

NARRATIVE AND FRAME IN HEALTH COMMUNICATION:
THE INFLUENCE OF NARRATIVE TRANSPORTATION
TO PROMOTE DETECTION BEHAVIOR

by

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ABSTRACT

The purpose of this thesis is to test two types of persuasive message strategies including narrative message type and message frame in health context and to investigate the potential interplay of those strategies when health messages contain multiple persuasive strategies that combine various categories (e.g., gain-framed narrative message or loss-framed statistical evidence). In fact, the combination of strategies seems likely to intensify or diminish the effect of health messages on persuasion.

The results are congruent with the transportation theory. Narrative messages produce higher transportation experiences than statistical evidence, and higher transportation yields positive attitudes and intentions toward skin cancer detection behaviors than low transportation. Moreover, the results also indicate that loss frames elicit no effect on attitude and intention toward skin cancer detection behaviors compared to gain frames. The findings support the meta-analyses of message frame literature, arguing that loss frames are only effective in promoting breast cancer detection behavior but not for other detection behaviors such as HIV testing and blood tests. This study is also designed to explore the possible moderating role of transportation in different message frames. It hypothesizes that for highly transported participants, loss frames will be more effective than gain frames in promoting positive attitudes and intentions to engage in detection behaviors. The findings show that message frames have no effect for those who are highly transported.

DEDICATION

This thesis is dedicated to my parents, Seong Gook Hong and Min Sook Lee, and my brother, Hyeonki Hong. Your love means the world to me.

LIST OF ABBREVIATIONS AND SYMBOLS

<i>a</i>	Cronbach's index of internal consistency
<i>df</i>	Degrees of freedom: number of values free to vary after certain restrictions have been placed on the data
<i>F</i>	Fisher's <i>F</i> ratio: A ration of two variances
<i>M</i>	Mean: the sum of a set of measurements divided by the number of measurements in the set
<i>p</i>	Probability associated with the occurrence under the null hypothesis of a value as extreme as or more extreme than the observed value
<i>r</i>	Pearson product-moment correlation
<i>t</i>	Computed value of <i>t</i> test
<	Less than
=	Equal to

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CONTENTS

ABSTRACT	ii
DEDICATION	iii
LIST OF ABBREVIATIONS AND SYMBOLS	iv
ACKNOWLEDGMENTS	v
LIST OF TABLES	vii
1. INTRODUCTION	1
2. LITERATURE REVIEW	4
3. METHODOLOGY	15
4. RESULTS	20
5. DISCUSSION	24
REFERENCES	30
APPENDIX A	37

LIST OF TABLES

3.1 Transportation Scale	18
3.2 Dependent Variables	19
4.1 Summary of Means for the Dependent Variable as Transportation	21
4.2 Summary of Means for the Dependent Variable as Attitude and Intention toward Detection Behaviors	22
4.3 Summary of Means for Transportation and Message Framing on Persuasion	23

CHAPTER 1

INTRODUCTION

Storytelling has long been an important part of communication. Storytelling is particularly influential in providing appropriate supporting ideas to people who are about to make their decisions (Fisher, 1985). When a story is well constructed and the features in the story resonate with recipients well, the story is more likely to persuade the readers to make story-consistent decisions. Due to such persuasive power of storytelling, narrative has been considered a more effective format for persuasive health messages than statistical evidence (e.g., Green, 2006; Hinyard & Kreuter, 2007; Kreuter et al., 2007). Health campaigns have utilized stories of patients who are willing to share their diseases-related experiences to promote its readers to accept the recommended disease protection behaviors (Feldman-Steward et al., 2006).

Although the growing evidence for the advantage of narrative health messages in promoting positive belief, attitude, and behavioral intention has been found (Slater, Buller, Waters, Archibeque, & LeBlanc, 2003; Wise, Han, Shaw, TcTavish, & Gustafson, 2008), some studies have reported mixed results. Two meta-analytic reviews of narrative studies (Allen & Preiss, 1997; Baesler & Burgoon, 1994) found that statistical evidence was more persuasive than narrative message. Also, there are other studies that reported narrative and statistical evidence are equally persuasive (Cody & Lee, 1990; Morman, 2000). To provide a better understanding of narrative effect, it has been recently proposed that the effect of narrative messages is dependent on how much the reader becomes involved with the narrative (Green & Brock, 2000; Slater & Rounder, 2002). This phenomenon has been termed as transportation, which is the feeling of

being lost or absorbed in a story (Green & Brock, 2000). That is, individuals who are exposed to narrative messages are more likely to experience a feeling of being lost from the real world and transported into the narrative world so that they are more likely to be motivated to have story-consistent belief, attitude, and behavioral intention in comparison to those who are exposed to statistics, advocacy, or expository messages. Based on the previous suggestion that links the transportation experience with a change of attitude and behavioral intention, the first purpose of this study is to examine the role of transportation in response to a short narrative message compared to statistical evidence.

Even though the concept of transportation offers the likelihood of understanding many aspects regarding narrative processing, numerous questions still remain. Specifically, the effect of particular features of narrative messages in relation to transportation is one of those questions. It has been suggested that using loss-framed messages, which emphasize the losses of failing to perform early detection behaviors, has been considered to be more effective in promoting disease detection behavior compared to gain-framed messages, which focus on the benefits of engaging regular detection behaviors (Kreuter et al., 2008; Meyerowitz & Chaiken, 1987; Rothman, Bartels, Wlaschin, & Salovey, 2006). However, not only a recent meta-analysis argued that the effect of message frame is still controversial (O’Keefe & Jensen, 2009), but also there is no study for the narrative frame in relation to transportation, although it is possible that transportation experience might yield a different impact depending on how the narrative is framed. Therefore, the secondary purpose of this study is to shed light on how the effect of message frame occurs in narrative format and whether there is a relationship between transportation and narrative frame or not.

