to which an individual will become involved with any specific story, both on a narrative and character level. This involvement then, in turn, predicts attitude, belief, and behavior change (Dal Cin et al., 2002; Dal Cin, Gibson, Zanna, Shumate, & Fong, 2007; Mazzocco, Green, Sasota, & Jones, 2010). Additionally, transportability is believed to be linked with only narrative materials, as a recent study has demonstrated that transportability is not in any way predictive of reactions to non-narrative rhetorical communication (Mazzocco et al., 2010).

Green and Jenkins (2014) identify transportability as a potential moderator of the relationship between interactivity and the model's mediating variables; they hypothesize that transportability will act as it always has, with higher levels of transportability predicting greater engagement with the story. There is some research to support this hypothesis. For example, one study suggests that transportability is able to predict

engagement with video game narratives, with those higher in transportability reporting that they identified more with the game characters and experienced a greater sense of presence (i.e., a sense of "being there," see Lee, 2004) in the game world (Christy & Fox, 2016). Another study found that transportability predicted the experience of presence while reading through a political candidate's Twitter feed, a quasi-narrative environment (Lee & Shin, 2013). Therefore, it is not unreasonable to assume that Green and Jenkins's (2014) hypothesis regarding transportability's role in affecting the influence of interactivity will likely prove correct.

Need for cognition. Another individual trait identified by Green and Jenkins (2014) as a potential moderator of the relationship between interactivity and engagement and self variables is need for cognition. Individuals who are high on need for cognition enjoy being intellectually challenged, preferring pastimes and tasks that require a bit of thought (Cacioppo, Petty, Feinstein, & Jarvis, 1996). Need for cognition is an important factor in rhetorical persuasion, as those high in need for cognition are unlikely to be influenced by low quality arguments, being significantly more likely to elaborate on those arguments and product counterarguments than those low in need for cognition (Cacioppo et al., 1996; Cacioppo, Petty, & Morris, 1983; Petty & Cacioppo, 1986). Some research has suggested that need for cognition may also impact the processing of narratives. For example, Green and colleagues (2008) found that narrative transportation varied as a function of need for cognition and media format. More specifically, individuals who were high in need for cognition were more transported while reading a story, whereas those low in need for cognition were more transported when watching a

film, a format often perceived to be less difficult to process and understand than reading (Beentjes & van der Voort, 1993). In terms of interactive narratives, Green and Jenkins (2014) hypothesize that interactive narratives will be most influential among those high in cognition, as the processes involved in an interactive narrative may be more cognitively effortful than simply reading a story.

Indeed, the existing research on interactive media suggests that need for cognition may be an important moderating variable. As noted in the earlier discussion of character involvement, Vorderer and colleagues (2001) had participants watch either an interactive television program (the program would pause and offer the participant story choices) or a traditional television program. They found that participants with greater cognitive capacity (as assessed by their high school graduation status and questionnaire response times) were more engaged with the interactive program, whereas those with lesser cognitive capacity were more engaged with the traditional program (Vorderer et al., 2001). It must be noted, however, that higher (or lower) cognitive capacity is not directly equivalent to need for cognition, although the two constructs tend to be correlated (Cacioppo et al., 1996). Therefore, this study must be interpreted as showing only indirect support for need for cognition as a moderator.

However, Green and Jenkins (2014) did directly assess need for cognition when exploring the impact of interactive narratives. They found that their results mirrored those of Vorderer and colleagues (2001), with individuals high in need for cognition identifying most strongly with the protagonist when the story was presented in an interactive format, whereas those individuals low in need for cognition identified most

strongly with the protagonist when the story was presented in a traditional, non-interactive format.

Need for control. Green and Jenkins (2014) also believe that individual differences in need for control may also be an important moderator of interactive narrative effects, as many scholars have noted that one of the key gratifications of interactivity is control (Heeter, 1989; Marathe & Sundar, 2011; Massey & Levy, 1999; Sundar, Xu, & Bellur, 2010). As such, individual variations in need for control could certainly do much to mediate the relationship between interactivity and effects. Indeed, some scholars believe that the desire to experience a sense of control is not only a major gratification of interactive media, but also one of the primary motivational factors for use of interactive media (Przybylski, Rigby, & Ryan, 2010; Ryan, Rigby, & Przybylski, 2006). Given this research, it is reasonable to believe that individuals with a higher need for control may well be more likely to become engaged with an interactive narrative.

Affinity for technology. The final individual moderating variable that Green and Jenkins (2014) identify is affinity for technology. Affinity for technology involves both comfort with and enjoyment of technology use. In terms of comfort with technology, there is still a sizeable population that may be unfamiliar or uncomfortable with manipulating interactive interfaces (e.g., "clicking" buttons, using touchscreens, manipulating video game controllers). For example, Sundar and Marathe (2010) found that technically savvy "power users" preferred using a news site that they could customize themselves, while "non-power" users preferred a news site that was tailored for them by the system.

Alternatively, people may be perfectly able to use technology, but may not enjoy using it. For example, Yin and colleagues (2012) found that participants who self-identified as gamers (and thus both frequently used and enjoyed interactive technology) were more engaged in an interactive narrative and gained the most benefit from that format. Those who said that they did not play games were significantly less engaged in the interactive story and gained the most benefit from either reading a story in a traditional format or from reading a non-narrative informational brochure. Therefore, it is likely that individual levels of affinity for technology will have some impact on engagement and outcomes within an interactive narrative context.

Chapter 3: Expanding the Model of Interactivity Effects

Although Green and Jenkins's (2014) model of interactivity effects provides a sound framework and testable hypotheses, there are some areas in which it could be expanded. Most notably, Green and Jenkins's (2014) operationalization of interactivity is vague and the words "interactivity" and "control" are used interchangeably, which is problematic as theories of interactive media effects make it clear that control is only *one* way in which a medium can be interactive (Sundar, Jia, Waddell, & Huang, 2015; Sundar, Xu, & Bellur, 2010). Green and Jenkins (2014) explain that the decision to operationalize interactivity as control was due to a focus on text-only narratives, and that their model was not designed with the intent of explaining the effects of narratives told using new technologies, which, they do note, "involve a much broader range of interactivity" (p. 482).

However, Green and Jenkins's (2014) decision to focus only on the presence of choice in text only narratives unnecessarily limits the applications of their model, which has the potential to be quite useful in exploring the persuasive effects of many types of interactive narrative, including video games. Fortunately, research from the communication technology field can help inform and expand Green and Jenkins's (2014) model, improving its explanatory power and permitting its application in multimedia and new technology contexts.

Interactivity

The biggest drawback to Green and Jenkins's (2014) model is its relatively narrow definition of interactivity. Sundar and colleagues' TIME model (Sundar et al., 2015) much more clearly delineates the various types of interactivity that new technologies afford, as well as identifying the psychological effects that each type of interactivity may produce. Additionally, Sundar's model—as well as a great deal of research—specifies that the ontological existence of an interactivity feature is the same as the psychological effects of that interactivity feature (Gaver, 1991; Rafaeli, 1998; Sundar et al., 2015), whereas Green and Jenkins's (2014) model talks about the presence of choice and perceptions of control near interchangeably, a conceptualization that is problematic from a process model viewpoint. For example, it is entirely possible for a user to be given choice within a story while still feeling that they have little control over the outcome of the story. Thus, it can be argued it is the *perception* of control that drives (or does not drive) the effects of the model of interactivity effects, not the structural affordance of choice itself. Indeed, Gaver's (1991) work strongly suggests that perceptions of interactivity can be present even when the actual affordance of interactivity is not and vice versa, something that Sundar and colleagues' (2015) model does not specify. Additionally, O'Keefe's (2003) discussion of research on message properties strongly encourages the assessment of psychological states as meaningful mediators between message features and message effects.

Sundar's model (Sundar, 2008; Sundar et al., 2010; Sundar et al., 2015) identifies three different types of interactivity: message interactivity, medium interactivity, and

source interactivity. Each of these forms of interactivity can result in any one of many psychological reactions, some of which are shared across multiple types of interactivity.

Message interactivity. Message interactivity, sometimes also referred to as contingency, is when a system reacts to a user's previous input (Sundar et al., 2010; Sundar et al., 2015; Sundar, Bellur, Oh, Jia, & Kim, 2014). Sundar conceptualizes contingency as having three general levels, as based upon Rafaeli's (1998) explication of interactivity (Sundar et al., 2010; Sundar et al., 2015). In this system, very low contingency is non-interactive; there is no exchange of information between user and system. Sundar and colleagues (2014) give the example of a website with all of its information on one scrollable page. Within a narrative context a low-contingency/non-interactive narrative would be a traditional narrative (i.e., a linear story).

The second level of contingency is the reactive level. At this level, the system does react, but only to the user's most recent input, with none of the previous interactions having any influence on the system's responses (Sundar et al., 2015; Sundar et al., 2010). Under this definition, any reaction—no matter how minimal—places the message on the reactive level. Sundar's work has tended to operationalize the levels of contingency as layers of hyperlinks; when one clicks on a hyperlink and is directed to a page, that is reactive (Sundar, Kalyanaraman, & Brown, 2003; Sundar & Kim, 2005).

Most studies done on interactive narratives have manipulated message interactivity at this medium level (e.g., Hand & Varan, 2007, 2009; Vorderer et al., 2001). This technique, sometimes referred to as the yo-yo method (Hand & Varan, 2009), involves readers making a story choice that influences only the scene immediately

following that choice. The story then returns to the same base storyline, with the reader's choice having had no influence on the larger story overall. This method is thus reactive, not interactive. This technique has typically been used in order to ensure that any effects noted can be connected to the presence of the opportunity to react rather than to the experience of significantly different stories.

Finally, the third level of contingency is full interactivity. In fully interactive, high contingency systems, the system not only reacts to the user's most recent input, but is also influenced by the input that has come before, creating a sense of dialogue with the system (Sundar et al., 2015; Sundar et al., 2010). Sundar and colleagues have tended to operationalize this form of interactivity by using both hierarchical systems of content and what they refer to as breadcrumbs, or visual cues displaying the idiosyncratic path a user has taken through a website or system (Bellur & Sundar, 2013; Oh & Sundar, 2013; Sundar et al., 2014).

Within the context of interactive narratives, this high level of contingency is most often seen in video game narratives. In this format, the choices the user makes while progressing through the story can have a significant impact on which version of the story the user will ultimately experience. Earlier choices influence what options are available later. For example, in the game *Dragon Age: Origins*, the player is faced with making many different decisions as they progress through the game. One particularly early choice involves the decision to either free a prisoner or to ignore him. If the player frees the prisoner, he becomes a member of their party. Having this party member unlocks several unique options that are not available if the player chooses to ignore the prisoner, and this

decision cannot be altered once the player has moved on from one of the initial game areas.

There is, however, very little research on the influence of these highly contingent story lines, largely due to concerns over experimental validity. The one example that was found in the literature is the previously mentioned study by Yin and colleagues (2012), where the high contingency interactive visual novel was compared to either a non-interactive or non-narrative (i.e., purely informative) condition. They found that the highly contingent narrative was significantly more effective in increasing self-efficacy regarding medical decisions than either of the other two conditions. This effect was largely mediated by participants' engagement with the narrative (i.e., the experience of flow) such that those who did not experience engagement with the narrative actually gained more benefit from the non-narrative and linear narrative materials.

It is important to note that contingency, as a system feature, is not equivalent to *perceived* contingency. Perceived contingency is the degree to which the user *believes* that a system's responses are contingent upon their prior input (Rafaeli, 1998; Sundar et al., 2014; Sundar et al., 2003). It is this perception of contingency, and not necessarily a system's actual contingency, that drives message interactivity effects. A system may be highly contingent, carefully tracking a user's behaviors and adapting itself to them, but not be perceived as being contingent by the user. For example, Google uses the cookies stored on a user's computer to personalize their search results; however, users may not be aware of this feature. Thus, the Google search system is, in terms of features, highly contingent, but many users are likely to perceive it as being low contingency. Thus, it is

entirely possible for a highly contingent system to be perceived as low contingency or vice versa. As such, any discussion of message interactivity effects should be understood as resulting from perceptions of contingency, not features of the system itself.

Message interactivity effects. The TIME model (Sundar et al., 2015) posits that high perceived contingency messages should result in increased engagement with the message which, in turn, enhances user perceptions of the message. Research has tended to support this relationship (Bellur & Sundar, 2013; Guillory & Sundar, 2014; Kim & Stout, 2010; Oh & Sundar, 2013; Sundar et al., 2014). For example, Bellur and Sundar (2013) developed a health question and answer system that varied in its level of contingency. The system was designed such that the system would ask the participant a question about their health behaviors, the participant would answer, and the system would display health information relevant to that answer, with the high contingency condition taking participants' earlier responses into account when asking for new information and when presenting responses. For example, the system might say "Previously, you mentioned that you like to walk every day…." The study found that higher levels of contingency led to greater perceived contingency, which in turn resulted in greater endorsement of a variety of health-related factors (e.g., perceived severity) and increased absorption with the site content (e.g., enjoyment).

However, this increased message engagement can also have negative consequences. For example, one study found that message interactivity interacts with content credibility such that high contingency produced significantly less agreement with message content when that message content was low in credibility (Johnson et al., 2014).

This negative effect may be due to the fact that higher contingency environments appear to increase elaboration in response to informational/rhetorical messages, which—as the elaboration likelihood model predicts—may increase central processing of the websites' claims, making the actual strength of the claims significantly more influential in the process of attitude change (Oh & Sundar, 2013; Petty & Caccioppo, 1986).

Although the vast majority of the research on the effects of message interactivity have taken place within a rhetorical/informational context, it is likely that increases in perceived contingency will have similar effects within an interactive narrative context. Indeed, as noted previously, the vast majority of research on interactive narratives has manipulated *only* message interactivity, although perceptions of contingency were not assessed. In these studies, increases in message interactivity have consistently led to greater involvement with both the narrative and the characters within the narrative (Hand & Varan, 2007, 2009; Vorderer et al., 2001; Yin et al., 2012). As such, it is likely that perceptions of contingency within an interactive narrative will lead to greater narrative involvement and increased character involvement, which will in turn result in persuasive outcomes.

Additionally, research coming from the narrative persuasion literature suggests that the causal nature of high contingency stories may have a direct effect on story outcomes. Causality, in this context, refers to the extent to which information presented in a narrative shows a causal link to future events within that same narrative (Dahlstrom, 2010, 2012). Information that is causal (i.e., is important later on within the same narrative) is significantly more persuasive than information that is non-causal (i.e., is

simply mentioned in the narrative; Dahlstrom, 2010, 2012). For example, a study by Dahlstrom (2010) found that simple facts (e.g., pansies always turn to face the sun) that were included in causal locations in a story were recalled much better and perceived as significantly more truthful. Within the context of interactive narratives, it seems likely that making choices within a high contingency interactive narrative, choices which later have an effect on the story line, may have significantly more impact on persuasive outcomes than reading a similar series of events within a linear narrative due to the higher level of concentration and involvement that is required to make choices.

Finally, high contingency interactive narratives may help readers increase their sense of self-efficacy and revise their outcome expectancies. According to social cognitive theory (Bandura, 2009), increases in self-efficacy and clear outcome expectancies are integral to the successful performance of learned behaviors. By permitting readers to make choices and experience the consequence of those choices within a relatively safe environment (i.e., a fictional story), high contingency narratives may help readers feel more confident in their own decision making abilities, as well as helping them explore and understand the various potential outcomes of those hypothetical behaviors. For example, Yin and colleagues (2012) found that individuals who used an interactive narrative to explore health decision making within a hospital context tended to have greater post-exposure self-efficacy than those who had read only a linear narrative or informational pamphlet.

In summary, message interactivity and its resultant influence on perceptions of contingency may increase narrative involvement and character involvement. In addition,

message interactivity may have a direct effect on outcome variables as a result of creating stronger causal links between a user's choices and story events.

Source interactivity. Source interactivity refers to the control a user has over a system, or "the degree to which the interface affords users the ability to act as the source of communication" (Sundar et al., 2015, p. 56). This form of interactivity can generally be thought of as affordances that permit one or more of the three "Cs": ability to customize, curate, or create.

Customization refers to one's ability to change either functional or cosmetic aspects of a system (Sundar, 2007; Sundar et al., 2015). A video game permitting one to assign their own key mappings to various commands would be an example of functional customization, while a game player changing their avatar's hair color would be an example of cosmetic customization. An interactive narrative could incorporate customization in a variety of ways, such as permitting customization of the main character or even by allowing users to change the interface so that it is more comfortable for them.

Sundar's conception of customization also includes tailoring, which involves a system's use of user information to provide a somewhat unique experience (Sundar et al., 2015). Tailoring is included under customization because although the user is not the one changing the system's features, the system is still using the user's personal information as the "source" of the changes, an important consideration when looking at Sundar's "self as source" concept (Sundar, 2008; Sundar et al., 2015). Perception of self as source, which I will refer to as *sourcefulness*, is the extent to which the system "makes salient the idea

that the user…is the source" (Sundar, 2008, p. 70). Indeed, many health communication interventions use tailored materials in order to increase engagement with the health message (see Noar, Benac, & Harris, 2007 and Rimer & Kreuter, 2006 for reviews). Tailoring could, of course, be used in interactive narratives. In fact, there has even been some research looking at the effectiveness of tailored narratives for health communication (Jensen et al., 2014; Khaled, Barr, Noble, Fischer, & Biddle, 2007).

The two other "Cs" of source interactivity (curation and creation) are less applicable to interactive narratives than customization. Curation refers to a user selecting and distributing content for others, a particularly common occurrence within today's social media environment (Sundar et al., 2015). Posting links on Facebook or Tumblr is curation, as are—to some extent—online rating systems on sites like Yelp or Amazon.com. There are even some sites where users' votes on others' posts either promote or hide/diminish the visibility of those posts (e.g., Reddit, Cracked.com). Creation simply refers to the creation of content, such as blogs, comics, or art (Sundar et al., 2015).

However, neither curation nor creation is particularly applicable to understanding interactive narratives. In terms of curation, interactive narratives do not tend to be a highly social experience; there is generally very little ability (or opportunity) to curate the content of an interactive narrative. As for creation, one can certainly create their own interactive narrative, but generally cannot have any influence on the creation of someone else's interactive narrative, although some online interactive comics, such as *Problem Sleuth* (Hussie, 2008-2009) and *Little Robot Big Scary World* (Claus-Nesbitt, 2007-

2009), have explored the possibilities for the co-creation of narratives by fans and author, as has the concept of interactive theater.

Having summarized the three Cs of source interactivity, the discussion will now move on to an exploration of source interactivity's effects. Because curation and creation are not salient to the discussion of interactive narratives, literature on the effects of these two forms of source interactivity will not be reviewed.

Source interactivity effects. There are two psychological effects that drive the majority of source interactivity effects. These are sourcefulness and perception of control, with perception of control referring to the extent to which a user feels that they control the system and the system outcomes (Sundar, 2008; Sundar et al., 2015; Sundar, Oh, Bellur, Jia, & Kim, 2012). Together, these two effects act to increase user enjoyment of the interactive context as well as increase user involvement with the information in that context (Marathe & Sundar, 2011; Sundar & Marathe, 2010; Sundar et al., 2012).

The ways that sourcefulness and perceptions of control may influence reactions to interactive narratives has not yet been empirically investigated. However, it is possible to theorize about the relationship between these constructs and those in Green and Jenkins's (2014) model of interactivity effects. As Sundar and colleagues note (2015), perceptions of control increase user engagement with a system; thus, it is possible that perceptions of control within an interactive narrative context will increase narrative involvement and character involvement. Sourcefulness, however, is significantly more self-focused, with sourcefulness coming from the degree to which one feels themselves reflected within the system, which will (in turn) increase engagement with that system (Sundar et al., 2015).

As such, one would expect perceptions of sourcefulness to have an impact on self-related variables in addition to narrative involvement and character involvement.

At this point, it is important to note that although the outcomes of source interactivity seem to overlap with the outcomes of message interactivity, there are conceptual differences between the two. Perception of contingency, the result of message interactivity, is the feeling that the system is responding to you, whereas sourcefulness and perceptions of control, the result of source interactivity, is the feeling that you are a message's source and/or that you have control over the interaction (respectively). It is completely possible to feel a sense of "dialogue" with a system without ever being in control of the outcomes. For example, in an interactive narrative the reader may be completely aware that the system is responding to their choices, but they may also perceive that none of their choices actually makes a difference (i.e., no perception of control or sourcefulness).

It is also quite possible to experience perceived contingency with or without sourcefulness. Imagine a player engaging with an interactive video game that does not allow any form of character customization, but allows the player to make plot choices. The player has contingency (and may perceive contingency). If the player makes the choices that *they themselves would make* (i.e., are attempting to play as themselves), they may also experience sourcefulness, as they are consciously projecting themselves into the narrative. However, a player may also attempt to make choices that *they believe the character would make* (i.e., are attempting to play as a character), which would not be expected to produce feelings of sourcefulness, as the player would not be projecting

themselves into the narrative. Although these constructs admittedly overlap when each is taken to the extreme (fully contingent and very high source interactivity), there is a conceptual difference, especially at lower levels of the constructs.

Customization significantly increases both sourcefulness and perceptions of control, leading to increased enjoyment of and engagement with a system and its content (Marathe & Sundar, 2011; Sundar & Marathe, 2010; Sundar et al., 2012). For example, Marathe and Sundar (2011) found that participants who were permitted to customize the functionality and appearance of a web news portal experienced significantly greater feelings of control and sourcefulness than those who were not permitted to customize the portal; these effects were strongest for those termed *power users* (i.e., those who are very familiar with and enjoy technology and use it frequently). Interestingly, they also found that perceptions of control were fully mediated by sourcefulness. Other research has also suggested that the difference between power users and non-power users may be extremely important in understanding the effects of customization. Sundar and Marathe (2010) found that power users evaluated a web portal more positively when they were given the ability to customize it themselves, whereas non-power users preferred a tailored (i.e., system customized) web portal. This suggests that experience with and enjoyment of technology may be an important moderating factor when looking at source interactivity.

Unfortunately, there is very little research available on customization within an interactive narrative context. However, one possible method of customization within an interactive narrative is the opportunity to customize the main character. This customization of the main character may have an important effect above and beyond

sourcefulness and perceptions of control: it may character involvement and role of self variables. Indeed, research on video game avatars suggests that users frequently customize avatars such that they resemble either themselves or an idealized version of themselves (Vasalou, Joinson, & Pitt, 2007; Yee, 2006). Within Green and Jenkins's (2014) model, increases in character involvement and role of self variables should increase an interactive narrative's effects.

As noted previously, tailoring can also facilitate the experience of sourcefulness and perceptions of control (Kalyanaraman & Sundar, 2006; Sundar & Marathe, 2010). Tailoring seems to work because although the user is not the one who makes changes to the system, the system still uses characteristics of the user as the source of its design, increasing the self-relevance of the system. There have been several studies exploring the efficacy of tailored narratives, primarily within the health communication field (Khaled, Barr, Noble, Fischer, & Biddle, 2007; Jensen et al., 2014). Generally, tailoring improves the effectiveness of a persuasive narrative.

Jensen and colleagues (2014), for example, tailored narratives such that the main character matched the user on sex, age, and race. They found that participants who had received the tailored narrative (relative to the non-tailored narrative) perceived fewer barriers to colorectal cancer screening. The tailored narratives were also significantly more effective at increasing screening behavior for individuals who were high on cancer information overload (CIO). This suggests an excellent and important use for tailored narratives: reaching out to populations that are feeling overwhelmed and uncertain (in this study, those high on CIO). Reaching these individuals is important, as they tend to be

fatalistic about their health, perceive greater barriers to action, and may even show boomerang effects in reaction to health recommendations (Jensen et al., 2013).

In conclusion, source interactivity is likely to be an important within Green and Jenkins's (2014) model of interactivity effects. More specifically, sourcefulness is likely to influence self-related variables (such as self-referencing and self-relevance) and is also likely to increase narrative and character involvement. Source interactivity can also result in increases in perceptions of control, which may manifest itself as increases in narrative and character involvement.

