

An Experimental Test of the Effectiveness of
Customized Narrative and Non-Narrative Health Blogs

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ABSTRACT

AMY SHIRONG LU: An Experimental Test of the Effectiveness of
Customized Narrative and Non-Narrative Health Blogs
(Under the direction of Jane D. Brown)

This dissertation examined the persuasive effects of narratives and customization in a health blog on readers' attitudes, self-efficacy, subjective norms, and intention to adopt a health behavior (running for exercise).

Narratives are stories with a beginning, middle, and end that provide information about the characters and plot. Customization refers to matching messages to each individual recipient. Narratives and customization have seldom been examined in tandem as strategies for effective health communication. In this dissertation, the message type (narrative vs. non-narrative) and the customization type between the blogger and each reader (no customization, health behavior-unrelated customization, and health behavior-related customization) were manipulated in a between-subjects pre-post experimental design.

Findings suggest that narratives and customization can be powerful health communication tools if applied appropriately. Readers of the narrative health messages intended to engage in longer periods of running than those who read non-narrative messages. Narrative messages also outperformed non-narrative messages when the health messages were not customized, or were customized with similarities unrelated to running (e.g., both the blogger and the reader liked the color green). Bloggers who shared health-related characteristics with the reader elicited stronger intentions to run and to run for

longer each time than bloggers who were similar but only on characteristics unrelated to running.

The study also showed that narrative and non-narrative messages were processed differently. Customization increased effortful processing (as measured by the number of thought meaning units), but only for non-narrative messages. Narrative messages tended to elicit more positive thoughts than the non-narrative messages.

To mom and dad.

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CHAPTER 1

INTRODUCTION

Evidence for the benefits of healthy lifestyles abounds. Numerous health threats can be minimized with appropriate lifestyle changes. Promotion of healthy lifestyles, therefore, occupies a central place in health communication, which “encompasses the study and use of communication strategies to inform and influence individual and community decisions that enhance health” (U.S. Office of Disease Prevention and Health Promotion, 2004, para. one).

Persuading people to change their lifestyles requires health communicators to craft effective messages. Narratives may be a valuable strategy. As one of the oldest and most basic forms of human communication, narratives, or stories, have existed for thousands of years. Since “all forms of narrative share the fundamental interest in making sense of experience, the interest in constructing and communicating meaning” (Chase, 2003), narratives may have immense persuasive potential. Yet systematic empirical exploration of narratives’ persuasive effects has been scarce until relatively recently. Interest in narratives in the fields of psychology (Green & Brock, 2000), marketing (Escalas, 2004), communication (Slater, Rouner, & Long, 2006), human-computer interaction (Mateas & Sengers, 2003), public health (Hinyard & Kreuter, 2007), and mathematics (R. S. D. Thomas, 2007) has surged in the past decade.

Health communicators increasingly turn to narratives (e.g., personal testimonials and stories in entertainment programming) in creating health campaign messages.

Entertainment narratives created for educational purposes (known as “entertainment education”) have been shown to be effective in health promotion and social change (Piotrow, Kincaid, Roimon, & Rinehart, 1997; Singhal & Rogers, 1999). For example, in one study, a prime-time medical television drama was found to be highly effective in informing the public about mother-to-child HIV transmission (Kaiser Family Foundation, 2008). In another intervention, a photo story book (fotonovela) and a radio story (radionovela) on AIDS prevention led to positive cognitive, attitudinal, and behavioral changes among Latino migrant workers (Mishra, Conner, & Lewis, 1996). Recent theoretical explorations of the possibility of using narratives in cancer communication are promising (Green, 2006; Hinyard & Kreuter, 2007; Kreuter et al., 2008).

Since human memory structures are experience-, or story-based (Schank & Berman, 2002), narratives may be especially effective in conveying health information. Social psychologists have introduced the concept of transportation, “a state in which a reader becomes absorbed in the narrative world” (Green & Brock, 2002, p. 317), as a distinct mental process that may increase the impact of narratives on readers (Green & Brock, 2000, 2002). When the persuasive intent is not as obvious in a narrative as it is in a didactic health message, receivers may be less prone to counter-argue (Slater, 2002a).

A narrative’s persuasive effects may be enhanced when readers find that there are some similarities between themselves and the characters in the narrative. Perceived similarities may help to enhance the transportation experience because it makes it easier for readers to connect, or identify, with characters, thus easing their transportation into the narrative. Such perceived similarities can be achieved by customization.

Customization, also known as tailoring, personalization, and matching, has been found to be another potentially powerful persuasive strategy in health communication (R. P. Hawkins, Kreuter, Resnicow, Fishbein, & Dijkstra, 2008; Kreuter, 2000). According to Kalyanaraman and Sundar (2006), across public health, marketing, psychology, and many other fields, the focal concept is essentially the same: each individual receives messages or products that are distinct from the ones offered to others.

According to Kreuter and colleagues (2000), the first 10 years of customized health communication focused primarily on establishing the effectiveness of customization relative to generic health messages that are not matched to each individual. Kreuter and colleagues argue that it is now time for a second wave of studies that compare different types of customized health messages with each other. The focus of customization research should shift from the question “Does it work?” to more theory-guided smaller studies asking “When and what works best?”

Whereas a number of scholars argue that customization increases message effectiveness (Rimer & Kreuter, 2006), a recent meta-analytic review of customized print health interventions found only small main effects (Noar, Benac, & Harris, 2007). Part of the reason for small effects is the lack of systematic theoretical development in the customization process to determine what aspects are more related to the health issue at hand when compared to others. For example, in a college drinking intervention, with the assumption that recipient gender should matter, scholars designed 21st birthday greeting cards containing gender-customized alcohol-poisoning information and compared the effect with that of the same birthday cards containing generic alcohol-poisoning

information (Hembroff, Atkin, Martell, McCue, & Greenamyre, 2007). They did not find evidence that gender customization enhanced the card's effectiveness.

Another explanation for the small effect is that customization may work differently in different message contexts (e.g., narrative or non-narrative messages). While customization helps to enhance the persuasive outcome through increasing message relevance relative to non-customized messages (Kreuter & Wray, 2003), such effects may be qualified by the context in which customization is applied. When a message is an involving narrative, the audience is likely to be absorbed into the story world, and attitude change may result no matter which part of the narrative has been "matched" to each person. When a message is non-narrative, the audience is less likely to be absorbed and customized aspects may become more salient to each person. In other words, customization may work better in the non-narrative context.

Therefore, both narratives and customization have unique advantages. Narratives increase the possibility that the recipient will be transported into an alternative world. Customization helps to increase perceived message relevance. In this study the interplay of these two message strategies was explored. An experiment was conducted testing the effects of the type of health message (narrative vs. non-narrative) and the type of customization (no customization vs. health-behavior-unrelated customization vs. health behavior-related customization) on recipients' likelihood of engaging in a healthy behavior.

Personal health blogs

A blog, short for weblog, refers to "a web site that contains an online personal journal with reflections, comments, and often hyperlinks provided by the writer"

(Merriam-Webster Online, 2009). The writer of a blog is called a blogger. Compared with entertainment narratives typically disseminated through mass media channels, blogs are more personalized media that allow for more customization. It is easy to change a blogger's characteristics (e.g., gender, age, interests, etc.). Blogs can also be written as narratives or non-narratives, which make blogs a good medium in which the interplay of message and customization types can be examined.

Health has been an important topic in personal blogs. From February to August 2008, almost half of adult American bloggers, or roughly 22.6 million people posted about health (Envision Solutions, 2008). Besides affecting readers' health knowledge (Huang, Chou, & Lin, 2008), personal health blogs may also influence people's intentions and beliefs about their abilities to engage in healthy behaviors in the future. Personal health blogs, therefore, offer an excellent platform with which to test the persuasive effects of customized narrative and non-narrative health messages.

Whether the blog offers step-by-step instruction on how to get rid of acne or a recount of the blogger's journey of smoking cessation, the sharing of personal health experiences is prevalent. Often bloggers recount their health experience like a personal story. For example, one woman recently recounted her three-month diet experience by blogging about how she resisted the temptation to eat cheesecake. Sometimes the same information is presented as non-story-like instructions. For example, this woman could have offered step-by-step "how-to" instructions on how to resist sweet desserts. In this study, the persuasive power of the two forms of narrative and non-narrative blogs is compared.

Although many would think that personal health is a private matter, the majority (more than 60%) of bloggers do not blog anonymously and many reveal personal information in their blogs (Envision Solutions, 2008). Aside from reading about a blogger's health experience, readers can also get to "know" the blogger. Personal information about the writer may play an important role in the extent to which readers learn from the blog.

Matching the right attributes of bloggers to appeal to different readers may help maximize the educational and persuasive effect of the blog's contents. When the blogger's attributes are customized, i.e., portrayed as having similar attributes as the reader, the reader may be more interested because the blogger appears similar. Perceived similarity between senders and receivers of messages, or homophily, has been found to be an important dimension in persuasion (Andsager, Bemker, Choi, & Torwel, 2006; Maccoby & Wilson, 1957).

When telling stories, bloggers may also be seen as characters in a story. Readers may develop close attachments with the blogger/character or even adopt the character's perspective as the narrative unfolds (Cohen, 2001; Green, 2004; Oatley & Gholamain, 1997). When not telling stories, the bloggers may be called sources,¹ which also have been found to be important in persuasion (Chaiken, 1980). Numerous studies in communication, psychology, and marketing research have shown that a source perceived as similar by the receiver is more influential in changing attitudes and opinions than dissimilar sources (Brock, 1965; Feick & Higie, 1992; Simons, Berkowitz, & Moyer, 1970).

¹ This does not suggest that bloggers are not sources when telling stories. Both "source" and "character" can refer to "blogger" no matter whether he/she tells a story.

In this project, a distinction is made between health behavior-related and health behavior-unrelated customization. For example, a blogger who blogs about running may share the same exercise routine (e.g., running for 1.5 miles on a trail every morning) and other aspects of running with a reader. On the other hand, this blogger may share a favorite laptop brand (e.g., Dell) and other characteristics unrelated to running. Relatedness, which is an expressed or manifested similarity relevant to the proposition being advocated (Simons et al., 1970), may play an important role in the persuasion process. If, all else being equal, health behavior-related aspects, instead of health behavior-unrelated aspects, are customized, a health blog's effects may be maximized.

The aim of this study is to test empirically the effects of narratives and customization in a health blog on readers' attitudes toward the health behavior, subjective norms, self-efficacy, and behavioral intentions. The study examines the interplay of narrative and customization in personal health blogs, addressing the research questions: (1) Will a reader be more influenced by a blogger who writes narrative blogs than a blogger who writes non-narrative blogs? (2) Will a reader be more influenced by a blogger who shares characteristics similar to the reader and related to the health issue than a blogger who is similar but only on characteristics unrelated to the health issue? (3) Will related or unrelated characteristics make a difference in both narrative and non-narrative blogs?

CHAPTER 2

THEORETICAL FRAMEWORK

This chapter reviews previous research on narratives and customization. Relevant theories and constructs are discussed and hypotheses are proposed.

Narratives

Narrative defined

There is little wonder that the narrative is placed next to language as one of the most distinctive of human characteristics. Fisher (1984) defined the narrative as a story people tell about themselves and others to establish a meaningful life-world. Jameson (1981, p. 13) called “narrative ... the central function or instance of the human mind.” Lyotard (1984, p. 19) described narratives as “the quintessential form of customary knowledge.” Barthes (1985, p. 251) wrote that the narrative “is present in every age, in every place, in every society.”

It is believed that narratives originate from ancient oral cultures where people shared stories as life experiences. The Latin root for narrative is *narrare*, or “to recount” (Oxford English Dictionary, 2008). In *Poetics*, Aristotle (1996) defined narrative as a story that has a beginning, a middle, and an end. A simpler definition defines narrative as any two events arranged in a chronological or causal sequence (Labov, 1972; Rimmon-Kenan, 2002). Hinyard and Kreuter (2007) offered one of the most comprehensive definitions of narrative: “any cohesive and coherent story with an identifiable beginning,

middle, and end that provides information about scene, characters, and conflict, raises unanswered questions or unresolved conflict; and provides resolution” (p. 778).

Although there are various definitions for narratives, it is generally agreed that the character and the plot are two main components. The character is a crucial structural property (Jacobs, 2002) and driving force of a narrative (Surmelian, 1969). Attachment to a character may be an important determinant of the persuasiveness of a narrative, as the character may serve as an “internal” source of information or beliefs (Green & Brock, 2000).

On the other hand, the plot, also referred to as “narrative discourse” (Abbott, 2008), is a way in which a story, or a narrative, is conveyed. The plot plays a pivotal role in story delivery by “organizing events and actions into a logically unfolding development” (R. H. Brown, 1987, p. 143). These events are usually organized in a temporal order (Labov, 1972).

Narrative transportation

According to Bruner (1986), there are two ways of knowing: the paradigmatic and the narrative. The more scientific paradigmatic way tends to logically verify and test for empirical truth. The narrative is a more subjective way of knowing that stresses the importance of the quality of the experience. The most crucial difference between narratives and non-narratives is the unique ability of narratives to “transport” people to another world and change their attitude through the journey-like experience. Gerrig (1993) was among the first to describe transportation, a phenomenological experience of people’s engagement with narratives, as a process in which people “travel” into the story

world and get changed by the journey. The changes are typically attitudinal, and sometimes even behavioral.

Systematic empirical exploration of narrative transportation was begun recently (Green & Brock, 2000, 2002; Green, Garst, & Brock, 2004). In their seminal work, Green and Brock (2000) conceptualized transportation into a narrative world as “a distinct mental process, an integrative melding of attention, imagery, and feeling” (p. 701). Transportation is a highly involving and integrative process whereby the cognitive and affective resources are concentrated. Green and Brock developed and validated a psychometric scale for narrative transportation and showed that narrative transportation is the mechanism whereby textual narratives persuade people. Subsequently, transportation has been shown to work in multiple modalities, including videotaped personal interviews and entertainment TV dramas (Kreuter et al., 2008; Slater et al., 2006).

How does transportation work? According to Green and colleagues (2004), there are at least three ways through which a vivid-imagery-invoking narrative influences people. First, transportation helps with the suspension of disbelief and the reduction of counterarguments. This can be due to limited mental resources and/or lack of motivation. When a reader, consciously or unconsciously, suppresses his doubt about some of the story elements, his cognitive capacity may be fully committed to imagining events and thus they do not have sufficient mental resources with which to counter-argue. One of the hallmarks of narrative enjoyment is that readers should have a “willing suspension of disbelief”(Coleridge, 1967). Readers may also withhold counterarguments because they do not wish to destroy the pleasure of the narrative experience.

Green and colleagues demonstrated readers' willing suspension of disbelief through a method called Pinocchio Circling. They asked respondents to go over a narrative again after reading it and to circle any passage they believed to be false. Results showed that highly transported readers circled significantly fewer "false" passages than their less transported counterparts and showed greater acceptance of story content (Green & Brock, 2000). So, instead of constantly verifying the truth or falsity of the information in a narrative, transported readers tend to suspend such thoughts to be able to fully enjoy the story.

The second explanation for transportation's influence is that the narrative experience can become a personal experience. Psychologists have found that direct experience with attitude objects results in stronger and more enduring attitudes. Thus, when a reader feels as if he/she has experienced the events depicted in a narrative, his/her attitudes should change more in accordance with the narrative. In addition, a well-written health narrative may create a sense of direct experience, which may later be incorporated into reader's memory as if he/she had actually performed the health behavior (See Loftus & Pickrell, 1995 for false narratives' effect on memory distortion). A reader of a narrative diet blog may later have thoughts like "I may have gone on a diet before. Therefore I should be able to do this one successfully."

Studies of source monitoring have also indicated that imagined events can be misremembered as real events to the extent that the memories had qualities similar to real memories (Johnson, Hashtroudi, & Lindsay, 1993). For example, President Ronald Regan recounted a heroic gunner's deed during World War II as an actual event. The story he told, however, was later revealed as coming from a popular wartime fictional

film, *A Wing and A Prayer* (1944) (Cannon, 2000). When a first-person narrative offers vivid details intertwined with some intriguing plot, a transported individual may even misremember, as President Regan did, the narrative experience as real.