Moreover, the current study moves beyond measuring the simple effect of narrative messages compared to statistical evidence by examining the possible interaction between transportation caused by narrative message and the message frame. One of the possible reasons that prior literature often reported no or mixed effects of message frame (O’Keefe & Jensen, 2009) may be due to neglect of the possible impact of other features embedded in the experimental stimuli (e.g., message source or other dimensional message frame) on the message frame effect (Shah, Kwak, Schmierbach, & Zubric, 2004). For example, the differences in experiencing narrative transportation affect persuasive outcomes of message, and thereby it may be possible that the differences in transportation may intensify or minimize the effect of message framing on persuasion. Surprisingly, research has not considered the potential interplay that may be occurred when message contains multiple persuasive strategies that combine various categories (e.g., loss-framed narrative or gain-framed statistical evidence).

Overall, the present study seeks to reconcile the inconsistent results obtained from previous literature for both narrative and message frame studies. It also proposes the narrative transportation-based interaction hypotheses for exploring the possible relationship between transportation and message frame on persuasive outcomes. This study manipulates two distinct message strategies of a health issue, skin cancer: (a) presentation of the issue based on personal story or statistical evidence (b) discussion of the issue in terms of losses or gains. To gauge the persuasive outcomes, attitude and behavioral intention to engage in skin cancer detection behavior are measured.

CHAPTER 1

LITERATURE REVIEW

Narrative Transportation

Narrative Communication

To date, even though there is no one definition of narrative widely accepted, many studies tend to conceptualize narrative in a similar way (Hinyard & Kreuter, 2006). For instance, Kreuter and colleagues (2007) conceptualize narrative as “a representation of connected events and characters that has an identifiable structure, is bounded in space and time, and contains implicit or explicit messages about the topic being addressed.” (p. 222). The latest meta-analysis of narrative literature defines narrative as “story-like prose pieces that focus on elaborating one example of an event, and they provide appealing detail, characters, and some plot, presented in either the first or third person” (Winterbottom, Bekker, Conner, & Mooney, 2008, p. 2080). There are numerous types of narrative formats. Narrative formats can be as simple as a patient’s story provided from a health brochure or as complicated as a soap opera. One of the prevalent formats of narrative used in health communication is a personal story from a survivor or a patient. In sum, a narrative is an account of an individual’s experience conveyed in the first or third person; for example, ‘I / Laura was diagnosed with skin cancer 1 year ago after I /she spent two consecutive summers at the beach. I / She was told from my / her dermatologist about two treatment options available to me / her...’.

It has long been considered that a narrative is one of the most effective strategies in health campaigns. Especially, recent studies have emphasized the importance of narratives in

cancer-related communications (Kreuter et al., 2007). A narrative has been recognized more persuasive and memorable than statistical evidence (Reinard, 1998; Taylor & Thompson, 1982). It is because narrative gives a story and experience of an individual with disease, instead of simply demonstrating facts and statistics about the disease. In the past decade, a number of empirical studies has found a greater persuasive effect of narrative messages on attitude and intention toward message argument compared to statistical evidence in a wide range of fields, such as communication (Beasler & Burgoon, 1994; Moyer-Guse & Nabi, 2010; Slater, Rouner, & Long, 2006), public health (Block & Keller, 1997; Kreuter et al., 2008), psychology (Green & Brock, 2000; Strange & Leung, 1999), and advertising (Escalas, 2004; 2007; Torres & Briggs, 2007). For example, Slater and Rouner (1996) found that individuals who were exposed to narratives rated the messages as more persuasive, more believable, and better written than those who were exposed to statistical evidence. Green and Brock (2000) reported that narrative elicited its readers' story-consistent belief and favorable evaluation than statistical evidence.

However, some studies also have reported inconsistent results. For instance, Gray and Harrington (2011) reported that there was no statistical difference between narrative messages and statistical evidence in promoting positive attitude and behavioral intention toward regular exercise. Similarly, Dunlop, Wakefield, and Kashima (2010, Study 2) reported no statistically significant difference between narrative, advocacy, and control groups in attitude and intention to engage in protection behaviors. Lemal and Van den Bulck (2010) also found that narrative messages had no significant difference compared to statistical evidence in skin cancer information seeking, attention to message, intention to talk to a physician, and intention to perform self-examinations. Moreover, Greene and Brinn (2003) found that statistical evidence presenting the relationship between tanning bed use and skin cancer risk was more effective in

increasing intention to reduce use of tanning beds than a narrative message presenting a case history of a woman who developed skin cancer through tanning bed use. In addition, there are studies that reported that both narrative and statistical evidence were equally persuasive in promoting favorable attitude and behavioral intention such as testicular self-examination (Morman, 2000), polio vaccination (Wilson, Mills, Norman, & Tomlinson, 2005), and skin cancer (Cody & Lee, 1990; Wise et al., 2008).

Several meta-analytic reviews also show that there are mixed results about the impact of narratives. For example, Taylor and Thompson (1982) reviewed 6 studies, which compared narrative messages and statistical evidence, and found that narratives have greater persuasive effects than statistical information. However, Baesler and Burgoon (1994) also examined 19 studies and found that 4 studies produced no difference and 2 studies reported statistical information as being more persuasive than narrative messages, while 13 studies revealed narrative messages were more persuasive than statistical information. In addition, Allen and Preiss (1997) conducted a meta-analysis across 16 studies and concluded that statistical information has a more persuasive impact than narrative messages. On the other hand, whereas many studies have tested the effect of narrative messages on belief and message evaluations (i.e., Green & Brock, 2000; Slater & Rouner, 1996), only a few studies examined the positive effect of narrative messages on promoting intention to engage in protection behaviors.

Exemplification Theory

One potential theoretical framework for understanding the uses and effects of narrative messages is the exemplification theory (Zillmann, 2006; Zillmann & Brosius, 2000). This theory suggests that a message-relevant exemplar is more likely than factual information to influence readers' decision-making related to the message argument. The theory posits that the vivid

exemplars contained in a message can create curiosity about a news issue, and the growing curiosity leads to extensive reading of the text to fulfill readers' questions, and thereby vivid exemplars influence their perception, attitude, and belief about the issue as the exemplars illustrate. Zillmann (2006) specifically emphasizes the exemplification effects in health-promoting messages, suggesting that qualitative evidence such as specific character exemplars and their disease-related stories will be more effective than quantitative evidence in promoting intention to engage in preventive behaviors recommended in the message, including disease rate and death rate.