Medium interactivity. Medium interactivity concerns the modalities that are used to present a message such as text, visuals, control schemes, and audio (Sundar et al., 2010; Sundar et al., 2015). Sundar and his colleagues argue that the primary psychological effect of medium interactivity is in its influence on a user's perceptual bandwidth and on the mental representation of a particular message (Sundar, 2007; Sundar et al., 2010; Sundar et al., 2015).

Perceptual bandwidth. Perceptual bandwidth refers to the number and variety of sensory channels (e.g., audio, animation, voice controls, and embodied control schemes) that are used to receive or disseminate a message; as such, it is sometimes referred to as a system's bells and whistles (Reeves & Nass, 2000; Sundar et al., 2010; Sundar et al., 2015; Xu & Sundar, 2014). Sundar argues that greater perceptual bandwidth should result in increased engagement with a system and increased perceptions of user control, which should in turn increase the effectiveness of the system's content (Sundar et al., 2015), and this hypothesis has been fairly well supported (e.g., Ahn, Bailenson, & Park, 2014; Oh,

Robinson, and Lee, 2013; Oh & Sundar, 2013; Sundar & Kim, 2005; Xu & Sundar, 2014).

For example, Xu and Sundar (2014) conducted an experiment using a product website with varying degrees of perceptual bandwidth. The low bandwidth condition simply had product specs and two images of the product. The medium bandwidth condition allowed users to browse a catalogue of several product images, where clicking on a thumbnail of an image would bring it up in the main viewing window (i.e., increased number of images, inclusion of an image browsing system). Finally, the high bandwidth condition provided a product demo, allowing participants to click and drag to rotate the product image, mouse over the image to zoom in on certain areas, and change the product color. The textual information presented remained constant across all three conditions.

Upon analysis, the authors found that perceptual bandwidth had a main effect on website engagement, with the high bandwidth condition consistently predicting greater engagement and perceptions of control than the medium or low bandwidth conditions (Xu & Sundar, 2014). In terms of the persuasiveness of the site's content, results showed that high bandwidth resulted in significantly better attitudes toward the product, greater purchase likelihood, and greater purchase behavior than either the medium or low bandwidth conditions. A mediation analysis confirmed the hypothesized path of perceptual bandwidth → control/engagement → effect. More specifically, the impact of perceptual bandwidth (high compared with low) on product attitudes was mediated by both perceived control and engagement (with both mediators operating in parallel), with product attitudes then predicting increases in purchase likelihood.

However, there are also instances in which increases in perceptual bandwidth actually decrease the effectiveness of system content. For example, Sundar (2000) showed participants several online news stories and then assessed their recall of story information and recognition of story information (i.e., cued recall). The news sites used in the experiment varied by what types of multimedia were featured in addition to the story text. The conditions were: text only; text + picture (picture); text + audio (audio); text, picture, and audio (picture + audio), and text + video (video). Contrary to the predictions of Sundar's (2007) perceptual bandwidth hypothesis, participants had the highest story recall and recognition when they were exposed to the picture condition and the lowest in the picture + audio and video conditions.

As Sundar (2000) notes, the video condition confounds image and audio; thus, a 2x2 MANOVA analysis of the audio and image was performed. Results showed that participants who were exposed to the audio had significantly lower recall and recognition than those who were not exposed to audio; however, there was no main effect for the presence/absence of a picture. Although the perceptual bandwidth was highest in the picture + audio condition, it performed worst in terms of story recall and recognition. Similar effects have been found in other studies (e.g., Copeland, Magliano, & Radvansky, 2006; Oh, Robinson, & Lee, 2013; Sundar & Kim, 2005; Xu & Sundar, 2011).

This degradation of information processing in high perceptual bandwidth environments may be due to cognitive overload. Research on cognition has suggested that humans have a limited pool of cognitive resources (Lang, 2000). It is likely that the use of too many modalities ends up dividing cognitive resources among so many

functions that the successful performance of any one function is inhibited. This is not surprising, as Reeves and Nass (2000) note that it is entirely possible for increases in perceptual bandwidth to have both positive and negative effects, as they view perceptual bandwidth as being an amplifying factor, where successes become even more successful and failures fail even more badly. They also note that the most important factor when considering perceptual bandwidth is the extent to which the modality features being used complement the overall experience, pointing out that different modalities have different strengths and weaknesses (Reeves & Nass, 2000). As such, researchers and system designers should take care when considering medium interactivity features, asking themselves if the features they are including are serving their desired message or are simply acting as distracting bells and whistles. The relationship between medium interactivity features, perceptual bandwidth, and effects is likely to hold true for interactive narratives just as it would for any other interactive system.

In addition to perceptual bandwidth, Sundar and colleagues (2015) argue that medium interactivity features can impact mental representations of a system and that system's information.

Mental representations. Research on cognition suggests that anything that influences the way a message is represented in our minds can directly affect what we remember from the message (Wyer, 2004). For example, we tend to represent incoming information as a series of event models within a single situation model (Wyer, 2004). If a situation model was a play, the event models would be acts within that play. The presence of multiple event models within a situation model is capable of both interfering

with and facilitating information recall. Having information stored across multiple event models can cause a fan effect (see Anderson & Reder, 1999; Zwaan & Radvansky, 1998) that interferes with recall of an individual piece of information from within the situation model; however, having information spread across several event models increases the sheer amount of information recalled (Radvansky, 2008; Radvansky & Zacks, 1991). Depending upon a message producer's goals, it may be better for system users to have more or less event models.

Any number of things can trigger the creation of a new event model. Within narrative contexts, research suggests that changes of character, location, time, and character motivation can all trigger the creation of a new event model (Scott & Taylor, 2000; Taylor & Tversky, 1997; Zwaan et al., 1995; Zwaan, 1999). Some research suggests that these same changes also trigger the creation of a new event model within an interactive context. For example, people playing a WWII aerial combat simulator showed a marked decrease in performance whenever they made a shift from one terrain region to another (e.g., forest to city), being less likely to successfully hit enemy planes and more likely to be hit by enemy fire (Copeland, Magliano, & Radvansky, 2006). The authors suggest that these results indicate the creation of a new event model at spatial boundaries, arguing that the decrease in performance was the result of a decrease in available cognitive resources due to the need to create a new event model (Copeland et al., 2006). This study suggests that certain elements of medium interactivity, particularly those that may cause a substantial spatial shift (e.g., slideshows, sliders), may have a significant

influence on mental representations of both the system and the information contained in the system.

This information is especially applicable to how interactive narratives are mentally represented, as much of the research on situation and event models has already been done within a narrative context. The greatest question remaining is how the various elements of medium interactivity will impact understanding and segmentation of the story text, something that has been almost entirely unexplored at this point.

To conclude, the role of medium interactivity within Green and Jenkins's (2014) model of interactivity effects is likely to be twofold. First, greater perceptual bandwidth should result in increased involvement with both narrative and characters, possibly as the result of increases in perceptual bandwidth. However, too many bells and whistles are likely to draw attention away from the content of the interactive narrative. Second, medium interactivity may have a direct effect on the outcomes of interactive narratives by influencing the way the narrative is stored within memory. In all cases, it is important to remember that medium interactivity is the broadest of the three forms of interactivity Sundar's interactivity effects model, and includes a huge variety of medium features, including sound, visuals, control schemes, displays, and more (Sundar et al., 2015). As such, each different affordance is likely to impact interactive narratives in a fairly unique way and may even differ from narrative to narrative. For example, the inclusion of music in an interactive narrative about musical performances or a historical musician may enhance the effectiveness of that narrative, whereas its inclusion in an interactive narrative about sport fishing may simply be a distraction.

Chapter 4: The Model of Interactive Narrative Effects (MINE)

By combining elements of Sundar and colleagues' (2015) TIME model and Green and Jenkins's (2014) model of interactivity effects, a larger integrated model—the model of interactive narrative effects (MINE)—can be produced (see Figure 1). MINE builds upon Green and Jenkins's (2014) model by expanding the conceptualization of interactivity, by disentangling the relationship between interactive features and the psychological effects of those features, and by making specific predictions about what kind of impacts the various psychological effects of interactivity may have on story engagement and role of self variables.

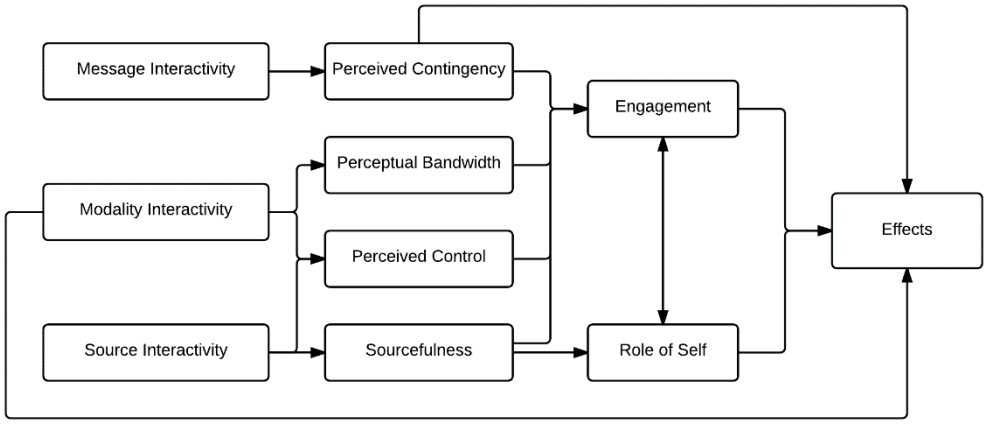

Figure 1. The model of interactive narrative effects (MINE)

More specifically, MINE makes the following propositions:

1. Message interactivity will increase perceived contingency.
2. Perceived contingency will increase engagement with the narrative.
3. Perceived contingency may directly influence interactive narrative effects.
4. Modality interactivity will increase perceptual bandwidth and perceived control.
5. Perceptual bandwidth will increase engagement with the narrative.
6. Perceived control will increase engagement with the narrative.
7. Source interactivity will increase perceived control and sourcefulness.
8. Perceived control will increase engagement with the narrative.
9. Sourcefulness will increase engagement with the narrative and role of self variables.

Although not shown in the figure, MINE also makes the following predictions regarding moderating variables:

1. Need for control will moderate the relationship between the psychological effects of interactivity and story engagement.
2. Need for cognition will moderate the relationship between the psychological effects of interactivity and story engagement.
3. Transportability will moderate the relationship between the psychological effects of interactivity and story engagement.
4. Affinity for technology will moderate the relationship between the psychological effects of interactivity and story engagement.

However, many of the MINE's hypotheses have never been formally tested; therefore, the remainder of this project will focus on two studies designed to investigate the impact of sourcefulness and perceived contingency (respectively) on four important narrative concepts—narrative involvement, character involvement, self-referencing, and self-relevance—within the context of the health belief model.

Chapter 5: Project Overview

This project consists of two studies that test the MINE's propositions within the context of the use of interactive narratives for improving preventative health beliefs and behaviors. The first study specifically assesses the impact of source interactivity and sourcefulness, whereas the second study looks at the influence of message interactivity and perceived contingency. A health context was selected because narrative persuasion has proven to be highly effective in persuading individuals to change their attitudes and adopt various health behaviors. For example, narrative persuasion has been used to change beliefs and behaviors related to safe sex practices (Moyer-Gusé, Chung, & Jain, 2011; Moyer-Gusé & Nabi, 2010), cancer (de Graaf, 2014; Green, 2006; Jensen et al., 2014; Kreuter et al., 2007; Murphy, Frank, Moran, & Patnoe-Woodley, 2011; Murphy, Frank, Chatterjee, & Baezconde-Garbanati, 2013), mental health issues (Caputo & Rouner, 2011; Chang, 2008; Ritterfeld & Jin, 2006), smoking (dal Cin, Gibson, Zanna, Shumate, & Fong, 2007), drinking (Slater & Rouner, 1996), other substance use (Lee, Hecht, Miller-Day, & Elek, 2011), and HIV/AIDS (Singhal & Rogers, 1999, 2001, 2004; Smith, Downs, & Witte, 2007). Given the fact that interactive narratives appear to outperform linear narratives in terms of narrative experiences (Hand & Varan, 2008, 2009; Vorderer et al., 2001; Yin et al., 2012), it seems logical to believe that interactive narratives may be more effective as agents of health belief and behavior change than

linear narratives. As such, the outcome variables selected for use in the following studies were the elements of the health belief model (HBM; Champion & Skinner, 2008; Hochbaum, 1958; Rosenstock, 1960, 1974).

The Health Belief Model

The health belief model was originally developed to help explain why people do not perform prevention and screening behaviors, and it has proven to be a valuable tool for understanding health behaviors (Champion & Skinner, 2008; Janz & Becker, 1984; Hochbaum, 1958; Rosenstock, 1960, 1974). The modern version of the HBM posits that there are five major components that can influence whether or not someone successfully performs a given health behavior: perceived susceptibility, perceived severity, perceived barriers, perceived benefits, and self-efficacy (Champion & Skinner, 2008).

Perceived susceptibility. Perceived susceptibility, sometimes also referred to as perceived vulnerability, is an individual's belief regarding the likelihood that they will be susceptible to a given health problem (Becker, 1974; Champion & Skinner, 2008). Perceived susceptibility is an important factor in increasing receptivity to messages regarding health behavior change. For example, individuals who do not perceive themselves as vulnerable to or at risk for lung cancer are unlikely to change their smoking behaviors (Weinstein, 2001). Some research on narrative persuasion within health contexts has found that perceived susceptibility tends to increase when readers identify with and perceive themselves as being similar to a character with the target health problem (de Graaf, 2014; Kreuter et al., 2007; Moyer Gusé, 2008; Moyer-Gusé et al., 2011; Moyer-Gusé & Nabi, 2010). Within the context of prevention, perceived

susceptibility is one of the strongest predictors of preventative health behaviors (Champion & Skinner, 2008).

Perceived severity. Perceived severity refers to how serious an individual perceives a given health problem—and its consequences—to be (Champion & Skinner, 2008). If an individual believes that the consequences of a given behavior are minor then they will be less likely to engage in prevention behaviors. Together, perceived susceptibility and perceived severity are sometimes referred to as perceived threat (Champion & Skinner, 2008). There is some evidence to suggest that narrative persuasion can have an impact on perceived severity (e.g., Keller, Wilkinson, & Otjen, 2010; Lapinski & Nwulu, 2008; So & Nabi, 2013; So & Shen, 2015). For example, a study looking at the effects of a film on HIV/AIDS-related attitudes and behaviors found that individuals who strongly identified with a character identified as HIV positive perceived HIV/AIDS as being significantly more severe than those who did not identify with that character (Lapinski & Nwulu, 2008).

Perceived barriers. Perceived barriers refer to the various negative outcomes or hurdles that an individual faces when considering a health behavior (Champion & Skinner, 2008). These barriers can refer to a variety of factors, including situational factors (e.g., the test is too expensive, I don't have any way to get to the appointment), psychological/emotional factors (e.g., embarrassment, worry), physical factors (e.g., the test will be painful), and risk factors associated with the behavior itself (e.g., being in a hospital will expose me to other illnesses, I don't want to expose myself to more radiation, if I stop smoking I'll gain weight; Dillard, Gaferlin, Dal Cin, Zikmund-Fisher,

& Ubel, 2010). Perceived barriers are the single most powerful predictor of health behavior within the HBM; thus, changing individuals' perceptions of barriers is essential to encouraging them to adopt or change a health behavior (Champion & Skinner, 2008; Jones et al., 2014). The narrative persuasion literature has demonstrated that stories can have an influence on perceived barriers. For example, Jensen and colleagues (2014) found that narratives tailored to match participants on age, sex, and race significantly decreased perceived barriers to colorectal cancer screening. A similar pattern was seen in Dillard, Fagerlin, Dal Cin, Zikmund-Fisher, and Ubel's (2010) study, with participants who read a narrative about colorectal cancer screening viewing barriers as being significantly less threatening and problematic.

Perceived benefits. Perceived benefits simply refers to the benefits an individual expects to gain from changing or adopting a health behavior (Champion & Skinner, 2008). These can relate both to the health consequences of the change (e.g., I will reduce my risk for cancer) and other peripheral benefits (e.g., I'll be more attractive, my family will be proud of me). Together, consideration of perceived barriers and perceived benefits create a kind of unconscious cost-benefit analysis; if the perceived benefits outweigh the perceived barriers, the health behavior is much more likely to be enacted (Champion & Skinner, 2008; Dillard et al., 2010; Rosenstock, 1974). However, relatively few studies have investigated the influence of narratives on perceived benefits, and research suggests that perceived benefits may be the least influential component of the HBM (Champion & Skinner, 2008).

Self-efficacy. Within the context of the HBM, self-efficacy can be defined as the belief that one will be able to successfully enact the desired health behavior (Bandura, 2004; Champion & Skinner, 2008). Self-efficacy is one of the primary components of social cognitive theory, and is the result of observing a model that is similar to oneself successfully overcoming challenges or having done so oneself (Bandura, 2004). Having high self-efficacy for a given health behavior increases the likelihood that an individual will engage in that behavior (Bandura, 2009). A wide body of research has determined that narrative mediums are extremely good at helping individuals develop health-related self-efficacy (e.g., Chang, 2008; de Graaf, 2014; Kreuter et al., 2007; Moyer-Gusé et al., 2011; Singhal & Rogers, 1999, 2004; Smith, Downs, & Witte, 2007). For example, Moyer-Gusé and colleagues (2011) found that character involvement with story characters who modeled STI prevention behaviors resulted in significantly higher self-efficacy for those prevention behaviors (e.g., getting tested for an STI), which had a significant effect on participants' actual behaviors two weeks later.

Now that the HBM has been overviewed, the specific health context which the studies will be examining, skin cancer screening, will be discussed.

The Health Behavior: Skin Examination

Skin cancer is the single most common human cancer in the United States, accounting for almost half of all new cancer cases and affecting over three million people each year (American Cancer Society, 2014; Centers for Disease Control and Prevention, 2014). It is estimated that 1 in 5 Americans will develop skin cancer at some point in their lifetimes (World Health Organization, 2014), and it is expected that the incidence of

skin cancer, including melanoma (the most deadly form of skin cancer), will continue to increase, as it has over the past 30 years (National Cancer Institute, 2014). In order to decrease rates of mortality and morbidity, both the National Cancer Institute (2014) and the American Cancer Society (2013) recommend monthly self skin examinations and annual full body examinations by a healthcare professional, as the earlier a skin cancer is detected the easier it is to treat and the less likely it is to be fatal (Geller & Swetter, 2012; National Cancer Institute, 2014; Oliveria et al., 1999; Oliveria et al., 2004). Indeed, at least one study has found that routine skin self examinations can decrease the mortality rate of melanoma by 63% (Berwick, Begg, Fine, Roush, & Barnhill, 1996). However, research shows that relatively few people—even among those who are survivors of aggressive melanoma—perform routine skin self examinations or have a doctor perform a full body skin examination annually (Heckman, Darlow, Munshi, & Perlis, 2013; Manne & Lessin, 2006). A such, there is a clear need for interventions designed to increase rates of skin self examination and professional full body skin examinations. Therefore, the following studies will attempt to influence beliefs about skin examinations.

Chapter 6

Study 1: Sourcefulness

Study 1 focused on investigating the impact of source interactivity and sourcefulness on the narrative engagement and role of the self variables of the MINE and those variables' effects on the various components of the health belief model. Creating a narrative that reflects the reader (i.e., a tailored narrative) is expected to increase engagement with the narrative and role of self-related variables (Kalyanaraman & Sundar, 2006; Sundar & Marathe, 2010). Indeed, many health communication interventions use tailored materials in order to increase engagement with the health message, although these messages are generally not narrative in nature (see Noar et al., 2007, and Rimer & Kreuter, 2006, for reviews). There has been some research that has examined the use of tailored narratives for health communication, finding that tailored materials do have a positive impact on changing health beliefs and behaviors (Jensen et al., 2014; Khaled et al., 2007). Although little of this research has investigated processes underlying these effects, Green and Jenkins (2014) posit that interactive narratives influence their readers primarily through engagement with the story and activation of role of self variables (e.g., self-referencing). Therefore, it is expected that conspicuous tailoring of a message (i.e., a message that the reader is aware is being tailored) will have the following effects:

H1: Participants in the tailored condition will show greater a) narrative involvement, b) character involvement, c) self-referencing, and d) self-relevance than those in the non-tailored condition.

As noted previously, tailoring can facilitate the experience of sourcefulness (Kalyanaraman & Sundar, 2006; Sundar & Marathe, 2010), the extent to which the system "makes salient the idea that the user…is the source" (Sundar, 2008, p. 70). Tailoring seems to work because although the user is not the one that makes changes to the system, the system still uses characteristics of the user as the source of its design or format, increasing the self-relevance of the system (Sundar, 2008; Sundar et al., 2015). Research has shown that sourcefulness acts to increase user enjoyment of the interactive context as well as increase user involvement with the information in that context (Marathe & Sundar, 2011; Sundar & Marathe, 2010; Sundar et al., 2012). Thus, it is expected that seeing oneself reflected in a tailored narrative will increase both engagement with the story and role of self variables:

H2: Greater experiences of sourcefulness will result in increases in a) narrative involvement, b) character involvement, c) self-referencing, and d) perceived self-relevance.

Finally, it is anticipated that these mediating variables will then influence the various components of the HBM, as a great deal of previous research on traditional narrative persuasion has demonstrated that narratives can have an impact on health beliefs and behaviors (e.g., Caputo & Rouner, 2011; Chang, 2008; de Graaf, 2014; Green, 2006; Jensen et al., 2014; Kreuter et al., 2007; Murphy et al., 2011; Moyer-Gusé et al.,

2011; Murphy et al., 2013). Sourcefulness is expected to have an indirect effect on the components of the HBM through these mediators.

H3: Higher narrative involvement will be associated with a) increases in perceived susceptibility, b) increases in perceived severity, c) increases in self-efficacy, d) decreases in perceived barriers, and e) increases in perceived benefits.

H4: Higher character involvement will be associated with a) increases in perceived susceptibility, b) increases in perceived severity, c) increases in self-efficacy, d) decreases in perceived barriers, and e) increases in perceived benefits.

H5: Higher self-referencing will be associated with a) increases in perceived susceptibility, b) increases in perceived severity, c) increases in self-efficacy, d) decreases in perceived barriers, and e) increases in perceived benefits.

H6: Higher self-relevance will be associated with a) increases in perceived susceptibility, b) increases in perceived severity, c) increases in self-efficacy, d) decreases in perceived barriers, and e) increases in perceived benefits.

H7: Sourcefulness will have an indirect effect on the components of the HBM such that greater experiences of sourcefulness will be associated with a) increases in perceived susceptibility, b) increases in perceived severity, c) increases in self-efficacy, d) decreases in perceived barriers, and e) increases in perceived benefits.

Method

Sample. A total of 130 participants were initially recruited from an online survey panel. However, there tend to be large differences between White/Caucasian individuals and non-White/Caucasian individuals in terms of beliefs and attitudes about skin cancer

in general (Agbai et al., 2014; Buster, You, Fouad, & Elmets, 2012; Hay, Coups, Ford, & DiBonaventura, 2009; Lingala et al., 2014; Pichon, Corral, Landrine, Mayer, & Adams-Simms, 2010; Robinson, Rigel, & Amonette, 1998) and skin cancer screening in particular (Agbai et al., 2014; Katz et al., 2008; Lakhani et al., 2011; Saraiya, et al., 2004; Robinson et al., 1998). Because the current study did not have a sufficient number of non-White/Caucasian participants to permit meaningful cross race comparisons, the decision was made to follow previous researchers (e.g., Felts, Burke, Vail-Smith, & Whetstone, 2010; Greene & Brinn, 2003; Keesling & Friedman, 1995; Rothman, Salovey, Antone, Keough, & Martin, 1993) in limiting the sample to Caucasian/White participants.[1]

The final sample consisted of 107 Caucasian/White participants ranging in age from 24-83 (M = 51.19, SD = 13.37). Participants were predominantly male (n = 67, 62.6%). In terms of conditions, 51 participants were assigned to the non-tailored condition and 56 participants were assigned to the tailored condition.