The third means of transportation's influence is through the creation of deep affection for narrative protagonists. The reader-character interaction may make the story more personally relevant to the readers. For example, if a reader strongly identifies with a character, the statement or the deeds of the character may have special influence as the reader may want to adopt this character's attitude or even imitate the character's behaviors. Green (2004) also found that people could be transported even when the portrayal of the character was not entirely positive.

Narrative and non-narrative persuasion

Scholars have compared the persuasive effects of narratives and non-narratives. The findings have been equivocal, however, because of the varying definition of narratives and non-narratives, different control conditions, and more importantly, inappropriate or inadequate theoretical frameworks.

Taylor and Thompson (1982) compared the persuasion outcome of case histories with more abstract or statistical messages. They found case histories to be more persuasive than the others in six of the seven studies they reviewed. The case history usually took the form of narratives while the abstract and statistical information, non-narratives. On the other hand, Allen and Preiss (1997) meta-analyzed 16 studies and found statistical evidence to be slightly more persuasive than narrative evidence.

One possible explanation for such mixed findings is that many of the reviewed studies had methodological problems. Each of the studies and reviews did not use the

same selection criteria to define narratives and non-narratives. For example, narratives were variously defined as case history, testimonial information, or exemplars (which may or may not be in narrative form). Within and across studies, messages were significantly different in length, conveying unequal amounts of information. Another important explanation is that many of the studies relied on the dual-processing models of persuasion, which may not be the most appropriate for studying narrative persuasion.

Dual-processing models include the Elaboration Likelihood Model (ELM) (Petty & Cacioppo, 1986b) and the Heuristic Systematic Model (Chaiken, 1980). According to these models, there are two routes for processing persuasive messages: central/systematic and peripheral/heuristic. When the persuasive message is relevant and the receiver is motivated to process information (e.g., high involvement) and/or has the ability to process information (e.g., sufficient knowledge; high need for cognition), central/systematic processing is predicted to occur. The receivers will be active information processors elaborating messages. In contrast, when the receivers do not find the issue relevant or are not motivated to process information, peripheral/heuristic processing is expected. Receivers will resort to elements not central to the argument and rely on mental shortcuts, or heuristics, to make their judgment. The dual-processing models predict that attitude change through central/systematic processing is more stable and resistant to change while attitude change through the peripheral/heuristic route is less stable.

Narrative theorists argue that the dual-processing models are more appropriate for “arguments, reasoning, claims, and so forth” (Green & Brock, 2000, 2002; Green et al., 2004) included in “overtly persuasive messages addressing issue- or outcome-relevant

topics” than for information imbedded in narratives (Slater, 2002b, p. 174). When the primary processing goal is to assess the validity of the messages, dual-processing theories (Chaiken, Liberman, & Eagly, 1989) are probably most relevant.

Dual-processing theories, however, may not be as effective in explaining the narrative’s influence. For example, dual-processing theories predict that personal relevance should enhance people’s motivation and ability to process information (Petty & Cacioppo, 1984). People will be more likely to engage in central processing when personal relevance is high. When this logic is applied to narratives, if readers are familiar with the location (e.g., home school) where a story containing blatantly false information occurs, they should be more likely to process the story thoroughly enough to reject the false assertions than readers of the same story occurring in an unfamiliar setting (e.g., unknown school). In other words, the school location should moderate the story’s influence.

Following this logic, Prentice, Gerrig, and Bailis (1997) found that away-school stories with false statements inserted were accepted as true and had a significant impact, but were rejected when the same stories occurred at the home school. The acceptance of the false statement was attributed to heuristic processing due to low involvement. Wheeler, Green, and Brock (1999), however, failed to replicate the result using exactly the same methods and stories. They found the acceptance of false assertions regardless of the setting’s familiarity and suggested that personal relevance did not affect narrative processing. They later proposed that a transportation-imagery model offers a more appropriate theoretical framework to explain the processing and impact of narratives. Prentice and Gerrig (1999) later also recognized that neither the Elaboration Likelihood

Model nor the Heuristic-Systematic Model seemed to capture the phenomenological experience of reading stories.

Although a few communication scholars have started to incorporate narrative processing in an extended version of dual-processing models (Slater, 2002b), others have suggested that the existing dual-processing models cannot explain the narrative impact. Theoretically, attitudes formed or changed via transportation should be strong, persistent over time, and resistant to counterargument, even though they may not be “centrally processed” in the dual-processing model’s sense (Green, 2008).

Narrative and behavior change theories

A well-constructed narrative may be especially suitable for health behavior change. The narrative idea can be incorporated in several of the best known and widely used behavioral change theories such as the Theory of Reasoned Action, the Theory of Planned Behavior, and Social Cognitive Theory.

Both the Theory of Reasoned Action (Fishbein, 1980; Fishbein & Ajzen, 1975) and Theory of Planned Behavior (Ajzen, 1991; Ajzen & Driver, 1991) are comprehensive behavioral theories that specify psychological variables influencing behavior. The Theory of Reasoned Action predicts that a person’s behavior is a function of the intention to perform that behavior, which is a function of the attitude toward performing the behavior and the subjective norm (Fishbein & Middlestadt, 1989; Sutton, McVey, & Glanz, 1999). The attitude toward performing the behavior refers to the positive or negative value an individual associates with performing the behavior (Ajzen, 1991). The subjective norm refers to the perceived pressure from other people to perform (or not to perform) the behavior. The Theory of Planned Behavior adds to the Theory of Reasoned Action the

concept of self-efficacy, or perceived behavioral control (Bandura, 1990; Bandura & Adams, 1977).

Narratives should induce a more positive attitude toward performing healthy behaviors than non-narratives because of the transportation process. Non-narrative persuasive messages usually present propositions or facts that do not create alternative worlds for individuals to enter. When a health narrative evokes vivid mental imagery, it may transport readers into the narrative world by inviting the readers to act as protagonists by offering a sense of direct experience, and by allowing the readers to mentally rehearse the health benefits related to that behavior. Taking the earlier diet blog as an example, a narrative account with a plot, and beginning, middle and end, should allow the readers to experience the blogger's happiness with her weight loss more directly and vividly than didactic instructions. This proposed sequence is also consistent with evidence that learning based on first-hand experience is more powerful than that based on information alone (Epstein, 1998; Fazio & Zanna, 1981). A well-written narrative, especially first-person ones (Hinyard & Kreuter, 2007), therefore, should leave readers with a more positive attitude toward performing the behavior they have just read about.

Subjective norms refer to the perceived pressure from others to engage (or not to engage) in a behavior (Ajzen, 1991). Ajzen considers subjective norms a function of the total number of accessible beliefs concerning the expectation from other social referents. Subjective norms include two types of norms: injunctive norms and descriptive norms. Injunctive norms are an individual's perceptions about what other people think he/she should do; descriptive norms are an individual's perceptions of what other people

actually do. The other people can be friends, family members, significant others, or social referents like peers who are similar to the individual. In this dissertation project, subjective norms are conceptualized as derived from similar others as social referents. The message type (narrative vs. non-narrative) should not affect subjective norms. In the diet blog example, readers' perception of whether others expect them to go on a diet should not be different regardless of whether the blogs are written in narrative format or not, because subjective norms are about readers' evaluation of others' behavior and expectations. The message context in which this social referent appears should not matter as much as whether the referent is similar or dissimilar.

Bandura's Social Cognitive Theory (1977) describes a system of triadic determinism of behavior that is governed by cognitive, environmental, and behavioral factors. Observational learning, or vicarious acquisition of knowledge from the social environment, according to Bandura, serves as the primary source of information that promotes both cognitive and behavioral development. By observing other people's behavior, people may acquire information of the full spectrum of challenges and expectations of a certain behavior.

Self-efficacy refers to the belief in one's capability to achieve different levels of performance attainment (Bandura, 1977). Self-efficacy has gained wide acceptance in health communication and behavioral science as well as in behavior change models. For example, the Health Belief Model (Janz, Champion, & Strecher, 2002), Prospect Theory (Meyerowitz & Chaiken, 1987), Cognitive Mediation Theory (Garland, Weinberg, Bruya, & Jackson, 1988), and the Transtheoretical model (Prochaska, Redding, & Evers, 2002) have been modified to include the construct. Self-efficacy is a pivotal factor in Social

Cognitive Theory because it mediates the application of knowledge and skills in behavioral change (Maibach & Cotton, 1995).

Narratives may be especially useful in improving self-efficacy through two of its four² determinants (Bandura, 1977, 1997): vicarious experiences and emotional arousal. Narratives provide better vicarious experiences than non-narratives. Transportation enables people to cognitively rehearse the process and enjoy the benefit of seeing someone else adopting a healthy behavior (Maibach & Flora, 1993). Cognitive rehearsal may help people organize, remember, and engender a greater sense of confidence that the behavior can be reproduced when necessary. Although non-narratives can also encourage people to be confident of performing some behavior directly, people may not be engaged in behavioral rehearsal, or not to the same extent as when they read narratives.

Narratives also can provide positive emotional arousal. People usually make inferences about their capacities from physiological cues such as emotional arousal. Arousal interpreted as positive should increase efficacy beliefs. A well-constructed and involving narrative should be able to engender positive and powerful arousal in readers because transportation can be considered a particularly dramatic example of arousal and attention (Slater, 2002a). Non-narrative health messages are less likely to induce the same level of cognitive or emotional arousal.

Narratives depicting a successful health behavior change should result in positive attitudes toward performing the health behavior and increased self-efficacy, both of

² The other two determinants are performance accomplishments and verbal persuasion. Performance accomplishments refer to actual performance history, which is different from the context of persuasive messages that discuss something yet to be accomplished. Verbal persuasion usually occurs in the form of words from significant others that the person possesses the capabilities to master given tasks or perform designated tasks. Since such words are usually delivered as explicit persuasive messages, they should occur more frequently in the non-narrative context. Since verbal persuasion tends to be less effective than performance accomplishments and vicarious experiences, it will not be considered here.

which are determinants of behavioral intentions. With subjective norms not being manipulated, readers of narrative blogs should have stronger behavioral intentions to perform a healthy behavior advocated in the blogs than readers of non-narrative blogs.

A narrative's persuasive effects may be further enhanced when readers find that there are some similarities between characters and themselves. Similarities may enhance the transportation experience because it makes it easier for readers to connect, or identify, with characters, thus easing their transportation into the narrative.

In this study, as bloggers discuss health issues and reveal personal characteristics, readers may perceive that the bloggers are similar to themselves when the blogger characteristics have been customized to each of the readers. Such perceived similarity may also augment persuasion.

Similarity

In general, people will be more likely to perform a health behavior if they see someone who is similar to themselves perform the behavior. The most effective models typically are people or characters who are similar but somewhat more competent at the advocated behavior (Maibach & Cotton, 1995). A recent study of African American cancer survivors, for example, found that one of the best predictors for a woman to have a positive attitude toward mammography was whether this woman viewed the narrative character as similar to herself (Kreuter et al., 2008).

Similarity defined

The concept of similarity has been studied in communication, sociology, and social psychology (Brock, 1965; Maccoby & Wilson, 1957; McPherson, Smith-Lovin, & Cook, 2001). Similarity refers to the degree to which pairs of individuals are alike with

respect to certain attributes (Rogers & Bhowmik, 1970). Similarity is often used interchangeably with “homophily.” Similarity has been seen as a powerful phenomenon for a long time. Idioms such as “birds of a feather flock together” can be found in many cultures. Aristotle and Plato both stated that similarity “begets” love and friendship (Aristotle, Roberts, & Bywater, 1984; Plato & Jowett, 2000). In this study, similarity refers to the matching of characteristics between bloggers and readers.

Lazarsfeld and Merton’s (1954) seminal study found that communication was more likely to occur between a source and a receiver similar to each other. They further distinguished two types of similarity: “Status homophily,” which includes social demographic dimensions and acquired characteristics; and “value homophily,” which concerns the internal state shaping people’s orientation toward future behavior.

Similarity operationalized

In experimental research, similarity has been operationalized in four ways. The first, “targeted similarity,” is to display characteristics created to resemble the participants. For example, in a study with college students, Swartz (1984) displayed two types of source portraits. One was drawn to visually resemble a typical college student participant while the other was not. Feick and Higie (1992) varied verbal descriptions of the source: One graduated from the same school and shared similar working experience with the participants while the other did not. Such strategies are considered “targeted similarity” instead of “customized similarity” because the same stimuli are created for more than one receiver grouped under different conditions (See Andsager et al., 2006).

The second similarity operationalization, “post hoc similarity,” asks participants to list favorite media characters and then analyzes the traits of the named characters.

Correlations identify the shared characteristics (e.g., age, income) between the characters and the participants *post hoc* (Greenwood, 2007; Hoffner & Buchanan, 2005). For example, if there is a high correlation between the characters' and the participants' age, income, etc., the characters and the participants are considered "similar." Because such a wide variety of characters are named, however, it is difficult in most circumstances to use this approach in subsequent message construction.

The third approach to manipulating similarity, "perceived similarity," presents each participant with the same generic stimuli and asks each participant to indicate the degree of perceived similarity with the character(s) (Oatley, 1999). Maccoby and Wilson (1957), for example, presented children with the same two episodes from *Junior G-Men* (1940) that featured both a strong male and a strong female lead. They found that children responded differently to the character of their own sex than the character of the other sex.

Both the second and the third approaches to manipulating similarity are based on the idea of perceived similarity, which refers to the extent to which an individual believes a portrayal seems to realistically reflect his/her own traits (Austin & Meili, 1994). The second approach does not control for any external confound such as the plot, however, and the third approach does not customize characters for each participant.

The fourth type of similarity manipulation, or "imagined similarity," asks participants to psychologically construct the level of similarity. For example, the visual feedback (Herbst, Gaertner, & Insko, 2003; Wetzel & Insko, 1982) method from interpersonal attraction research in social psychology usually shows participants a graph that visually depicts the level of similarity on a scale. Similarly, Park and Schaller (2005)

asked participants to imagine that the source gives the same or different attitudinal answers.

In this dissertation, similarity is operationalized by including blogger characteristics uniquely matched to each individual reader. Different from targeted similarity and perceived similarity, each participant (in customization conditions) is a unique audience who receives unique blogs customized to their individual characteristics. Each message is created with a unique audience member in mind. In the health blogs written for this study everything besides the bloggers' personal characteristics are the same. This provides better contextual control than post hoc similarity. More concrete than imagined similarity, each participant receives messages from a source who actually shares some similar characteristics.

Effects of similarity

Since the early 20th century, social scientists have studied group formation and network ties, finding ample support for similarity theory. For example, Tarde (1903) noted that social relations are generally formed between individuals similar in occupation and education. In the 1920s, Bott (1928) and Wellman (1929) noted that children formed friendships and play groups at higher rates if they were similar in demographic characteristics. Numerous studies since then have consistently demonstrated the same pattern. Sociologists (McPherson et al., 2001) argue that geographical locations, family ties, school, work, voluntary organizational foci, and isomorphic sources such as occupation all underlie the phenomenon of similarity.

The power of similarity has also been documented in communication, interaction, and social influence. Incidental similarities of birthdays increase interpersonal pro-social

and helping behaviors (Burger, Messian, Patel, del Prado, & Anderson, 2004); people are more willing to help a hypothetical person who shares similar attitudes (Park & Schaller, 2005); and similarity enhances attraction (Berscheid & Walster, 1974) and interaction (Huston & Levinger, 1978). Evolutionary psychologists (Fletcher & Mitchener, 1987), like some sociologists, argue that similarity, especially facial similarity, is related to genes and the survival instinct. In other words, similar-looking people are more likely to be genetically related. When similar people start to favor each other and interact more, the group as a whole may have higher survival probability.