Vividness (Rook, 1987) is one of the important features that provides an explanation for the effect of specific exemplars over statistical evidence in persuasive messages (Zillmann & Brosius, 2000). Nisbett and Ross (1980) suggest that "vivid information is likely to attract and hold [readers'] attention and to excite the imagination" (p. 45). Consequently, individuals tend to formulate or modify their attitude and belief about the issue based on samplings of directly or indirectly experienced and witnessed occurrences. A number of empirical studies found that individuals who read the message with qualitative exemplars pay more attention to the issues raised in the message, perceive the message as more representative, more easily remembered and more easily retrieved from memory than messages with statistical evidence (Brosius & Bathelt, 1994; Zillmann & Brosius, 2000).

Transportation

To further understand narrative processing, systematic theoretical discussion has been made based on various perspectives (Green, 2006; Hinyard & Kreuter, 2007; Kreuter et al., 2007; Larkey & Hecht, 2010; Moyer-Guse, 2008; Slater & Rouner, 2002). Many early narrative studies have utilized the cognitive processing models to provide an explanation for narrative

processing. Yet, several scholars recently have claimed that the models have been shown to be unsuitable for addressing the processes and outcomes following exposure to narratives (Green & Brock, 2000; Slater & Rouner, 2002; Wang & Calder, 2006).

Among several approaches that provide an explanation for narrative processing, transportation theory (Green & Brock, 2000, 2002; Green, 2006) is one of the most promising theoretical frameworks to advance our understanding of narrative processing compared to statistical messages. The term *transportation* is defined as “a convergent process, where all mental systems and capacities become focused on events occurring in the narrative” (Green & Brock 2000, p. 701). The theory explains that people are likely to be cognitively and affectively absorbed when they are exposed to narratives, and thereby they are removed from their real world and ‘*transported*’ into the narrative world. More importantly, a higher level of transportation yields more narrative-consistent attitude and belief than a lower level of transportation (Green & Brock, 2000; Kreuter et al., 2008; Slater & Rouner, 2002). Hence, exposure to narrative messages will elicit a higher transportation than exposure to statistical evidence, and thereby highly transported individuals will be more likely to be influenced by the narrative message than those who are exposed to statistical evidence. Across studies, narrative scholars have labeled the notion of transportation with different terms, including absorption, engagement, immersion, and engrossment, but the main concept of the phenomenon is “that of being primarily engaged in the storyline, rather than in one’s immediate environment, and experiencing vicarious cognitive and emotional responses to the narrative as it unfolds.” (Moyer-Guse, 2008, p. 409).

While the dual-processing models argue that the impact of a message depends on the extent to which recipients become involved in the message, these studies conceptualize the

phenomenon as being termed *transportation* by modifying involvement as conceptualized in dual-processing models. As compared to involvement, transportation refers to the feeling of being lost or absorbed in a narrative (Green & Brock, 2002). Transportation can be distinguished from involvement in several areas. Whereas cognitive-processing models imply readers' attention to message arguments, transportation focuses on readers' immersion in a text itself. In addition, while involvement predicts how people recognize that the message is relevant to them or brings them a desirable outcome in cognitive processing models, transportation is an experience in which people feel caught up in the story itself and not in any consequences extrinsic to the narrative. Green and Brock (2000) suggest that "transportation is considered a convergent process, whereas elaboration might be conceived of as a divergent process" (p. 702). Based on these points, transportation will provide a more appropriate approach to the narrative message that may lead to more story-consistent outcomes. To date, even though there is no clear evidence that differentiates the greater role of transportation on narrative messages over involvement, some attempts have been made to enlighten it. For instance, Wang and Calder (2006, Study 3) found the evidence that transportation operates independently of involvement. They argued that transportation should be treated as separated from involvement and provided one theoretical possibility that involvement may be able to cause transportation but that transportation does not necessarily imply involvement. However, they stated that further research is needed to clarify the relationship between these two variables. Therefore, based on the discussion above, these hypotheses are proposed to provide more clear evidence in this area.

H 1: Participants who are exposed to narrative messages will experience greater levels of transportation than those who are exposed to statistical evidence.

Message Framing

Prospect Theory

There are many ways to construct health promoting messages. In order to promote any kind of action for health, either the potential gains from performing recommended behaviors or the potential losses from not performing them can be portrayed in the message. Narrative messages such as personal stories and testimonies are especially more likely to contain either a gain- or loss-frame. For example, a health campaign message could provide a story about a breast cancer patient who has been suffering painful chemotherapy for years because she did not perform a breast self-checkup and schedule a regular mammography, or a story from a breast cancer survivor who detected her tumor in its early stages through performing regular breast self- and professional checkups and so was able to be cured in a relatively easy and simple way. Both stories are common types of narrative messages shown in health brochures and on health information websites. The former would be a loss-framed narrative message; the latter would be a gain-framed narrative message.

A large amount of literature has reported that health-promoting messages yield different outcomes depending on how the message is framed. According to the prospect theory (Kahneman & Tversky, 1979; Tversky & Kahneman, 1992), gain-framed messages motivate risk-averse behavior (e.g., engaging in preventive behaviors), and loss-framed messages motivate risk-seeking behaviors (e.g., engaging in detective behaviors). To be specific, when recommended behaviors are involved in uncertainty or risk (e.g., blood tests and breast cancer screening), individuals will be more likely to take that risk if the health message is framed in terms of losses; however, when the recommended behaviors have little uncertainty or risk (e.g., exercise and healthy eating), individuals will be more likely to accept the behaviors if the health

message is framed in terms of gains (Salovey, Schneider, & Apanovitch, 2002; Rothman et al., 2006). In short, the theory predicts that individuals will be more likely to engage in detections when they are exposed to loss-framed messages; individuals will more likely to engage in preventions when they are exposed to gain-framed messages.