Materials. The narrative used in this study tells the story of a person who discovers an odd growth on their back during a party at their friend's and then goes through the steps of researching the growth, going to a dermatologist, and receiving a diagnosis of a benign growth. The decision to have the main character ultimately not have skin cancer was based upon research suggesting that stories using health scares (i.e.,

[1] Results using the full sample are substantially similar to those reported here. There are three differences. In the full sample 1) narrative involvement has a direct effect on perceived severity (B = .49, SE = .24, p = .047); 2) sourcefulness has an indirect effect on perceived severity through narrative involvement (magnitude = .16, LLCI = .01, ULI = .33; and 3) there is no direct effect of character involvement on self-efficacy.

culminating in negative test results) are at least as, if not more, effective at communicating risk as stories in which the main character actually experiences the target health issue (So & Nabi, 2013; So & Shen, 2015).

The source interactivity manipulation took the form of a tailoring manipulation. Participants in the tailored condition read a tailored linear narrative. Prior to reading the story, participants were asked to fill out a demographic questionnaire asking them about their race, age, sex, and complexion. Participants' answers were then used to tailor the narrative they were exposed to, matching the protagonist's age, sex, and complexion to theirs and appropriately adjusting which passages the participant would be exposed to (for an example please see Appendix B). In order to ensure that the source interactivity manipulation was very explicit, the instructions for the demographic questionnaire read: "We want the story you read to be relevant to your own life and experiences. Please answer the following questions so that our system can personalize a story for you."

Participants in the non-tailored condition simply read a linear, non-tailored story. In the non-tailored story, the protagonist is left nondescript, not being given an explicit sex, age, or complexion, and the phrasing was made as general as possible (see Appendix B). Additionally, participants in the non-tailored condition did not fill out the demographic questionnaire prior to completing the study.

Procedure. The study took place in two parts: a pre-test and the experimental survey. Participants were recruited from an online survey panel and informed that they would be compensated up to $1.75 for participation in the study. Upon recruitment, the participants were provided with a link to the pre-test, which had to be completed at least

5 days prior to the experimental survey. The pre-test contained an electronic consent form, questions about participants' demographic information, measures of need for control, need for cognition, transportability, and affinity for technology, and measures for the components of the HBM.

Upon opening the experimental survey, participants were randomly assigned to either the tailored or non-tailored condition by the survey software being used to display the story and collect study responses. The survey software also handled the tailoring of the stories. Participants were then asked to read the story and complete the post-test survey, a process that took approximately 40 minutes. Once participants had completed the study they were thanked and the online survey panel handled their monetary compensation.

Measures. Cronbach's alpha and means (both overall and by condition) can be found in Table 1.

Demographics/Tailoring items. Participants were asked to provide their age, sex (Female = 0, Male = 1), race, education level, and previous experience with skin cancer (No = 0, Yes = 1) during the pre-test. Participants in the tailored condition were also asked to provide their age, sex, race, and complexion at the beginning of the second part of the study. Exact item wording can be found in Appendix B.

Sourcefulness. Sourcefulness was assessed using three items adapted from Sundar and Limperos (2013). These items were assessed on a 7-point Likert scale ranging from *Strongly Disagree* to *Strongly Agree*. The items are as follows: 1) "I felt like this story was uniquely mine"; 2) "This story featured content that was a reflection of

myself"; and 3) "This story allowed me to customize it." All items can be found in Appendix D.

Narrative variables. As noted previously, Green and Jenkins's (2014) model conceptualizes story engagement as consisting of both narrative involvement and character involvement. Within the context of this study, narrative involvement was operationalized as narrative transportation (Green & Brock, 2000) and character involvement was operationalized as identification (Cohen, 2001). Given that sourcefulness is expected to influence role of self variables, both self-referencing and perceived message self-relevance were also assessed. A full list of these items can be found in Appendix E.

Narrative involvement. Narrative involvement was assessed using Green and Brock's (2000) narrative transportation scale (NTS). The NTS consists of 10 items measured on a 7-point Likert-type scale ranging from *Not at All* to *Very Much*. The NTS is designed to assess the dimensions of emotions, attention, feelings of suspense, a lack of awareness of surroundings, and mental imagery. Sample items include "This story affected me emotionally" and "I could picture myself in the scene of the events described in the story."

Character involvement. In order to measure involvement with story characters, Moyer-Gusé and Nabi (2010) developed a scale based off of Cohen's (2001) operationalization of identification. Identification occurs when a reader temporarily takes on the identity of a story character, adopting their feelings and perspective (Cohen, 2001). This state can be also be thought of as a heightened experience of empathy. The scale

consists of ten items measured on a 7-point Likert scale anchored by *Strongly Disagree* and *Strongly Agree.* Sample items include "While I read the story, I could feel the emotions the main character portrayed" and "At key moments, I felt I knew exactly what the main character was going through."

Self-referencing. Self-referencing was assessed using a four item scale adapted from Dunlop, Wakefield, and Kashima (2010). The items were measured using a 7-point scale ranging from *Not at all* to *A Great Deal*. The items themselves are as follows: 1) "How much did this story make you think about your own skin health?"; 2) "How much did you think about what it would be like if the events in the story happened to you?"; 3) "To what extent did you think the story related to you personally?"; and 4) "To what extent were you reminded of your own experiences while viewing the story?"

Message self-relevance. Although message self-relevance isn't typically assessed in traditional narrative persuasion contexts, it has been found to be an important factor in health communication (Anghelcev & Sar, 2011; Renner & Schwarzer, 2003; Roser, 1990), especially within tailoring contexts (Chua, Liberzon, Welsh, & Strecher, 2009; Dijkstra, 2008; Kruglanski et al., 2006). Given that self-relevance falls under the role of self variables (i.e., it addresses the degree to which a reader perceives that a message matters to them) and its importance in health communication it was also assessed. Four items were used to assess perceived message self-relevance. All items were measured on a 7-point Likert scale ranging from *Strongly Disagree* to *Strongly Agree*. The items are as follows: 1) "The story was very relevant to my situation"; 2) "The information in the

story was relevant to my own health"; 3) "I found the information in this story helpful"; 4) "I don't feel like this story applied to me at all."

Health beliefs. Unless otherwise noted, all items were measured on a 7-point Likert scale ranging from *Strongly Disagree* to *Strongly Agree.* A full list of the items and their sources can be found in Appendix F.

Perceived susceptibility. Perceived susceptibility was assessed using four items adapted from Robinson, Fisher, and Turrisi (2002) and de Graaf (2014). Two items were measured on a 7-point Likert scale ranging from *Strongly Disagree* to *Strongly Agree*. These two items were: 1) "It is very likely that I will get skin cancer" and 2) "I am concerned about the possibility of developing skin cancer." The third item asks participants how likely it is that they will get skin cancer at some point in their lives and is assessed on a 7-point scale ranging from *Almost Certainly Won't Happen* to *Very Likely to Happen*. The fourth item asks participants how likely they are to get skin cancer compared to someone else of their own age and skin tone and is assessed on a 7-point scale ranging from *Significantly Less Likely* to *Significantly More Likely*.

Perceived severity. Perceived severity was assessed using four items. Two items were adapted from de Graaf (2014) and Manne and Lessin (2006). They are 1) "Skin cancer can be a life threatening problem" and 2) "Many people die of skin cancer." The other two items were created for this study and are 3) "Getting skin cancer would have a major impact on my life" and 4) "Skin cancer is a very costly health problem."

Perceived barriers. Perceived barriers were assessed using a 7 item inventory adapted from Manne and Lessin (2006) and Robinson, Fisher, and Turrisi (2002). Sample

items include “Doing a skin self exam would be very embarrassing” and “It takes too much time to do regular skin self exams.”

Perceived benefits. Perceived benefits were assessed using an 11 item inventory adapted from Manne and Lessin (2006) and Robinson and colleagues (2002). Sample items include “Doing regular skin exams would help me avoid developing skin cancer” and “Getting checked for skin cancer increases the chances of finding it when it is easy to treat.”

Self-efficacy. Self-efficacy was assessed using 4 items adapted from Robinson and colleagues (2002). Sample items include “I am confident that I know how to examine myself for unusual moles or growths” and “I am able to tell when something is wrong with a mole.”

Covariates. The full scales for all of the following measures can be found in Appendix G. Again, unless otherwise noted, all items were scored on a 7-point Likert scale ranging from *Strongly Disagree* to *Strongly Agree*.

Need for control. Need for control was assessed using Burger and Cooper’s (1979) 20 item desirability of control scale. Sample items include “I enjoy making my own decisions” and “I try to avoid situations where someone else tells me what to do.”

Need for cognition. Need for cognition was assessed using a 19 item scale designed by Cacioppo, Petty, and Kao (1984). Sample items include “I prefer my life to be filled with puzzles I must solve” and “I really enjoy a task that involves coming up with new solutions to problems.”

Transportability. Transportability was assessed using Dal Cin et al.'s (2002) 19 item transportability measure. Sample items include "I sometimes feel as if I am part of a story" and "I find I can easily lose myself in stories."

Affinity for technology. Affinity for technology was assessed using a reduced version of Marathe, Sundar, Bijvank, Van Vugt, and Veldhuis's (2007) power usage scale. The scale consists of 9 items. Sample items include "I like to challenge myself by figuring out how new technology works" and "Using technology comes easy to me."

Results

Unless otherwise noted, all of the following analyses were conducted with the following included as possible covariates: age, sex, education level, need for cognition, need for control, transportability, affinity for technology, and previous experience with skin cancer (self and other). Please see Table 2 for bivariate correlations between all dependent variables and covariates.

Tailoring Analysis. The first hypothesis concerns differences between participants in the tailored and non-tailored conditions (H1a-d). To test this hypotheses a MANCOVA was used to test for differences between conditions in narrative involvement, character involvement, self-referencing, and perceived self-relevance. Results using Pillai's trace showed that tailoring condition had no impact on any of the dependent variables, V = .03, F(4, 101) = .64, p = .63, η2partial = .03. Hypothesis 1 was not supported.

As seen in Table 3, the only significant covariate was transportability, which was significant across narrative involvement ($F(1, 104) = 11.13$, $p = .001$, $\eta^2_{\text{partial}} = .10$),

character involvement ($F(1, 104) = 17.73$, $p < .001$, $\eta^2_{partial} = .15$), self-referencing ($F(1, 104) = 11.34$, $p = .001$, $\eta^2_{partial} = .10$), and perceived self-relevance ($F(1, 104) = 4.37$, $p = .04$, $\eta^2_{partial} = .04$).

Sourcefulness Analysis. Due to a programming error, perceptions of sourcefulness were assessed only for participants in the tailored condition. The subsample consisted of 56 participants ranging in age from 26-71 ($M = 50.79$, $SD = 12.49$). Participants were predominantly Male ($n = 36$, 64.3%).

The next set of hypotheses (H2a-d) concerns the relationships between sourcefulness and the following mediators: narrative involvement, character involvement, self-referencing, and self-relevance. For each of these analyses an OLS regression was run using the relevant mediator as the dependent variable and sourcefulness as the independent variable. Tests of multicollinearity were run for all OLS analyses; each indicated only low levels of multicollinearity (all *VIF*s < 5).

Sourcefulness and narrative involvement. The overall model was significant ($F(2, 53) = 38.34$, $p < .001$), accounting for approximately 58% of the variance in narrative involvement ($R^2 = .58$). Sourcefulness ($B = .38$, $SE = .04$, $p < .001$) was positively related to narrative involvement. Hypothesis 2a was supported.

In terms of covariates, only age ($B = .02$, $SE = .01$, $p = .004$) was significantly associated with narrative involvement. For the full model, please see Table 4.

Sourcefulness and character involvement. The overall model was significant ($F(2, 53) = 31.53$, $p < .001$), accounting for approximately 53% of the variance in

character involvement (R^2 = .53). Sourcefulness (B = .48, SE = .06, p < .001) was positively related to character involvement. Hypothesis 2b was supported.

In terms of covariates, only age was significantly associated with character involvement (B = .03, SE = .01, p = .004). For the full model, please see Table 5.

***Sourcefulness and self-referencing*.** The overall model was significant (F(2, 53) = 38.55, p < .001), accounting for approximately 58% of the variance in self-referencing (R^2 = .58). Sourcefulness (B = .63, SE = .07, p < .001) was positively related to self-referencing. Hypothesis 2c was supported.

Age was also positively related to self-referencing (B = .03, SE = .01, p = .02). For the full model, please see Table 6.

***Sourcefulness and self-relevance*.** The overall model was significant (F(1, 54) = 34.88, p < .001), accounting for approximately 38% of the variance in self-relevance (R^2 = .38). Sourcefulness (B = .43, SE = .07, p < .001) was positively related to character involvement. Hypothesis 2d was supported. No covariates were significant. For the full model, please see Table 7.

Model testing. The final set of hypotheses (H3-H7) concerns the relationships between sourcefulness, the mediating variables of the MINE (character involvement, narrative involvement, self-referencing, and self-relevance), and the components of the HBM. More specifically, they concern the direct effects of the MINE's mediating variables and the indirect effects of sourcefulness on the components of the HBM.

To examine these relationships, a series of multiple parallel mediation analyses were conducted using Model 4 of Hayes's (2013) PROCESS macro for SPSS. The

models were run with bootstrapping specified at 10,000 samples. Sourcefulness was entered as the independent variable, with character involvement, narrative involvement, self-referencing, and self-relevance acting as the mediating variables and each of the components of the HBM as the dependent variable (for a conceptual diagram, please see Figure 2). The following covariates were examined for all models: Time 1 scores on the relevant HBM component, age, sex, education level, need for cognition, need for control, transportability, affinity for technology, and previous experience with skin cancer (self and other). Only significant covariates were retained in the final models.

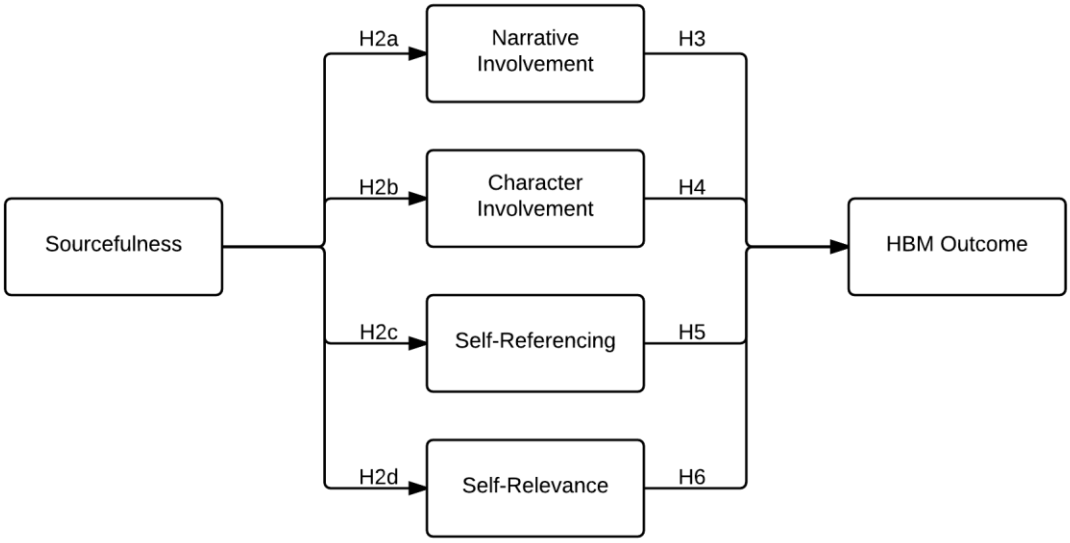

Figure 2. Multiple mediation model for the direct and indirect effects of sourcefulness on HBM outcomes.

Perceived susceptibility (PSus). As seen in Table 8, there was no main effect of any of the mediating variables on perceived susceptibility, nor was there any indirect effect of sourcefulness. Hypotheses 3a, 4a, 5a, 6a, and 7a were all rejected.

In terms of covariates, only perceived susceptibility at Time 1 (B = .70, SE = .09, p < .001) had a positive relationship with perceived susceptibility.

Perceived severity (PSev). As Table 9 shows, there was no main effect of any of the mediating variables on perceived severity. Hypotheses 3b, 4b, 5b, and 6b were all rejected.

There was a significant indirect effect of sourcefulness on perceived severity through the combined influence of all mediators (narrative involvement magnitude = .12, character involvement magnitude = .04, self-referencing magnitude = .05, and self-relevance magnitude = -.08). The total indirect effect had a magnitude of .17, and the 95% bootstrap confidence interval did not include zero (LLCI = .06, ULCI = .31), indicating that the effect was significantly different from 0. Hypothesis 7b was supported.

In terms of covariates, only perceived severity at Time 1 (B = .47, SE = .10, p < .001) had a significant relationship with perceived severity.

Self-efficacy. As seen in Table 10, character involvement was associated with self-efficacy (B = .38, SE = .18, p = .04). Hypothesis 4c was supported. No other mediators had a significant relationship with self-efficacy. Hypotheses 3c, 5c, and 6c were rejected.

There was also an indirect effect of sourcefulness on self-efficacy through character involvement. The indirect effect had a magnitude of .16, and the 95% bootstrap confidence interval did not include zero (LLCI = .01, ULCI = .38), indicating that the effect was significantly different from 0. Hypothesis 7c was supported.

Of the covariates, only self-efficacy at Time 1 was associated with self-efficacy (B = .44, SE = .11, p < .001).

Perceived barriers (PBar). As seen in Table 11, there was no main effect of any of the mediating variables on perceived barriers, nor any indirect effect of sourcefulness. Hypotheses 3d, 4d, 5d, 6d, and 7d were rejected.

In terms of covariates, only perceived barriers at Time 1 (B = .67, SE = .10, p < .001) had a significant relationship with perceived barriers.

Perceived benefits (PBen). As Table 12 shows, both character involvement (B = .35, SE = .15, p = .03) and self-relevance (B = .22, SE = .11, p = .049) were positively associated with perceived benefits. Hypotheses 4e and 6e were supported. Hypotheses 3d and 5d were rejected.

There was an indirect effect of sourcefulness on perceived benefits through self-relevance. The indirect effect had a magnitude of .10, and the 95% bootstrap confidence interval did not include zero (LLCI = .02, ULCI = .20), indicating that the effect was significantly different from 0. Hypothesis 7e was supported.

The only significant covariate was Time 1 scores for perceived benefits (B = .59, SD = .13, p < .001).

Discussion

This study investigated the relationships between source interactivity, sourcefulness, narrative and self variables, and the components of the HBM. It demonstrated that although conspicuous tailoring does not seem to have a significant effect on the mediating variables of the MINE, sourcefulness (the degree to which one feels that they are the source of the message) consistently predicted each of the mediating variables, at least within the tailored condition. More specifically, sourcefulness was positively related to narrative involvement, character involvement, self-referencing, and self-relevance.

Although a programming error prohibited the assessment of sourcefulness across both the tailored and non-tailored conditions, these results seem to suggest that variance in the psychological experience of sourcefulness may be a valuable predictor of user experiences independent of the source interactivity features present in the system. If the experience of sourcefulness was not at least somewhat independent of source interactivity features, sourcefulness would have had little influence on the mediating variables within the tailored condition, as all the users were exposed to the same features of source interactivity.

It is, however, puzzling that there were no significant differences between tailoring conditions for any of the engagement or role of self variables. There are several possibilities that may explain why this occurred. The first possibility is that there truly is no difference between a tailored and a non-tailored narrative. There has not been a great deal of research done on the tailoring of persuasive health narratives. One of the few

studies previously conducted on this topic found mixed results; a tailored health narrative was more effective at reducing perceived barriers than a non-tailored narrative, but had little to no effect other outcomes, such as screening behavior or perceived relevance (Jensen et al., 2014). However, the literature on tailored health messages in general makes it very clear that tailoring has a significant, if small, effect within a non-narrative context (see meta-analyses from Krebs, Prochaska, & Rossi, 2010; Noar, Benac, & Harris, 2007; Shen, Sheer, & Li, 2015). Thus it seems odd that the effect would not carry over into a narrative context, although it is possible that the current study simply did not have enough statistical power to detect a relatively small effect.

Interestingly, research on non-narrative tailored health communication has demonstrated that a non-tailored message that provides incidental goodness of fit is equally as effective as a tailored message (Kreuter, Oswald, Bull, & Clark, 2000; Kreuter & Wray, 2003). Goodness of fit refers to the degree to which a message addresses the needs of the participant; incidental goodness of fit occurs when the information contained in a message is a good fit for the participant purely by chance (i.e., not due to any tailoring efforts). It is possible that a similar effect is being seen in this study. The protagonist in the non-tailored story was purposely designed to be as neutral as possible; they were not assigned a sex, race, or age and were not visually described (e.g., hair color, skin tone). This "blank slate" character may have inspired just as much engagement with the story and activation of role of self concepts as the tailored character, with participants easily projecting themselves onto the non-tailored character. As such, the incidental goodness of fit (in terms of the main character) may have reduced effects.

It is also possible that the tailoring manipulation was simply not strong enough. Research on tailored health communication suggests that that tailoring is most effective when it addresses relevant theoretical constructs (e.g., cancer information overload) and the tailoring occurs on four or five dimensions (Kreuter et al., 2000; Noar et al., 2007; Rimer & Kreuter, 2006). Due to technical and financial limitations, the tailoring in this study was fairly narrow, focusing only on three basic demographic traits. It is possible that more extensive tailoring may produce stronger effects, something that future research should investigate.

This study also found that higher character involvement was associated with greater self-efficacy, and greater character involvement and increased self-relevance were both associated with increases in the perceived benefits of skin cancer screening. These results are consistent with previous research on narrative health communication (e.g., Greene & Brinn, 2003; Greene, Campo, & Banerjee, 2010; Jensen et al. 2014; Kreuter et al., 2007). Sourcefulness itself had an indirect effect on perceived severity through the collective effect of all mediators, on self-efficacy through character involvement, and on perceived benefits through self-relevance, further supporting the idea that sourcefulness is an important construct to examine when investigating the impact of source interactivity. There was no effect, however, on perceived susceptibility or perceived barriers. For further discussion of the relationship between components of the MINE model and the HBM, please see the General Discussion.

A major limitation of this study is the programming error that prohibited the assessment of sourcefulness across both the tailored and non-tailored conditions. This

error somewhat limits the ability of this study to make concrete statements about the relative influence of source interactivity features and sourcefulness on the engagement and role of self variables of the MINE model. Future studies should, of course, assess sourcefulness across all manipulation conditions.

Another potential limitation is that asking only the participants in the tailored condition to fill out demographic information immediately prior to reading the story may have acted as an unintended prime. Future research should consider including such demographic questionnaires across both tailored and non-tailored conditions, with only the instructions (e.g., "Please fill out this questionnaire so we can personalize a story for you") differing across conditions.

Finally, the use of online data collection procedures has a number of limitations. The most important limitation is that the researcher has very little control over the environment and manner in which participants complete the survey. When collecting data in a lab, the researcher is able to limit or remove external distractions and monitor participant behavior. As this is not possible with an online sample, the possibility exists that any given online sample will include more "noise" than a sample where data was collected in lab.

There are several possible routes for future research in this area. One obvious direction would be to investigate different approaches to story tailoring, such as investigating the impact of reflecting users' individual concerns within a story, as opposed to merely mirroring their demographic traits. If, for example, an individual mentions that they do not feel confident in identifying a cancerous or pre-cancerous mole

(i.e., low self-efficacy), a module could be inserted into the story that addresses that issue in a more in-depth manner than for a person who was high in self-efficacy.

This level of tailoring would be fairly time intensive, however, as well as being technically difficult to achieve. Thus, another possibility would be to increase the specificity of the "personal survey" presented at the beginning of the story. By including significantly more dimensions and questions for "personalization" (asking about the user's job, favorite color, pets owned, etc.) without actually altering the story based upon those responses it may be possible to create the illusion of in-depth tailoring (i.e., increase sourcefulness) without making the tailoring itself more complex.