In human-computer interaction research, virtual agents mimicking the head movement of participants were rated to be more persuasive and more positive than non-mimickers (Bailenson & Yee, 2005). In advertising and marketing research, similarity between salesmen and consumers has led consumers to change purchase preference (Brock, 1965) and rate the endorser to be more friendly (Swartz, 1984). In political psychology, a recent study found that political candidates whose faces morphed with faces of participants led to more positive ratings of the candidates (Bailenson, Iyengar, Yee, & Collins, 2009, in press). When children, adolescents and college students think that media characters are similar to them, they identify with the characters more strongly (Hoffner, 1996; Hoffner & Buchanan, 2005; McDonald & Kim, 2001). In health communication, perceived similarity between a college student exemplar in a magazine article and readers resulted in increased persuasion (Andsager et al., 2006).

In narrative research, Green (2004) found that similarity between a character and readers could affect the readers' ability to relate to the character. Readers are more likely transported by narratives when they share similar experience, knowledge, or background

with a narrative character. For example, when people read a narrative featuring a homosexual man attending his college fraternity reunion, individuals who had a homosexual friend or family member, and who were members of fraternities were more likely to be transported and to show more story-consistent beliefs than readers who did not have such characteristics.

Source-receiver similarity may not always be an important factor in persuasion (O'Keefe, 2002), however. Stiff and Mongeau (2002) even suggest that source similarity is usually unrelated to persuasion. Such lack of relationship may be because the domain of similarity was not to the point or not presented in the best way. In this dissertation, the source's role in persuasion is treated as an empirical question.

Mechanisms of similarity

Scholars have proposed various explanations for the power of similarity. There are two main perspectives on the source similarity effect in advertising research (Feick & Higie, 1992). The first comes from the source attractiveness model, which suggests that similar sources are influential because people identify with them more (Kelman, 1961; Norman, 1976). The second suggests that source similarity should be considered as information. The effectiveness of a source's persuasive intention may depend on the degree to which the source's image matches up to the self-concept of the receiver and the product because the match-up will become relevant information for the product (D. I. Hawkins, Best, & Coney, 2001; Kamins, 1990).

Social Comparison Theory (Festinger, 1954) and Consistency Theory (Darley & Aronson, 1966) offer two social psychological explanations. Social Comparison Theory suggests that people evaluate their own attitudes by comparing them with similar others.

Both theories predict that agreement from a dissimilar source tends to make judgments unstable or decrease confidence in attitude. Confidence in attitude should increase when similar others agree.

Interpersonal communication scholars (Rogers & Bhowmik, 1970) suggest that individuals enjoy the ease of interacting with similar others since talking with different others would require more effort to make communication effective. Communication with dissimilar individuals may also lead to cognitive dissonance that may result in an uncomfortable psychological state.

Classical Conditioning Logic (CCL) (Byrne, 1971; Clore & Byrne, 1974) underlies most of the explanations for the power of similarity. CCL suggests that similarity is inherently reinforcing because it offers consensual validation for a person's own characteristics, attitudes, and identity (Festinger, 1954). Similarity is therefore assumed to be an unconditioned stimulus evoking implicit positive affective responses. The self-serving bias (Sedikides, Campbell, Reeder, & Elliot, 1998) offers a similar explanation: People have an innate tendency to think positively of themselves and their positive views of themselves will extend to others when others exhibit similar characteristics (J. D. Brown, 1986).

All of the aforementioned theoretical perspectives have two things in common: One, similarity has something to do with the self. Two, as long as one's self-concept is not threatened, similarity should result in positive evaluation of the other and this positive response should facilitate processing of messages.

Processing source similarity

In this dissertation, the effect of customized character similarity was focused on in narrative and non-narrative health messages. When the messages are non-narrative, dual-processing models explain how similarity between the blogger and the reader may lead to increased persuasion (Fleming & Petty, 2000; Mackie, Worth, & Asuncion, 1990; O'Keefe, 2002). A similar source (or in-group member) has been found to be more persuasive than a dissimilar (or out-group member) source (Mackie et al., 1990).

Evidence of which type of processing source similarity induces seems inconclusive. The source similarity's effect on processing styles may be influenced by factors such as whether the issue at hand is group-relevant (Mackie, Gastardo-Conaco, & Skelly, 1992), whether the recipient is aware of the source's position beforehand (Mackie et al., 1992), and whether the group membership is made salient (McGarty, Haslam, Hutchinson, & Turner, 1994).

In the original ELM model, source similarity is seen as a cue operating via the peripheral route (Petty & Cacioppo, 1984). For example, source characteristics such as category membership (Kelman, 1961) may operate as a heuristic because participants may think the source is more attractive. An alternative explanation is that participants may easily consider a similar other as an appropriate reference to reality when there is no readily accessible other information (Festinger, 1950).

On the other hand, source similarity may encourage more effortful cognitive processing and scrutiny of the blog. Perceived similarity between the blogger and the reader should increase personal relevance, which refers to the extent to which the blog concerns the reader personally. Many studies have shown that personal relevance (Petty

& Cacioppo, 1984) helps to increase readers' motivation and ability to process a message. Similarity should increase the blog's personal relevance to each reader, who then should be more motivated to engage in central/systematic processing of the blog.

Mackie and Wright's (2001) research on in-group membership and persuasion also help to explain how a similar source may encourage readers to engage in systematic processing because in-group membership can be seen as a type of similarity. If accuracy is the recipient's goal, the message from a similar source should provide information of high interest and diagnosticity, which increase processing motivation. Increase in processing capacity may result from the activation of category-relevant information induced by the recognition of similarity. Therefore, similarity may not only increase the processing motivation but also processing capacity.

In this dissertation, source similarity is expected to evoke systematic processing instead of heuristic processing when the persuasive messages are non-narrative. The blog content is more prescriptive than descriptive. Its purpose is to persuade the readers to start a new health routine, which is highly self-relevant. The operationalization of similarity has also gone beyond the original crude category membership both in depth and width, which should make the readers less likely to treat the similarities between the bloggers and themselves as heuristic cues. Indeed, persuasion scholars have consistently shown that as personal relevance increases people do more central processing of the arguments (Petty & Cacioppo, 1986a).

Source-receiver similarity should increase personal relevance, which in turn, should motivate receivers to engage with and process the narratives. In his work on film narratives, Tan (1996) considered viewers' narrative interest as a self-enhancing process

that leads to more cognitive and affective engagement, which helps to make the narrative experience more rewarding. When the messages are narrative, similarity may also lead to increased transportation. According to Green (2004), similarity may make it easier for readers to create mental imagery of the narratives, which leads to further narrative enjoyment. Similarity may also encourage *reminders*, i.e., links between the narrative and the readers' own life (Larsen & László, 1990). After reading a narrative with a similar character, individuals may generate story-consistent beliefs and apply those thoughts to their own lives.

Customization

In this dissertation, the similarity between the blogger and audience is achieved through customization, a comparatively new term that is about providing products, services, and messages designed for each unique individual.

Customization defined

A bill is one of the most common forms of customization. Customization first appeared in manufacturing of products. Davis coined the term “mass customization” in his seminal book, *Future Perfect* (1987), arguing that technology would play a pivotal role in customization. Several years later, Pine (1993) defined the goals of customization as providing enough variety so that everyone could find exactly what they want.

Customization has since been adopted in a wide variety of industries and disciplines. It has been referred to as “segmented marketing” (Dickson & Ginter, 1987), “niche marketing” (Shani & Chalasani, 1992), “agile manufacturing” (Kidd, 1994), “adaptive interface,” (Billsus, Brunk, Evans, Gladish, & Pazzani, 2002), “personalization” (Murthi & Sarkar, 2003), “matching” (Petty & Wegener, 1998), and

“tailoring” (Kreuter et al., 2000) in different contexts. No matter under which label, Kalyanaraman and Sundar (2006) argue, customization is fundamentally about matching messages to the self. In this dissertation, customization is defined as matching characteristics of the health blogger with those of each reader.

Customization differs from targeting, because customization is more specialized and is created for each individual rather than demographic groups³. While targeting involves reaching small segments of the people based on their individual differences (usually demographics), customization addresses people more specifically (Noar et al., 2007). Each recipient gets something distinct and unique (Gilmore & Pine, 2000; Kalyanaraman & Sundar, 2006).

Customization operationalized

Customization is accomplished through different strategies, which are named differently across fields. Three approaches have been developed for web customization (Mobasher, Dai, Luo, Sung, & Zhu, 2000). The first depends on manual decision rule systems based explicitly on user-supplied information. Users provide information to message creators, who customize messages in return. For example, after a user finishes online registration, he/she will be greeted with his/her name when logging in. The second approach is content-based filtering, which collects information and delivers similar content as recommendations. For example, Buy.com collects information of an individual’s browsing behavior and recommends related products. The third approach is a collaborative filtering system, or learning community behavior, which provides content

³ While occasionally the end product of customized messages may appear to be the same as that of targeted messages when the total number of categories for customization is limited, customized and targeted messages are still conceptually different because of their priori condition: whether the message is created with an individual or a group in mind.

based on similar preferences of other users. For example, Amazon.com presents information about other consumers' purchases under a "consumers who bought this item also bought ..." section.

In health communication, personalization, feedback, and content matching are three typical strategies of customization that often are used in tandem (R. P. Hawkins et al., 2008). These strategies have gone beyond web-based customization. Personalization explicitly or implicitly informs each individual that the message is designed for him or her. There are three sub-tactics for personalization: (1) directly addressing with recipients' names; (2) overt claims that the messages are created for each individual; and (3) framing messages in a context meaningful to each individual.

Feedback, the second strategy used in health communication, involves presenting people with information about themselves. Types include *descriptive* feedback (i.e., reporting what is known about the recipient based on information collected), *comparative* feedback (i.e., contrasting what is known about the recipient with what is known about others), and *evaluative* feedback (i.e., making interpretations based on individual information). The third strategy, content matching, directs messages to recipients on key theoretical determinants of the outcome behavior of interest (i.e., If a person has not formed a strong behavioral intention, the message will focus increasing this person's behavioral intention. If another person has intended to perform a health behavior but does not have enough skills, the message will focus on skill development.).

In this dissertation, customization takes the form of manual decision rule systems and implicit descriptive feedback. Information about personal characteristics was collected from each individual and then implicitly presented as the blogger's information

in the context of an individualized health behavior. Here customization is operationalized on two levels. First, participants are allowed to choose a health behavior to work on. Second, the blogger's characteristics are matched to those of the readers. The types of blogger characteristics include those related or unrelated to the health behavior advocated. Customization is based on prior input from the participants and is scattered through the health blog they read. In other words, the operationalization of customization adopted here is the *first* approach to web customization that provides *feedback* through *content matching*.

Mechanisms of Customization

Scholars have identified two main explanations for the effects of customization. The first explanation is that customization enhances cognitive preconditions for message processing and acceptance. The second proposes that customization can enhance message impact through selective modification of initial behavioral determinants of goal outcomes (i.e., Once health communicators have identified the most influential determinants of the desired health behavior for each individual, they can customize the health messages with proper emphasis on different determinants for different individuals.) (R. P. Hawkins et al., 2008).

In support of the first proposition, Kalyanaraman and Sundar (2006), for example, showed that customization of a web portal led to an increase in perceived relevance, involvement, interactivity, and novelty, which resulted in more positive perceptions of the portal and more browsing behavior. In Western societies that value individualism (Triandis, 1995), when customization provides people with unique messages, these messages should be better processed and positively evaluated because they provide each

person with self-validation and a positive affirmation of the self-identity (Vignoles, Chryssochoou, & Breakwell, 2000).

In support of the second proposition, Dijkstra, De Vries, and Roijackers (1998) found that customization of the outcome of smoking cessation, when compared with customization of self-efficacy enhancement, led to more changes in positive and negative outcome expectations. In other words, selective customization of different health aspects will alter different psychological variables related to behavior change accordingly.

The exact mechanisms of customization are still relatively unexplored. In this dissertation, similarity and relatedness were focused on as two constructs that may be important to customization.

The power of customization

The power of customization for attitude and behavior change has varied across studies. Many customized health interventions have found positive effects on attitudinal change (Brug, Steenhaus, van Assema, & de Vries, 1996; Kreuter, Bull, Clark, & Oswald, 1999; Rimer et al., 2001). Customization has been found to influence behaviors as well. A recent systematic review of computer-tailored health messages showed the effect to be quite strong (Kroeze, Werkman, & Brug, 2006). Light and Maybury (2002) found customization to elevate user recall and enjoyment. Kalyanaraman and Sundar (2006) have found customized web portals to increase users' browsing activity.

Skepticism about the effectiveness of customization remains, however. In one study, only 14% of consumers said that customized offers and recommendations from retail websites led them to purchase more often (Jupitermedia, 2003). Although several literature reviews suggest that customized health messages work better than the non-

customized (Kroeze et al., 2006; Revere & Dunbar, 2001; Rimer & Glassman, 1999; Skinner, Campbell, Rimer, Curry, & Prochaska, 1999), several more systematic and quantitative meta-analyses have found only small effect sizes (Edwards et al., 2006; Lancaster & Stead, 2005). A recent meta-analysis of print-based customized health messages found the effect size to be less than small (Noar et al., 2007).

In their book on health message tailoring, Kreuter and colleagues (2000) identified only the Elaboration Likelihood Model (Petty & Cacioppo, 1986b) as the theoretical rationale for customization. There are at least two problems with relying on the Elaboration Likelihood Model. First, although the ELM offers an explanation for why customization may be effective (increasing message involvement and thus central route processing), it is mostly from a posteriori point of view. More priori theoretical perspectives might help create more effective customized messages. Second, the ELM was designed with traditional didactic non-narrative messages in mind but narratives may be processed differently.

Another explanation for the relatively small effects of customization or tailoring in health communication is that most health messages have customized only one or two variables at a time (Kreuter et al., 2000). As technological innovations make customization of health messages easier on a number of attributes as well as more accessible for both the sender and receivers, it is important to assess which kind and how many characteristics are important in effective customization. Even if a message may have been customized for an individual, the message's persuasive effect may not be maximized because customized characteristics may be too few or not sufficiently related to the health issue.

Customization also may have situational requirements. For example, Kreuter and Wray (2003) identified three situational considerations that should enhance the effectiveness of customization. First, there should be some variance among the target audience so that the messages will not end up being generic. Second, the target audience should understand the health issue to some extent so that they could provide health communicators with their information in a meaningful way. Third, there must be some mechanism to help gather information from the population. The small effect sizes observed in recent studies may be because the general situational considerations for customization have not been met.

Besides the three constraints, a more serious problem is that many projects, especially those in public health, might have customized “wrong” elements in a message from the start. For example, in the 21st birthday card for excessive drinking prevention project (Hembroff et al., 2007), the message creators thought gender customization would be effective in making more students, especially males, receptive to the health message. The results indicated, however, slightly more females than males remembered the health information. These studies may have customized aspects assumed to be related by the researchers, but were not actually effective to the actual recipients of the messages. The relatedness of the characteristics to be customized, therefore, deserves more attention.

Relatedness

While customization helps create highly similar bloggers for each reader, similarity may be an unstable concept (Goodman, 1972). Similarity properties may vary according to different contexts. For example, in a cancer survivor support group, a woman may find another woman to be similar and more influential in persuading her to

continue with chemotherapy because they both have the same type of a rare breast cancer. This woman, however, probably will not find this other woman similar or persuasive regarding politics if they are affiliated with different political parties. In other words, although both women are still similar, their perception changes according to different issues of interest. Perceived similarity is also different from actual similarity. Goodman (1972), therefore, argues that similarity must be studied in conjunction with issue relatedness, i.e., whether the similarity is related to the issue at hand.

To produce the ideal persuasive outcome, customized aspects should be related to the theme of the message. For example, a health communicator trying to persuade someone who has engaged in high risk sexual behaviors to test for HIV will probably not succeed by merely pointing out that they both favor the same brand of canned nuts.

Relatedness is similar to perceived relevance. Both vary from context to context (Chiappe, 1998). Relevance differs from relatedness in that relevance refers to some expressed or manifested similarity *logically* related to the proposition being advocated (Aronson & Golden, 1962; Berscheid, 1966). Simons and colleagues (1970) suggested that relevant similarities may or may not be *psychologically* related to the proposition, however. Relatedness, on the other hand, refers to some expressed or manifested similarity *psychologically* related to the proposition (based on participants' perceptions) and may or may not be *logically* related to the proposition. In the context of customization where everything is based on individual user's psychological perception, logical assumptions no longer applies because it usually assumes an external judgment of some absolute rule instead of coming from individual perspectives.