Gain- versus Loss-frame

Much empirical research has supported the premise of the prospect theory. This phenomenon is called “prevention-detection distinction” (Salovey et al., 2002, p. 394). On the one hand, some evidence has consistently supported that gain-framed messages motivate more prevention behavior than loss-framed messages. For example, Detweiler, Bedell, Salovey, Prinon, and Rothman (1999) distributed either gain- or loss-framed health brochures about skin cancer to beachgoers. They found that people who read gain-framed brochures, compared to those who read loss-framed brochures, were significantly more likely to have intentions to request a sample of sunscreen offered by researchers, to repeatedly apply sunscreen, and to use sunscreen over SPF 15 or higher. Millar and Millar (2000) also found that gain-framed messages promoting safe driving were more effective at encouraging participants’ intention to perform safer driving behaviors than did loss-framed messages. Schneider and colleagues (2001) distributed visual and auditory messages about tobacco smoking emphasizing either gains from quitting smoking or losses from failing to quit smoking to undergraduate students. They also found that the gain-framed message was more persuasive than the loss-framed in attitude and intention to quit smoking. Gain-framed health messages promote prevention behaviors, such as sunscreen use (Rothman, Salovey, Antone, Keough, Martin, 1993), physical exercise (Robberson & Rogers, 1988; Gray & Harrington, 2011), condom use (Linville, Fischer, & Fischhoff, 1993), and so forth.

On the other hand, other studies reported that loss-framed messages, which are about losses from failing to get screened, were more effective in promoting risk-seeking behaviors (detection) than gain-framed messages, which are about gains from screening. For example, Meyerowitz and Chaiken (1987) found that individuals who were exposed to the message emphasizing losses from not performing breast self-examinations (BSE) were more motivated to perform BSE than those who were exposed to the message focusing on gains from performing BSE. Likewise, Cox and Cox (2001) reported consistent results that negatively framed messages about breast cancer detection behavior are more persuasive than positively framed messages.

However, some studies (Lauver & Rubin, 1990; Lerman et al., 1992) have failed to find the beneficial effects of message framing on abnormal screening behaviors. In fact, previous findings, especially for the effect of loss-framed messages, are mixed. Moreover, two recent meta-analytic reviews (O’Keefe & Jensen, 2006, 2009) strongly cast doubt on the effect of loss-framed messages on detection behaviors. The authors reviewed 53 studies that examined the persuasive effect of message framing on disease detection behaviors. They found that loss-framed appeals have only a small statistically significant advantage for the messages emphasizing breast cancer detection behaviors, but not for detection behaviors associated with other diseases, including skin cancer, other cancers, and dental problems. In other words, it needs to be studied whether loss-framed messages have an actual impact on promoting positive attitude and intention toward detection behaviors for other diseases besides breast cancer.

H2: Loss-framed messages will be more effective than gain-framed messages in promoting (a) positive attitude toward detection behaviors and (b) intention regarding the detection behavior.

Transportation and Message Framing

Message involvement has been considered a moderator for the effect of message framing (Block & Keller, 1995; Maheswaran & Myers-Levy, 1990; Millar & Millar, 2000; Rothman, Martino, Bedell, Detweiler, & Salovey, 1993; Rothman & Salovey, 1997; Shiv, Britton, & Payne, 2004). Whereas loss-framed messages are more effective when people are involved and systematically processing the message, gain-framed messages are more effective when people are less involved and heuristically processing the message. For instance, Block and Keller (1995) examined the role of involvement as a moderator on the effect of message framing for sexually transmitted diseases and skin cancer. They manipulated involvement by altering perceived efficacy based on the previous study (Gleicher & Petty, 1992), suggesting that when individuals were assured the protective behavior was effective, they were less likely to scrutinize the message than when they were doubtful as to the effectiveness of protective behavior. The authors hypothesized that among subjects in a low efficacy condition (high involvement), loss-framed messages would be more persuasive than gain-framed messages, and that among subjects in a high efficacy condition (low involvement), both loss- and gain-framed messages would be equally effective. The findings confirmed these hypotheses.

Cox and Cox (2001) attempted to enlighten the relationship between message type (narrative versus statistical evidence) and message framing (loss- versus gain-framed messages). The authors assumed that individuals who are exposed to narratives would yield high involvement so that loss-framed messages would be perceived as more persuasive and more informational and would elicit more positive attitude and belief toward breast cancer detection behavior than gain-framed messages. They also hypothesized that individuals who are exposed to statistical information would yield low involvement; thereby, message framing would have less influence on attitude and belief toward the recommended preventions than those in the

narrative condition. The findings showed that people were more involved in narrative than statistical information, and that loss-framed narratives were more persuasive than gain-framed narratives. As hypothesized, statistical evidence yielded no significant difference between loss-frame and gain-frame.

These findings are meaningful for narrative studies. However, the authors treated narrative as a high-involvement, arousing message and did not examine the role of transportation on message framing. Based on the transportation theory, however, transportation should be examined to understand the effect of narrative messages. Notably, there is no study examining the relationship between transportation and message framing for promoting detection behaviors. One recent study (Gray & Harrington, 2011) attempted to investigate the interactive effect between narrative messages and message framing in the context of promoting regular exercise (prevention behavior). They hypothesized that a gain-framed narrative would be more effective in promoting positive belief, attitude, intention, and perceived message effectiveness than the other three conditions (gain-framed statistics, loss-framed narrative, and gain-framed statistics), but failed to find any significant interaction. Thus, to provide more evidence for those remaining questions about the interaction, the present study will examine the relationship between transportation and message framing in the context of promoting cancer detection behaviors. Based on this discussion, the following hypotheses are proposed.

H3: The level of transportation will be associated with (a) a more positive attitude toward detection behaviors and (b) intention regarding the detection behavior.

H4: Among high-transported participants, loss framing will be more effective than gain framing in promoting (a) positive attitude toward detection behavior and (b) intention regarding the detection behavior.

CHAPTER 3

METHODOLOGY

Overview

An experiment was conducted to answer the research questions and examine the hypotheses. An experiment with a 2 (message type: narrative message vs. statistical evidence) x 2 (message framing: gain frame vs. loss frame) between-subject factorial design was conducted. To examine the relationship the persuasive outcomes and particular health message strategies, it was necessary to develop a study that centered on a specific health issue. For this study, the issue of skin cancer was chosen because: (a) it permitted investigation of multiple health message strategies that urge to engage in relatively easy and economic persuasive outcomes (b) skin cancer is the most common types of cancer for young adults in the United States but the most preventable cancer by performing regular detection behavior.