Alternatively, altogether different routes of source interactivity could be investigated. For example, many video games contain an avatar customization component, where users are permitted to adjust features of the main character, such as appearance or background (e.g., selecting the avatar's job). Customization differs from tailoring in that in customization the user is the one directly making decisions about the message contents (e.g., avatar hair color, avatar occupation), whereas in tailoring information about the user is requested and then the system alters the message along the lines of what the message producer deems appropriate. In this case, the user has no real control over the message contents, only in their responses to the questions asked by the message producer. Previous research has suggested that customization can increase character involvement (Fischer, Kastenmüller, & Greitemeyer, 2009; Klimmt, Hefner, & Vorderer, 2009; Vasalou et al., 2007; Yee, 2006). Given that sourcefulness appears to be a precursor to character involvement, it would not be unreasonable to assume that

character customization would increase sourcefulness, which would then influence character involvement which would in turn produce persuasive effects.

It is important, however, to remember that giving a user greater control over a system can come with drawbacks as well. Although research suggests that users tend to customize avatars such that they resemble either themselves or an idealized version of themselves, this is, of course, not true for all individuals (Vasalou et al., 2007; Yee, 2006). If a user develops an avatar that is significantly different from themselves, it is possible that the persuasive message will not have the desired effect, as any negative outcomes may be interpreted as the result of characteristics that the avatar does not share with the user. For example, a darker haired individual with a darker complexion may create a red-headed avatar with fair skin. In the context of skin cancer, fair skin is a risk factor for melanoma, so in a story where the avatar receives a diagnosis of skin cancer it is possible that the user would distance themselves from the avatar with the reasoning that because they do not share a similar skin tone the experiences of the avatar do not apply to themselves. Indeed, research has shown that avatars that do not resemble the self are not as effective in health behavior or attitude change (Ahn, Fox, & Hahm, 2014; Fox & Bailenson, 2009; Fox, Bailenson, & Binney, 2009; Song, Kim, Kwon, & Jung, 2013).

Ultimately, this study is a first step toward a better understanding of the interrelationships between source interactivity, sourcefulness, engagement and role of self variables, and interactive narrative effects. Future research should continue to investigate the impacts of source interactivity and sourcefulness.

Source interactivity and sourcefulness, however, are not the only components of the MINE. The second study will examine a different route of interactive narrative influence: that through contingency and perceived contingency.

Chapter 7

Study 2: Message Interactivity and Perceived Contingency

Study 2 will focus on two elements of the MINE model. First it will demonstrate that perceived contingency is not dependent upon the presence or absence of an affordance, but upon the observer's beliefs about that affordance (Gaver, 1991; Rafaeli, 1998). As such, the contingency manipulations should have the following effect:

H1: The contingency manipulations will affect perceived contingency such that those in the Choices Matter condition (CM) will have significantly higher levels of perceived contingency than those in the No Choice (NC) or Choices Don't Matter (CDM) conditions.

The study will then move on to testing the theorized connections between perceived contingency and the mediators of narrative persuasion: narrative involvement and character involvement. Previous research has found that increases in message interactivity have consistently led to greater involvement with both the narrative and the characters within the narrative (Hand & Varan, 2008, 2009; Vorderer et al., 2001; Yin et al., 2012). As such, it is likely that perceptions of contingency within an interactive narrative will lead to greater narrative involvement and increased character involvement:

H2: Higher perceived contingency will be related to increased narrative involvement.

H3: Higher perceived contingency will be related to increased character involvement.

These mediators should then have an effect on the various components of the HBM, as has been demonstrated by a great deal of previous research on traditional narrative persuasion (e.g., Caputo & Rouner, 2011; Chang, 2008; de Graaf, 2014; Green, 2006; Jensen et al., 2014; Kreuter et al., 2007; Murphy et al., 2011; Moyer-Gusé et al., 2011; Murphy et al., 2013).

H4: Higher levels of narrative involvement will be associated with a) increases in perceived susceptibility, b) increases in perceived severity, c) increases in self-efficacy, d) decreases in perceived barriers, and e) increases in perceived benefits.

H5: Higher levels of character involvement will be associated with a) increases in perceived susceptibility, b) increases in perceived severity, c) increases in self-efficacy, d) decreases in perceived barriers, and e) increases in perceived benefits.

It is also expected that perceived contingency will have an indirect effect on the components of the HBM through narrative involvement or character involvement:

H6: Higher levels of perceived contingency will be indirectly associated with a) increases in perceived susceptibility, b) increases in perceived severity, c) increases in self-efficacy, d) decreases in perceived barriers, and e) increases in perceived benefits.

Finally, as discussed earlier, it is also possible that perceived contingency will have a direct effect on self-efficacy. According to social cognitive theory (Bandura,

2009), increases in self-efficacy and clear outcome expectancies are integral to the successful performance of learned behaviors. By permitting readers to feel they are making choices and experiencing the consequence of those choices within a relatively safe environment (i.e., a fictional story), perceived contingency may ultimately help readers feel more confident in their own decision making abilities. Thus, the following hypothesis will also be tested:

H7: Higher perceived contingency will directly increase self-efficacy.

Method

Sample. A total of 108 undergraduate students were initially recruited. As noted in Study 1, there tend to be large differences between White/Caucasian individuals and non-White/Caucasian individuals in terms of beliefs and attitudes about skin cancer in general (Agbai et al., 2014; Buster et al., 2012; Hay et al., 2009; Lingala et al., 2014; Pichon et al., 2010; Robinson et al., 1998) and skin cancer screening in particular (Agbai et al., 2014; Katz et al., 2008; Lakhani et al., 2011; Saraiya, et al., 2004; Robinson et al., 1998), and—again—there were an insufficient number of non-Caucasian/White participants to permit meaningful cross race comparisons. Therefore, the decision was made to follow previous researchers (e.g., Felts et al., 2010; Greene & Brinn, 2003; Keesling & Friedman, 1995; Rothman et al., 1993) in limiting the sample to Caucasian/White participants.[2]

[2] Results using the full sample are substantially similar to those reported here. There are two differences. In the full sample 1) perceived contingency is positively associated with narrative involvement (B = .14, SE = .05, p = .008); 2) there is a direct effect of character involvement on perceived severity (B = .37, SE = .14, p = 003. These differences are most likely due to the increased statistical power associated with a greater number of participants.

The sample consisted of 82 Caucasian/White undergraduate students. Participants who failed the manipulation check (to correctly identify whether or not the instructions told them they had control over the story) were removed from the sample, leaving a total of 70 participants (NC n = 18, CDM n = 26, CM n = 26). Participants were dropped evenly across all conditions. The participants ranged in age from 18 to 28 (M = 20.21, SD = 1.81) and were predominantly female (n = 39, 55.7 %).

Materials. The narratives used in this study were substantially similar to those used in Study 1. Perceived contingency was manipulated via a combination of the presence or absence of choice points within the narrative and reading instructions, creating three conditions: No Choice, Choice Doesn't Matter, and Choice Matters.

Participants were given one of two different story versions: a traditional (i.e. linear) narrative (NC) or the interactive narrative containing several choice points. The interactive narrative used in this study employs a false choice paradigm; regardless of which option a participant selected at each of the choice points, they received the same text as the participants in the traditional narrative condition. For an example comparing the same scene from the two different versions of the narratives, please see Appendix J.

In addition to the presence or absence of choice points, the instructions a participant was given were manipulated so as to create three different levels of perceived contingency. Participants in the NC condition received no special instructions and read the linear narrative (i.e., no contingency). Participants in the CDM condition received the interactive narrative and the following instructions: "As you read this narrative, please select whichever choices you wish. The choices you make will not have an impact on the

events of the story and are present only to make the narrative more interesting." These instructions were designed to create the perception that the story would react to the participants' choices, but that their choices would not have a lasting influence. This level of contingency is often referred to as the reactive level of contingency, as the system only reacts to the participant's most recent action (Sundar et al., 2010; Sundar et al., 2015).

Participants in the CM also received the interactive narrative, but their instructions read: "As you read this narrative, please make your choices carefully. The choices you make will have an impact on the events of the story." These instructions were designed so as to suggest that the participants' actions had a lasting influence in the story; this level of contingency is often referred to as "true" interactivity because of the system's dependency upon a user's input going several steps back (Sundar et al., 2010; Sundar et al., 2015). In both conditions, the instructions were displayed prominently at the side of the screen as the participants read the story (see Appendix J).

Procedure. The study took place in two sections: a pre-test and the experimental survey. In all cases, the experimental survey was completed at least 5 days after completion of the pre-test. Participants were recruited from the School of Communication research pool at a large Midwestern college, and received course credit for participation.

After recruitment, participants were provided with a link to the pre-test, which they were able to complete at their leisure on a computer of their own choosing. The pre-test contained an electronic consent form, questions about participants' demographic information, measures of need for control, need for cognition, transportability, and affinity for technology, and measures for the components of the HBM.

For the experimental portion of the study, participants came to a computer lab on campus. Upon opening the survey they were randomly assigned to one of the three conditions (NC, CDM, CM) by the survey software used to display the story and collect study responses. The experimenter briefly explained that the study was interested in understanding how people process stories and asked participants to carefully follow the instructions displayed on the screen. Participants then read the story and completed the survey, a process that took approximately 40 minutes. Once participants had completed the study they were thanked and dismissed.

Measures. All measures used in Study 1, with the exception of sourcefulness, self-relevance, and self-referencing, were also used in Study 2. What follows are the measures unique to Study 2. For alphas and means for all measures (both overall and by condition), please see Table 13.

Demographics. Participants were asked to provide their age, sex (Female = 0, Male = 1), and race. In order to control for previous experience with skin cancer, participants were also asked if they themselves or someone in their family had experienced skin cancer (No = 0, Yes = 1).

Manipulation check. In order to ensure that participants were aware of the contingency manipulation a one item manipulation check was used. This item was a yes or no question and asked participants "Did the reading instructions tell you that the choices you made had an impact on the events of the story?" All participants, including those in the NC condition, received this item.

Perceived contingency. Perceived contingency was operationalized using a scale developed using items from Sundar and Limperos (2013) and Sundar et al. (2014). The scale consists of four items measured on a 7-point Likert scale. The items are: 1) "I was able to interact with the story"; 2) "The story changed immediately in response to my choices"; 3) "I feel like the choices I made earlier in the story had an impact on later events"; 4) "I feel like the story I read was the result of the choices I made." A list of these items and the manipulation check can be found in Appendix I.

Results

For all analyses (unless otherwise mentioned), the following covariates were included in the initial models: age, sex, need for cognition, need for control, affinity for technology, transportability, and personal experience with skin cancer (both self and close other). Only significant covariates were retained for the final models and tables reported here. For a table of raw bivariate correlations, please see Table 14.

Contingency condition and perceived contingency. An ANCOVA was run comparing perceived contingency across the three conditions: No Choice (NC), Choice Doesn't Mater (CDM), and Choice Matters (CM). As predicted, there was a significant difference between conditions, $F(2, 67) = 19.47$, $p < .001$, $\eta^2_{part} = .37$. Post-hoc tests revealed that those in the CM condition showed significantly greater perceived contingency ($M = 5.03$, $SD = .22$) than those in both the NC ($M = 3.56$, $SD = .27$, $p < .001$) and CDM ($M = 3.16$, $SD = .22$, $p < .001$) conditions. There was no significant difference between those in the NC and CDM conditions. Hypothesis 1 was supported.

Perceived contingency and narrative involvement. OLS regression was used to assess the impact of perceived contingency on narrative involvement. Tests of multicollinearity indicated only a very low degree of multicollinearity (all *VIF*s < 5). The overall model was significant ($F(2, 67) = 5.70$, $p = .005$), accounting for approximately 12% of the variance in narrative involvement ($R^2 = .12$). Perceived contingency ($B = .14$, $SE = .07$, $p = .06$) was not significantly related to narrative involvement. Hypothesis 2 was rejected.

In terms of covariates, only transportability ($B = .27$, $SE = .13$, $p = .03$) was significantly associated with narrative involvement. For the full model, please see Table 15.

Perceived contingency and character involvement. OLS regression was used to assess the impact of perceived contingency on character involvement. Tests of multicollinearity indicated only a very low degree of multicollinearity (all *VIF*s < 5). The overall model was significant ($F(2, 67) = 7.06$, $p < .001$), accounting for approximately 22% of the variance in identification ($R^2 = .22$). Perceived contingency ($B = .19$, $SE = .07$, $p = .01$) was positively related to character involvement. Hypothesis 3 was supported.

Of the covariates, only transportability ($B = .39$, $SE = .13$, $p = .004$) had any impact on character involvement. For the full model, please see Table 16.

Model testing. In order to test H4 – H7, a series of multiple parallel mediation analyses were conducted using Model 4 of Hayes's (2013) PROCESS macro for SPSS. This process was run with bootstrapping specified at 10,000 samples. Perceived

contingency was used as the independent variable, character involvement and narrative involvement as the mediating variables, and each of the components of the HBM as the dependent variable (for a conceptual diagram, please see Figure 3). The following covariates were examined in all models: Time 1 scores on the relevant HBM component, age, sex, need for cognition, need for control, transportability, affinity for technology, and personal experience with skin cancer (self and other). Only significant covariates were retained in the final model.

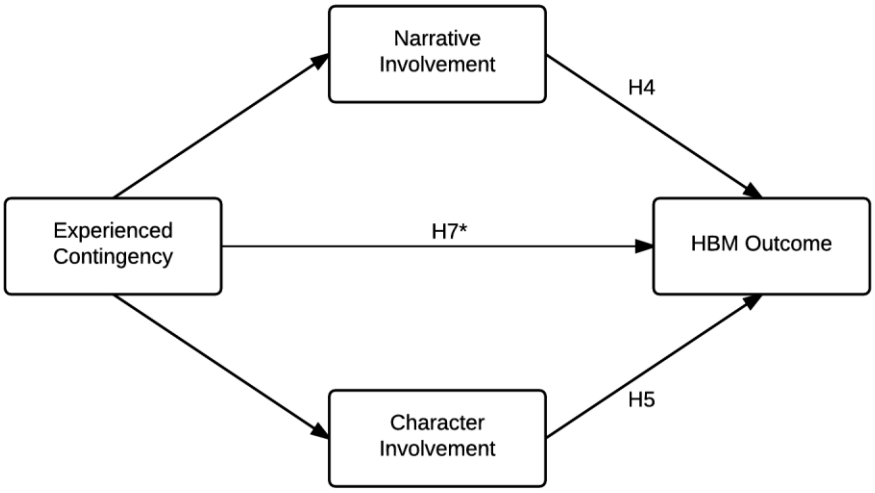

Figure 3. Multiple mediation model for the direct and indirect effects of contingency on HBM outcomes. *Applies only for self-efficacy.

Perceived susceptibility (PSus). The impact of narrative involvement and character involvement on perceived susceptibility was investigated. Neither mediator had an impact on perceived susceptibility (see Table 17).

There was, however, an indirect effect of perceived contingency on perceived susceptibility through narrative involvement. The indirect effect had a magnitude of .04, and the 95% bootstrap confidence interval did not include zero (LLCI = .003, ULCI = .12), indicating that the effect was significantly different from 0. Hypotheses H4a and H5a were rejected. Hypothesis H6a was supported.

The only covariates with a significant impact on perceived susceptibility were personal experience of skin cancer (B = 1.38, SE = .49, p = .007) and Time 1 score on perceived susceptibility (B = .51, SE = .06, p < .001).

Perceived severity (PSev). As seen in Table 18, neither narrative involvement nor character involvement had an effect on perceived severity. There was, however, a total indirect effect of contingency on perceived severity through the combined influence of narrative involvement (magnitude = .01) and character involvement (magnitude = .05). The total indirect effect had a magnitude of .06, and the 95% bootstrap confidence interval did not include zero (LLCI = .01, ULCI = .12), indicating that the effect was significantly different from 0. Hypothesis H6b was supported. Hypotheses H4b and H5b were rejected.

The only significant covariates were Time 1 score on perceived severity (B = .51, SE = .11, p < .001) and need for control (B = -.41, SE = .14, p = .008).

Self-efficacy. The impact of narrative involvement and character involvement on self-efficacy was investigated. Neither mediator had an impact on self-efficacy (see Table 19). Two covariates had a significant impact on self-efficacy: need for control (B = .48, SE = .21, p = .03) and Time 1 score on self-efficacy (B = .30, SE = .10, p = .004). Thus hypotheses H4c, H5c, H6c, and H7 were rejected.

Perceived barriers (PBar). As seen in Table 20, neither narrative involvement nor character involvement had an effect on perceived barriers. There was no indirect effect of perceived contingency. The only significant covariate was Time 1 score on perceived barriers (B = .45, SE = .10, p < .001). Thus, H4d, H5d, and H6d were rejected.

Perceived benefits (PBen). The impact of narrative involvement and character involvement on perceived benefits was investigated. As seen in Table 21, character involvement had a significant impact on perceived benefits (B = .27, SE = .10, p = .009). There was also an indirect effect of perceived contingency on perceived benefits through character involvement. The indirect effect had a magnitude of .05, and the 95% bootstrap confidence interval did not include zero (LLCI = .008, ULCI = .11), indicating that the effect was significantly different from 0. Hypotheses H5e and H6e were supported. Hypothesis H4e was rejected.

The only significant covariate was Time 1 score on perceived benefits (B = .53, SE = .07, p < .001).

Discussion

Study 2 examined the relationships between contingency, perceived contingency, the mediating variables of the MINE model, and the components of the HBM. There are

several main findings. First, it was demonstrated that perceptions of contingency seem to be independent of the presence of contingency creating features, such as choice. Even when choice was "present" in the story, participants did not perceive the system to be contingent if they were told that their choices did not matter. In fact, there was no significant difference between this group and the group that received the story without the choice points. Conversely, when participants were told their choices mattered, they experienced higher levels of perceived contingency, although the system itself was not, in fact, contingent (i.e., all three conditions read an identical story with noncontingent choices). This result seems to support previous researchers' assertions that the mere presence of interactive features is not equivalent to perceptions or experiences of interactivity, which strongly suggests that it is user perception of interactivity that drives interactivity effects (Gaver, 1991; Rafaeli, 1998).

The study also found that, as predicted, perceived contingency predicted character involvement. It did not, however, predict narrative involvement. This lack of a relationship seems strange, as previous research has demonstrated a connection between the presence of choice and engagement with a narrative (Hand & Varan, 2007, 2008; Vorderer et al., 2001; Yin et al., 2012), and perceived contingency is simply the perception that the story is responding to one's input. There are a few possible explanations for the failure of this relationship to emerge. One possibility is that there is an effect, but that the effect size is small enough that the current study did not have sufficient power to detect it.

It is also possible that the nature of the choice points present in the story were not sufficiently engaging. The previous research mentioned above consistently employed either the yo-yo paradigm (when choices affect only a small segment of the story following the decision before returning to the base story line; i.e., Hand & Varan, 2007, 2008; Vorderer et al., 2001) or a truly contingent system where choices did impact the story outcome (Yin et al., 2012). However, the false choice paradigm employed in this study was such that the choices being presented were all similar (e.g., leave a polite note vs. leave a rude note) so that either choice could plausibly lead to the next presented scene. It is possible that making more important decisions would create greater engagement.

Alternatively, it may be that there truly is no connection between perceived contingency and narrative involvement. As mentioned previously, narrative involvement has been demonstrated to take place across a wide variety of mediums (Bilandzic & Busselle, 2011; Green & Brock, 2000; Murphy et al., 2011; Lu, 2012; Zheng, 2014), most of which are not interactive in nature, suggesting that things like channels and formal features may be less important in creating narrative involvement than the quality of the individual story. Indeed, Green and Jenkins (2014) reported that in some experiments in their lab contingent narratives were not significantly more involving than linear narratives. Thus it may be that some as yet unknown factor related to story content or quality mediates or moderates the relationship between perceived contingency and narrative involvement, as it is currently unclear why contingency may sometimes predict increased narrative involvement and other times not. Further research is required to

determine whether this lack of relationship between perceived contingency and narrative involvement is found consistently across stories and contexts.

In terms of the influence of narrative engagement variables on the various components of the HBM, the only significant direct relationship found was that between character involvement and perceived benefits. Perceived contingency indirectly influenced perceived susceptibility through narrative involvement, perceived severity through the combined effects of narrative and character involvement, and perceived benefits through character involvement. For further discussion of the relationship between components of the MINE model and the HBM, please see the General Discussion.

Finally, there were a number of limitations of the current study. One is that the sample was limited to a college undergraduate population. As such, it is likely that a significant proportion of the sample has had high levels of exposure to interactive narratives in the form of video games. Roughly one third of the video game players in the United States are between the ages of 18 and 35, with the average gamer playing approximately 8 hours per week (Entertainment Software Association, 2015; Entertainment Software Rating Board, 2016). As such, this sample may react to interactive narratives in ways that are not consistent with the broader U.S. population. The sample was also relatively small, meaning that the study had a limited ability to detect small effects. The study also used a single message in a single context; further research will be required to determine whether or not this study's results will replicate with other stories or contexts.

This study was one of the first to specifically examine the relationship between contingency, perceived contingency, narrative engagement variables, and media effects. As such, it represents only a first step toward a better understanding of the effects of interactive narratives and the MINE model. Future research should continue to investigate the impacts of message interactivity and perceived contingency.

Chapter 8: General Discussion

These two studies provided the first tests of the model of interactive narrative effects (MINE). Sourcefulness predicted character involvement, narrative involvement, self-referencing, and self-relevance, whereas perceived contingency predicted character involvement. However, there was no relationship between perceived contingency and narrative involvement. It seems precipitous, however, to make a blanket claim that this relationship should not be included in the MINE. As noted previously, several studies of interactive narratives have found a connection between the presence of choice and increased narrative involvement (Hand & Varan, 2007, 2008; Vorderer et al., 2001; Yin et al., 2012). It is important to note, though, that all of these previous studies looked at the presence or absence of choice as a feature (e.g., contingency), not the psychological experience of perceived contingency. It is possible that some other psychological experience, such as perception of control, is the primary factor in the relationship between contingency and narrative involvement. In any case, further research should be conducted before modifying this particular aspect of the MINE.

Both studies also demonstrated that perceptions of interactivity are, at least to some extent, independent of the presence or absence of interactivity features. As such, it seems reasonable to focus on these psychological experiences (sourcefulness and

perceived contingency in these studies) as the primary predictors of story and role of self variables, and not the mere presence or absence of a feature. Interestingly, this somewhat conflicts with Sundar and colleagues' (2015) conception of interactivity effects. They argue that the psychological effect of an interactivity feature acts only as a mediator between the feature and system engagement (i.e., it is the presence/absence of a feature that drives the psychological response that drives engagement). However, this research suggests that psychological perceptions of interactivity can be present even when the affordance of interactivity is not actually present, which tends to indicate that user perception, not the ontological existence or non-existence of a given interactivity feature, is the primary force behind reactions to interactive media, including interactive narratives. There have been other authors that have argued that this is the case (e.g., Gaver, 1991; Rafaeli, 1998). Indeed, Gaver (1991) coined two terms, "hidden affordance" and "false affordance" to describe such situations.

A hidden affordance is when an interactivity feature is present, but users do not psychologically experience interactivity. There is some evidence to suggest that this is what happened in Study 1, where the tailored (interactive) and non-tailored (non-interactive) conditions didn't differ significantly in their effects on story engagement or role of self variables. A false affordance occurs when the perception of interactivity is present but the actual interactivity function is absent (i.e., in which the perception of interactivity does not match reality). In Study 2, participants perceived the CM condition to be more contingent than the NC or CDM conditions, although none of the three conditions were actually contingent. This research provides one of the first instances of

empirical support for these concepts and arguments, which has interesting implications for future research on interactive media. Therefore, it is hoped that this demonstration of the MINE's propositions will further encourage future researchers to include assessments of psychological experiences of interactivity when examining interactive media (including narratives) instead of relying solely upon experimental manipulations of interactivity features.