Relatedness has been studied in social psychology and advertising. Berscheid (1966), for example, found that related similarities induced more attitude change than unrelated ones. Swarz (1984) varied the occupational similarity (e.g., college student vs. nutritionist vs. receptionist) in a macaroni and cheese advertisement and found no effect of the irrelevant similarity. Thus, only similarities that are related to the theme of the message are likely to influence the persuasive outcome (Michinov & Monteil, 2002).

Goodman (1972) proposed that two entities should not be considered similar unless they possess related common contextual properties. People tend to use related rather than unrelated similarities as the basis for judgment (Read, 1984). Simons and colleagues (1970) also suggested that unrelated similarities merely help to gain rapport and produce little persuasion effect. Therefore, it is likely that the lack of relatedness to the health condition may underlie the non-significant and small effects found in many customized health interventions.

Differential similarity effects may also result in difference in perceived source credibility (Simons et al., 1970). Source credibility includes factors such as perceived trust, respect, and attraction. Source customization has been found to enhance perceived source credibility (Campbell et al., 1999). The persuasive intention of a source should be perceived as more genuine when the source has been customized with related similarities. A source that presents many similarities unrelated to the issue at hand may rouse suspicion in the readers and reduce credibility. Green and colleagues (2004; 2003), for example, reported a study in which manipulation of the narrative character's gender to be similar with the reader's did not affect transportation or persuasion. Gender may have been perceived as only a superficial similarity in the context of that study.

In this dissertation, customization is operationalized in three conditions: no customization, health behavior-unrelated customization, and health behavior-related customization. The total number of customized characteristics remains constant. Since similarities are realized through customization, which stresses the preferences of individual readers, the relatedness refers to similarity information revealed by bloggers that are *psychologically* but not necessarily *logically* related to the outcome of the health behavior, i.e., whether the readers will perform the health behavior advocated in the blogs. For example, in the diet blog mentioned previously, the message designers may consider the number of children the blogger has as *logically* related to diet. In this dissertation, the number of children would be considered a related characteristic for customization only if the reader perceives it to be related *psychologically* to diet. In other words, relatedness is based on individualized relative perception, not some universal principles or expert opinions (See Quintiliani, 2006).

Effects of customization and relatedness

To sum up, similarity between the source and receiver related to the message theme should increase persuasion. If readers of customized non-narrative blogs process messages with higher engagement, they should evaluate the relatedness of customized characteristics with a heightened sensitivity. When a blogger claims to have many health behavior outcome-related similarities, readers should consider the blogger to be more credible and should be more persuaded to perform the health behavior.

On the other hand, when a blogger is customized with many similarities unrelated to the outcome of the health behavior, the reader may consider the blogger as a less credible advocate for that particular behavior. No matter whether the similarity is related

or unrelated to the health behavior, both customized blogs should be more persuasive than non-customized blogs. In other words, health blogs featuring a blogger who shares similarities that are perceived to relate to the health behavior advocated should be more persuasive and influential than a blogger with unrelated similarities, who should be more persuasive and influential than a blogger with no similarities. The attitude toward performing the behavior and self-efficacy, accordingly, should be greater for bloggers with related similarities than for bloggers with unrelated similarities and greater than for bloggers with no similarities.

As for the third TPB-predicted determinant of behavioral intention, subjective norms, since similar others have been found to increase the norm evaluation (Maibach & Cotton, 1995), no matter whether the similarity is related to the health behavior, both customized conditions should produce higher subjective norms than non-customized conditions because similar others usually are perceived to have more influence than non-similar ones.

Interaction between narratives and customization

Although similarity may help to increase transportation, similarity is not a necessary condition for transportation to occur (Slater & Rouner, 2002). It is possible that a skilled writer may make a story seem more relevant to his readers through elements other than the character-reader similarity, e.g., vivid descriptions and involving narrative sequences, no matter whether the characters resemble the readers or not.

Similarly, although relatedness may help to increase transportation (Green, 2004), the customization effect may not be as pronounced as in non-narrative conditions. When the customized blog messages are written as narratives, readers may be engaged with the

stories and may not scrutinize messages or evaluate the relatedness of customized characteristics as logically as those in the non-narrative conditions. In other words, when a narrative capable of invoking vivid mental imagery transports its readers, the similar characteristics between the blogger and the readers may play less of a role in the persuasion process, no matter whether the similar characteristics are related or unrelated to the health behavior.

Therefore, there should be an interaction effect between narratives and customization, which should be more effective in non-narratives.

Hypotheses

In this dissertation, the persuasive effects of no customization, health behavior-unrelated customization, health behavior-related customization in a narrative and non-narrative context were tested. One independent variable was the message type: narrative or non-narrative. The other independent variable was the customization type: no customization, health behavior-unrelated customization, and health behavior-related customization. The effect of exposure to a health blog on readers' subsequent attitudes toward the health behavior, subjective norms, self-efficacy, and behavioral intentions was explored. Three sets of hypotheses were proposed.

Hypothesis 1a: Narratives should produce more positive attitudes toward performing a health behavior than non-narratives. Narrative blogs can offer readers direct experience by bringing them into the story world, may reduce counterarguing, and possibly, enable readers to develop affective relationships with the protagonist. More positive behavioral beliefs are expected to influence the attitude toward performing the behavior.

H1a: *Readers of a narrative health blog will have a more positive attitude toward performing the health behavior than those who read a non-narrative health blog promoting exercise.*

Hypothesis 1b: A well-written first-person narrative inducing vivid mental imageries should create a sense of direct experience, which may later be incorporated into the reader's memory. Readers can cognitively rehearse the process as they read about someone else's process and vicariously enjoy the positive outcome. Narratives should also offer readers more positive emotional arousal through the transportation process than didactic non-narratives. Narratives, therefore, should be more effective in improving self-efficacy for engaging in the health behavior than non-narratives.

H1b: *Readers of a narrative health blog will have higher self-efficacy for engaging in the health behavior than those who read a non-narrative health blog promoting exercise.*

Hypotheses 1c-f: Behavioral intention is a function of the attitude toward performing the behavior, self-efficacy, and subjective norms (Ajzen, 1991). Neither narratives nor non-narratives should affect factors related to the subjective norm of performing that health behavior because subjective norms are more about one's perception of the expectations of other people, especially similar others, on whether one should do something and what they themselves are doing. This should not vary between the narrative and the non-narrative conditions. With subjective norms being the same, since narratives should produce a more positive attitude toward performing the behavior and stronger self-efficacy, narratives should result in more positive behavioral intentions than non-narratives.

Since behavioral intention for exercise has been found to be a significant predictor of intended exercise frequency and duration (Courneya & McAuley, 1994), both of which are important for evaluating the potential health benefits of exercise (American College of Sports Medicine Position Stand, 1998), three additional measures, intended exercise frequency, intended exercise duration, and the health gift selection, were included as separate indicators to measure behavioral intentions. The more motivated one is to perform some health behavior, the more likely this person will be to select a gift related to the health behavior, to intend to exercise more frequently, and for longer periods. Therefore,

H1c: *Readers of a narrative health blog will have stronger behavioral intentions than those who read a non-narrative health blog promoting exercise.*

H1d: *Readers of a narrative health blog will have higher intended exercise frequency than those who read a non-narrative health blog promoting exercise.*

H1e: *Readers of a narrative health blog will have longer intended exercise duration than those who read a non-narrative health blog promoting exercise.*

H1f: *More readers of a narrative health blog will choose a gift rather than monetary compensation than those who read a non-narrative health blog promoting exercise.*

Hypothesis 2a: Readers of non-narrative blogs are likely to engage in central/systematic processing when they find the source to be similar. Health behavior-related customization is expected to be more effective in persuasion, and readers should be more likely to identify the relatedness of customized characteristics and perceive the blogger to be more credible. Bloggers customized with related similarities, therefore,

should sound more genuine and produce more positive attitudes toward performing the behavior than bloggers with unrelated similarities. Since similar sources have been found to produce more persuasive outcomes than non-similar sources, both types of bloggers, no matter whether their customized similarities are health-related or not, should produce more positive attitudes toward performing the behavior than bloggers in non-customized conditions. This main effect should hold when non-narrative conditions are combined with narrative conditions.

H2a: *Readers of a blog featuring a blogger with health-related similarities will have a more positive attitude toward performing the health behavior than those who read a blog featuring a blogger with health-unrelated similarities, and than those who read a blog featuring a blogger with no similarities.*

Hypothesis 2b: A similar pattern should be observed for self-efficacy to pursue the health behavior. When readers process the blog centrally/systematically, their heightened sensitivity to customization type should affect their engagement with the blog messages because of their perception of the blogger. A blogger perceived to be more credible should offer the readers a better sense of performance accomplishment, a more involving vicarious experience, and more positive emotional arousal, all of which have been found to predict increased self-efficacy. Similarly, both customized conditions should influence the readers more than non-customized conditions.

H2b: *Readers of a blog featuring a blogger with health-related similarities will have higher self-efficacy toward performing the health behavior than those who read a blog featuring a blogger with health-unrelated similarities, and than those who read a blog featuring a blogger with no similarities.*

Hypothesis 2c: A similar other will be more influential in generating perceived subjective norms supporting the behavior than a dissimilar other. Bloggers with similarities (both related and unrelated) should produce more positive subjective norms (injunctive and descriptive) toward engaging in the behavior than bloggers with no similarities.

H2c: *Readers of a health blog featuring a blogger with health-related similarities will have the same subjective norms toward performing the health behavior as those who read a blog featuring a blogger with health-unrelated similarities. Both kinds of readers will have a more positive subjective norm than those who read a blog featuring a blogger with no similarities.*

Hypotheses 2d-g: When readers of non-narrative blogs engage in central/systematic processing, the overall behavioral intention should be higher for readers of a blog customized with related similarities than participants who read customized blogs with unrelated similarities and more than those who read non-customized blogs. Similarly, such pattern should be expected for the other three indicators of behavioral intention: intended exercise frequency, intended exercise duration, and gift selection.

H2d: *Readers of a blog featuring a blogger with health-related similarities will have stronger behavioral intentions than those who read a blog featuring a blogger with health-unrelated similarities and stronger than those who read a blog featuring a blogger with no similarities.*

H2e: *Readers of a blog featuring a blogger with health-related similarities will have higher intended exercise frequency than those who read a blog featuring a blogger*

with health-unrelated similarities and higher than those who read a blog featuring a blogger with no similarities.

H2f: *Readers of a blog featuring a blogger with health-related similarities will have longer intended exercise duration than those who read a blog featuring a blogger with health-unrelated similarities and longer than those who read a blog featuring a blogger with no similarities.*

H2g: *More readers of a blog featuring a blogger with health-related similarities will choose gifts over monetary compensation than those who read a blog featuring a blogger with health-unrelated similarities and more than those who read a blog featuring a blogger with no similarities.*

Hypotheses 3: Due to readers' different ways of processing narratives and non-narratives, the effect of customization type will be stronger in the non-narrative conditions as compared to the narrative conditions. An interaction effect, therefore, may occur between the two independent variables on three outcome variables, attitude toward performing the behavior, self-efficacy, and behavioral intention. Customization type will have a stronger effect in non-narratives than in narratives. Therefore:

H3a: *The effect of customization type will have a stronger influence on the attitude toward performing the health behavior for those who read a non-narrative health blog than for those who read a narrative health blog.*

H3b: *The effect of customization type will have a stronger influence on self-efficacy for those who read a non-narrative health blog than for those who read a narrative health blog.*

H3c: *The effect of customization type will have a stronger influence on behavioral intentions for those who read a non-narrative health blog than for those who read a narrative health blog.*

H3d: *The effect of customization type will have a stronger influence on intended exercise frequency for those who read a non-narrative health blog than for those who read a narrative health blog.*

H3e: *The effect of customization type will have a stronger influence on intended exercise duration for those who read a non-narrative health blog than for those who read a narrative health blog.*

H3f: *The effect of customization type will have a stronger influence on whether readers will choose gifts over monetary compensation for those who read a non-narrative health blog than for those who read a narrative health blog.*

In addition, narrative and customization's influence on six other theoretically relevant variables were explored. Two assess readers' processing of the blog (*Number of meaning units* and *Thought valence*) and four address readers' involvement with the blogger (*Perceived source credibility*, *Interpersonal attraction*, *Identification*, and *Parasocial interaction*). Formal hypotheses were not proposed for these variables because their theoretical relationships with narrative structure and customization have not been established; these variables are not of essential concern to the main themes of the dissertation; and the variables are not clearly distinct from each other theoretically or empirically. These variables, however, were considered as potentially valuable in understanding the process and consequence of the interaction of message and customization types.

CHAPTER 3

PILOT STUDY

A pilot study was conducted to check the efficacy of the narrative and customization manipulation, and to evaluate the feasibility of the insertion of multiple personal characteristics into two blog prototypes. The study used a 2 (message type) x 3 (customization type) between-subjects pre-/post-test design. Participants were randomly assigned to one of six conditions.

Pilot participants

Thirty-three UNC students participated in the pilot study. One participant encountered a computer-related problem during the data collection stage and was dropped from the analysis.

Pilot procedures

Participants were recruited from Facebook.com on February 9, 2009. Following the procedure of Kalyanaraman and Sundar (2006), an online questionnaire titled “2009 Student Preference Survey” was emailed to them on February 10, 2009. Participants filled it out between February 11 and 15, 2009. Running as a healthy behavior was listed along with two other health behaviors—yoga and eating five servings of fruits and vegetables per day. These health behaviors were identified as potentially relevant given the top health concerns of college students according to recent national and regional college health surveys (American College Health Association, 2008; Dyson & Renk, 2006; University of Minnesota, 2008) and the *Healthy Campus 2010* goals (American

College Health Association, 2002). Each health behavior was feasible to carry out for 21 days. To ensure that a particular highly desired healthy habit was not excluded, participants were also allowed to indicate other health behaviors not on the initial list.

The online survey also collected personal information in 42 categories and asked the participants to rate the relatedness of these 42 categories to whether they would begin running. The participants also provided pre-test measures of the dependent variables: attitude toward running, self-efficacy, subjective norms, and behavioral intentions.

The post-test questionnaire was administered online between February 18 and 22, 2009, one week after each participant completed the pre-test questionnaire, to reduce the possibility of participants' remembering their initial responses. The pre- and post-test questionnaires also had different titles. Each of the participants was emailed a link that directed them to the posttest. Once they started the posttest, they were asked to read a personal blog and answer some questions. The second page of the posttest survey contained a link that opened a new window containing a personal blog created by a person named Chris. The time each participant spent reading the blog was documented by an embedded web application.

Participants were asked to guess the gender of Chris in the post-test questionnaire. To ensure the most gender-neutral name was identified for the main study in case Chris was seen too often male or female, participants were asked to indicate their first impression of the gender of another eight gender-neutral names (Andy, Alex, Cameron, Casey, Jaime, Jesse, Kerry, and Sam).

Design and layout of the blogs were identical across the six conditions except for manipulation of two independent variables: message type (narrative vs. non-narrative)

and customization type (no customization vs. unrelated customization vs. related customization).

After reading the blog, participants returned to the post-test survey to fill out the questionnaire assessing manipulation check items (narrative transportation, customization, and relatedness) and dependent variables including attitude toward performing the health behavior, self-efficacy, subjective norms, behavioral intention, intended exercise frequency, and intended exercise duration. They were also asked to guess the intention of the study and to type any thoughts or concerns they had about the study.

Since the post-questionnaire session was conducted online, the behavioral outcome of whether participants would take gifts over monetary compensation was postponed till the main study. All participants were asked to indicate how they would prefer to be compensated (either a \$10 check sent by mail or a \$10 Amazon.com gift certificate sent by E-mail).