Participants

A total of 168 college students were recruited from undergraduate communication classes at a large southeastern university in the United States. Because the intention to protect themselves from skin cancer risk is important in this study, answers from ethnicities other than Caucasians were excluded, resulting in a total of 130 usable samples. The participants' mean age was 22 ($SD = 2.40$) and 55.4 % of participants were female. Participants were offered extra credit as compensation. All participants were randomly assigned to one of the following four

conditions: (a) gain-framed narrative message ($n = 32$), (b) gain-framed statistical evidence ($n = 32$), (c) loss-framed narrative message ($n = 35$), and (d) loss-framed statistical evidence ($n = 31$).

Procedure

Participants received a web link. Once they clicked the link, they were directed to the informed consent form of the study followed by IRB instructions. If they agreed to participate in the study, they were randomly assigned to one of four experimental conditions. First, participants were exposed to the experimental stimuli. After reading the given message, they were asked to click ‘next’ to answer a series of measures. On the next page, participants were instructed to fill out survey questionnaires including transportation, behavioral intention, attitude toward preventions, and demographic information. Once the participants completed the questionnaires, they were debriefed, thanked, and dismissed.

Stimulus

The current study manipulated four message conditions following the previous study (Gray & Harrington, 2011), which examined the interaction between message type and message frame. In this study, narrative message was operationally defined as a personal story related to skin cancer that focused on an event and that provides appealing detail, characters, and some plot, presented in the first person (Winterbottom et al., 2008). Statistical evidence was defined as an argument that contains statistical evidence about skin cancer such as incident rate and death rate in the United States.

Following Bruner’s criteria of narrative (1986), a personal story with a clear beginning, middle, and end about the event regarding skin cancer was told in narrative conditions. The story character was clearly described as a female college student. The story was very detailed about the procedure of cancer diagnosis and treatment and was a personal story full of feelings. The

statistical evidence was composed of skin cancer facts and statistics, including skin cancer occurrence rate and death rate. The main focus in both the narrative and statistical evidence emphasized the danger of skin cancer. It also focused on the importance of performing detection behaviors such as monthly self skin-examinations and professional examinations when suspicious moles were found on the skin as a means to prevent skin cancer. All health information contained in the stimuli was based on health information found on credible health websites such as CDC, NIH, and The American Cancer Society.

For the message framing, the operational definition of message framing followed the definition from previous studies (Cox & Cox, 2001; Rothman et al., 2006). Loss framing was defined as losses from failing to perform preventive behaviors, and gain framing as gains from having performed preventive behaviors. In this study, a loss-framed message was manipulated to focus on the potential negative outcomes such as long and painful treatment and likelihood of death when people did not perform detection behaviors. A gain-framed message was manipulated to emphasize the likelihood of preventing skin cancer through performing regular detection behaviors. For a complete version of stimuli, see Appendix A.

Measurement

Transportation. Eleven items developed by Green & Brock (2000) were used to examine participants' transportation experience into the stimuli while they read the message. Sample items included: "While I was reading the message, I could easily picture the events in it taking place" "I could picture myself in the scene of the events described in the message" and so forth (See Table 3.1). Participants were asked to indicate how much the statement represented their experience while reading the message on 7-point Likert scales (1 = *Strongly disagree*; 7 = *Strongly agree*). The items were analyzed for reliability and revealed good internal consistency,

$a = .84$. Therefore, the 11 items were averaged to create a transportation scale ($M = 4.36$, $SD = .93$, ranged from 1 strongly disagree to 7 strongly agree).

Table 3.1

Transportation Scale

Statement	Mean	Standard deviation
While I was reading the message, I could easily picture the event in it taking place.	5.51	1.33
I could picture myself in the scene of the event described in the message.	4.91	1.48
I was mentally involved in the message.	5.36	1.26
I found it is easy to put it out of my mind. (Reversed)	3.91	1.49
I wanted to learn how the message ended.	4.78	1.41
The message affected me emotionally.	3.70	1.77
I found myself thinking of ways the message could have turned out differently.	4.03	1.54
I found my mind wandering. (Reversed)	4.21	1.61
The event in the message is relevant to my everyday life.	4.50	1.50
The event in the message has changed my life.	3.09	1.48
I had a vivid image of the message writer.	3.92	1.58
Cronbach's $a = .84$		

Attitude toward detection behaviors

Participants were asked to rate their attitude toward monthly skin self-examinations ranging from 1 – 7, which was comprised of seven pairs of bipolar adjectives including:

“useless/useful,” “unfavorable/favorable,” “bad/good,” “beneficial/harmful,” “important/unimportant,” “foolish/wise,” and “worthless/valuable”. ($M = 5.82$, $SD = .89$).

Intention to engage in detection behaviors

Intention was measured using two items, including: “I intend to perform skin self-examinations once every month ($M = 4.49$, $SD = 1.58$)”, and “I intend to have a professional skin examination if I find anything suspicious on my skin ($M = 5.72$, $SD = 1.29$)”. Participants were asked to indicate their answers on 7-point Likert scales (1 = *not at all*; 7 = *very much*).

Skin cancer experience

Participants were asked to indicate their personal and family history of skin cancer using yes/no items. Items included: “Have you ever had any form of skin cancer?” and “Has anyone in your family, or a close friend, ever had any form of skin cancer”.

Demographic variables

Participants were asked to respond with their gender, age, and ethnicity.