The HBM and MINE

In terms of the relationship between the mediating variables of the MINE and the components of the HBM, both perceived benefits and perceived severity were affected across both studies. That these effects were consistent across both studies and samples seems to suggest a message effect, as both studies used the same story base (i.e., major plot events were identical across all story versions). It is possible that this story was particularly effective in influencing readers' perceived benefits of skin cancer screening and the severity of skin cancer.

Interestingly, both studies also showed an indirect effect of sourcefulness and contingency respectively; however, in the sourcefulness study sourcefulness had an indirect effect through self-relevance, whereas in the contingency study the effect was mediated by character involvement. It is possible that self-relevance would have mediated the relationship between contingency and perceived benefits, but did not simply because message self-relevance was not assessed in the contingency study, as the MINE does not currently suggest a connection between perceived contingency and role of self variables. However, it is also possible that the differing forms of interactivity (source

interactivity and message interactivity) and their psychological correlates (sourcefulness and perceived contingency) had an impact on perceived benefits through different paths.

What is somewhat unclear is why the sourcefulness study saw impacts in self-efficacy, whereas the contingency study did not and why the contingency study saw effects in perceived susceptibility while the sourcefulness study did not. It is possible that this may have been an effect of the differing samples. The sourcefulness study had a much broader pool of participants, as it included individuals of widely varying age, educational background, and location, whereas the contingency study sample was comprised solely of undergraduates at a single large Midwestern university, providing a substantially younger, more homogenous sample. The marked age differences between the samples may have been a factor. Research has shown that younger people have poorer rates of skin cancer prevention behaviors—including screening—than older adults (Felts et al. 2010; Santmyire, Feldmen, & Fleischer, 2001; Saraiya et al., 2004). This relationship between age and skin cancer prevention behaviors may explain why an association with self-efficacy was seen in Study 1 (the sourcefulness study), but not in Study 2 (the contingency study); older adults may have already been familiar with skin cancer screening procedures and were thus more easily influenced when it came to perceptions of their own efficacy.

As for perceived susceptibility, research has shown that younger people tend to be less informed about skin cancer (Felts et al., 2010). As such, it may have been easier to influence perceived susceptibility in the younger sample simply because they did not previously perceive themselves to be susceptible, whereas the older sample may already

have been quite aware of their susceptibility, making it more difficult to substantially influence. Alternatively, this may be an effect of the story's main character being more similar to the college student sample than the older sample. The story used across both studies featured a main character that was currently attending college courses, although their actual age was either manipulated (in the sourcefulness study) or left open (in the contingency study). Modeling research suggests that the greater the perception of similarity between a person modeling a behavior and the observer, the more likely the observer will be to apply the lessons learned from the model to themselves (Bandura, 2009). This incidental similarity may have resulted in a situation in which the college student sample was more likely to apply the lessons about skin cancer susceptibility to themselves simply because the story's main character was in a similar life situation, whereas it was slightly more difficult for the older sample to make this connection.

It is difficult to determine why neither study saw an impact on perceived barriers. It is possible that the story itself simply did not satisfactorily address this particular dimensions of the HBM. The use of a single message makes it difficult to determine whether or not this lack of effects is due to the larger theoretical issues (e.g., for whatever reasons narrative persuasion is less effective in this domain) or due to issues unique to the stimulus (e.g., the story events did not lend themselves to decreasing perceived barriers). This question can only be ultimately resolved through replication with alternative messages or the use of multiple messages in future research. It is also important to note that some research on traditional narrative persuasion has found that the persuasiveness of narratives substantially increases over time, a phenomenon sometimes referred to as

the sleeper effect (Appel & Richter, 2007; Jensen, Bernat, Wilson, & Goonewardene, 2011). As such, it is possible that looking at the effects of the MINE on the HBM components as little as a week later may have yielded significantly different results. Future research should attempt to assess whether or not the sleeper effect also occurs within the context of interactive narratives.

Practical Implications

These studies also have significant ramifications for the design and implementation of interactive media. In terms of contingency, it is, without question, more cost effective to simply tell a person that their choices matter in a forced choice scenario than to put effort and time into creating highly contingent stories. Cost is something that is of special concern when considering the development of persuasive and educational messages, which may need to be developed by a small staff on a low budget. It also suggests that the development of interactive stories need not be highly complex to create perceptions of contingency; relatively small system responses may produce effects. To that end, future research should continue to examine the boundaries of this effect. For example, would there be a difference in perceived contingency between the forced choice paradigm employed in Study 2 and a story where choices affect a small segment of the story and then return to the story's base line (the so-called "yo-yo" structure)?

It is also important to consider the potential ramifications of users discovering that a system is not as interactive as they initially perceived. For example, video game company BioWare discovered this in 2012 when it released the final installment of its highly anticipated Mass Effect trilogy. The game series had always championed its

highly contingent nature, allowing players to make hundreds, if not thousands, of individual choices across the three games. However, when it came to the conclusion of the storyline, players were essentially given three choices. These three choices then led to a concluding cutscene that differed very little in its content across the three choices. Indeed, some players and outlets described it as differing in little more than the primary color of the ensuing cutscene (Clarkson, 2012). The backlash against BioWare was immense, as disappointed players lambasted the company for their "deception" (Clarkson, 2013; Tsukayama, 2012).

In fact, the situation became so bad that BioWare responded by developing and releasing free downloadable content that heavily revised the original ending so as to differentiate the three choices and reflect choices made by the players across the previous games (BioWare, 2016; Samuel, 2012). Although this example is only anecdotal in nature, it does suggest that user reaction to interactive narratives that violate perceptions of contingency is an important consideration. Such strongly negative responses may even retroactively influence the effects of the message. It is, without question, an area that deserves further investigation and research.

Indeed, the potential for reactance in general should be considered. An attempt was made in this project to account for reactance due to dislike of new technology in general by assessing users' affinity for technology, but there are many potential pitfalls to the use of interactive technology. Source interactivity, for example, could produce reactance if a depiction of the user in the story (whether visual or textual) is "off" in some way, or users may find it unsettling or aversive for a system to take their personal

information and use it to tailor an interaction. Reactance in a message interactivity context might take the form of rejection of all potential inputs and choices (e.g., "I wouldn't do either of those things!"). Even medium interactivity could result in reactance, although this form would likely have less to do with cognition than with aversive responses to the stimulus (e.g., getting motion sick from VR). Future research should take this potential into consideration and attempt to assess whether or not reactance has occurred at any point in the process.

These studies also suggest that there is almost certainly a place in health communication for interactive narratives. These studies are two of the first to empirically examine the relationships between perceptions of interactivity, narrative persuasion elements, and health belief outcomes. Across both studies, elements of the interactive narratives influenced four of the five components of the HBM: perceived susceptibility, perceived severity, perceived benefits, and self-efficacy. What is particularly interesting about this outcome is that the narrative itself, as mentioned previously, does not need to be particularly elaborate in order to observe effects. The message used in these studies was very simple, just text on a screen with some minor programming behind the scenes. This simplicity has positive implications for the widespread use of interactive narratives for health communication.

For example, it could be possible to very inexpensively develop a simple smartphone app containing a text-based interactive narrative similar to the one used in the study. Placing a QR code on posters in a dermatologist's waiting room would allow patients to download the app and read the story while waiting for their appointment. In

this way, the interactive narrative could be used as a way of helping prepare the patient for their upcoming appointment and possibly allow the doctor a natural way to address specific concerns that the story brought up. It should be noted, however, that this intervention could potentially cause reactance and result in greater anxiety for patients; thus, any research on the topic should first take place in a lab setting in order to ensure that the intervention does not unintentionally result in negative effects.

Alternatively, such methods could also be employed in a more naturalistic setting. Within the context of skin cancer this could be places such as in the changing rooms or resting areas of venues where heavy sun exposure is likely (e.g., amusement parks, beaches, college quads) in the hopes of increasing the use of sun protective behaviors (e.g., using sunscreen, wearing protective clothing). Such applications may also have potential in the use of warning labels, such as including such a QR code on cigarette or alcohol packaging, or even just as extra encouragement to actually use protective products, such as on the packaging of sunscreen or toothpaste. Future research should examine the possible uses of interactive narratives in such settings.

Limitations and Future Directions

One limitation shared across both studies was the use of a single story that focused on a very specific health topic. Although this is not an uncommon research methodology among communication scholars, it does present some problems. First of all, it is difficult to determine the extent to which the unique features of the story (plot, setting, etc.) or topic influenced the study results. For example, it is quite possible, and even likely, that another story would have been more or less effective in influencing the

various components of the HBM. For example, a story where the main character had more immediate social support (e.g., family members) while facing their skin cancer scare may have had a significantly different impact on perceived barriers than the current story, in which the main character dealt with the situation mostly independently. In terms of health topic, research has shown that attitudes toward screening behaviors varies widely across individual types of cancer (Hsia et al., 2000; Katz et al., 2008), let alone across multiple health risks (e.g., heart disease, STIs, oral health). Future research should determine whether or not the effects demonstrated in this study replicate across different messages and contexts.

It should also be noted that both studies had a fairly small number of participants. This limited the statistical power of the tests conducted, limiting their ability to detect small effect sizes, which may have influenced the study results. Future research should seek to replicate the results within a larger sample.

Another limitation of the current studies was in the operationalization of character involvement. As noted earlier, character involvement been conceptualized of and measured in a number of different ways and is, in a sense, an umbrella term that encompasses many related but distinct experiences. In this study, the decision was made to operationalize character involvement as identification, as this is one of the more commonly used constructs for assessing character involvement. However, identification cannot necessarily completely encompass the full range of experiences that may fall under the label of character involvement. Future studies should assess other forms of character involvement, such as perceived similarity, character liking, sympathy, and

empathy, in order to determine to what degree these factors play unique roles in the effects of interactive narratives. Although narrative involvement is substantially less varied than character involvement, there could still potentially be an impact of choosing to use Green and Brock's (2000) narrative transportation scale as opposed to, for example, Busselle and Bilandzic's (2009) narrative engagement scale, which covers slightly different aspects of narrative involvement. Again, future research should attempt to replicate these studies' results using alternate instrumentation.

There were also components of the MINE that were not assessed in this study. More specifically, neither study assessed perceptions of control, which may be associated with but not identical to perceptions of contingency and sourcefulness. Although users may see themselves reflected in a system (sourcefulness) or feel that the system is reacting to them (perceived contingency), they may not feel that they have a great deal of control over either of these factors. Indeed, in the sourcefulness study the participants were explicitly told that the system would personalize the story for them. In this case, it is possible that users would have a sense of sourcefulness, but not perceptions of control. This is an important component to examine in the future, as some research has suggested that perceptions of control have the potential to mediate the effect of sourcefulness (Marathe & Sundar, 2011), and it would be reasonable to think that it may also influence perceptions of contingency. Indeed, having either of these experiences without the perception of control may lead to a substantially different experience and reaction than the combination of perception of control and sourcefulness or contingency.

These studies also only assessed two of many potential role of self variables: self-referencing and self relevance. Another role of self variable that deserves special consideration is sense of responsibility. As Green and Jenkins (2014) noted, it is possible that interactive narratives may increase participants' sense of responsibility for story outcomes, especially in cases where the user is the one making story decisions. Given that sense of responsibility is a theoretically important concept in many theories of persuasion and behavior change, such as Cooper and Fazio's (1984) new look model. As such, it is likely of value to investigate sense of responsibility in future studies.

It should also be noted that the current construction of the MINE is based upon relationships suggested by previously research and theory. For example, the MINE currently does not propose a link between perceived contingency and role of self variables because previous research and theory do not support such a connection. However, that does not necessarily mean that there are not relationships between these variables, only that current theory and research do not suggest one. Future research should investigate these potential pathways in order to determine whether additional relationships between constructs should be included within the model or not.

Another way that the MINE can be further refined in the future is in the examination of the relationships between story engagement related and role of self related variables. Although the current model suggests that these variables work as parallel mediators, it is more than likely that they interact with each other and would be more accurately conceptualized of as serial mediators. Research on traditional narrative persuasion has demonstrated links among these constructs, including links between

narrative involvement and character involvement (e.g., Caputo & Rouner, 2011; Murphy et al., 2011; van Laer, de Ruyter, Visconti, & Wetzels, 2014), character involvement and role of self variables (e.g., de Graaf, 2014), and narrative involvement and role of self variables (e.g., Merchant & Rose, 2013). There is also research that has suggested that the relationship between narrative involvement and character involvement persists within the context of interactive narratives (Christy & Fox, 2016; Schneider, Lang, Shin, & Bradley, 2004).

Why, then, did the MINE conceptualize the role of self and narrative engagement variables as parallel rather than serial mediators? The primary reason is that although there is a great deal of research demonstrating the links between these constructs, there has been little to no research on the directionality of these relationships. For example, some authors provide compelling theoretical explanations for why character involvement should precede narrative involvement (e.g., van Laer et al., 2014) while others provide equally compelling reasons for why narrative involvement should precede character involvement (e.g., Brown, 2015). It is even possible that the causal relationships among these variables shifts depending upon the various features of the narrative, especially within an interactive narrative context.

Take, for instance, a narrative video game like Bioshock that presents the player with a vividly realized virtual world from the very beginning, but doesn't do much to reveal information about the main character until much later in the game. In this case, it is possible that the experience of presence precedes that of identification. Alternatively, games like Dragon Age: Inquisition have highly elaborate character customization

sequences prior to the start of the game, meaning that the player has some investment in their avatar before they even enter the virtual world of the game. In this case, it is possible that the experience of identification precedes that of presence. Future research on the MINE should investigate these relationships and the possibility for serial mediation across a number of differing stories and contexts in order to determine whether or not the ordering of mediators can be generalized enough to alter the model, or even to determine whether or not serial mediation is a significantly better fit than parallel mediation.

Another obvious direction for further exploration of the MINE is to examine the impact of multiple forms of interactivity (e.g., source interactivity and message interactivity) and how they interact. The vast majority of real world interactive narratives (such as video games) include many interactive features, and it is possible that these features interact to produce unique effects that would not be seen when examining each feature in isolation. For example, the game Dishonored allows the player to make a large number of choices throughout the game that substantially impact the progression of the game and the game's ending. However, it does not allow the player to customize the main character; in all cases the player is in control of a male character named Corvo. Contrast this with a game like Fallout 4 where the player can not only influence the story via their choices, but is also fully in charge of creating and naming a player avatar. These differences in source interactivity may potentially cause a difference in perception, experience, and—ultimately—effects.

In Dishonored, the player may interpret the choices being made as Corvo's choices, attempting to get into the character's head and making choices based upon what they believe the character would do in that situation. Indeed, research has suggested that individuals confronted with human-like representations of characters tend to react similarly as they would to meeting another person, inferring their personality from the cues given (Guadagno, Swinth, & Blascovich, 2011; Nowak & Rauh, 2006, 2008). In Fallout 4, the player may interpret the choices they make as their own choices; the character is not a separate entity but the player's representation of themselves in the virtual world. As noted previously, video game players often attempt to recreate an ideal version of themselves when creating an avatar (Vasalou et al., 2007; Yee, 2006). The choices they make may be based upon what they, themselves, would do in that situation.

Indeed, preliminary research from Green and Jenkins (2014) suggests that these two experiences may have a differential impact on narrative involvement. They asked readers of an interactive narrative to assess the degree to which they made story choices based on what they themselves would do, what the character would do, and what would make the best story. They found that only scores on what they themselves would do were associated with narrative involvement items, which in turn predicted attitude change, suggesting that making choices as a character is different form making choices as oneself. It could also be interesting to examine whether or not different interactive features are perceived differently in terms of their psychological correlates. For example, does permitting a video game player to complete game goals in any order they choose produce greater perceived contingency than forcing a player to complete game goals in a pre-

determined order? If so, is it possible to make the latter look like the former in order to produce higher levels of perceived contingency?

Conclusion

The model of interactive narrative effects was developed in order to expand upon and enhance previous theories of interactive narrative effects. This was accomplished by synthesizing Green and Jenkins's (2014) model of interactivity effects with elements of Sundar and colleagues' (2010) interactivity effects model, with the aim of expanding Green and Jenkins's definition of interactivity and disentangling the presence of an interactivity feature from the various psychological experiences and perceptions of interactivity. This goal seems to have been achieved, with the two studies largely providing support for the propositions of the MINE, suggesting that it may be a useful framework to help guide future investigation of interactive narratives and their effects.

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Appendix A: Tables

Table 1

Study 1 Scale Alphas, Means, and Standard Deviations

		Total	Condition	
			Tailored	Non-Tailored
	α	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)
Sourcefulness	.95	3.93 (1.85)	3.93 (1.85)	--
Narrative Involvement	.88	4.71 (.91)	4.68 (.92)	4.75 (.90)
Character Involvement	.94	5.25 (1.10)	5.20 (1.21)	5.29 (.98)
Self-Referencing	.88	4.87 (1.48)	4.77 (1.52)	4.99 (1.45)
Self-Relevance	.83	4.79 (1.28)	4.79 (1.12)	4.80 (1.29)
Perceived Susceptibility (T1)	.89	3.51 (1.31)	3.42 (1.33)	3.60 (1.29)
Perceived Susceptibility (T2)	.88	4.05 (1.19)	4.06 (1.15)	4.04 (1.24)
Perceived Severity (T1)	.81	5.43 (.99)	5.53 (.98)	5.31 (.99)
Perceived Severity (T2)	.76	5.43 (.93)	5.79 (.88)	5.67 (.99)
Self-efficacy (T1)	.89	4.80 (1.13)	4.88 (.99)	4.72 (1.27)
Self-efficacy (T2)	.87	5.22 (1.06)	5.28 (.98)	5.15 (1.15)
Perceived Barriers (T1)	.86	3.17 (1.14)	2.94 (1.05)	3.42 (1.20)
Perceived Barriers (T2)	.87	3.36 (1.02)	3.24 (.99)	3.50 (1.04)
Perceived Benefits (T1)	.93	5.64 (.95)	5.87 (.79)	5.38 (1.05)
Perceived Benefits (T2)	.95	5.64 (.95)	5.98 (.96)	5.87 (.92)
Need for Cognition	.91	4.40 (.88)	4.40 (.94)	4.40 (.81)
Need for Control	.84	4.98 (.70)	5.09 (.78)	4.87 (.58)
Affinity for Technology	.89	4.80 (1.10)	4.95 (1.06)	4.64 (1.13)
Transportability	.90	4.82 (.74)	4.90 (.78)	4.73 (.68)

T1 = Time 1; T2 = Time 2

Table 2

Bivariate Correlations for Study 1

		2	3	4	5	6	7	8	9	10
Sourcefulness (N = 56)	**1**	.72**	.68**	.63**	.74**	.18	.24	.05	.31*	.36**
Narrative Involvement	**2**	-	.83**	.69**	.76**	.30**	.46**	-.16	.55**	.37**
Character Involvement	**3**		-	.59**	.71**	.29**	.55**	-.15	.67**	.39**
Self-Relevance	**4**			-	.80**	.46**	.29**	.03	.49**	.18
Self-Referencing	**5**				-	.45**	.48**	.02	.56**	.29**
Perceived Susceptibility	**6**					-	.29**	.07	.23*	-.10
Perceived Severity	**7**						-	.01	.61**	.26**
Perceived Barriers	**8**							-	-.26**	-.50**
Perceived Benefits	**9**								-	.50**
Self-Efficacy	**10**									-
Age	**11**									
Sex (Female = 0, Male = 1)	**12**									
Education	**13**									
Need for Cognition	**14**									
Need for Control	**15**									
Transportability	**16**									
Affinity for Technology	**17**									
Experience with Skin Cancer (Self; No = 0, Yes = 1)	**18**									
Experience with Skin Cancer (Other; No = 0, Yes = 1)	**19**									

$^{*}p < .05$, $^{**}p < .01$

Continued

Table 2 Continued

		11	12	13	14	15	16	17	18	19
Sourcefulness (N = 56)	**1**	-.16	-.26*	-.10	.20	.11	.27*	.13	-.12	.26
Narrative Involvement	**2**	.3	-.17	-.08	.12	.16	.30**	-.02	-.05	.13
Character Involvement	**3**	.14	-.29**	-.10	.06	.19	.37**	.00	-.06	.16
Self-Relevance	**4**	.00	-.04	-.06	.20*	.22*	.20*	.06	.06	.11
Self-Referencing	**5**	.02	-.10	.03	.20*	.23*	.30	.14	.03	.13
Perceived Susceptibility	**6**	.12	-.02	-.10	.02	.02	-.02	-.06	.23*	.25**
Perceived Severity	**7**	-.07	-.14	.12	.06	.20*	.30**	.18	.10	.06
Perceived Barriers	**8**	-.36**	.07	-.12	.15	-.26**	-.16	-.03	-.12	-.06
Perceived Benefits	**9**	.17	-.19*	-.03	.11	.33**	.40**	.17	.01	.11
Self-Efficacy	**10**	.16	-.02	.10	.17	.31**	.44**	.26**	.06	.05
Age	**11**	-	.07	-.23*	-.03	.15	.10	-.22	.00	.00
Sex (Female = 0, Male = 1)	**12**		-	.01	.14	.09	-.15	.15	.10	-.05
Education	**13**			-	.43**	.07	.17	.25*	.08	-.07
Need for Cognition	**14**				-	.57**	.36**	.47**	.12	.17
Need for Control	**15**					-	.22*	.44**	.09	.04
Transportability	**16**						-	.33*	-.07	.18
Affinity for Technology	**17**							-	-.18	.11
Experience with Skin Cancer (Self; No = 0, Yes = 1)	**18**								-	.06
Experience with Skin Cancer (Other; No = 0, Yes = 1)	**19**									-

$*p < .05$, $**p < .01$

Table 3

Impact of Tailoring on Narrative Involvement, Character Involvement, Self-referencing, and Self-relevance

		F(1,104)	*p*	η^2_{part}
Condition	Narrative Involvement	.60	.44	.01
	Character Involvement	.91	.34	.01
	Self-referencing	1.44	.23	.01
	Self-relevance	.09	.77	.001
Transportability	Narrative Involvement	**11.13**	**.001**	**.10**
	Character Involvement	**17.73**	**< .001**	**.15**
	Self-referencing	**11.34**	**.001**	**.10**
	Self-relevance	**4.37**	**.04**	**.04**

Table 4

Study 1 OLS Regression Model for Sourcefulness and Narrative Involvement

Predictor	*B*	*SE*	*t*	*p*
Constant	2.147	.41	5.31	< .001
Sourcefulness	.38	.04	8.59	< .001
Age	.02	.01	3.03	.004

Table 5

Study 1 OLS Regression Model for Sourcefulness and Character Involvement

Predictor	*B*	*SE*	*t*	*p*
Constant	1.93	.57	3.40	.001
Sourcefulness	.48	.06	7.74	< .001
Age	.03	.01	3.01	.004

Table 6

Study 1 OLS Regression Model for Sourcefulness and Self-Referencing

Predictor	*B*	*SE*	*t*	*p*
Constant	.90	.67	1.34	.19
Sourcefulness	.63	.07	8.71	< .001
Age	.03	.01	2.51	.02

Table 7

Study 1 OLS Regression Model for Sourcefulness and Self-Relevance

Predictor	*B*	*SE*	*t*	*p*
Constant	3.08	.32	9.65	< .001
Sourcefulness	.43	.07	5.91	< .001