Pilot stimulus materials

A personal health blog was created with the help of two professional writers specifically for use in the pilot study. The blog belonged to a hypothetical college student who wrote about beginning to run for at least four days per week in the past three weeks. To avoid potential gender confound (See Lonial & Van Auken, 1986 , for a discussion of female's departure from gender congruency effect as they age), the student blogger was named "Chris." The gender of Chris was not revealed throughout the blog, which was written in gender-neutral language.

The 21-day time frame was based on Maxwell Maltz's work on habit formation, *Psycho-Cybernetics* (1973). Originally a plastic surgeon, Maltz noticed that it usually

took 21 days for amputees to stop feeling phantom limb sensations after surgery. Subsequent studies showed that it took 21 days to create a new habit because the brain produces neuroconnections and neuropaths only after activation for at least 21 days. Since it may be unrealistic to ask a non-runner to start running on a daily basis, this project loosely adopted the 21-day framework with the blog advocating adoption of running for at least four days per week for three weeks.

Two running blog prototypes in narrative and non-narrative format were created (See Figure 1 and 2). Each prototype allowed the insertion of the 42 pieces of information in 42 exclusive categories (e.g., hometown and favorite movie genre) about the blogger without invoking logical errors or inconsistencies. The 42 categories were identified through extensive reading of running books and magazines and interviews with amateur and professional runners, and exercise scientists to ensure that they conformed with running-related knowledge and educational messages in both the narrative and non-narrative versions.

To determine how many pieces of personal information should be inserted into the blogs, 42 categories were asked about with the thought that 21 would be perceived to be related (e.g., exercise frequency) and the other half would be perceived to be unrelated (e.g., favorite T-shirt color) to the advocated health behavior, running. Participants provided information about their own characteristics in the 42 categories. Each participant was allowed to indicate up to five additional personal characteristics they perceived to be extremely related to their starting running.

Since customization was based on matching messages to the self, “relatedness” should be based on the reader’s perception rather than the experimenter’s. Thus, only

those characteristics perceived by each participant to be related to running would be included in the blog as related characteristics. Likewise, even if some characteristics may seem highly related to running, they would be included as unrelated characteristics as long as the readers thought so.

Based on each student's ratings, answers to the 42 categories were carefully screened. If any unique personal information was provided, this piece of personal information was linked to the relatedness or unrelatedness rating. If a participant answered questions generally rather than specifically (i.e., answered "What is your favorite movie" with "I like many kinds of movies"), the answer was not considered unique personal information and was not included in the subsequent analysis.

After all usable personal information pieces were identified, they were divided into related and unrelated characteristics. On a 7-point scale, those categories rated above 4 were considered "related" while those rated below 4 were considered "unrelated." Depending on the condition each participant was assigned to, six related or unrelated characteristics were randomly selected for each person.

Then, unique participant information was inserted in either blog prototype for the four customization conditions. When a reader's preferences were unique or obscure, [e.g., a reader's favorite song was *Three People in Love* (1968) by Mack Rice], instead of the exact match, a categorical description (e.g., "some early style funky music in the 1960s") was used. To prevent an incredulity reaction, i.e., readers might start to feel the blog and the blogger were fake because of too many similarities, the appropriate number of embedded characteristics was determined to be six by interviewing a separate group of

undergraduate and graduate students. Care was taken to ensure that each blog were edited to the same length.

The blog page layout consisted of five sections (See Figure 1). The top was a blog blurb. To ensure that the blurb did not confound the processing style of the blog, the blurb was written in accordance with the message type in the main blog, i.e., a narrative blurb accompanied a narrative blog while a non-narrative blurb accompanied a non-narrative blog.

The middle of the blog was composed of three parts. The left narrow panel showed a blog theme-related icon (in the case of running, it was a running shoe), blogger's name (Chris), and some basic information (e.g., age or hometown) customized to participants based on the pre-questionnaire. The right narrow panel showed a monthly calendar. The bigger middle panel showed the main experimental blog titled "21 Days Later."

All six conditions of the blogs provided the same information. The only difference was the readers' own characteristics inserted in the left and middle panels and the style in which the blog was written (narrative or non-narrative). The blogger information was customized to each reader based on his/her responses in the pre-questionnaire. The bottom part of the blog showed three reader comments kept constant across conditions.

Manipulation checks

Three variables, *Transportation*, *Customization*, and *Relatedness* were assessed in the manipulation check.

Transportation. Transportation into the narrative was assessed using questions from Green and Brock's (2000) 11-item transportation scale. Items used included, "I was mentally involved in the blog while reading it" and "The blog affected me emotionally" (1 = Strongly disagree; 7 = Strongly agree). Three items were reverse coded: "While I was reading the blog, activity going on in the room around me was on my mind;" "After finishing the blog, I found it easy to put it out of my mind;" and "I found my mind wandering while reading the blog."

Transportation served as the manipulation check variable for message type. The 11-item narrative transportation scale was analyzed for reliability and demonstrated fairly good internal consistency given the small sample size, $\alpha = .70$. Therefore, the 11 items were averaged to form a "transportation" scale, $M = 4.17$, $SD = .74$.

Customization. Customization was assessed by a two-item measure from the customized web portal study by Kalyanaraman and Sundar (2006): "This blog targeted me as a unique individual" and "This blog was personalized according to my interests" (1 = Strongly disagree; 7 = Strongly agree). The two items measuring perceived customization exhibited a high degree of correlation, $r(30) = .85$, $p < .001$ and therefore were averaged to form a single "customization" scale, $M = 4.22$, $SD = 1.96$.

Relatedness. Relatedness was assessed by a two-item measure: "The similarities between Chris and me are related to whether I will begin running 30+ minutes at least 4 times a week in the near future," and "The characteristics shared by Chris and me are related to whether I will beginning running 30+ minutes at least 4 times a week in the near future" (1 = Strongly disagree; 7 = Strongly agree). The two items measuring

perceived relatedness of the customization were strongly correlated, $r(30) = .73, p < .001$) and therefore were averaged to form a single “relatedness” scale, $M = 3.65, SD = 1.33$.

Dependent variable

Since the main purpose of the pilot study was to make sure that the manipulations worked, given the limited number of participants, only behavioral intention was analyzed at this stage to assess the persuasive effects of the health blogs.

Behavioral intention. Behavioral intention was measured by a single-item measure that asked participants the likelihood of performing the behavior in the near future. The rationale for using a single-item behavioral intention scale was Rossiter’s (2002) suggestion on the measurement of behavioral intentions. He proposed the use of single-item measures for assessing such concrete constructs as behavioral intention because multi-item measures often involve the addition of unnecessary and conceptually inappropriate items.

Scholars from Harris Interactive (R. K. Thomas, Terhanian, & Bayer, 2004) have found that across countries, languages, and response categories, a unipolar scale (Not at all likely – Extremely likely) leads to better criterion-related validity than bipolar scales (Very unlikely – Very likely). Therefore, behavioral intention was measured by a single question with a unipolar scale: “Please indicate the likelihood you would start running for 30+ minutes at least 4 times per week in the near future (1 = Not at all likely; 7= Extremely likely),” Pretest: $M = 4.07, SD = 1.76$; Posttest: $M = 3.83, SD = 1.72$.

Results

On average, it took participants 20.03 minutes ($SD = 6.24$) to complete the pre-test survey and 17.97 minutes ($SD = 6.95$) to complete the post-test survey.

Among the 32 participants, one mentioned in the post-test questionnaire that the second survey might be linked to the first survey because her personal information (e.g., birthday) was inserted in the blog. Another correctly guessed that part of the research purpose was to manipulate the related and unrelated customization because of the manipulation check questions, which specifically asked whether the similarities between Chris and him were related or unrelated to the health behavior. These two participants were excluded from further analysis. The remaining 30, with five participants per condition, were included in the pilot study analysis.

Of the 30 participants, 11 (37%) were male and 19 (63%) were female. The mean age of the group was 27.87 ($SD = 6.28$). On average, they used the Internet for 4.57 hours everyday ($SD = 1.81$). All of them were members of one or more social networking websites. Four (13%) had a personal website and the other 26 (87%) did not. The group had a moderately low frequency of reading other people's blogs, $M = 2.83$, $SD = 2.14$. Two (7%) had a personal blog and the other 28 (93%) did not. Yet among those who did not have a personal blog ($N = 28$), five (18%) planned to start one in the near future (Table 1).

Of the 30 blogs created for the pilot study, all of them were carefully edited to around 1,000 words across all conditions, $M = 1,016$, $SD = 27$. The average reading time of the blogs was 209.86 seconds ($SD = 86.73$). The length of the blogs and the blog reading time did not differ across conditions, $ps > .80$.

Manipulation checks

Several statistical tests were performed to check the effectiveness of the message type and customization type manipulations. Results indicated mostly statistically

significant main effects for each of the manipulations and no statistically significant interaction. The following statistical analyses, however, should be interpreted with caution due to the limited number of participants (30) and small subgroups (five per condition).

A 2 (Narrative, Non-narrative) x 3 (No customization, Unrelated customization, Related customization) ANOVA indicated a marginally significant main effect for the narrative manipulation, $F(1, 24) = 4.19, p = .052$, partial $\eta^2 = .15$. Specifically, the mean score for narrative conditions, $M = 4.43, SD = .87$ was marginally higher on the “transportation” scale than that of non-narrative conditions, $M = 3.90, SD = .48$. There was neither a significant main effect for customization type on transportation, $F(2, 24) < 1$, nor a significant interaction of the two on transportation, $F(2, 24) = 1.62, p = .22$.

The customization type manipulation was checked by two two-way ANOVAs. The first 2 (Narrative, Non-narrative) x 3 (No customization, Unrelated customization, Related customization) ANOVA revealed a significant main effect for the existence of customization, $F(1, 24) = 11.47, p < .001$, partial $\eta^2 = .489$. Specifically, post-hoc comparisons using the Tukey HSD test indicated that the mean score for participants in both related and unrelated customization conditions (with characteristics related to the health behavior: $M = 4.95, SD = 1.79$; with characteristics unrelated to the health behavior: $M = 5.35, SD = 1.08$) was significantly higher on the customization scale than those of participants in no customization condition, $M = 2.35, SD = 1.43$. There was no difference between the two customization conditions on the customization scale ($p = .83$). The analysis also revealed that there was no significant main effect for narrative on

customization type, $F(1, 24) < 1$, or significant interaction on customization type, $F(1, 24) < 1$.

The second 2 (Narrative, Non-narrative) x 2 (Unrelated customization, Related customization) ANOVA revealed a significant main effect of relatedness for both of the customization conditions, $F(1, 16) = 5.74, p = .029$, partial $\eta^2 = .264$. Specifically, an independent-samples t-test indicated that the mean score for participants in related customization conditions, $M = 4.10, SD = 1.10$, was significantly higher on the relatedness scale than those of participants in unrelated customization conditions, $M = 2.70, SD = 1.42, p = .025$. The analysis also revealed that there was neither statistically significant main effect for narrative on relatedness, $F(1, 16) < 1$, nor significant interaction for relatedness, $F(1, 16) < 1$.

Dependent variable

Given the limited number of participants, only H1c and H2d were examined (See Table 2). H1c predicted that readers of a narrative health blog would have more positive behavioral intentions than those who read a non-narrative health blog. H2d predicted that readers of a blog featuring a blogger customized with health behavior-related characteristics would have stronger behavioral intentions than those who read a blog featuring a blogger customized with health-unrelated characteristics and stronger than those who read a blog featuring an uncustomized blogger with no similarities. Hypotheses were tested using ANCOVA with the post-test behavioral intention as the dependent variable and the pre-test behavioral intention as the covariate with message and customization type as the between-subject factors.

Preliminary checks were conducted to ensure that the data did not violate the assumptions of normality, linearity, and homogeneity of variances. A two-way ANCOVA was conducted with the two independent variables, message type and customization type, entered as fixed factors, post-test behavioral intention, entered as the dependent variable, and pre-test behavioral intention, entered as the covariate. The model revealed no statistically significant main effects for narrative, $F(1, 23) = 1.17, p = .29$, or customization type, $F(2, 23) < 1$, on the follow up behavioral intention, and no statistically significant interaction effect, $F(2, 23) = 1.03, p = .37$. For exploratory purposes, gender was entered as another fixed factor and the findings did not differ from before. The descriptive statistics of the pre-test and follow-up behavioral intentions can be found in Table 3. (Also see Figure 3.)

There results did not demonstrate support for H1c or H2d. A closer examination of the descriptive statistics (Table 3) showed that the blog exposure actually decreased the behavioral intention of the participants, Pretest $M = 4.07, SD = 1.76$; Posttest $M = 3.83, SD = 1.72$, especially among those in the narrative conditions, Pretest $M = 4.20, SD = 1.74$; Posttest $M = 3.67, SD = 1.92$, albeit the difference was statistically non-significant, Paired sample $t(29) = .94, p = .35$.

Other measures

Four participants out of 30 mentioned some exercise other than running they would like to start (two mentioned walking, one hiking, and one cycling). A close examination of the running intentions of these four participants indicated that they were moderately high, which indicated running was still an acceptable exercise to focus on in the experiment.

When asked to indicate any other personal characteristics besides the 42 included in the survey that they perceived as highly related to starting running, eight participants mentioned 26 characteristics. A close examination of these answers showed they could be categorized into three categories. The first type ($N = 6$) included some abstract characteristics (e.g., ambition and discipline). The second type ($N = 6$) included some characteristics atypical of the general UNC college population (e.g., whether one has children.). The third type ($N = 14$) overlapped with the 42 original characteristics (e.g., age and health status).

Among the 42 characteristics, the top six characteristics rated to be *most* related to starting running were: Free time, Exercise frequency, Current exercise, Ideal body shape, Longest running distance, and Longest running time. The top six characteristics rated to be *least* related to starting running were: Favorite bookstore, Hair color, Favorite book, Favorite news site, Favorite T-shirt color, and Favorite movie type (See Table 4).

Eighty percent of the participants ($N = 24$) guessed Chris to be male. A few also mentioned in the thought-listing task that Chris was a male name. Among the other eight gender-neutral names, Kerry, $M = 2.22$, $SD = .71$, and Jaime, $M = 2.19$, $SD = .54$, were judged most gender neutral (1 = Male; 2 = Both; 3 = Female).

Discussion

The primary purpose of the pilot study was to examine the efficacy of narrative and customization manipulations. The results indicated that the manipulation of customization type was successful. One thing that needed to be improved for the main study was that the questions for the manipulation check of “relatedness” might have

roused suspicion about the real purpose of the study. They were moved to the end of the questionnaire after participants have guessed the study purpose in the main study.

Although the narrative manipulation approached statistical significance with a small sample, the difference in the transportation scale between non-narratives, $M = 3.91$, $SD = .48$, and narratives, $M = 4.43$, $SD = .87$, was small. Revisions were needed to improve the degree of transportation for narrative messages and/or to reduce transportation for the non-narrative messages. A close examination of the narrative prototype revealed several aspects that needed more work. First, more descriptive details, which have been seen as “both practically and logically necessary” to narrative texts were needed (Bal, 1997, p. 36).

Some of the transitions in the narratives also were awkward. The writing seemed somewhat disorganized and lacked a tight chronological structure. This was partly due to the health education nature of the blog message. The health messages identified through the interview sessions with veteran runners and exercise scientists were sometimes difficult to insert without disrupting the narrative flow. In addition, the insertion of personal characteristics, although there were only six, could have been more natural. Although it was a personal blog, the readers might still find it strange that the author revealed personal details if customization was not done smoothly.

Another objective of the pilot study was to examine the feasibility of the insertion of personal information into the blogs. The initial response from respondents showed that running was a generally acceptable exercise because the majority of the participants did not mention that they wanted to start an exercise other than running. Among the four who mentioned different activities, their behavioral intention for running was still moderately

high. The pretest also showed variance in participants' pre-test behavioral intentions to begin running, an important requirement for effective customization suggested by Kreuter and Wray (2003).

The pilot study also explored the possibility of collecting 40+ personal characteristics in the pre-test survey. The length of the survey was originally a source of concern because it had 137 questions. The survey tracking data indicated, though, that the average time for completing the online questionnaire was around 20 minutes. No participants complained about the length of the questionnaire or had trouble understanding or answering the questions. While there were a few (<15%) missing data points regarding personal characteristics, participants provided answers to most of the questions.