Table 3.2

Dependent Variables

Variable	Range	Mean	Standard deviation
Transportation	1 - 7	4.36	.93
Attitude toward detection behavior	1 - 7	5.82	.89
Intention toward monthly skin self-examinations	1 - 7	4.49	1.58
Intention toward professional skin examination if anything suspicious found on skin	1 - 7	5.72	1.29

CHAPTER 4

RESULTS

Descriptive

The total sample used for data analysis was 130 participants. Of the 130 participants, 72 participants were female (55.4%) and 57 were male (44.6%). All samples were Caucasian and their mean age was 22 ($SD = 2.40$). In the loss-framed narrative condition, there were 19 female participants and 13 male participants. Of the total 32 participants in the gain-framed narrative condition, 21 participants were female and 11 were male. In a the loss-framed statistics condition, 13 females and 22 males answered, and 19 female and 12 male participants were in a gain-framed statistics condition. 82 participants (64.1%) perceived that their skin burns and tans easily. Sixty five participants (50%) reported they have someone in their family or a close friend who experienced skin cancer, and 5 participants (3.9%) answered that they had experienced some form of skin cancer before.

Hypotheses

H1 predicted that participants who were exposed to narrative messages will experience a greater level of transportation than those who are exposed to statistical evidence. To examine the H1, a 2 x 2 analysis of variance (ANOVA) with transportation as a dependent variable was conducted to explore the effect of message type on level of transportation. This analysis revealed a significant main effect of message type for transportation, $F(1, 120) = 12.02, p = .001, \eta_p^2 = .091$. It indicated that participants who were exposed to the narratives message experienced a higher level of transportation ($M = 4.65, SD = .86$) than those who were exposed to the

statistical evidence ($M = 4.10, SD = .92$). However, there was no significant main effect of message framing ($F(1, 120) = 1.33, N.S.$) and no interaction effect on transportation $F(1, 120) = .13, N.S.$. Thus, hypothesis 1 was supported. Table 4.1 presents the means and standard deviations.

Table 4.1

Summary of Means (with standard deviation in parentheses) for the Dependent Variable as Transportation

	Narrative message		Statistical evidence	
	Loss-frame	Gain-frame	Loss-frame	Gain-frame
Transportation	4.71 (.76)	4.58 (.95)	4.21 (.93)	4.35 (.90)

H2a and H2b predicted that participants who are exposed to loss-framed message will report a greater level of positive attitude and intention toward detection behavior than those who are exposed to gain-framed message. To examine these H2a and H2b, another 2 x 2 analysis of variance (ANOVA) with attitude and intention toward detection behaviors as dependent variables was conducted. However, there was no significant main effect of message framing on attitude, $F(1, 122) = .50, N.S.$, intention toward self skin-examination, $F(1, 122) = .42, N.S.$, and intention toward professional skin-check up, $F(1, 122) = .56, N.S.$. And there was no interaction effect between message type and message framing on attitude, $F(1, 122) = 1.44, N.S.$, intention toward self skin-examination, $F(1, 122) = .08, N.S.$, and intention toward professional skin-check up, $F(1, 122) = 1.45, N.S.$. Thus, hypothesis 2a and 2b were rejected. Table 4.2 present the means and standard deviations.

Table 4.2

Summary of Means (with standard deviation in parentheses) for the Dependent Variables as Attitude and intention toward detection behaviors

	Loss-framed		Gain-framed	
	Narrative	Statistics	Narrative	Statistics
Attitude toward detection	5.94 (.98)	5.79 (.90)	6.02 (.66)	5.50 (.95)
Intention toward self-examination	4.78 (1.84)	4.41 (1.46)	4.52 (1.34)	4.31 (1.69)
Intention toward professional checkup	5.94 (1.11)	5.62 (1.33)	5.48 (1.55)	5.72 (1.19)

H3a and H3b predicted that the level of transportation would influence attitude and intention toward skin cancer detection behaviors. To test H3a and H3b, participants' ratings on the transportation scale were categorized into high versus low transportation groups with a median split on the transportation scores ($mdn = 50$, range = 22 - 69). A 2 x 2 analysis of variance (ANOVA), in which the factors were transportation (high versus low) and message framing (loss versus gain), was conducted. The dependent variables included participants' attitudes toward monthly skin self-examinations, intention to perform a self skin-checkup, and intention to have a professional skin-checkup if they found anything suspicious on their skin. The analyses yielded a significant main effect of transportation for promoting positive attitude toward detection behavior ($F(1, 117) = 26.72, p < .001, \eta_p^2 = .186$), indicating that the high transportation ($M = 6.18, SD = .80$) was more effective in promoting positive attitudes toward self skin-checkup than low transportation ($M = 5.40, SD = .84$). In addition, the analyses revealed a significant main effect of the level of transportation for promoting intention to perform monthly self skin examinations ($F(1, 117) = 22.48, p < .001, \eta_p^2 = .161$), indicating that the high transportation ($M = 5.10, SD = 1.43$) was more effective in promoting positive intention toward self skin-checkups than low transportation ($M = 3.82, SD = .80$). Lastly, the analysis yielded a significant main

effect for transportation on intention to perform skin self-examinations, $F(1, 120) = 7.63, p < .01, n_p^2 = .060$, indicating that the high transportation ($M = 6.02, SD = 1.33$) was more effective in promoting positive intention toward a professional skin-checkup than low transportation ($M = 5.38, SD = 1.21$), and intention to have a professional skin examination if they find something suspicious on their skin ($F(1, 117) = 8.66, p = .004, n_p^2 = .069$). These results indicated that high-transported participants have a more positive attitude and intention toward detection behaviors than low-transported participants. Thus, hypothesis 3a and 3b were supported. Table 4.3 presents means and standard deviations.

Table 4.3

Summary of Means for the Effects of Transportation and Message Framing on Persuasion:

	High transportation		Low transportation	
	Loss-frame	Gain-frame	Loss-frame	Gain-frame
Attitude toward detection	6.18 (.86)	6.17 (.73)	5.44 (.92)	5.35 (.77)
Intention toward self-examination	5.17 (1.54)	5.00 (1.31)	3.75 (1.53)	3.88 (1.48)
Intention toward professional checkup	5.97 (1.38)	6.07 (1.27)	5.59 (1.05)	5.19 (1.33)

H4 predicted that loss-framed messages would be more effective in promoting positive attitude and intention toward detection behaviors than gain-framed messages for high-transported participants. The simple effects of message framing were analyzed only for high-transported participants. However, these analyses revealed that loss-framed messages had no effect on attitudes toward monthly skin self-examinations, $F(1, 61) = .06, N.S.$ and intentions toward monthly skin self-examinations, $F(1, 61) = .22, N.S.$, and skin professional-examination if

anything suspicious were found on their skin, $F(1, 61) = .9$, *N.S.* among highly transported participants. Thus, H4 was rejected.