Table 8

Study 1 Results of PROCESS Model for Perceived Susceptibility

	Consequent														
	Narrative Involvement (M_1)			Character Involvement (M_2)			Self-Referencing (M_3)			Self-Relevance (M_4)			Perceived Susceptibility (Y)		
Antecedent	ß	*SE*	*p*	ß	*SE*	*p*	ß	*SE*	*p*	ß	*SE*	*p*	ß	*SE*	*p*
Sourcefulness (X)	**.38**	**.67**	**< .001**	**.46**	**.06**	**< .001**	**.61**	**.07**	**< .001**	**.43**	**.07**	**< .001**	.09	.10	.36
Narrative Involvement (M_1)	--	--	--	--	--	--	--	--	--	--	--	--	.13	.27	.64
Character Involvement (M_2)	--	--	--	--	--	--	--	--	--	--	--	--	.05	.19	.81
Self-Referencing (M_3)	--	--	--	--	--	--	--	--	--	--	--	--	-.13	.15	.42
Self-Relevance (M_4)	--	--	--	--	--	--	--	--	--	--	--	--	-.01	.14	.96
PSus Time 1	.01	.06	.86	.08	.08	.33	**.25**	**.09**	**.009**	**.23**	**.09**	**.02**	**.70**	**.09**	**< .001**
Age	**.02**	**.01**	**.005**	**.03**	**.01**	**.005**	**.03**	**.01**	**.009**	**.02**	**.01**	**.046**	.01	.01	.46
Need for Control	.10	.11	.35	.23	.15	.11	..25	.16	.12	**.33**	**.16**	**.047**	.10	.14	.50
Constant	**1.68**	**.67**	**.02**	.57	.90	.53	-1.20	1.01	.24	-.40	1.00	.69	.26	.96	.79
	R^2 = .60			R^2 = .57			R^2 = .66			R^2 = .53			R^2 = .63		
	$F(4, 51) = 19.01$ $p < .001$			$F(4, 51) = 17.22$ $p < .001$			$F(4, 51) = 28.84$ $p < .001$			$F(4, 51) = 17.46$ $p < .001$			$F(8, 47) = 10.13$ $p < .001$		

Table 9

Study 1 Results of PROCESS Model for Perceived Severity

	Consequent														
	Narrative Involvement (M_1)			Character Involvement (M_2)			Self-Referencing (M_3)			Self-Relevance (M_4)			Perceived Severity (Y)		
Antecedent	ß	*SE*	*p*	ß	*SE*	*p*	ß	*SE*	*p*	ß	*SE*	*p*	ß	*SE*	*p*
Sourcefulness (X)	**.37**	**.05**	**<.001**	**.44**	**.06**	**< .001**	**.63**	**.08**	**< .001**	**.47**	**.08**	**< .001**	-.13	.08	.12
Narrative Involvement (M_1)	--	--	--	--	--	--	--	--	--	--	--	--	.67	.23	.12
Character Involvement (M_2)	--	--	--	--	--	--	--	--	--	--	--	--	.13	.17	.44
Self-Referencing (M_3)	--	--	--	--	--	--	--	--	--	--	--	--	.10	.13	.45
Self-Relevance (M_4)	--	--	--	--	--	--	--	--	--	--	--	--	-.18	.12	.15
PSev Time 1	.09	.09	.32	**.27**	**.11**	**.02**	.02	.14	.89	-.06	.14	.65	**.46**	**.10**	**< .001**
Age	**.02**	**.01**	**.003**	**.03**	**.01**	**.002**	**.03**	**.01**	**.02**	.02	.01	.07	-.01	.01	.41
Constant	**1.71**	**.32**	**.008**	.51	.82	.54	.79	1.02	.44	**2.28**	**1.02**	**.03**	**2.08**	**.77**	**.01**
	R^2 = .60			R^2 = .59			R^2 = .59			R^2 = .43			R^2 = .52		
	$F(3, 52) = 25.89$ $p < .001$			$F(3, 52) = 24.55$ $p < .001$			$F(3, 52) = 25.23$ $p < .001$			$F(3, 52) = 25.23$ $p < .001$			$F(7, 48) = 7.34$ $p < .001$		

Table 10

Study 1Results of PROCESS model for Self-efficacy

	Consequent														
	Narrative Involvement (M_1)			Character Involvement (M_2)			Self-Referencing (M_3)			Self-Relevance (M_4)			Self-efficacy (Y)		
Antecedent	*ß*	*SE*	*p*	*ß*	*SE*	*p*	*ß*	*SE*	*p*	*ß*	*SE*	*p*	*ß*	*SE*	*p*
Sourcefulness (X)	**..4**	**.05**	**< .001**	**.43**	**.07**	**< .002**	**.60**	**.08**	**< .001**	**.40**	**.08**	**< .001**	-.09	.10	.34
Narrative Involvement (M_1)	--	--	--	--	--	--	--	--	--	--	--	--	-.16	.27	.54
Character Involvement (M_2)	--	--	--	--	--	--	--	--	--	--	--	--	**.38**	**.18**	**.04**
Self-Referencing (M_3)	--	--	--	--	--	--	--	--	--	--	--	--	.07	.15	.64
Self-Relevance (M_4)	--	--	--	--	--	--	--	--	--	--	--	--	..07	.14	.63
Self-efficacy Time 1	.16	.09	.07	.15	.12	.20	.09	.14	.51	.18	.14	.21	**.44**	**.11**	**< .001**
Age	**.02**	**.01**	**.01**	**.02**	**.01**	**.01**	**.02**	**.01**	**.03**	.02	.01	.14	-.01	.01	.48
Need for Control	.11	.10	.28	.25	.14	.09	.28	.17	.11	**.36**	**.17**	**.04**	.20	.14	.16
Constant	1.10	.70	.12	.26	.97	.79	-.70	1.16	.55	-.30	1.12	.79	.92	.93	.33
	R^2 = .62			R^2 = .58			R^2 = .62			R^2 = .49			R^2 = .50		
	F(4, 51) = 21.19 p < .001			F(4, 51) = 17.62 p < .001			F(4, 51) = 20.40 p < .001			F(4, 51) = 12.32 p < .001			F(8, 47) = 5.98 p < .001		

Table 11

Study 1 Results of PROCESS Model for Perceived Barriers

	Consequent														
	Narrative Involvement (M_1)			Character Involvement (M_2)			Self-Referencing (M_3)			Self-Relevance (M_4)			Perceived Barriers (Y)		
Antecedent	ß	*SE*	*p*	ß	*SE*	*p*	ß	*SE*	*p*	ß	*SE*	*p*	ß	*SE*	*p*
Sourcefulness (X)	**.38**	**.04**	**< .001**	**.47**	**.06**	**< .001**	**.63**	**.07**	**< .001**	**.45**	**.07**	**< .001**	.04	.09	.65
Narrative Involvement (M_1)	--	--	--	--	--	--	--	--	--	--	--	--	.11	.25	.66
Character Involvement (M_2)	--	--	--	--	--	--	--	--	--	--	--	--	-.28	.17	.10
Self-Referencing (M_3)	--	--	--	--	--	--	--	--	--	--	--	--	.11	.14	.41
Self-Relevance (M_4)	--	--	--	--	--	--	--	--	--	--	--	--	.05	.13	.70
PBar Time 1	-.10	.08	.21	-.06	.11	.62	-.09	.13	.49	-.18	.13	.18	**.67**	**.10**	**< .001**
Age	**.02**	**.01**	**.01**	**.03**	**.01**	**.007**	**.03**	**.01**	**.03**	.02	.01	.12	-.01	.01	.36
Constant	**2.59**	**.52**	**< .001**	**2.16**	**.74**	**.005**	1.28	.87	.15	**2.67**	**.86**	**.003**	**1.65**	**.78**	**.04**
	R^2 = .60			R^2 = .55			R^2 = .60			R^2 = .45			R^2 = .57		
	$F(3, 52) = 26.42$ $p < .001$			$F(3, 52) = .74$ $p < .001$			$F(3, 52) = 25.60$ $p < .001$			$F(3, 52) = 14.27$ $p < .001$			$F(7, 48) = 9.20$ $p < .001$		

Table 12

Results of PROCESS Model for Perceived Benefits

	Consequent														
	Narrative Involvement (M_1)			Character Involvement (M_2)			Self-Referencing (M_3)			Self-Relevance (M_4)			Perceived Benefits (Y)		
Antecedent	*ß*	*SE*	*p*	*ß*	*SE*	*p*	*ß*	*SE*	*p*	*ß*	*SE*	*p*	*ß*	*SE*	*p*
Sourcefulness (X)	**.34**	**.04**	**< .001**	**.40**	**.05**	**< .001**	**.59**	**.07**	**< .001**	**.43**	**.08**	**< .001**	-.03	.08	.69
Narrative Involvement (M_1)	--	--	--	--	--	--	--	--	--	--	--	--	-.10	.21	.64
Character Involvement (M_2)	--	--	--	--	--	--	--	--	--	--	--	--	**.35**	**.15**	**.03**
Self-Referencing (M_3)	--	--	--	--	--	--	--	--	--	--	--	--	-.12	.12	.30
Self-Relevance (M_4)	--	--	--	--	--	--	--	--	--	--	--	--	**.22**	**.11**	**.049**
PBen Time 1	**.36**	**.10**	**< .001**	**.61**	**.13**	**< .001**	**.38**	**.17**	**.03**	.21	.18	.23	**.59**	**.13**	**< .001**
Age	**.02**	**.01**	**.01**	**.02**	**.01**	**.01**	**.02**	**.01**	**.04**	.02	.01	.10	.01	.01	.06
Constant	.46	.60	.45	-.97	.78	.22	-.96	1.05	.38	.91	1.08	.40	.12	.71	.87
	R^2 = .67			R^2 = .68			R^2 = .63			R^2 = .45			R^2 = .67		
	$F(3, 52) = 35.94$ $p < .001$			$F(3, 52) = 37.15$ $p < .001$			$F(3, 52) = 29.22$ $p < .001$			$F(3, 52) = 14.05$ $p < .001$			$F(7, 48) = 13.76$ $p < .001$		

Table 13

Study 2 Scale Alphas, Means, and Standard Deviations

		Total	Condition		
			NC	CDM	CM
	α	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)
Perceived Contingency	.84	3.95 (1.41)	3.56 (1.29)	3.13 (1.00)	5.03 (1.15)
Narrative Involvement	.78	4.67 (.85)	4.42 (1.03)	4.55 (.88)	4.96 (.58)
Character Involvement	.92	5.21 (.92)	4.98 (1.29)	5.07 (.81)	5.51 (.62)
Perceived Susceptibility (T1)	.89	3.55 (1.34)	3.70 (1.52)	3.46 (1.13)	3.54 (1.43)
Perceived Susceptibility (T2)	.83	4.26 (1.07)	4.49 (1.25)	4.05 (.95)	4.31 (1.04)
Perceived Severity (T1)	.72	5.89 (.77)	6.13 (.63)	5.87 (.85)	5.75 (.77)
Perceived Severity (T2)	.69	5.65 (.85)	5.74 (.89)	5.53 (.91)	5.72 (.78)
Self-efficacy (T1)	.82	3.68 (1.25)	4.08 (1.30)	3.36 (1.19)	3.71 (1.23)
Self-efficacy (T2)	.83	4.64 (1.12)	4.79 (1.37)	4.52 (1.10)	4.66 (.98)
Perceived Barriers (T1)	.84	3.12 (1.02)	3.12 (1.03)	3.13 (.94)	3.11 (1.13)
Perceived Barriers (T2)	.80	2.65 (.89)	2.47 (.86)	2.73 (.84)	2.71 (.98)
Perceived Benefits (T1)	.92	5.55 (.91)	5.81 (.98)	5.29 (.96)	5.64 (.76)
Perceived Benefits (T2)	.89	5.96 (.70)	6.15 (.82)	5.81 (.72)	5.97 (.58)
Need for Cognition	.92	4.46 (.95)	4.34 (1.07)	4.43 (.87)	4.58 (.95)
Need for Control	.84	5.00 (.95)	5.05 (.65)	4.94 (.58)	4.94 (.59)
Affinity for Technology	.89	4.89 (1.12)	4.81 (1.29)	4.86 (1.02)	5.16 (.70)
Transportability	.90	5.00 (.78)	5.13 (.85)	4.75 (.77)	4.97 (1.13)

T1 = Time 1; T2 = Time 2

Table 14

Study 2 Bivariate Correlations for Contingency Study

		2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Perceived Contingency	**1**	.29*	.37**	.20	-.13	-.03	.22	.15	-.13	.03	.18	.19	.26*	.12	.05	.31*
Narrative Involvement	**2**	-	.76**	.37**	.17	-.07	.29*	-.01	-.25*	-.14	.04	.00	.31**	.06	-.17	.15
Character Involvement	**3**		-	.63**	.20	-.09	.41*	.06	-.12	-.06	.09	.13	.41**	.17	-.18	.15
Perceived Susceptibility	**4**			-	.30*	-.06	.50**	-.01	-.01	-.18	-.20	-.04	.16	-.10	-.30	.45**
Perceived Severity	**5**				-	.18	.16	-.27*	-.03	-.26*	-.25*	-.34**	-.07	-.13	-.06	.07
Perceived Barriers	**6**					-	-.30*	-.23	-.16	-.20	-.20	-.28*	-.02	-.28	-.07	-.01
Perceived Benefits	**7**						-	.56*	.04	-.07	.01	.20	.32**	.21	.08	.20
Self-Efficacy	**8**							-	.08	.05	.19	.40**	.35**	.29*	-.04	-.03
Age	**9**								-	.31**	.13	-.03	-.02	.19	.12	-.13
Sex (Female = 0, Male = 1)	**10**									-	.16	.12	-.12	.28*	.19	-.13
Need for Cognition	**11**										-	.43**	.42**	.37**	-.19	-.19
Need for Control	**12**											-	.32**	.29*	-.07	.00
Transportability	**13**												-	.14	-.12	.06
Affinity for Technology	**14**													-	-.09	-.14
Experience with Skin Cancer (Self; No = 0, Yes = 1)	**15**														-	.25*

**p < .05, **p < .01*

Table 15

Study 2 OLS Regression Model for Narrative Involvement

Predictor	*B*	*SE*	*t*	*p*
Constant	2.76	.63	4.37	< .001
Perceived contingency	.14	.07	1.95	.06
Transportability	**.27**	**.13**	**2.16**	**.03**

Table 16

Study 2 OLS Regression Model for Character Involvement

Predictor	*B*	*SE*	*t*	*p*
Constant	2.52	.65	3.90	< .001
Perceived contingency	**.19**	**.07**	**2.62**	**.01**
Transportability	**.39**	**.13**	**3.01**	**.004**

Table 17

Study 2 Results of PROCESS Model for Perceived Susceptibility

	Consequent								
	Narrative Involvement (M_1)			Character Involvement (M_2)			Perceived Susceptibility (Y)		
Antecedent	*ß*	*SE*	*p*	*ß*	*SE*	*p*	*ß*	*SE*	*p*
Perceived contingency (X)	.14	.07	.051	**.19**	**.07**	**.009**	-.02	.06	.80
Narrative Involvement (M_1)	--	--	--	--	--	--	.28	.14	.054
Character Involvement (M_2)	--	--	--	--	--	--	.19	.14	.17
PSus Time 1	.06	.07	.39	.07	.08	.33	**.51**	**.06**	**<.001**
Transportability	.24	.13	.07	**.35**	**.13**	**.01**	-.03	.11	.80
Skin Cancer Experience - Self	-.90	.59	.13	-1.03	.60	.09	**1.38**	**.49**	**.007**
Constant	**2.72**	**.65**	**< .001**	**2.48**	**.67**	**< .001**	.31	.60	.61
	R^2 = .18			R^2 = .29			R^2 = .67		
	$F(4, 65) = 3.52$ $p = .01$			$F(4, 65) = 6.26$ $p < .001$			$F(6, 63) = 21.23$ $p < .001$		

Table 18

Study 2 Results of PROCESS Model for Perceived Severity

	Consequent								
	Narrative Involvement (M_1)			Character Involvement (M_2)			Perceived Severity (Y)		
Antecedent	*ß*	*SE*	*p*	*ß*	*SE*	*p*	*ß*	*SE*	*p*
Perceived contingency (X)	**.15**	**.07**	**.04**	**.20**	**.07**	**.01**	-.05	.07	.47
Narrative Involvement (M_1)	--	--	--	--	--	--	-.01	.15	.95
Character Involvement (M_2)	--	--	--	--	--	--	.29	.15	.05
PSev Time 1	.03	.13	.84	.05	.13	.73	**.51**	**.11**	**< .001**
Need for Control	-.19	.17	.28	-.04	.18	.81	**-.41**	**.15**	**.008**
Transportability	**.31**	**.14**	**.02**	**.39**	**.14**	**.006**	-.15	.12	.24
Constant	**3.31**	**1.19**	**.007**	2.41	1.23	.05	**4.14**	**1.09**	**< .001**
	R^2 = .16			R^2 = .16			R^2 = .41		
	$F(4, 65) = 3.15$ $p = .02$			$F(4, 65) = 3.15$ $p = .02$			$F(6, 63) = 7.16$ $p < .001$		

Table 19

Study 2 Results of PROCESS Model for Self-efficacy

	Consequent								
	Narrative Involvement (M_1)			Character Involvement (M_2)			Self-Efficacy (Y)		
Antecedent	*ß*	*SE*	*p*	*ß*	*SE*	*p*	*ß*	*SE*	*p*
Perceived contingency (X)	.14	.07	.05	**.19**	**.07**	**.01**	.02	.09	.83
Narrative Involvement (M_1)	--	--	--	--	--	--	-.18	.22	.40
Character Involvement (M_2)	--	--	--	--	--	--	.01	.21	.98
Self-efficacy Time 1	.05	.08	.57	-.04	.09	.65	**.30**	**.10**	**.004**
Need for Control	-.21	.17	.24	-.04	.18	.83	**.48**	**.21**	**.03**
Transportability	**.30**	**.13**	**.03**	**.42**	**.14**	**.004**	.29	.18	.11
Constant	**3.47**	**.90**	**< .001**	**2.69**	**.92**	**.005**	.46	1.21	.71
	R^2 = .17			R^2 = .25			R^2 = .33		
	$F(4, 65) = 3.23$ $p = .02$			$F(4, 65) = 5.28$ $p = .001$			$F(6, 63) = 5.02$ $p < .001$		

Table 20

Study 2 Results of PROCESS Model for Perceived Barriers

	Consequent								
	Narrative Involvement (M_1)			Character Involvement (M_2)			Perceived Bariers (Y)		
Antecedent	*ß*	*SE*	*p*	*ß*	*SE*	*p*	*ß*	*SE*	*p*
Perceived contingency (X)	.14	.07	.05	**.19**	**.07**	**.01**	.1	.07	.85
Narrative Involvement (M_1)	--	--	--	--	--	--	-.17	.18	.35
Character Involvement (M_2)	--	--	--	--	--	--	..06	.17	.74
PBar Time 1	.07	.09	.48	-.05	.10	.58	**.45**	**.10**	**< .001**
Transportability	**.27**	**.13**	**.04**	**.39**	**.13**	**.003**	-.02	.14	.90
Constant	**2.56**	**.69**	**< .001**	**2.67**	**.71**	**< .001**	**1.76**	**.78**	**.03**
	R^2 = .15			R^2 = .25			R^2 = .26		
	$F(3, 66) = 3.94$ $p = .01$			$F(3, 66) = 7.16$ $p < .001$			$F(5, 64) = 4.46$ $p < .001$		

Table 21

Study 2 Results of PROCESS Model for Perceived Benefits

	Consequent								
	Narrative Involvement (M_1)			Character Involvement (M_2)			Perceived Benefits (Y)		
Antecedent	*ß*	*SE*	*p*	*ß*	*SE*	*p*	*ß*	*SE*	*p*
Perceived contingency (X)	.12	.07	.08	**.18**	**.07**	**.02**	.01	.04	.78
Narrative Involvement (M_1)	--	--	--	--	--	--	-.16	.10	.12
Character Involvement (M_2)	--	--	--	--	--	--	**.27**	**.10**	**.009**
PBen Time 1	.19	.11	.09	.15	.11	.19	**.53**	**.07**	**< .001**
Transportability	.20	.13	.13	**.33**	**.14**	**.02**	-.007	.08	.93
Constant	**2.10**	**.73**	**.005**	**1.99**	**.75**	**.01**	**2.37**	**.46**	**< .001**
	R^2 = .18			R^2 = .26			R^2 = .60		
	$F(3, 66) = 4.90$ $p = .004$			$F(3, 66) = 7.81$ $p < .001$			$F(5, 64) = 18.87$ $p < .001$		

Appendix B: Tailoring Example

The following text will be used in the untailored version, where the protagonist is undefined (i.e., not given any physically or demographically recognizable characteristics).

The doctor looked at me and said, "You really need to be more careful about checking your skin. Skin cancer is the single most common form of cancer, and so it is important to check your skin each month."

The following text is a tailored version of the narrative where the participant is a 30-50 year-old woman with a darker complexion. The colored text indicates places where age and skin condition will be used to tailor the content.

The doctor looked at me and said, "You really need to be more careful about checking your skin. The risk of skin cancer increases as you get older, and you can still develop skin cancer even though you have a darker complexion. In fact, darker skin tone can hide unusual marks or moles, so it is important to check your skin each month."

Appendix C: Demographic/Tailoring Items

1. Please provide your age

   18-29

   30-49

   50+

2. Please provide your sex

   Male (1)

   Female (0)

3. Please select your race

   Caucasian/White

   Black/African American

   Hispanic/Latino/Latina

   Asian

   Indian

   Native American/Inuit

   Other _____

4. Which of the following best describes the natural color of your skin?

   Ivory White

   Fair or pale

   Fair to beige, with golden undertone

   Olive or light brown

   Medium brown

   Dark brown

5. Have you ever had skin cancer?

   Yes (1)

   No (0)

6. Has anyone in your close family (mother, father, grandparents, etc.) ever had skin cancer?

   Yes (1)

   No (0)

Appendix D: Sourcefulness Items

All items are measured on a 7-point Likert scale ranging from *Strongly Disagree* to *Strongly Agree*

1) I felt like this story was uniquely mine.

2) This story featured content that was a reflection of me.

3) This story allowed me to customize it.

Appendix E: Narrative Scales and Role of Self Scales

Unless otherwise noted, all scales are measured on a 7-point Likert scale ranging from *Strongly Disagree* to *Strongly Agree*.

*Indicates an item is reverse scored.

Narrative Transportation (Green & Brock, 2002)

1. While I was reading the story, I could easily picture the events in it taking place
2. I could picture myself in the scene of the events described in the story
3. I was mentally involved in the story while reading it
4. After finishing the story, I found it easy to put out of my mind*
5. I wanted to learn how the story in the story ended
6. The story affected me emotionally
7. I found myself thinking of ways the story could have turned out differently
8. I found my mind wandering while reading the story*
9. The events found in the story are relevant to my everyday life
10. The events in the story have changed my life

Identification (Moyer-Guse & Nabi, 2010)

1. While reading the story, I felt as if I were part of the action
2. While reading the story, I forgot myself and was fully absorbed
3. I was able to understand the events in the program in a manner similar to the way the main characters understood them
4. I think I have a good understanding of the main characters
5. I tend to understand the reasons why the main characters did what they did
6. While reading I could feel the emotions the main characters portrayed
7. While reading, I felt I could really get inside the main characters' heads
8. At key moments in the story, I felt I knew exactly what the main characters were going through
9. While reading the story, I wanted the main characters to succeed in their goals
10. When main characters succeeded, I felt joy, but when they failed, I was sad

Self-Referencing (Dunlop, Wakefield, & Kashima, 2010)

All items were measured using a 7-point scale ranging from *Not at all* to *A Great Deal*.

1. How much did this story make you think about your own skin health?
2. How much did you think about what it would be like if the events in the story happened to you?
3. To what extent did you think the story related to you personally?
4. To what extent were you reminded of your own experiences while viewing the story?
5.

Message Self-Relevance

1. The story was very relevant to my situation;
2. The information in the story was relevant to my own health.
3. I found the information in this story helpful.
4. I don't feel like this story applied to me at all.

Appendix F: Health Belief Model Measures

The measures used to assess the components of the health belief model came from a variety of sources. The superscript after each item indicates which publication(s) that item came from. Unless otherwise noted, all items are scored on a 7-point Likert scale ranging from Strongly Disagree to Strongly Agree.