Further concern arose over the counter-hypothetical effect of the narratives. While the unexpected negative effect of the narrative blog might be an artifact because of the small sample, re-examination of the narrative blogs suggested several aspects that could be improved besides the transportation-related issues already discussed. One possibility was that the narrative blogs lacked the right type of descriptive details and/or included too many negative and distracting descriptive details to create a transportation experience. For example, in the beginning section of the narrative, Chris vividly discussed the difficulty of finding the right type of exercises online. This might lead readers to share the frustration Chris had. Although Chris then discussed in the next couple of paragraphs how he/she discovered running as a good substitute and how nice the first run was, these paragraphs, which could have been transporting, were not written with the same amount of detail.

The most problematic section came in the middle of the narrative. In this section, Chris gave a highly detailed description of how the morning was cold and frigid; how he/she was sore and cold; and how upset he/she felt when the sports drink was spilled. These vivid descriptions, while originally created as the obstacles to be overcome by the blogger, may have induced the readers to create mental imagery that actually magnified the obstacles. Chris also complained, “What’s the point of living longer if I’m in pain?” Although most participants during the message creation stage said they liked that sentence and that it made the language sound more colloquial and more interesting, in retrospect, this complaint might have increased mortality salience, making the readers decrease their behavioral intention. Although in the next sentence Chris overcame these difficulties by turning back to finish the run, that sentence may have lacked description enough to overcome the “damage” done by the previous negative images.

Additionally, the pilot blog’s headline was “21 Days Later,” followed by a blog blurb saying that the goal of the blog was to share the blogger’s running experience. After the pilot test, several participants mentioned that they doubted that a beginning runner such as Chris would create a blog exclusively on running or even write extensively about it. Too much emphasis on running, or the persuasive goal, might result in reader resistance and might reduce the believability of the blogs.

It may also have been important that many participants in the pilot study guessed that Chris was male. Besides figuring that Chris was a male name, the running partner of Chris was Pat, who was referred to as “he” in the blog. Another reason for guessing that Chris was male might have been that the blog layout and the banner’s color contrast were stark, which may have made the blog look like a guy’s page to participants. Thus, it was

decided that more gender-neutral names should be used for the main study and the gender of the running partner should also be blurred.

In sum, the pilot study was successful in general. It fulfilled the task of manipulation check and making sure the procedure was feasible. The customization and relatedness manipulations were successful. The manipulation check questions for customization type, though, needed adjustment to prevent participants from guessing the study's real purpose. While the narrative manipulation was marginally significant and the post-test behavioral intention not only did not improve significantly from the pretest to posttest but also showed some counter-hypothetical change, a close examination of the health message prototype provided helpful insights for improvement. The insertion of personal information into narrative and non-narrative health blogs proved feasible. No radical changes were needed for the experimental procedure or the questionnaires. The major necessary revisions, therefore, were to include more participants to increase statistical power and to improve the narrative blog prototype to make it more transporting and persuasive

CHAPTER 4

MAIN STUDY

Following the pilot study, the main study was conducted. The main study shared the same 2 (Narrative, Non-narrative) x 3 (No customization, Unrelated customization, Related customization) design as the pilot study but was run with more participants, a refined stimulus, and minor revisions of the experimental procedure.

Changes from the pilot study

Based on the findings of the pilot study, changes were made to improve the blog's persuasive outcome, the transportation manipulation and the experimental procedure. More dependent variables were added. The specific changes are highlighted below:

Revision of blog prototypes

Two professional writers and psychologists were invited to help with revising the stimulus materials, with an emphasis on increasing the possibility of persuasion and transportation.

1. *Changed blog title and deleted blurbs.* To prevent readers' doubt about the believability of the blog, anything indicating the sole purpose of the blog was devoted to running was revised or removed. The headline was changed into a general one, "Kerry's online ramblings: A student, a blog, and the life in-between," with the blurb deleted.

2. *Changed blogger's and friend's names:* To avoid gender difference as a confound, the blogger's name was changed from Chris to Kerry. The running partner's

name was also changed from Pat to Jaime. Jaime was no longer referred to as a “he” but simply as “J” to remain gender-neutral.

3. Added positive description: Descriptive phrases and sentences were added to the narrative version with the goal of creating vivid mental images of a pleasant running experience. For example, in the pilot version, during Pat’s absence, Chris did not provide much positive description about the running experience: “The next morning Pat couldn’t make it, but I got up and ran by myself. I took my MP3 player and listened to my favorite song. It felt great.”

This was revised to: “The next morning J couldn’t make it, but I got up and ran by myself. ... Steadily I breezed through scattered streams of sunlight beaming through breaks in the trees as small white puffs came out of my mouth and dissipated gradually into the air. It didn’t take very long till I felt far away from everything I’d been having stress about. My pace increased as my mind raced. Faster, faster, faster...”

For the non-narrative blog prototype, a number of descriptive terms and sentences that might have helped to increase transportation were taken out and replaced with more didactic instruction.

4. Toned down negativity: The originally detailed description of the obstacles faced by a runner was made less directly. For example, Chris originally wrote: “On Monday morning I didn’t want to get out of my warm bed. In a typical North Carolina fashion, the weather had gone from nice to frigid, overnight. Nothing is more discouraging to a runner, I think, than to see frost on the ground. You know it’s going to be cold. I was still sore from the running I had been doing. My entire body protested. I nearly went back to bed.”

The revision read: “The real test came in the second week. In a typical North Carolina fashion, the weather had gone from nice to frigid, overnight. On that morning I felt like being pounded into a huge bathtub of clay. I won’t get into how my entire body protested as I drudged out, but you can probably imagine how unpleasant it was.” Thus, the difficulties were described in a more indirect way.

Comments that might increase mortality salience were removed. For example, when Chris accidentally broke a water bottle on the trail, he/she wrote: “That was the low point for me. That broken bottle was so discouraging that I turned around to go home. My legs hurt. My back hurt. I was tired. What’s the point of living longer if I’m in pain? I could go back to bed for half an hour and still shower and make it to the class.”

In the revised blog, this portion was re-written as: “That was the low point for me. That broken bottle was so discouraging that I almost turned around to go back. Why not lie back in bed, take a shower, head to the class like before? Then maybe some snacks and some pizza and some soda for a treat...”

5. *Condensed the temporal structure:* The blog was rewritten to cover less time. While the blog was a recollection of Chris’ experience over a three-week span, a temporal structure spread out too much might sound too bland and lack focus. Originally, the blog’s narrative sequence was:

Present day (Tonight) – A month ago – Less than a month ago – Three weeks ago – Day one of exercise – Day two of exercise – The first week –The first weekend – The Monday in the second week – The following weeks –Present day (This morning)

The revised sequence condensed the portion at the end:

Present day (Tonight) – A month ago – Less than a month ago –Three weeks ago
–Day one of exercise –Day two of exercise – The second week –The following weeks –
Present day (This morning)

6. *Included “buffers:”* To ensure that the insertion of personal information went along with the narrative, all 42 categories and their contextual positions were reevaluated with minor adjustment to make insertion sound natural. Some buffers were added to accompany the insertions. For example, the “favorite song” as a personal characteristic was originally inserted in the prototype as “...I took my MP3 player and listened to (favorite song). It felt great...” For the main study, a sentence was added: “I took the MP3 player (I can’t run in silence; it drives me NUTS) and started off with (favorite song)...”

Similarly, buffers were also added when novel information was introduced. For example, some pilot test participants answered in the “questions and/or concerns” section that a sentence seemed to “come out of no where when the blogger suddenly started to introduce the special running socks”: “I put on ... special running socks. These socks feature a hand-linked seamless toe and wick moisture off my feet to stay warm and dry in the winter...” In the revised version, a buffer was added: “...I put on a pair of new trail running socks. Well, this may sound silly but I was THRILLED to be in them...”

7. *Removed irrelevant health information:* Several participants said that the insertion of too much health education information annoyed them. Since the purpose of the blog was to encourage people to start running instead of lecturing on different aspects about running, running-related health information, if not related to the narrative development, was removed or toned down.

8. *Included summary:* Research in entertainment education suggested that the addition of an epilogue recapping the message may help to increase the narrative's persuasive outcome (Slater, 2002a). Accordingly, a narrative paragraph describing the positive outcome of running was moved from the middle to the ending section of the narrative blog prototype to recap the potential health outcome of adopting the health behavior:

“A funny thing started to happen after that. Sure, I still set my alarm clock and struggle with hair messed up occasionally but most of the time I just wake up, ready to hit the trail. I now realize what it is that running provided for me. It's not just building muscle and losing weight. As my body becomes stronger and my stride longer, my confidence grows and I'm ready for any new challenges ahead.”

9. *Changed description of socks:* Since an additional behavioral measure, whether the participants would choose a running-related gift (e.g., two pairs of special trail running socks) over the monetary compensation (e.g., a \$10 check), was added to the main study, the original description of the advantages of running socks was revised to be specifically about trail running socks.

Throughout the revision, caution was taken to ensure both the narrative and the non-narrative blog prototypes provided the same kind of information and were of the same length.

Procedural adjustments

To observe the participants' behavioral outcome after the health blog exposure and to have a stricter experimental control, the main study differed from the pilot study in that it invited students to complete the post-test session in a campus computer lab.

To ensure that the data would have enough statistical power to compare potential gender differences, if any, equal numbers of male and female participants were recruited.

To ensure sufficient variance in the outcome variable, recruited participants who were already runners were excluded from the analysis because regular runners are likely to have stronger behavioral intentions, which would leave little room for improvement. Besides, the blog was written from a beginner's perspective, which would not be considered customization for the veteran runners. Participants who mentioned explicitly that they hated running or they had physical limitations preventing them from running were also excluded.

Participants

The E-mail addresses of 300 (150 men and 150 women) UNC students were collected (See Figure 4 for a flow chart for recruitment and analysis). Half were recruited from five large classes and 10 small classes. A third were recruited through advertisements posted on the bulletin boards of three departments, three libraries, and three student organizations on the UNC campus. The rest were solicited directly from a campus dining hall.

Almost all of the participants were college students, who were an appropriate population for this study, because college is a time of change for young adults between 18 and 24 years old. Changes during this period occur not only in knowledge and intellectual thinking but also in attitudes, world views, and behaviors (Pascarella & Terenzini, 2005). Education during college can help improve health knowledge and habits. Studies have shown that physical activity habits formed in college are more likely to be maintained into adulthood than those begun later (Sparling & Snow, 2002).

Procedures

The students were told that they were invited to participate in a research project that would include two sessions – one to fill out an online pretest survey and the second to come to a computer lab for a follow-up post test. They were paid after the second session. By providing their personal E-mail addresses, they indicated their consent to participate.

An E-mail containing the link to an online questionnaire titled “2009 UNC Campus Student Preference Survey” (See Appendix B, “Pre-test Questionnaire”) was sent to the 300 addresses on February 25, 2009. Students were asked to complete the survey by March 6, 2009. The end of the questionnaire was linked to an experimental scheduling page. Participants were automatically directed to the scheduling page to sign up for a post-test experimental session after they submitted the survey.

By March 7, 2009, 222 (74%) students completed the questionnaire and signed up for the experimental sessions. To reduce the likelihood that the students could remember their answers to the pre-test questionnaire during the posttest, at least two weeks lapsed between the pre- and post-test. The 222 participants were randomly assigned to one of the six experimental conditions, with 37 persons per condition.

From March 8 to March 15, 2009, 222 personal blogs were created and uploaded to a web server hosted by the School of Journalism and Mass Communication at UNC-Chapel Hill.

From March 16 to March 26, 2009, 25 experimental sessions were held in a campus computer laboratory with PC computers with Internet connection. 204 (68%)

participants completed the experimental sessions. Each session included up to 20 participants with two to four participants in at least two conditions.

As the sign-up information (participants' names and E-mail addresses) for each of the 25 experimental sessions was available, each participant was linked to a unique computer ID so he/she could be directed to the blog created for him or her. Before each experimental session, each of the computers was labeled with a unique ID ranging from 0A01 to 0A20. Participants assigned to the same condition were not allowed to sit next to each other.

Ten to fifteen minutes before each session, assistants were given a name sheet with student names and their assigned computer IDs. The assistants were instructed to load the experimental page on each computer for each student in the session.

Upon arrival, students were greeted by the experimenter or the assistants, who checked them in and guided them to the assigned computers. Students were instructed that they should read and sign the consent forms placed by the computer and not to click anything until further instructed. In around five minutes, after most people had arrived and been seated, the experimenter first thanked the students for participating in the study, then instructed them to start by clicking the links. The link took them to a follow-up survey titled "Be-Logg National College Usability Assessment" (See Appendix B, "Post-test Questionnaire").

On the second page of the survey, the participants saw a link (The link was unique for each participant because of the previously loaded files.). The participants were instructed to click the link, which opened a blog. Once they finished reading the blog,

they completed the rest of the survey. They were told not to click the back button once they started.

Once the participants had submitted their answers, they were automatically directed to a “Thank You” page, which offered two options for compensation. One option was two pairs of high-quality trail running socks available only in professional running stores (See Appendix B, “Compensation page”). The other option was a personal check of \$10. (Both options were confirmed with a group of UNC students to be perceived as worth the same monetary value.) The participants were instructed to choose one form of compensation and to inform the experimenter or the assistants of their choices as they turned in the consent forms (See Appendix A, “Research participation consent form”) they had signed at the beginning of the study as they left the computer lab. They were then compensated, given a debriefing form, debriefed (See Appendix A, “Debriefing form”), thanked again for their participation, and dismissed. The posttest session lasted 20 to 35 minutes.

Of the 204 participants, 39 (19%) identified themselves as regular runners who ran at least 30+ minutes 4 times a week; eight (4%) expressed concern that their answers to the pretest were used to create the blogs and guessed the research purpose was related to that; three (2%) were non-native English speakers; three (2%) wrote explicitly that they did not want to run at all because of health conditions (depression, fracture, and paralysis); and one (.5%) accidentally completed the survey assigned to another student by sitting at the wrong computer. These 54 (27%) students were excluded from analysis, resulting in a sample of 150 participants, with 25 per condition. The subsequent analyses focused exclusively on these 150 participants.

Of the 150 participants, 68 (45%) were male and 82 (55%) were female. The mean age was 21.23, $SD = 2.29$. Participants came from 33 academic majors at UNC, ranging from anthropology to chemistry: 26 (17%) were freshmen; 45 (30%) were sophomores; 30 (20%) were juniors; 47 (31%) were seniors; and two (1%) were graduate students.

Although 24 participants (16%) preferred some exercise other than running, a closer examination indicated their running intentions were high enough that the focus of the blog should be relevant for them.

On average, the participants used the Internet for 4.26 hours every day, $SD = 1.57$. All except five (3%) were members of one or more social networking websites such as Myspace.com or Facebook.com. While 23 (15%) had a personal website and 25 (17%) had a personal blog, the group had a moderately low frequency of reading other people's blogs, $M = 2.48$, $SD = 1.83$. A detailed comparison between the participants in the pilot study and those in the main study can be found in Table 1.

Stimulus materials

Stimulus creation was similar to that of the pilot study. In addition to the revisions of the blog prototypes discussed above, several other changes were made based on the pilot. (See Figures 5 and 6.)

To prevent potential confounding of the blog layout and color scheme on participants' perception of the blogger's gender, the blog template was changed from the previous colors (aqua blue, dodger blue, and dark orange) to less contrasting colors (steel blue, royal blue, and light gray). The font color was also changed from black to dark gray. The calendar on the right panel was removed.

After the responses were examined for unique personal characteristics, SAS macro programming was used to randomly select and print six related or unrelated personal characteristics for 148 (37 per condition x 4 conditions) out of the 222 participants assigned to the four customization conditions.