CHAPTER 5

DISCUSSION

In spite of the potential benefits from performing regular detection behaviors against the risk of contracting skin cancer, people tend to be reluctant to engage in those behaviors. Due to the importance of early detection of cancer, many cancer campaigns try to persuade people to perform regular detection behaviors, but it often has a limited effect. To find more persuasive message strategies for encouraging detection behaviors, this study attempted to examine the influence of message style and message framing on attitude and intentions toward detection behaviors. Moreover, the study also focuses on the relationship between transportation caused by narrative and message framing.

The results show that exposure to narrative messages elicits greater levels of transportation than exposure to statistical evidence, and the higher level of transportation increases positive attitude toward detection behavior and intention toward skin self- and professional- examinations. It seems likely that narrative does affect the individuals' decision-making processes and outcomes in a health context. In the context of skin cancer, some previous studies failed to find the persuasive effect of narrative on attitude and intention toward skin cancer detection behaviors compared to statistical evidence (Dunlop et al., 2010; Gray & Harrington, 2011). Yet, this result shows consistent results with the findings (Lemal & Van den Bulck, 2010), implying that when exposed to narratives, the attitude and intention of highly transported individuals were more influenced by the message regarding skin cancer detection behaviors. Thus, the findings strongly supported the premise of transportation theory (Green &

Brock, 2000; Green, 2006), which proposes that narrative messages positively influence individuals' attitude and intention toward detection behaviors and that transportation plays a role as a mediator of the narrative processing.

For the effect of message framing, the results reveal the opposite findings of previous studies (Meyerowitz & Chaiken, 1987; Cox & Cox, 2001), suggesting that a loss-framed message is more likely to increase individuals' positive attitude and intention toward detection behaviors than a gain-framed message. The results show that there is no greater significant effect of loss-framed messages on attitude and intention toward skin cancer detection behaviors than gain-framed messages. However, this result seems consistent with the meta-analyses (O'Keefe & Jensen, 2006; 2009), arguing that loss-framed messages have no significant impact on attitude and behavioral intentions for encouraging detection behaviors for various diseases, including skin cancer, heart disease, and colon cancer, with the exception of breast cancer (e.g., mammogram and breast self-examination). As O'Keefe and Jensen (2009) suggested, the result might lead one to suspect that loss-framed appeals are more persuasive than gain-framed in promoting disease detection behaviors for females but not males. Therefore, it seems likely that future studies using other diseases are needed to examine the problem.

As predicted, the findings show that message framing has no effect on attitude and intention toward detection behaviors for less-transported individuals. However, message framing also has no effect for highly-transported individuals. For high-transported individuals, both loss- and gain-framed messages yielded no influence on attitude and intention toward detection behaviors. One possible explanation is that the effect of transportation may be stronger than message framing, and thereby all high-transported individuals indicated positive attitude and intention toward detection regardless of message framing.

Although previous studies have sometimes used involvement for examining the effect and processing of narrative messages, this result may show a clear difference between transportation and involvement in the message processing. Many studies have considered the message involvement as a moderator of message framing, suggesting that individuals who are involved in the message are more likely to be influenced by a loss-framed message rather than a gain-framed message (Block & Keller, 1995; Maheswaran & Myers-Levy, 1990). However, this study shows that message framing revealed no effect among high-transported individuals. It seems likely that transportation operates independently of involvement in the narrative processing. According to Wang and Calder (2006), involvement can cause transportation, but transportation does not necessarily imply involvement. However, to date, there are limited evidence to understand the difference and the relationship between involvement and transportation. Therefore, further evidence is needed to better explain the phenomenon.

Overall, a major goal of this research is to advance theoretical understanding of the role of transportation, which has been recently proposed as a mechanism of narrative processing in which a person is absorbed into the flow of a story. The second purpose of the current study is to examine the integrated effect of transportation and message framing in a detection-promoting health context. On a practical level, the current results offer evidence for the persuasive effects of narrative health messages on detection behaviors. Health campaigns, which emphasize early detection behaviors such as regular breast self-check up and mammography screening, should adopt patients' personal stories to encourage its readers to follow the recommended detection behaviors. More importantly, it is important that health practitioners primarily focus on the construction of narrative message for effective persuasion. As shown this result, once high enough level of transportation into a narrative message is elicited, message frame has almost no

effect on promoting detection behaviors. To have clear understandings of any possible relationship between transportation and message framing, further study is also needed. Lastly, future study should focus on the influence of other possible variables, such as different media types (i.e., entertainment education program and online chatting), narrative strength, the level of difficulty of recommended behaviors, and social distance between the narrator and audience, on transportation as well as persuasive outcomes.

This study has some limitations. First, this study utilized young college students as its participants. The use of a student sample limits the external validity of the experiment; thereby the findings of this study may not be generalized to other populations. This group may not be as concerned about skin cancer than others. Therefore, future research will benefit from studying other targeted populations who are keenly concerned about skin cancer. Second, this study used intention to engage in protection behaviors as a dependent variable based on the assumption that behaviors are strongly guided by intentions (Ajzen & Fishbein, 1980). However, it should be noted that intentions do not always predict behaviors, especially when individuals are not very concerned about the possible negative health consequences of risks. On the one hand, this limitation will be cleared by examining the groups who are much worried about the possibility to have skin cancer. On the other hand, future study may use a follow-up survey by asking whether they have performed recommended detection behaviors after they are exposed to the message. Third, this study only tested the effect of first-person narrative. Many health promoting messages are also using the third-person narrative and some studies found the impact of third-person narrative on intention to perform detection behaviors (See Winterbottom et al., 2008). Future study may examine the possible different impact of the first- and third-person narrative on transportation and persuasive outcomes. Last, this study did not test the effect of

transportation on attitude and intention toward performing prevention such as avoiding tanning bed and reducing alcohol consumption. Although recent meta-analyses (O'Keefe & Jensen, 2006, 2009) argued that there is no clear evidence of the effect of message framing on promoting prevention versus detection behaviors, there is no study examining the difference of framing in a narrative context. Given that the amount of health information is rapidly increasing, it is essential to investigate more effective way of creating health campaign message.