Perceived Susceptibility

1. It is very likely that I will get skin cancer. [4]
2. I am concerned about the possibility of developing skin cancer. [4]
3. How likely is it that you will get skin cancer at some point in your life? [1]

Almost Certainly Won't Happen	Probably Won't Happen	May or May not Happen	Likely to Happen	Very Likely to Happen

4. How likely are you to get skin cancer compared to someone else of your own age and skin tone?[1 4]

Much less likely	Less likely	Neither more nor less likely	More likely	Much more likely

Perceived Severity

1. Skin cancer can be a life threatening problem. [2]
2. Many people die of skin cancer. [5]
3. Getting skin cancer would have a major impact on my life
4. Skin cancer is a very costly health problem

Perceived Barriers

1. I am too embarrassed to ask a doctor to do a skin exam for me. [4]
2. I don't have time to do a skin self examination. [4]
3. I do not like to look at my body. [4]
4. If I find something, it will cost a lot to get treated. [4]
5. Doing a skin self exam would be very embarrassing. [5]
6. Doing a skin self exam gets in the way of other things I have to do for myself and others.[5]
7. It takes too much time to do regular skin self exams. [5]

Perceived Benefits

1. By doing skin exams I can find moles or growth on my skin that are cancerous or may become cancerous.[5]
2. Doing skin exams is a part of overall good health care. [5]
3. Regular skin exams would help me live a long life. [5]
4. People who are close to me would benefit if I do regular skin exams. [5]
5. Doing regular skin exams will help me feel in control of my health. [5]
6. Doing regular skin exams would help me avoid developing skin cancer. [5]

7. Doing skin exams would provide me with peace of mind about my health. [5]
8. Finding skin cancer early will improve my chances of surviving. [4]
9. Catching skin cancer when it is in its early stages can reduce the costs associated with treatment.
10. Doing skin exams helps catch skin cancer early.
11. Getting checked for skin cancer increases the chances of finding it when it is easy to treat. [3]

Self-Efficacy

1. I am able to tell when something is wrong with a mole. [4]
2. I can do a skin self examination. [4]
3. I could find skin cancer early by doing a skin self examination. [4]
4. I am confident that I know how to examine myself for unusual moles or growths. [4]

Sources

[1] Bränström, R., Kristjansson, S., & Ullén, H. (2005). Risk perception, optimistic bias, and readiness to change sun related behavior. *European Journal of Public Health*, *16*, 492-497. doi: 10.1 093/eurpub/cki193

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States probability sample. *Journal of the American Academy of Dermatology*, *61*, 783-792. doi: 10.1016/j.jaad.2009.04.023 (SCS2)

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Appendix G: Covariates

Unless otherwise noted, all scales are measured on a 7-point Likert scale ranging from *Strongly Disagree* to *Strongly Agree*.

*Indicates an item is reverse scored.

Need for Control (Burger and Cooper, 1979)

1. I prefer a job where I have a lot of control over what I do and when I do it.
2. I enjoy political participation because I want to have as much of a say in running government as possible.
3. I try to avoid situations where someone else tells me what to do.
4. I would prefer to be a leader than a follower.
5. I enjoy being able to influence the actions of others.
6. I am careful to check everything on a car before I leave for a long trip.
7. Others usually know what is best for me.*
8. I enjoy making my own decisions.
9. I enjoy having control over my own destiny.
10. I would rather someone else take over the leadership role when I'm involved in a group project.

11. I consider myself to be generally more capable of handling situations than others are.
12. I'd rather run my own business and make my own mistakes than listen to someone else's orders.
13. I like to get a good idea of what a job is all about before I begin.
14. When I see a problem, I prefer to do something about it rather than sit by and let it continue.
15. When it comes to orders, I would rather give them than receive them.
16. I wish I could push many of life's daily decision off on someone else.*
17. When driving, I try to avoid putting myself in a situation where I could be hurt by another person's mistake.
18. I prefer to avoid situations where someone else has to tell me what it is I should be doing.
19. There are many situations in which I would prefer only one choice rather than having to make a decision.*
20. I like to wait and see if someone else is going to solve a problem so that I don't have to be bothered with it.*

Need for Cognition (Cacioppo, Petty, & Kao, 1984)

1. I prefer complex to simple problems
2. I like to have the responsibility of handling a situation that requires a lot of thinking
3. Thinking is not my idea of fun*

4. I would rather do something that requires little thought than something that is sure to challenge my thinking abilities*
5. I try to anticipate and avoid situations where there is a likely chance I will have to think in depth about something*
6. I find satisfaction in deliberating hard for long hours
7. I only think as hard as I have to*
8. I prefer to think about small daily projects to long term ones*
9. I like tasks that require little thought once I've learned them*
10. The idea of relying on thought to make my way to the top appeals to me
11. I really enjoy a task that involves coming up with new solutions to problems
12. Learning new ways to think doesn't excite me very much*
13. I prefer my life to be filled with puzzles I must solve
14. The notion of thinking abstractly is appealing to me
15. I would prefer a task that is intellectual, difficult, and important to one that is somewhat important but does not require much thought
16. I feel relief rather than satisfaction after completing a task that requires a lot of mental effort*
17. It's enough for me that something gets the job done; I don't care how or why it works*
18. I usually end up deliberating about issues even when they do not affect me personally

Transportability (Dal Cin, Zanna, & Fong, 2002)

The next questions are asking you about how you respond to stories *in general*, not how you responded to the story you read today.

1. I can easily envision the events in a story.
2. I find I can easily lose myself in a story
3. I find it difficult to tune out activity around me*
4. I can easily envision myself in the events described in a story
5. I get me mentally involved in a story
6. I can easily put stories out of my mind after I've finished reading them*
7. I sometimes feel as if I am part of a story
8. I am often impatient to find out how a story ends
9. I find that I can easily take the perspective of character(s) in a story
10. I am often emotionally affected by what I've read
11. I have vivid images of characters
12. I find myself accepting events that I might have otherwise considered unrealistic
13. I find myself thinking what characters may be thinking
14. I find myself thinking of other ways a story could have ended
15. My mind often wanders*
16. I find myself feeling what characters may feel
17. I find that events in a story are relevant to my everyday life.
18. I often find that reading stories has an impact on the way I see things.
19. I easily identify with characters in a story
20. I have vivid images of the events in a story

Affinity for Technology (Marathe, Sundar, Bijvank, Van Vugt, & Veldhuis, 2007)

1. I love to use gadgets like computers, smart phones, tablets, etc.
2. I think most technology is hard to use.*
3. I make good use of most of the features available in any technological device.
4. Using technology comes easily to me.
5. I like to challenge myself by figuring out how new technology works.
6. A little bit of intuition is all that I need to figure out how to use any new technology.
7. I need very detailed instructions when using a gadget for the first time.*
8. It is easy for me to navigate websites and find exactly what I want.
9. I like to learn about new software or new technological devices .

Appendix H: Tables Including All Covariates

Table 22

Impact of Tailoring on Narrative Involvement, Character Involvement, Self-referencing, and Self-relevance

	Pillai's Trace	*F(4,93)*	*p*	η^2_{part}
Condition	.04	1.02	.40	.04
Age	.02	.56	.69	.02
Sex (Female = 0, Male = 1)	.07	1.69	.16	.07
Education	.04	.93	.45	.04
Past Experience with Skin Cancer (Self; No = 0, Yes = 1)	.03	.60	.66	.03
Past Experience with Skin Cancer (Other; No = 0, Yes = 1)	.02	.48	.75	.02
Transportability	**.13**	**3.39**	**.01**	**.13**
Need for Cognition	.05	1.32	.27	.05
Need for Control	.06	1.41	.24	.06
Affinity for Technology	.04	1.02	.40	.04

Table 23

Study 1 OLS Regression Model for Sourcefulness and Narrative Involvement

Predictor	*B*	*SE*	*t*	*p*
Constant	**1.80**	**.82**	**2.19**	**.03**
Sourcefulness	**.35**	**.05**	**6.78**	**< .001**
Transportability	-.04	.14	1.03	.31
Age	**.02**	**.01**	**2.30**	**.03**
Sex	-.21	.19	-1.15	.26
Education	.17	.10	1.67	.10
Affinity for Technology	-.11	.10	-1.07	.29
Need for Cognition	.02	.14	.13	.90
Need for Control	.15	.15	1.03	.31
Skin Cancer Experience - Self	-.35	.35	-1.01	.32
Skin Cancer Experience-Other	.28	.20	1.41	.17

Table 24

Study 1 OLS Regression Model for Sourcefulness and Character Involvement

Predictor	*B*	*SE*	*t*	*p*
Constant	**.25**	**1.10**	**.22**	**.83**
Sourcefulness	**.43**	**.07**	**6.19**	**< .001**
Transportability	.23	.18	1.23	.23
Age	.02	.01	1.99	.05
Sex	-.23	.25	-.92	.36
Education	.13	.13	.96	.34
Affinity for Technology	-.08	.13	-.64	.53
Need for Cognition	-.35	.18	-1.91	.06
Need for Control	**.53**	**.20**	**2.70**	**.01**
Skin Cancer Experience - Self	-.02	.47	-.04	.97
Skin Cancer Experience- Other	.29	.27	1.09	.28

Table 25

Study 1 OLS Regression Model for Sourcefulness and Self-Referencing

Predictor	*B*	*SE*	*t*	*p*
Constant	-1.51	1.38	-1.09	.28
Sourcefulness	**.64**	**.09**	**7.25**	**< .001**
Transportability	.07	.23	.32	.75
Age	**.03**	**.01**	**2.24**	**.03**
Sex	-.02	.31	-.06	.96
Education	.18	.17	1.04	.30
Affinity for Technology	.09	.17	.55	.59
Need for Cognition	-.17	.23	-.74	.46
Need for Control	.12	.34	.35	.73
Skin Cancer Experience - Self	.64	.58	1.09	.28
Skin Cancer Experience- Other	.12	.34	.35	.73

Table 26

Study 1 OLS Regression Model for Sourcefulness and Self-Relevance

Predictor	*B*	*SE*	*t*	*p*
Constant	-.12	1.39	-.09	.93
Sourcefulness	**.44**	**.09**	**5.04**	**< .001**
Transportability	.08	.23	.63	.72
Age	.02	.01	1.47	.15
Sex	.09	.31	.29	.77
Education	-.04	.17	-.21	.84
Affinity for Technology	.08	.17	.47	.64
Need for Cognition	-.10	.23	-.04	.97
Need for Control	.30	.25	1.20	.24
Skin Cancer Experience - Self	.35	.59	.59	.56
Skin Cancer Experience- Other	-.11	.34	-.33	.75

Table 27

Study 1 Results of PROCESS Model for Perceived Susceptibility

	Consequent														
	Narrative Involvement (M_1)			Character Involvement (M_2)			Self-Referencing (M_3)			Self-Relevance (M_4)			Perceived Susceptibility (Y)		
Antecedent	ß	*SE*	*p*	ß	*SE*	*p*	ß	*SE*	*p*	ß	*SE*	*p*	ß	*SE*	*p*
Sourcefulness (X)	**.35**	**.05**	**<.001**	**.43**	**.07**	**< .001**	**.63**	**.08**	**< .001**	**.44**	**.08**	**< .001**	.12	.11	.26
Narrative Involvement (M_1)	--	--	--	--	--	--	--	--	--	--	--	--	.28	.31	.38
Character Involvement (M_2)	--	--	--	--	--	--	--	--	--	--	--	--	.01	.22	.97
Self-Referencing (M_3)	--	--	--	--	--	--	--	--	--	--	--	--	-.01	.15	.94
Self-Relevance (M_4)	--	--	--	--	--	--	--	--	--	--	--	--	-.01	.15	.95
PSus Time 1	.04	.08	.60	.11	.10	.27	**.34**	**.12**	**.005**	**.33**	**.12**	**.008**	**.70**	**.11**	**< .001**
Age	**.02**	**.01**	**.02**	**.02**	**.01**	**.03**	**.04**	**.01**	**.004**	**.03**	**.01**	**.04**	.02	.01	.16
Sex	-.23	.19	.24	-.27	.25	.29	-.14	.29	.63	-.03	.29	.93	-.17	.24	.48
Education	.17	.10	.09	.15	.14	.27	.24	.16	.13	.03	.16	.87	.02	.13	.88
Need for Cognition	.03	.14	.85	-.33	.18	.08	-.10	.21	.65	.06	.22	.78	-.14	.19	.48
Need for Control	.14	.15	.36	**.50**	**.20**	**.02**	.21	.23	.36	.20	.23	.40	.06	.20	.76
Transportability	-.05	.14	.74	.22	.18	.24	.05	.21	.82	.06	.22	.78	-.17	.18	.37

Continued

Table 27 Continued

	Consequent														
	Narrative Involvement (M_1)			Character Involvement (M_2)			Self-Referencing (M_3)			Self-Relevance (M_4)			Perceived Susceptibility (Y)		
Antecedent	*ß*	*SE*	*p*	*ß*	*SE*	*p*	*ß*	*SE*	*p*	*ß*	*SE*	*p*	*ß*	*SE*	*p*
Affinity for Technology	-.10	.10	.31	-.08	.13	.60	.11	.15	.46	.10	.16	.52	.25	.13	.06
Skin Cancer Experience - Self	-.42	.37	.27	-.22	.50	.66	.02	.58	.49	-.24	.59	.69	..64	.48	.19
Skin Cancer Experience – Close Other	.24	.22	.27	.18	.29	.54	-.23	.33	.49	-.45	.34	.19	-.12	.29	.68
Constant	1.64	.88	.07	-.20	1.17	.87	**-2.85**	**1.36**	**.04**	-1.41	1.38	.31	-.17	1.36	.90
	R^2 = .65			R^2 = .65			R^2 = .70			R^2 = .56			R^2 = .68		
	$F(11, 44) = 7.55$ $p < .001$			$F(11, 44) = 7.33$ $p < .001$			$F(11, 44) = 9.16$ $p < .001$			$F(11, 44) = 5.11$ $p < .001$			$F(15, 40) = 5.76$ $p < .001$		

Table 28

Study 1 Results of PROCESS Model for Perceived Severity

	Consequent														
	Narrative Involvement (M_1)			Character Involvement (M_2)			Self-Referencing (M_3)			Self-Relevance (M_4)			Perceived Severity (Y)		
Antecedent	*ß*	*SE*	*p*	*ß*	*SE*	*p*	*ß*	*SE*	*p*	*ß*	*SE*	*p*	*ß*	*SE*	*p*
Sourcefulness (X)	**.34**	**.05**	**<.001**	**.42**	**.07**	**< .001**	**.65**	**.09**	**< .001**	**.46**	**.09**	**< .001**	-.06	.09	.50
Narrative Involvement (M_1)	--	--	--	--	--	--	--	--	--	--	--	--	**.54**	**.26**	**.04**
Character Involvement (M_2)	--	--	--	--	--	--	--	--	--	--	--	--	.07	.18	.69
Self-Referencing (M_3)	--	--	--	--	--	--	--	--	--	--	--	--	-.01	.13	.92
Self-Relevance (M_4)	--	--	--	--	--	--	--	--	--	--	--	--	-.20	.13	.12
PSev Time 1	.10	.10	.34	.15	.13	.28	-.12	.17	.48	-.20	.17	.24	**.37**	**.11**	**.002**
Age	**.02**	**.10**	**.02**	**.02**	**.01**	**.04**	.03	.01	.05	.02	.01	.23	.00	.01	.93
Sex	-.20	.19	.29	-.21	.25	.41	-.03	.31	.91	.06	.31	.84	.10	.20	.62
Education	.17	.10	.09	.14	.13	.31	.17	.17	.33	-.05	.17	.78	.15	.11	.20
Need for Cognition	.07	.15	.64	-.28	.20	.17	-.23	.25	.35	-.11	.25	.65	-.23	.17	.18
Need for Control	.09	.16	.59	.43	.21	.05	.39	.27	.16	.43	.67	.12	.18	.19	.34
Transportability	-.09	.14	.55	.16	.19	.41	.13	.24	.61	.17	.24	.48	.10	.16	.55

Continued

Table 28 Continued

	Consequent														
	Narrative Involvement (M_1)			Character Involvement (M_2)			Self-Referencing (M_3)			Self-Relevance (M_4)			Perceived Severity (Y)		
Antecedent	*ß*	*SE*	*p*	*ß*	*SE*	*p*	*ß*	*SE*	*p*	*ß*	*SE*	*p*	*ß*	*SE*	*p*
Affinity for Technology	-.11	.10	.28	-.09	.13	.51	.09	.17	.58	.08	.17	.62	.21	.11	.06
Skin Cancer Experience - Self	-.45	.36	.22	-.17	.48	.73	.75	.61	.22	.55	.61	.37	.76	.41	.07
Skin Cancer Experience – Close Other	.28	.20	.17	.29	.27	.29	.12	.34	.72	-.10	.64	.77	.04	.22	.86
Constant	1.52	.87	.08	-.17	1.17	.88	-1.16	1.47	.43	.45	1.46	.76	.10	1.04	.92
	R^2 = .66			R^2 = .65			R^2 = .64			R^2 = .50			R^2 = .62		
	$F(11, 44) = 7.72$ $p < .001$			$F(11, 44) = 7.31$ $p < .001$			$F(11, 44) = 7.13$ $p < .001$			$F(11, 44) = 4.01$ $p < .001$			$F(15, 40) = 4.28$ $p < .001$		

Table 29

Study 1 Results of PROCESS Model for Self-Efficacy

	Consequent														
	Narrative Involvement (M_1)			Character Involvement (M_2)			Self-Referencing (M_3)			Self-Relevance (M_4)			Self-efficacy (Y)		
Antecedent	ß	*SE*	*p*	ß	*SE*	*p*	ß	*SE*	*p*	ß	*SE*	*p*	ß	*SE*	*p*
Sourcefulness (X)	**.32**	**.05**	**< .001**	**.40**	**.07**	**< .001**	**.62**	**.09**	**< .001**	**.40**	**.09**	**< .001**	-.08	.10	.47
Narrative Involvement (M_1)	--	--	--	--	--	--	--	--	--	--	--	--	-.30	.31	.33
Character Involvement (M_2)	--	--	--	--	--	--	--	--	--	--	--	--	**.45**	**.21**	**.04**
Self-Referencing (M_3)	--	--	--	--	--	--	--	--	--	--	--	--	.03	.16	.85
Self-Relevance (M_4)	--	--	--	--	--	--	--	--	--	--	--	--	.11	.15	.46
Self-efficacy Time 1	**.19**	**.10**	**.05**	.14	.13	.28	.06	.17	.73	.20	.17	.23	**.43**	**.13**	**.002**
Age	.01	.01	.07	.02	.01	.10	**.03**	**.01**	**.04**	.02	.01	.26	-.01	.01	.60
Sex	-.15	.18	.40	-.18	.25	.47	.00	.32	.99	.15	.31	.63	.13	.24	.60
Education	.14	.10	.16	.11	.14	.43	.17	.17	.34	-.07	.17	.70	.19	.13	.15
Need for Cognition	.04	.13	.76	-.33	.18	.08	-.16	.23	.49	.01	.23	.95	.07	.19	.70
Need for Control	.18	.14	.22	**.55**	**.20**	**.007**	.32	.25	.20	.32	.25	.20	.12	.20	.57
Transportability	-.08	.13	.53	.19	.19	.30	.06	.24	.80	.04	.23	.86	.08	.18	.68

Continued

Table 29 Continued

	Consequent														
	Narrative Involvement (M_1)			Character Involvement (M_2)			Self-Referencing (M_3)			Self-Relevance (M_4)			Self-efficacy (Y)		
Antecedent	*ß*	*SE*	*p*	*ß*	*SE*	*p*	*ß*	*SE*	*p*	*ß*	*SE*	*p*	*ß*	*SE*	*p*
Affinity for Technology	-.14	.10	.15	-.11	.13	.40	.08	.17	.65	.04	.17	.83	-.02	.13	.87
Skin Cancer Experience - Self	-.36	.34	.30	-.03	.46	.96	.63	.59	.29	.34	.58	.56	-.16	.46	.72
Skin Cancer Experience – Close Other	.37	.20	.07	.36	.28	.20	.15	.35	.68	-.02	.35	.96	.29	.27	.28
Constant	1.39	.82	.10	-.06	1.14	.96	-1.63	1.44	.26	-.55	1.43	.70	.20	1.19	.87
	R^2 = .68			R^2 = .65			R^2 = .64			R^2 = .50			R^2 = .57		
	$F(11, 44) = 8.50$ $p < .001$			$F(11, 44) = 7.31$ $p < .001$			$F(11, 44) = 7.03$ $p < .001$			$F(11, 44) = 4.02$ $p < .001$			$F(15, 40) = 3.60$ $p = .001$		

Table 30

Study 1 Results of PROCESS Model for Perceived Barriers

	Consequent														
	Narrative Involvement (M_1)			Character Involvement (M_2)			Self-Referencing (M_3)			Self-Relevance (M_4)			Perceived Barriers (Y)		
Antecedent	ß	*SE*	*p*	ß	*SE*	*p*	ß	*SE*	*p*	ß	*SE*	*p*	ß	*SE*	*p*
Sourcefulness (X)	**.35**	**.05**	**< .001**	**.43**	**.07**	**< .001**	**.63**	**.09**	**< .001**	**.45**	**.09**	**< .001**	.02	.10	.85
Narrative Involvement (M_1)	--	--	--	--	--	--	--	--	--	--	--	--	.04	.29	.90
Character Involvement (M_2)	--	--	--	--	--	--	--	--	--	--	--	--	-.30	.20	.15
Self-Referencing (M_3)	--	--	--	--	--	--	--	--	--	--	--	--	.14	.15	.36
Self-Relevance (M_4)	--	--	--	--	--	--	--	--	--	--	--	--	.05	.14	.72
PBar Time 1	-.04	.09	.65	.04	.12	.77	.01	.16	.95	-.11	.16	.48	**.73**	**.11**	**< .001**
Age	**.02**	**.01**	**.04**	.02	.01	.05	**.03**	**.0**	**.03**	.02	.01	.20	-.01	.01	.35
Sex	-.19	.19	.33	-.25	.26	.35	-.03	.32	.95	.15	.33	.65	-.10	.24	.68
Education	.16	.10	.12	.13	.14	.33	.18	.17	.31	-.05	.17	.77	.02	.13	.87
Need for Cognition	.01	.14	.96	-.34	.19	.07	-.17	.24	.48	-.04	.24	.88	.07	.18	.72
Need for Control	.14	.15	.35	**.54**	**.20**	**.01**	.31	.25	.22	.27	.25	.30	.10	.20	.62
Transportability	-.04	.14	.76	.23	.19	.23	.07	.23	.75	.09	.23	.72	-.01	.18	.95

Continued

Table 30 Continued

	Consequent														
	Narrative Involvement (M_1)			Character Involvement (M_2)			Self-Referencing (M_3)			Self-Relevance (M_4)			Perceived Barriers (Y)		
Antecedent	*ß*	*SE*	*p*	*ß*	*SE*	*p*	*ß*	*SE*	*p*	*ß*	*SE*	*p*	*ß*	*SE*	*p*
Affinity for Technology	-.11	.10	.28	-.08	.13	.55	.09	.17	.59	.07	.17	.67	-.01	.12	.94
Skin Cancer Experience - Self	-.35	.35	.32	-.02	.47	.97	.63	.59	.29	.35	.59	.56	-.51	.44	.26
Skin Cancer Experience – Close Other	.27	.20	.19	.30	.27	.28	.12	.34	.73	-.13	.34	.70	.31	.25	.23
Constant	**2.08**	**1.02**	**.048**	.003	1.38	.99	-1.57	1.72	.37	.61	1.72	.73	1.24	1.41	.39
	R^2 = .65			R^2 = .64			R^2 = .64			R^2 = .49			R^2 = .61		
	$F(11, 44) = 7.53$ $p < .001$			$F(11, 44) = 7.03$ $p < .001$			$F(11, 44) = 7.00$ $p < .001$			$F(11, 44) = 3.85$ $p < .001$			$F(15, 40) = 4.20$ $p < .001$		