One participant from the pilot study suspected the link between the pre-test and the blog because Chris had the same birthday. Studies (Finch & Cialdini, 1989; Matthews & Blackmore, 1995) show birthday to be an important aspect of one's individuality but it could be a characteristic too salient and unique to customize. Therefore, "Birthday" was excluded from the 41 characteristics asked about in the main study.

After that, 148 unique personal blogs were constructed by manually inserting all of the selected personal information into the blog prototypes. Two blogs with all personal information removed were made for the narrative and non-narrative control conditions by being duplicated 37 times. In total, 222 (148 + 37 + 37) personal blogs were prepared for all participants who completed the pre-test survey.

Manipulation checks

The same measures used in the pilot study were used to conduct manipulation checks for the main study.

Transportation. The 11 items measuring narrative transportation demonstrated good internal consistency, $\alpha = .88$, and therefore were averaged to form a transportation scale, $M = 4.25$, $SD = 1.12$.

Customization. The two items measuring perceived customization were strongly correlated, $r(150) = .80$, $p < .001$, so the items were averaged to form a single scale, $M = 3.54$, $SD = 1.77$.

Relatedness. The two items measuring relatedness were strongly related, $r(150) = .77, p < .001$, so were summed and averaged to form a single scale, $M = 3.28, SD = 1.45$.

Dependent measures

The characteristics of each of the multi-item dependent measures are in Table 5.

Attitude toward running

The measure designed to assess the reader's attitude about performing the advocated health behavior was developed following the scale and measurement guidelines suggested by Ajzen (2006) and Hagger and Chatzisarants (2005). Semantic differential scales were used to measure the participant's attitude toward running. Four items assessed the affective aspects and the other four assessed the instrumental aspects of the attitude. The question was: "I think running for 30+ minutes at least 4 times per week in the near future would be..." followed by eight 7-point adjective pairs: Sad-Happy, Unsatisfying-Satisfying, Enjoyable-Unenjoyable (Reverse coded), Pleasant-Unpleasant (Reverse coded), Useful-Useless (Reverse coded), Important-Unimportant (Reverse coded), Not Worthwhile-Worthwhile, and Worthless-Valuable.

The eight-item attitude scale was analyzed for reliability and demonstrated good internal consistency, Pretest $\alpha = .83$, Posttest $\alpha = .90$. Therefore, the six items were averaged: Pretest $M = 5.17, SD = 1.00$; Posttest $M = 5.50, SD = 1.00$.

Self-efficacy

The self-efficacy measure was developed from Ajzen's (2006) scale and measurement guidelines. Four semantic differential items were used. Items included: "I think running for 30+ minutes at least 4 times per week in the near future would be... (1

= Impossible; 7= Possible);” “If I wanted to, I could start running for 30+ minutes at least 4 times per week in the near future (1 = Definitely false; 7= Definitely true);” “How much control do you believe you have over running for at 30+ minutes at least 4 times per week in the near future? (1 = No control; 7 = Complete control);” and “It is mostly up to me whether or not I run for 30+ minutes at least 4 times per week in the near future (1 = Strongly disagree; = Strongly agree).”

The four items demonstrated good internal consistency, Pretest $\alpha = .80$, Posttest $\alpha = .89$, and were averaged to form a “self-efficacy” scale: Pretest $M = 5.50$, $SD = 1.08$; Posttest $M = 5.59$, $SD = 1.06$.

Subjective norms

The measurement of subjective norms also followed Ajzen’s (2006) scale. Subjective norms consist of injunctive (what others think one should do) and descriptive norms (what others themselves do).

Injunctive norms were measured with three items: “People like me expect that I run for 30+ minutes at least 4 times per week in the near future (1 = Extremely unlikely; 7 = Extremely likely);” “People similar to me would think that I (1 = Should not; 7 = Should) run for 30+ minutes at least 4 times per week in the near future;” and “People who have a lot in common with me would (1 = disapprove; 7 = approve) of my running for 30+ minutes at least 4 times per week.”

Descriptive norms were measured with: “Many people like me run or exercise for 30+ minutes at least 4 times per week (1 = Extremely unlikely; 7 = Extremely likely);” “People who have a lot in common with me (1 = do not run; 7 = run) or exercise for 30+

minutes at least 4 times per week;” and “People sharing many things with me run for 30+ minutes at least 4 times per week (1 = Completely false; 7 = Completely true).”

All six items exhibited internal consistency, Pretest $\alpha = .76$; Posttest $\alpha = .86$, so were summed and averaged to form one “subjective norm” scale: Pretest $M = 4.45$, $SD = .95$; Posttest $M = 4.82$, $SD = .82$.

Behavioral intention

The single item measure of behavioral intention was included in the main study without change: Pretest $M = 3.53$, $SD = 1.72$; Posttest $M = 3.93$, $SD = 1.58$.

Three additional dependent variables were included to assess the participants’ intention to exercise. The *Intended running frequency* measure asked: “If you start running, how many days in a typical week do you plan to run or exercise? __Days:” Pretest $M = 2.89$, $SD = 1.07$; Posttest $M = 3.41$, $SD = 1.00$.

Intended running duration asked: “If you start running in the near future, how long would you like to do it every time? __Minutes:” Pretest $M = 23.89$, $SD = 8.81$; Posttest $M = 30.93$, $SD = 9.97$.

Gift selection noted whether participants chose the trail running socks or the \$10 check as compensation. Of 150 participants, 32 (21%) chose the socks.

Other measures

Six other potentially relevant variables were included in the post-test questionnaire to provide further explanation and to explore non-hypothesized relationships. Participants also were asked to guess Kerry’s gender.

Among the six variables, two were about readers’ processing of the blogs: the number of *Meaning units* and *Thought valence*. These items were included to measure the

readers' processing styles of the blogs. The number of meaning units measures the effort readers devote in processing the blogs. When the blog messages are non-narrative, according to dual-processing models, customization should lead to an increased level of cognitive processing of the blogs, resulting in more meaning units. When the blog messages are narrative, according to narrative transportation theories, customization should not lead to the increase in level of cognitive processing as much as in non-narrative blogs, resulting in relatively the same number of meaning units across all three conditions. In terms of thought valence measurement, because narrative messages can offer readers the experience of transportation, and in this context, a mainly pleasant experience of transportation, readers are likely to have more positive thoughts than readers under non-narrative conditions, who might feel that they were being lectured to.

Another four measures assessed readers' involvement with the bloggers:

Perceived source credibility, Interpersonal attraction, Identification, and Parasocial interaction. These measures were included to shed light on the interaction between readers and bloggers under different conditions. For example, bloggers customized with related characteristics might be perceived to be more credible than bloggers with unrelated characteristics. When a blogger tells a good story instead of giving many lines of instructions, readers might find this blogger more attractive, be more likely to identify with the blogger, and thus have higher levels of para-social interaction.

Meaning units

Meaning units refers to a collection of words or phrases that relate to one central meaning. It is also called an idea unit (Kovach, 1991) or textual unit (Krippendorff, 1980). In the post-test questionnaire, participants were asked to list all of the thoughts they had

while reading Kerry's blog. They were provided with 24 boxes and instructed to list one thought per box without worrying about grammar or spelling (Cacioppo & Petty, 1981).

Two native English speakers who were not aware of the experimental purpose of the study served as coders. They were instructed to first go through each line of thought and type in the number of meaning units for each line. Then, they decided what the meaning unit was about: the blogger (e.g., "Kerry sounds like an interesting person"), the blog (e.g., "The blog template seems pretty neat"), the self (e.g., "I should start running soon"), or something irrelevant (e.g., "When is the ECON homework due?"). The irrelevant thoughts were excluded from further analysis. Inter-coder agreement was 97%. The few differences were resolved by discussion. The total number of relevant meaning units about the blogger, the blog, and the self were summed for each participant, $M = 9.13$, $SD = 4.97$.

Thought valence

The coders were also asked to code the valence of each relevant thought. They were instructed to put in a "-1" if a thought was negative (e.g., "I don't think Kerry is trustworthy"), a "0" if the thought was neutral (e.g., "She must be a morning person"), and a "1" if a thought was positive (e.g., "I like seeing a deer!"). When there was more than one meaning unit in one box, the coders were instructed to code the valence based on the general valence of the whole sentence. For example, one participant wrote, "While I think Kerry has a point, running is just not for me." Although there are two meaning units in this sentence (one is positive and the other is negative), it was still coded as "negative" because of its overall valence. Initial inter-coder agreement was 85%. Differences were resolved by discussion.

The valence scores of each participant were aggregated to form a valence scale. For example, if a participant wrote 10 thoughts, with seven being coded as positive, two as neutral, and one as negative, the valence scale of this person would be six [$7 \times 1 + 2 \times 0 + 1 \times (-1)$]. The mean of the valence scores for all 150 participants was .11, $SD = 5.02$.

Perceived source credibility

Participants' perception of the blogger as a credible source was assessed by the six-item measure adapted from Metzger and colleague's (2003) research: "I trust the blog Kerry posted;" "Kerry is credible;" "The blog Kerry posted is high quality;" "The blog Kerry posted is accurate;" "I think Kerry is reliable;" and "I think Kerry is believable" (1 = Strongly disagree; 7 = Strongly agree).

The six-items demonstrated good internal consistency, $\alpha = .93$, so were averaged to form a "Perceived source credibility" scale, $M = 4.88$, $SD = 1.07$.

Interpersonal attraction

Interpersonal attraction refers to "a constellation of sentiments which comprise the evaluative orientation of one person toward another" (Huston, 1974, p. 11). It was measured by McCroskey and McCain's (1974) 10-item interpersonal attraction scale. Sample items included: "I think Kerry could be a friend of mine;" and "I would like to have a friendly chat with Kerry (1 = Strongly disagree; 7 = Strongly agree)." Five items were reverse coded: "It would be difficult to meet and talk with Kerry;" "Kerry just wouldn't fit into my circle of friends;" "Kerry and I could never establish a personal relationship with each other;" "I don't like the way Kerry looks⁴;" and "Kerry is somewhat ugly."

⁴ The blog did not show Kerry's picture. Kerry, however, occasionally described how his/her body looked in some of the blogs.

The 10 items demonstrated adequate internal consistency, $\alpha = .78$, so were averaged to form an “interpersonal attraction” scale, $M = 4.60$, $SD = .71$.

Identification

Identification refers to “an imaginative process through which an audience member assumes the identity, goals, and perspective of a character” (Cohen, 2001, p. 261). During identification, audience members will temporarily lose their self-awareness and take on the role of the character. Although Cohen (2001) suggested 10 items to measure identification, several items are highly similar to the items in the transportation scale used in this study. Eyal and Rubin (2003) developed another identification scale that has good internal reliability but overlaps less conceptually and operationally with the transportation scale. Seven items relevant to the current research context were selected from the Eyal and Rubin 10-item scale to measure readers’ identification with the blogger, Kerry. Sample items included: “When I was reading the blog, I believed that I was Kerry” and “While reading the blog, I imagined myself doing the same thing Kerry was doing (1 = Strongly disagree; 7 = Strongly agree).”

The seven items demonstrated good internal consistency, $\alpha = .90$, so were averaged to form an “identification” scale, $M = 4.00$, $SD = 1.38$.

Parasocial Interaction

Parasocial Interaction (PSI) refers to the pseudo relationship an audience member may have in their mind with a media character (Horton & Wohl, 1956). PSI differs from identification in that identification implies the loss of self-identity into that of the media characters while PSI assumes that the self is an individual entity separate from the media character. Rubin’s parasocial interaction scale (Rubin, 1994; Rubin & Perse, 1987) was

adapted to this research context. Sample items included, “Kerry makes me feel comfortable, like I’m with a friend;” “If Kerry posts another blog, I would want to read it (1 = Strongly disagree; 7 = Strongly agree).”

The four items were demonstrated good internal consistency, $\alpha = .90$, so were averaged to form a “parasocial interaction” scale, $M = 4.36$, $SD = 1.23$.

RESULTS

Preliminary Analyses

Preliminary checks were conducted on all continuous variables to ensure that the data did not violate the assumptions of normality and linearity. Homogeneity of variances was checked on all continuous variables and there was no significant difference across the six conditions, $ps > .10$. A series of 2 (Narrative, Non-narrative) x 3 (No customization, Unrelated customization, Related customization) ANOVAs were conducted on all continuous pre-test dependent variables with the two independent variables entered as fixed factors in full factorial models. None showed significant differences, $ps > .10$. Therefore, the participants did not differ on any of the pre-test continuous measures and the gender distribution was proportional across all six conditions.

A series of paired sample *t*-tests indicated that all post-test dependent variables, *Attitude toward running*, *Self-efficacy*, *Subjective norms*, *Behavioral intention*, *Intended running frequency*, and *Intended running duration* had significantly increased, $ps < .001$ from the pre-test measures.

The 150 blogs created for the pretest were carefully edited to be around 1,300 words across all conditions, $M = 1,323$, $SD = 26$. The average reading time of a blog was

256.82 seconds, $SD = 100.73$, or a little more than four minutes. The reading time did not differ across conditions, $ps > .25$.

The gender distribution also did not differ across conditions, $\chi^2(5, N = 150) = 5.70, p = .34$. Although both characters in the blog were judged to be female by the majority of the participants (79.3% for Kerry and 68.7% for Jaime), participants tended to guess that Kerry was the same gender as themselves, $\chi^2(1, N = 150) = 10.36, p = .001$. The majority of participants also tended to guess Kerry and Jaime were of the same gender: $\chi^2(1, N = 150) = 7.47, p = .006$.

A series of independent-sample t-tests were conducted on all continuous pre-test dependent variables with gender entered as the grouping variable. There was no pre-test difference between male and female participants, $ps > .30$, on all but one dependent variable: The self-efficacy for running of male participants, $M = 5.71, SD = 1.07$, was higher than that of the female participants, $M = 5.34, SD = 1.05, t(148) = 2.11, p = .04$.

While individual customized blogs differed in the insertion of specific personal characteristics, of all the 41 characteristics included in the main study, Free time, Exercise frequency, Ideal body shape, Lack of sleep, Current favorite exercise, and Favorite weather were rated to be the most related characteristics. Favorite bookstore, Hair color, Favorite book, Favorite T-shirt color, Favorite news site, and Favorite movie were rated to be the least related characteristics. (See Table 4.)

Manipulation Checks

A series of ANOVAs, like in the pilot study, were performed to check the manipulation of message type and customization type in the main study. The results confirmed that the manipulations were successful.

A 2 (Narrative, Non-narrative) x 3 (No customization, Unrelated customization, Related customization) ANOVA indicated a significant main effect for the narrative manipulation, $F(1, 144) = 13.46, p < .001, \text{partial } \eta^2 = .09$. The mean score for transportation was significantly higher in the narrative conditions, $M = 4.58, SD = .96$, than in non-narrative conditions, $M = 3.93, SD = 1.19$. There was neither a significant main effect for customization type on transportation, $F(2, 144) < 1$, nor a significant interaction effect of the two independent variables on transportation, $F(2, 144) < 1$.

Post-hoc analysis of transportation showed that in the control conditions where there was no customization, there was no difference between the narrative and the non-narrative messages, $F(1, 144) = 1.07, p = .30, \text{partial } \eta^2 = .007$. But narrative messages, $M = 4.54, SE = .22$, produced significantly more transportation than non-narrative messages, $M = 3.65, SE = .22$, in the unrelated customization condition, $F(1, 144) = 8.40, p = .004, \text{partial } \eta^2 = .055$, as well as in the related customization condition, Narrative: $M = 4.69, SE = .22$, Non-narrative: $M = 3.95, SE = .22, F(1, 144) = 13.46, p < .001, \text{partial } \eta^2 = .09$. When the messages were non-narrative, unrelated customization, $M = 3.65, SE = .22$, produced marginally less transportation than no customization, $M = 4.18, SD = .22, F(1, 144) = 3.00, p = .085, \text{partial } \eta^2 = .02$. (See Table 6⁵ and Figure 7.)