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APPENDIX A

Loss-framed narrative message

Getting used to a three-inch scar isn't easy. – Katie Donnar, FL.

My name is Katie. I'm 20 years old and was diagnosed with melanoma last year. It was not the skin cancer that can be burnt off, but the deadliest form of skin cancer, that can be fatal if not detected in time. No one in my family had ever had skin cancer, and I thought I had always taken sun protection seriously by wearing sunscreen over SPF 30 and a hat. But I didn't follow the advice of the American Cancer Society to have a monthly self skin-checkup. Consequently, I failed to detect skin cancer early.

One day, I went back home to spend the summer break with my family, and my dad noticed that a mole on the left side of my face seemed bigger, darker, and a different shape than he had remembered. I thought it was not that serious, but I got a skin checkup from my family doctor.

A few days later, my mom told me some bad news: I had malignant melanoma in advanced stages. I was really freaked out. I could die from skin cancer. The very next day, we went to see a melanoma specialist. The doctor found several more suspicious moles, and decided to remove the tumor right away to prevent the cancer from spreading to other organs. The surgery was very painful. I had to spend my summer lying in bed worried I was going to die. A few weeks later, I heard the melanoma hadn't spread to other organs yet, so I wouldn't need to have radiation or chemotherapy.

Because I didn't perform monthly self skin-checkups, I failed to detect it before it developed to advanced stages. I had to undergo painful treatment procedures. Now, I have scars on my left cheek, neck, chest, and arm, and getting used to these scars isn't easy. I am still scared to death because no one knows if it will come back again.

Start to perform a self skin-checkup once a month! If you find anything suspicious on your skin, make an appointment with a dermatologist right away to have professional skin-examination!

Gain-framed narrative

Getting used to protecting yourself is easy. – Katie Donnar, FL.

My name is Katie and I'm 20 years old. No one in my family has ever had skin cancer, and I have always taken sun protection seriously by wearing sunscreen over SPF 30 and a hat. I also have followed the advice of the American Cancer Society to have a monthly self skin-checkup. By doing so, I was able to detect skin cancer in its early stage before it developed too much.

I went back home to spend the summer break with my family. One day, I had my monthly self-skin examination as usual, and noticed that a mole on the left side of my face seemed bigger, darker, and a different shape than before. I thought it was not that serious, but I got a skin checkup from my family doctor. A week later, I simply had the mole removed and was waiting to hear the results with no worries. I thought everything would be fine because there wasn't a lump or anything big.

A few days later, my mom told me some good news: my body is clear now. The doctor said there was a possibility that the mole could have developed into cancer or spread to other organs, if it had not been detected in an early stage. Because I noticed it early by self skin-examinations, it was caught before it became serious.

Now, I still have regular skin self-examinations once a month. Getting used to protecting myself is easy. If I notice new moles and any change on my skin, I will immediately go for a skin examination from a dermatologist. I'm not scared because I know skin cancer is preventable with careful self skin-checkup. Start to perform a self skin-checkup once a month! If you find anything suspicious on your skin, make an appointment with a dermatologist right away to have a professional skin-examination!

Loss-framed statistical evidence

In love with outdoor activities or tanning? Think again.

Skin cancer accounts for nearly half of all cancers in the United States. According to the American Cancer Society, skin cancer is the most common type of cancer, with 1 million cases diagnosed annually, and almost 8,000 people die from melanoma, the deadliest form of skin cancer, every year. Melanoma is the most common form of cancer for young adults 25- to 29-years-old and the second most common cancer in adolescents and young adults 15- to 29-years-old.

Skin cancer is caused by not avoiding sun exposure or not wearing sunscreen. Moreover, it is hard to cure when it is not detected in its early stages. For early detection, you must perform self skin-examinations on a monthly basis, and must immediately visit a dermatologist if you find anything suspicious. Not having a monthly self skin-checkup decreases your chance of beating the disease easily.

In fact, many college students have no family history of skin cancer and think that they have always taken sun protection seriously by wearing sunscreen and a hat. But they may disregard the importance of having monthly self skin-examinations, which is the most effective way to avoid cancer death.

Even if you use a tanning bed only once, your risk for skin cancer increases by 75 percent. If you fail to detect it early by not performing self skin-examinations, your risk of developing skin cancer in advanced stages increases and you will have to suffer from painful treatment procedures such as chemotherapy and radiation treatment, or even death. Start to perform a self skin-checkup once a month! If you find anything suspicious on your skin, make an appointment with a dermatologist right away to have a professional skin-examination!

Gain-framed statistical evidence

In love with outdoor activities or tanning? Think again.

Skin cancer accounts for nearly half of all cancers in the United States. According to the American Cancer Society, skin cancer is the most common type of cancer, with 1 million cases diagnosed annually, and almost 8,000 people die from melanoma, the deadliest form of skin cancer, every year. Melanoma is the most common form of cancer for young adults 25- to 29-years-old and the second most common cancer in adolescents and young adults 15- to 29-years-old.

Skin cancer is preventable by wearing sunscreen with at least SPF 30 and avoiding sun overexposure. Moreover, it is curable when it is detected in its early stages. For early detection, you must perform self skin-examinations on a monthly basis, and must immediately visit a dermatologist if you find anything suspicious. This increases your chance of beating the disease easily.

In fact, many college students have no family history of skin cancer and think that they have always taken sun protection seriously by wearing sunscreen and a hat. But they may disregard the importance of having monthly self skin-examinations, which is the most effective way to avoid cancer death.

Even if you use a tanning bed only once, your risk for skin cancer increases by 75 percent. If you detect it early by performing self skin-examinations, your risk of developing skin cancer in advanced stages decreases and you don't have to suffer from painful treatment procedures such as chemotherapy and radiation treatment. Start to perform a self skin-checkup once a month! If you find anything suspicious on your skin, make an appointment with a dermatologist right away to have a professional skin-examination!