Table 31

Study 1 Results of PROCESS Model for Perceived Benefits

	Consequent														
	Narrative Involvement (M_1)			Character Involvement (M_2)			Self-Referencing (M_3)			Self-Relevance (M_4)			Perceived Benefits (Y)		
Antecedent	*ß*	*SE*	*p*	*ß*	*SE*	*p*	*ß*	*SE*	*p*	*ß*	*SE*	*p*	*ß*	*SE*	*p*
Sourcefulness (X)	**.33**	**.05**	**< .001**	**.40**	**.06**	**< .001**	**.62**	**.09**	**< .001**	**.44**	**.09**	**< .001**	-.02	.09	.84
Narrative Involvement (M_1)	--	--	--	--	--	--	--	--	--	--	--	--	-.09	.26	.74
Character Involvement (M_2)	--	--	--	--	--	--	--	--	--	--	--	--	.36	.18	.06
Self-Referencing (M_3)	--	--	--	--	--	--	--	--	--	--	--	--	-.14	.13	.31
Self-Relevance (M_4)	--	--	--	--	--	--	--	--	--	--	--	--	.22	.12	.09
PBen Time 1	**.39**	**.12**	**.001**	**.53**	**.16**	**.002**	.30	.22	.18	.12	.22	.59	**.57**	**.16**	**< .001**
Age	**.02**	**.01**	**.03**	.02	.01	.06	**.03**	**.01**	**.04**	.02	.01	.16	.02	.01	.06
Sex	-.08	.17	.64	-.05	.23	.82	.08	.32	.80	.13	.32	.69	-.02	.20	.92
Education	.15	.09	.10	.11	.12	.37	.16	.17	.33	-.04	.17	.82	.04	.11	.72
Need for Cognition	.11	.13	.39	-.23	.17	.18	-.10	.23	.66	.02	.24	.94	-.01	.16	.95
Need for Control	-.03	.14	.82	.28	.19	.14	.17	.26	.51	.24	.27	.38	-.01	.18	.96

Continued

Table 31 Continued

	Consequent														
	Narrative Involvement (M_1)			Character Involvement (M_2)			Self-Referencing (M_3)			Self-Relevance (M_4)			Perceived Benefits (Y)		
Antecedent	*ß*	*SE*	*p*	*ß*	*SE*	*p*	*ß*	*SE*	*p*	*ß*	*SE*	*p*	*ß*	*SE*	*p*
Transportability	-.17	.13	.19	.05	.1	.76	-.02	.24	.92	.04	.24	.86	-.03	.16	.84
Affinity for Technology	-.12	.09	.19	-.10	.12	.40	.08	.16	.62	.07	.17	.66	.07	.11	.51
Skin Cancer Experience - Self	-.53	.32	.10	-.27	.43	.53	.50	.59	.40	.29	.60	.63	.01	.40	.97
Skin Cancer Experience – Close Other	.21	.18	.25	.20	.24	.41	.07	.34	.84	-.13	.34	.71	-.07	.22	.74
Constant	.89	.89	.27	-.98	1.06	.36	-2.19	1.45	.14	-.39	1.49	.79	-.22	1.05	.83
	R^2 = .72			R^2 = .71			R^2 = .65			R^2 = .49			R^2 = .67		
	$F(11, 44) = 10.46$ $p < .001$			$F(11, 44) = 9.87$ $p < .001$			$F(11, 44) = 7.47$ $p < .001$			$F(11, 44) = 3.81$ $p < .001$			$F(15, 40) = 5.53$ $p < .001$		

Table 32

Study 2 OLS Regression Model for Narrative Involvement

Predictor	*B*	*SE*	*t*	*p*
Constant	5.36	1.46	3.66	.001
Perceived Contingency	.13	.08	1.66	.10
Transportability	**.33**	**.14**	**2.27**	**.03**
Age	-.09	.06	-1.61	.11
Sex	-.02	.22	-.07	.94
Affinity for Technology	.08	.10	.84	.40
Need for Cognition	-.09	.13	-.68	.50
Need for Control	-.19	.18	-1.06	.30
Skin Cancer Experience - Self	-.78	.62	1.25	.22
Skin Cancer Experience- Other	.13	.23	.57	.57

Table 33

Study 2 OLS Regression Model for Character Involvement

Predictor	*B*	*SE*	*t*	*p*
Constant	3.23	1.52	2.14	.037
Perceived Contingency	**.18**	**.08**	**2.31**	**.02**
Transportability	**.44**	**.15**	**2.99**	**.004**
Age	-.03	.06	-.52	.61
Sex	.07	.23	.29	.77
Affinity for Technology	.13	.10	1.30	.20
Need for Cognition	-.18	.13	-1.38	.17
Need for Control	-.04	.19	-.20	.84
Skin Cancer Experience - Self	-1.06	.64	-1.65	.10
Skin Cancer Experience- Other	.15	.24	.62	.54

Table 34

Study 2 Results of PROCESS Model for Perceived Susceptibility

	Consequent								
	Narrative Involvement (M_1)			Character Involvement (M_2)			Perceived Susceptibility (Y)		
Antecedent	*ß*	*SE*	*p*	*ß*	*SE*	*p*	*ß*	*SE*	*p*
Perceived Contingency (X)	.13	.08	.10	**.18**	**.08**	**.03**	-.004	.07	.94
Narrative Involvement (M_1)	--	--	--	--	--	--	.30	.15	.05
Character Involvement (M_2)	--	--	--	--	--	--	.16	.15	.27
PSus Time 1	.04	.09	.64	.07	.09	.44	**.49**	**.08**	**<.001**
Age	-.09	.06	.10	-.04	.06	.54	.04	.05	.41
Sex	.01	.22	.97	.11	.23	.65	-.08	.19	.67
Need for Cognition	-.09	.13	.54	-.17	.13	.20	-.09	.11	.41
Need for Control	-.20	.19	.30	-.04	.19	.84	.05	.16	.76
Transportability	**.32**	**.15**	**.03**	**.43**	**.15**	**.006**	-.00	.13	1.00
Affinity for Technology	.08	.10	.40	.14	.10	.18	.02	.08	.80
Skin Cancer Experience - Self	-.83	.63	.20	-1.14	.65	.08	**1.32**	**.21**	**.02**

Continued

Table 34 Continued

	Consequent								
	Narrative Involvement (M_1)			Character Involvement (M_2)			Perceived Susceptibility (Y)		
Antecedent	*ß*	*SE*	*p*	*ß*	*SE*	*p*	*ß*	*SE*	*p*
Skin Cancer Experience – Close Other	.08	.25	.76	.06	.26	.82	.04	.21	.84
Constant	**5.29**	**1.48**	**< .001**	**3.13**	**1.53**	**.04**	-.51	1.38	.71
	R^2 = .24			R^2 = .32			R^2 = .68		
	$F(10, 50) = 1.93$ $p = .06$			$F(10, 59) = 2.79$ $p = .006$			$F(12, 57) = 9.96$ $p < .001$		

Table 35

Study 2 Results of PROCESS Model for Perceived Severity

	Consequent								
	Narrative Involvement (M_1)			Character Involvement (M_2)			Perceived Severity (Y)		
Antecedent	*ß*	*SE*	*p*	*ß*	*SE*	*p*	*ß*	*SE*	*p*
Perceived Contingency (X)	.13	.08	.11	**.19**	**.08**	**.02**	-.03	.07	.67
Narrative Involvement (M_1)	--	--	--	--	--	--	-.01	.16	.93
Character Involvement (M_2)	--	--	--	--	--	--	.28	.16	.09
PSev Time 1	.00	.14	.98	.05	.14	.71	**.50**	**.12**	**< .001**
Age	-.09	.06	.11	-.03	.06	.60	.02	.05	.70
Sex	-.01	.23	.93	.09	.24	.70	-.12	.21	.56
Need for Cognition	-.09	.13	.51	-.19	.13	.17	-.11	.12	.37
Need for Control	-.19	.19	.30	-.03	.19	.87	-.33	.17	.05
Transportability	**.32**	**.15**	**.03**	**.44**	**.15**	**.004**	-.12	.14	.40
Affinity for Technology	.08	.10	.40	.13	.10	.21	-.02	.09	.79
Skin Cancer Experience - Self	-.78	.62	.22	-1.07	.65	.10	-.22	.57	.71

Continued

Table 35 Continued

	Consequent								
	Narrative Involvement (M_1)			Character Involvement (M_2)			Perceived Severity (Y)		
Skin Cancer Experience – Close Other	.13	.23	.55	.13	.24	.57	-.03	.21	.89
Constant	**5.34**	**1.68**	**.002**	2.93	1.73	.10	**3.95**	**1.63**	**.02**
	R^2 = .24			R^2 = .32			R^2 = .43		
	$F(10, 59) = 1.90$ $p = .06$			$F(10, 59) = 2.72$ $p = .008$			$F(12, 57) = 3.51$ $p < .001$		

Table 36

Study 2 Results of PROCESS Model of Self-Efficacy

	Consequent								
	Narrative Involvement (M_1)			Character Involvement (M_2)			Self-Efficacy (Y)		
Antecedent	*ß*	*SE*	*p*	*ß*	*SE*	*p*	*ß*	*SE*	*p*
Perceived Contingency (X)	.12	.08	.13	**.18**	**.08**	**.03**	.05	.10	.62
Narrative Involvement (M_1)	--	--	--	--	--	--	-.15	.23	.51
Character Involvement (M_2)	--	--	--	--	--	--	-.10	.22	.65
Self-efficacy Time 1	.08	.09	.35	-.01	.09	.92	**.33**	**.11**	**.003**
Age	-.10	.06	.09	-.03	.06	.62	.002	.07	.97
Sex	.03	.22	.89	.06	.23	.80	.15	.27	.59
Need for Cognition	-.10	.13	.45	-.18	.13	.18	-.28	.16	.09
Need for Control	-.22	.19	.24	-.04	.19	.86	**.48**	**.23**	**.04**
Transportability	**.30**	**15**	**.04**	**.45**	**.15**	**.005**	**.40**	**.19**	**.04**
Affinity for Technology	.08	.10	.41	.13	.10	.20	.21	.12	.09
Skin Cancer Experience - Self	-.86	.63	.17	-1.05	.65	.11	-.54	.78	.49

Continued

Table 36 Continued

	Consequent								
	Narrative Involvement (M_1)			Character Involvement (M_2)			Self-Efficacy (Y)		
Skin Cancer Experience – Close Other	.12	.23	.59	.15	.24	.54	-.13	.28	.66
Constant	**5.53**	**1.48**	**< .001**	**3.22**	**1.54**	**.04**	.22	2.03	.91
	R^2 = .25			R^2 = .31			R^2 = .39		
	$F(10, 59) = 2.02$ $p = .05$			$F(10, 59) = 2.70$ $p = .009$			$F(12, 57) = 3.00$ $p = .002$		

Table 37

Study 2 Results of PROCESS Model for Perceived Barriers

	Consequent								
	Narrative Involvement (M_1)			Character Involvement (M_2)			Perceived Barriers (Y)		
Antecedent	*ß*	*SE*	*p*	*ß*	*SE*	*p*	*ß*	*SE*	*p*
Perceived Contingency (X)	.12	.08	.11	**.17**	**.08**	**.03**	.06	.08	.45
Narrative Involvement (M_1)	--	--	--	--	--	--	-.25	.18	.17
Character Involvement (M_2)	--	--	--	--	--	--	.12	.18	.52
PBar Time 1	-.02	.10	.82	-.12	.10	.24	**.39**	**.10**	**< .001**
Age	-.09	.06	.11	-.04	.06	.47	-.03	.06	.68
Sex	-.01	.22	.96	.08	.22	.72	-.18	.22	.41
Need for Cognition	-.09	.13	.50	-.19	.13	.15	-.05	.13	.72
Need for Control	-.20	.19	.29	-.08	.19	.68	-.26	.19	.18
Transportability	**.33**	**.15**	**.03**	**.47**	**.15**	**.003**	.07	.16	.66
Affinity for Technology	.08	.10	.42	.12	.10	.23	-.11	.10	.26
Skin Cancer Experience - Self	-.80	.63	.21	-1.20	.65	.07	.03	.65	.96

Continued

Table 37 Continued

	Consequent								
	Narrative Involvement (M_1)			Character Involvement (M_2)			Perceived Barriers (Y)		
Antecedent	*ß*	*SE*	*p*	*ß*	*SE*	*p*	*ß*	*SE*	*p*
Skin Cancer Experience – Close Other	.14	.23	.56	.19	.24	.43	-.25	.23	.30
Constant	**5.52**	**1.63**	**.001**	**4.08**	**1.67**	**.02**	**4.11**	**1.78**	**.02**
	R^2 = .24			R^2 = .33			R^2 = .35		
	$F(10, 59) = 1.90$ $p = .06$			$F(10, 59) = 2.90$ $p = .005$			$F(12, 57) = 2.57$ $p = .009$		

Table 38

Study 2 Results of PROCESS Model for Perceived Benefits

	Consequent								
	Narrative Involvement (M_1)			Character Involvement (M_2)			Perceived Benefits (Y)		
Antecedent	*ß*	*SE*	*p*	*ß*	*SE*	*p*	*ß*	*SE*	*p*
Perceived contingency (X)	.11	.08	.14	**.17**	**.08**	**.03**	-.003	.05	.95
Narrative Involvement (M_1)	--	--	--	--	--	--	-.13	.11	.22
Character Involvement (M_2)	--	--	--	--	--	--	**.26**	**.10**	**.01**
PBen Time 1	.19	.12	.12	.12	.12	.34	**.51**	**.07**	**< .001**
Age	-.10	.06	.07	-.04	.06	.52	.01	.03	.84
Sex	.06	.22	.77	.11	.23	.62	-.13	.13	.33
Need for Cognition	-.07	.13	.61	-.17	.13	.21	-.08	.08	.27
Need for Control	-.18	.18	.32	-.03	.19	.88	.21	.11	.06
Transportability	.26	.15	.09	**.40**	**.16**	**.01**	-.004	.09	.96
Affinity for Technology	.04	.10	.72	.10	.10	.33	.02	.06	.72
Skin Cancer Experience - Self	-.76	.61	.22	-1.05	.64	.11	.63	.36	.09

Continued

Table 38 Continued

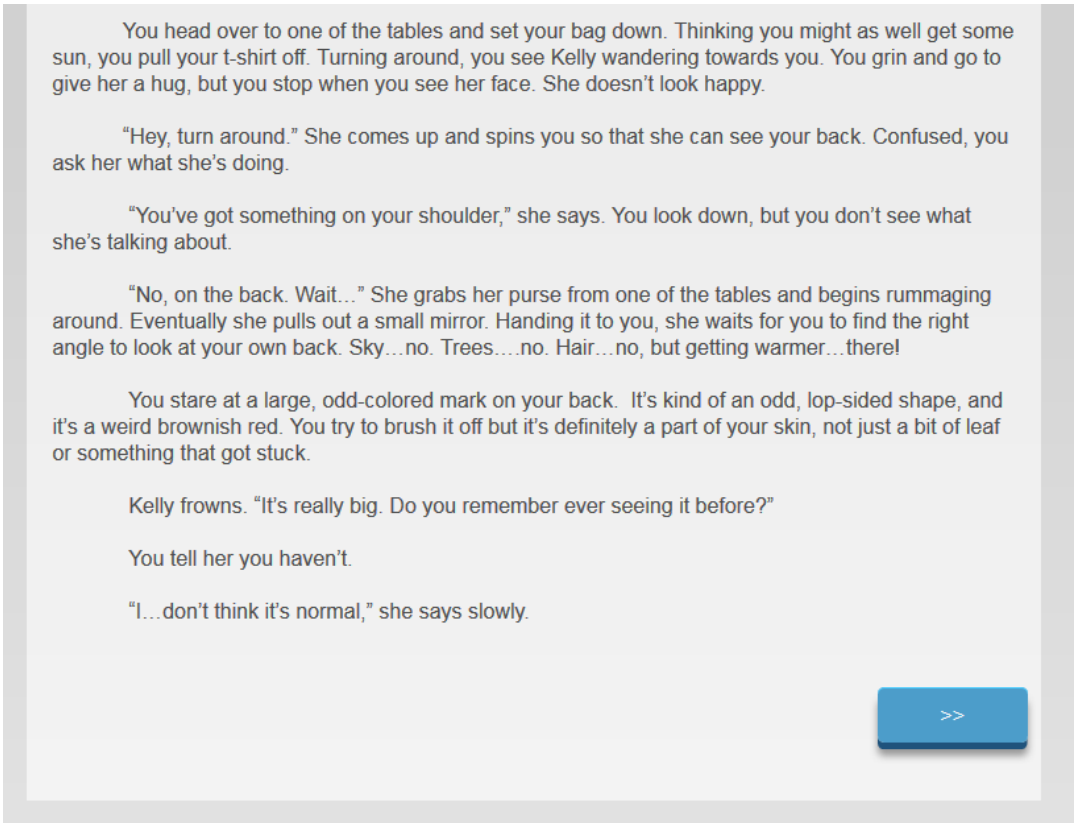
	Consequent								
	Narrative Involvement (M_1)			Character Involvement (M_2)			Perceived Benefits (Y)		
Antecedent	*ß*	*SE*	*p*	*ß*	*SE*	*p*	*ß*	*SE*	*p*
Skin Cancer Experience – Close Other	.10	.23	.66	.13	.24	.59	.04	.13	.76
Constant	**4.98**	**1.47**	**.001**	2.99	1.54	.06	1.56	.94	.10
	R^2 = .27			R^2 = .32			R^2 = .65		
	$F(10, 59) = 2.23$ $p = .03$			$F(10, 59) = 2.84$ $p = .006$			$F(12, 57) = 8.86$ $p < .001$		

Appendix I: Contingency Study Manipulation

Below is a scene from the experimental narrative, one as it will be presented in the No Choice condition and one as it will be presented in the Choice Doesn't Matter/Choice Matters conditions. In this scene, one of the main character's friends notices a strange mark on their back and the character learns that it may be skin cancer. The way the story is broken up is identical across story versions. The only difference is that the interactive narrative requires the participant to make a "choice" before advancing the story; as can be seen, making a choice has no influence on what text is displayed next.

No Choice Narrative

Page 1:



Page 2:

Kelly presses her lips together in a tight line. She pulls her phone out of her purse and plays with it for a minute or two, then hands it to you without a word. Confused, you look down and see a lecture slide. You're about to ask her why she's showing you this when you see the title of the slide: "Identifying Skin Cancer."

Heart sinking, you read the list…Asymmetrical, uneven border, multiple colors, larger than a pencil eraser, sudden changes… Next to you, Kelly is staring at the screen, too. You understand; it's just too awkward for her to look anywhere else. The music and talking in the background sound weird and far away. Almost like you're under water.

"We were talking about it in our public health class," she says quietly. You nod, sick to your stomach. You hand Kelly's phone back to her and she grabs your hand. "Promise me you'll make an appointment with Student Health," she says. She's deadly serious. You promise and ask her if she'd tell the others that something had come up and you had to get home. She agrees and heads toward Mike, who is standing by the grill and chatting with some girls you don't know. You pick up your shirt from the table and pull it on. You imagine that you can feel the shirt rasping across the mark on your shoulder.

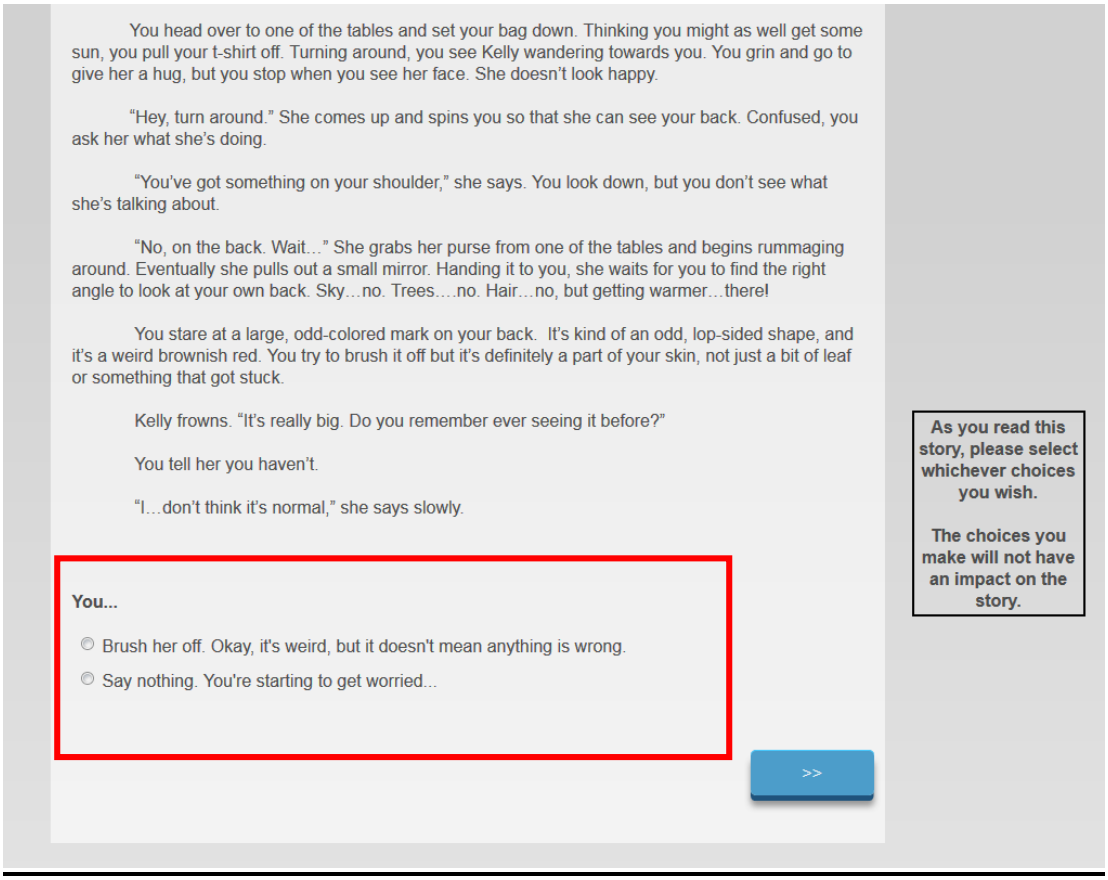
Picking your bag back up, you make your way down the stairs and back across the beautiful lawn, past the swimming pool and the net and all of the other rich people stuff. With each step you feel heavier. Sliding back into the hot car, you take a minute to rest your head on the steering wheel, hearing the air conditioning start to kick on. You stay that way for several minutes before sitting up and numbly driving back home, trying not to think about anything.

After getting back home, you head up to your room and take off your shirt, twisting to try and see the thing on your shoulder in the mirror. How did you not notice it before? It's huge, almost the size of your thumbnail. Turning away, you grab your laptop and sit on your bed, leaning back against the headboard. You open your laptop and start up the browser, staring at the blank bar beneath the Google logo.

>>

Choice Narrative (seen with Choice Doesn't Matter instructions)

Page 1:



Page 2:

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"We were talking about it in our public health class," she says quietly. You nod, sick to your stomach. You hand Kelly's phone back to her and she grabs your hand. "Promise me you'll make an appointment with Student Health," she says. She's deadly serious. You promise and ask her if she'd tell the others that something had come up and you had to get home. She agrees and heads toward Mike, who is standing by the grill and chatting with some girls you don't know. You pick up your shirt from the table and pull it on. You imagine that you can feel the shirt rasping across the mark on your shoulder.

Picking your bag back up, you make your way down the stairs and back across the beautiful lawn, past the swimming pool and the net and all of the other rich people stuff. With each step you feel heavier. Sliding back into the hot car, you take a minute to rest your head on the steering wheel, hearing the air conditioning start to kick on. You stay that way for several minutes before sitting up and numbly driving back home, trying not to think about anything.

After getting back home, you head up to your room and take off your shirt, twisting to try and see the thing on your shoulder in the mirror. How did you not notice it before? It's huge, almost the size of your thumbnail. Turning away, you grab your laptop and sit on your bed, leaning back against the headboard. You open your laptop and start up the browser, staring at the blank bar beneath the Google logo.

As you read this story, please select whichever choices you wish.

The choices you make will not have an impact on the story.

Appendix J: Perceived Contingency

Manipulation Check

1. Did the reading instructions tell you that the choices you made had an impact on the events of the story?

   Yes / No

Perceived Contingency

All items measured on a 7-point Likert scale

1) I was able to interact with the story.

2) The story changed immediately in response to my choices.

3) I feel like the choices I made earlier in the story had an impact on later events.

4) I feel like the story I read was the result of the choices I made.