Two two-way ANOVAs showed the manipulation of customization type was successful. The first 2 (Narrative, Non-narrative) x 3 (No customization, Unrelated customization, Related customization) ANOVA revealed a significant main effect for the existence of customization, $F(1, 144) = 7.69, p = .001, \text{partial } \eta^2 = .097$. Post-hoc

⁵ Estimated marginal means are presented here because both ANOVAs and ANCOVAs test adjusted means. Unadjusted, or raw means are presented in the tables because the data are not intended to generalize to the population.

comparisons using the Tukey HSD test indicated that the mean score of customization for participants in both related, $M = 3.84$, $SD = 1.75$, and unrelated customization conditions, $M = 4.00$, $SD = 1.78$, was significantly higher, $p = .001$, on the customization scale than those of participants in no customization conditions, $M = 2.77$, $SD = 1.55$. There was no difference between related and unrelated customization conditions on the customization scale, $p = .89$. The analysis also revealed that there was no statistically significant main effect for narrative on customization, $F(1, 144) = 1.06$, $p = .31$, and no significant interaction effect of the two independent variables on customization, $F(1, 144) < 1$, $p = .88$.

The second 2 (Narrative, Non-narrative) x 2 (Unrelated customization, Related customization) ANOVA revealed a statistically significant main effect for the related scale, $F(1, 96) = 4.98$, $p = .028$, partial $\eta^2 = .049$. Specifically, the mean score for participants in related customization conditions, $M = 4.18$, $SD = 1.12$, was significantly higher, $p < .001$, on the relatedness scale than those of participants in the unrelated customization condition, $M = 3.66$, $SD = 1.19$. The analysis also revealed that there was neither a significant main effect for narrative on relatedness, $F(1, 96) < 1$, $p = .67$, nor a significant interaction effect of the two independent variables on relatedness, $F(1, 96) < 1$, $p = .55$.

Additional analyses of the two processing variables, number of *Meaning units* and *Thought valence*, suggested that the manipulation was successful and that readers processed different types of messages differently. (See Table 7 and Figures 8 and 9.)

Of all meaning units, 21.0%, $M = 1.91$, $SE = 2.19$, were about the blogger, 29.9%, $M = 2.73$, $SE = 2.91$, were about the blog, and 49.1%, $M = 4.49$, $SE = 4.84$, were about

the participants themselves. While the full 2 (Narrative, Non-narrative) x 3 (Control, Unrelated customization, Related customization) ANOVA did not reveal any significant differences, the post-hoc multiple tests⁶ showed that when the message type was non-narrative, related customization, $M = 11.00$, $SE = .99$, produced significantly more thoughts than no customization, $M = 8.08$, $SE = .99$, $p < .05$.

Similarly, while the 2 (Narrative, Non-narrative) x 2 [No customization, Customization (Unrelated + Related)] did not reveal any significant differences, the post hoc multiple tests showed that when the blogs were customized (both related and unrelated customization), non-narrative messages, $M = 10.50$, $SE = .70$, produced significant more thoughts than narrative messages, $M = 8.52$, $SE = .70$, $p < .05$.

Of all valence codings, the most positive ones were about the self, $M = .25$, $SE = 2.97$; the second most positive ones were about the blogger, $M = .03$, $SE = 1.46$; and the most negative ones were about the blog, $M = -.18$, $SE = 2.94$. Message type was a significant factor in thought valence, $F(1, 144) = 6.18$, $p = .014$, partial $\eta^2 = .041$. Specifically, readers tend to have more positive thoughts about narrative messages, $M = 1.24$, $SE = .61$, than about non-narrative messages, $M = -1.10$, $SE = .61$.

In summary, the manipulation checks for message and customization types suggested the manipulations were effective. Findings indicated that readers were more transported in the narrative conditions than in the non-narrative conditions. Readers perceived both of the customization conditions to be more customized to themselves than

⁶ While the traditional view on the relationship between the omnibus F test and the post-hoc means comparison is that one should not carry out the latter unless the former is significant at the .05 level, several scholars (Hancock & Klockars, 1996; Howell, 2007; Wilcox, 1987) think otherwise. Multiple comparisons, compared with omnibus F tests, have the advantage of conducting some particular comparisons unplanned a priori that may help to explore theoretical relationships among the variables. Therefore, post-hoc multiple comparisons were conducted, controlling for family wise error rate. The results should be interpreted with caution.

the no customization conditions. Readers perceived the similarities between themselves and the bloggers in the related customization conditions as more related to their starting running than the similarities in the unrelated customization conditions. Additional analyses also suggested that readers process different messages differently. Specifically, both related and unrelated customization produced significantly more thought meaning units than no customization when the message was non-narrative. Narratives also produced more positive thoughts than non-narratives.

Testing of hypotheses

To test the hypotheses, a series of ANCOVA tests were performed on all continuous outcome variables. Most ANCOVAs were conducted with the post-test measures as dependent variables, message types and customization (types) as fixed factors, and the pre-test measures as the covariates. For gift selection, the only categorical outcome variable, full and conditional cross-tabulations were performed. A summary of the results of all the hypothesis tests is presented in Table 2. In all ANCOVAs, the pre-test measure was a significant factor and so was not reported individually.

Attitude toward running. H1a predicted that readers in the narrative conditions would have a more positive attitude toward running than those in the non-narrative conditions. Analyses showed that message type (narrative or non-narrative) was not significant, $ps > .13$. Thus, H1a was not supported. (See Figure 10.)

H2a predicted that readers in the related customization conditions would have a more positive attitude toward running than those in the unrelated customization conditions, and than those in the no customization conditions. The factor of customization type was not significant, $ps > .28$. Therefore, H2a was not supported.

H3a predicted that the effect of customization type on attitude toward running would be stronger in the non-narrative conditions than in the narrative conditions. The factor of message type x customization type was not significant, $ps > .26$. Therefore, H3a was not supported.

Self-efficacy. H1b predicted that readers in the narrative conditions would have higher self-efficacy toward running than those in the non-narrative conditions. The factor of message type was not significant, $ps > .57$. Therefore, H1b was not supported.

H2b predicted that readers in the related customization conditions would have a higher self-efficacy toward running than those in the unrelated customization conditions, and than those in no customization conditions. The factor of customization type was not significant, $ps > .65$. Therefore, H2b was not supported.

H3b predicted that the effect of customization type would be stronger in the non-narrative conditions than in the narrative conditions. The factor of message type x customization type was not significant, $ps > .68$. Therefore, H3b was not supported.

Subjective norms. H2c predicted that readers in the related customization conditions would have similarly positive subjective norms about running as those who were in the unrelated customization conditions, and both sets of readers would have more positive subjective norms than those in no customization conditions. With the factor of customization type and customization not being significant across models, $ps > .37$, H2c was not supported.

Behavioral intention. H1c predicted that readers in the narrative conditions would have higher behavioral intentions than those in the non-narrative conditions. The factor of message type was not significant, $ps > .11$. Therefore, H1c was not supported.

H2d predicted that readers in the related customization conditions would have higher behavioral intentions than those in the unrelated customization conditions, and than those in the no customization conditions. The factor of customization type was not significant, $ps > .15$. Post-hoc comparisons showed that there were no differences in customization types across three narrative conditions, $ps > .15$. In the non-narrative conditions, though, the post-test behavioral intention for participants in the unrelated customization condition, $M = 3.27$, $SE = .28$, was marginally lower than that of participants in the no customization condition, $M = 4.01$, $SE = .28$, $p < .07$, and significantly lower than that of participants in the related customization condition, $M = 4.31$, $SE = .28$, $p < .02$. There was no difference between the related customization and the no customization conditions, $p > .46$. (See Table 8 and Figure 11.)

Therefore, H2d was partially supported. When the health messages were non-narrative, unrelated customization was less effective in increasing post-test behavioral intention than the related and non-customized blogs.

When a 2 (Narrative, Non-narrative) x 2 (No customization, Customization) ANCOVA test was performed, though, there was no difference between the customization and no customization conditions no matter whether the messages were narrative or non-narrative, $p > .52$. In other words, the null finding was due to the weak effect of unrelated customization conditions canceling out the positive effect of related customization conditions.

H3c predicted that the effect of customization type on behavioral intention would be stronger in the non-narrative conditions than in the narrative conditions. The factor of

message type x customization type was not significant across models, $ps > .16$. Therefore, H3c was not supported.

A 2 (Narrative, Non-narrative) x 2 (Unrelated customization, Related customization) ANCOVA test, though, provided some marginal evidence: The tests showed that the difference in behavioral intention means between unrelated customization and related customization for non-narratives minus the difference in means between unrelated customization and related customization for narratives was marginally significant, $F(1, 95) = 3.38, p = .069, \text{partial } \eta^2 = .034$. The graph of the change score of behavioral intention was also in accordance with the predicted relationships. (See Figure 11.)

Intended running frequency. H1d predicted that readers in the narrative conditions would have higher intended running frequency than those in the non-narrative conditions. The factor of message type was not significant across models, $ps > .39$. Therefore, H1d was not supported.

H2e predicted that readers in related customization conditions would have higher intended running frequency than those in the unrelated customization conditions, and than those in no customization conditions. The factor of customization type was not significant across models, $ps > .46$. Therefore, H2e was not supported.

H3d predicted that the effect of customization type on intended running frequency would be stronger in the non-narrative conditions than in the narrative conditions. The factor of message type x customization type was not significant across models, $ps > .72$. Therefore, H3d was not supported.

Intended running duration. H1e predicted that readers in the narrative conditions would have longer intended running duration than those in the non-narrative conditions. The ANCOVAs revealed a marginally significant effect, $F(1, 143) = 3.30, p = .071$, partial $\eta^2 = .023$ for narratives, $M = 32.10, SE = .91$ over non-narratives, $M = 29.76, SE = .91$. Post-hoc comparisons showed that narrative messages, $M = 32.33, SE = 1.57$, produced significantly longer post-test intended running duration than non-narrative messages, $M = 26.51, SE = 1.58$, when the customization type was about unrelated characteristics, $p < .01$, but not for the related and no customization conditions, $p > .60$. Therefore, H1e was marginally supported.

H2f predicted that readers in the related customization conditions would have longer intended running duration than those in the unrelated customization conditions, and than those in no customization conditions. The ANCOVA model showed a significant effect for customization type, $F(2, 143) = 3.17, p = .045$, partial $\eta^2 = .043$. Post-hoc comparisons indicated that the effect was mainly because the post-test intended running duration for participants in the unrelated customization condition, $M = 26.51, SE = 1.58$, was significantly lower than that of participants in the related customization condition, $M = 33.06, SE = 1.57, p < .01$, when the messages were non-narrative. There was no difference between the related customization and no customization conditions, $ps > .15$. Therefore, H2f was partially supported.

H3e predicted that the effect of customization type on intended running duration would be stronger in the non-narrative conditions than in the narrative conditions. The interaction of message type by customization type was not significant in the full factorial model, $F(2, 143) = 1.86, p = .16$, partial $\eta^2 = .025$. Although post-hoc comparisons

showed that there were no differences in customization types across the three narrative conditions, $p > .27$, a closer look showed that the difference in the means of intended running duration between unrelated customization and related customization for non-narratives minus the difference in means between unrelated customization and related customization for narratives was marginally significant, $p = .08$. Therefore, H3e was marginally supported. The graph of the change score of intended running duration was also in accordance with the predicted relationships. (See Tables 9, 10 and Figure 12.)

Gift selection. Of the 32 participants who chose to take two pairs of professional trail running socks instead of the \$10 check, 15 (46.9%) were males and 17 (53.1%) were females. There was no gender difference, $p = .55$. Because of the small sample ($N = 150$) and the few event cases ($N = 32$), neither Logistic Regression nor Rare Event Logistic Regression (King & Zeng, 2001) could provide sufficient statistical estimation with good power, so non-parametric statistics were used to test this outcome. (See Table 11 and Figure 13.)

H1f predicted that more readers in the narrative conditions would choose socks than those who read a non-narrative health blog. The difference between readers in the non-narrative compared to the narrative conditions was not statistically significant, $\chi^2 (1, N = 150) = 1.43, p = .23$, however. A separate analysis of the readers in the related customization conditions produced only a marginally significant effect of non-narrative ($N = 10$) over narrative ($N = 4$), $\chi^2 (1, N = 50) = 3.57, p = .059$. Therefore, H1f was not supported.

H2g predicted that more readers in the related customization conditions would choose the socks than those in the unrelated customization conditions, and than those in

no customization conditions. A closer examination of the raw count showed that 14 people from the related customization conditions, eight from the unrelated customization conditions, and 10 from the no customization conditions took the socks, but the Chi-square test was not significant, $\chi^2(2, N = 150) = 2.23, p = .33$. The same analysis conducted with participants in the non-narrative customization type conditions, revealed a marginally significant effect, $\chi^2(2, N = 75) = 5.22, p = .074$. Further analyses of the non-narrative data showed that more participants in related customization conditions choose the socks ($N = 10$) than those in unrelated customization conditions ($N = 3$), $\chi^2(1, N = 50) = 5.09, p = .024$. More participants ($N = 10$) in the related customization conditions chose the socks than the other two conditions combined ($N = 9$), $\chi^2(1, N = 75) = 4.27, p = .039$. Therefore, H2g was partially supported.

H3f predicted that the effect of customization type on gift selection would be stronger in the non-narrative conditions than in the narrative conditions. This hypothesis was partially supported because differences appeared within customization type in the non-narrative conditions (See previous paragraph) but not in the narrative conditions, $\chi^2(1, N = 75) < .2$. Therefore, H3f was partially supported.

Involvement measures

The four involvement measures, *Perceived source credibility*, *Interpersonal attraction*, *Identification*, and *Parasocial interaction* were first analyzed in a series of ANOVAs as dependent variables. (See Table 12.)

Perceived source credibility. When a 2 (Narrative, Non-narrative) x 3 (No customization, Unrelated customization, Related customization) ANOVA was performed, a significant main effect, $F(1, 146) = 3.89, p = .05$, partial $\eta^2 = .026$, was found. The

blogger who exhibited unrelated similarities was perceived as less credible, $M = 4.7$, $SE = .14$, than the blogger who had related similarities, $M = 5.13$, $SE = .14$. (Figure 14.)

Interpersonal attraction. Customization had a marginally significant effect, $F(1, 148) = 3.22$, $p = .075$, partial $\eta^2 = .021$, on interpersonal attraction. Specifically, bloggers with similarities, no matter whether they were related to health conditions or not, were perceived to be more attractive, $M = 4.67$, $SE = .07$, than bloggers with no customization, $M = 4.45$, $SE = .10$. (Figure 15.)

Identification. Readers tended to identify more with bloggers of narrative messages, $M = 4.30$, $SE = .16$, than with bloggers of non-narrative messages, $M = 3.70$, $SE = .16$, $F(1, 144) = 7.43$, $p = .007$, partial $\eta^2 = .049$. (Figure 16.)

Parasocial interaction. Readers also tended to have a higher level of parasocial interaction with bloggers of narrative messages, $M = 4.58$, $SE = .15$, than with bloggers of non-narrative messages, $M = 4.14$, $SE = .15$, $F(1, 144) = 4.75$, $p = .031$, partial $\eta^2 = .032$. (Figure 17.)

Each of the four involvement variables was then included as a statistical control in the significant ANCOVA models. While they were significantly correlated with the outcome variables, $ps < .05$, and none of the previous significant effects from the independent variables were eliminated, they were not significant in the models, suggesting that the involvement variables were not mediating the effect of customization and message type on the attitudinal and behavioral outcome variables.

Gender was also included as a third independent variable in all of the previous models but no significant main effects or interactions were found, $ps > .32$. The results of

the ANOVAs and ANCOVAs with gender did not differ significantly from those without gender.

Summary of findings

In summary, the data provided partial support for H2d, H2f, H2g, and H3f, and marginal support for H1e and H3e. Consonant with the predictions, narrative health messages as compared to non-narrative health messages encouraged readers to have longer intended running duration, even when the customization was unrelated to the health issue. Bloggers who shared health-related characteristics with the reader elicited stronger health behavior intentions, longer intended running duration, and choice of the health-related gift than bloggers who were similar but only on characteristics unrelated to the health issue. The difference between the effects of related and unrelated customization on intended running duration, and gift selection was stronger in the non-narrative conditions than in the narrative conditions. While readers considered bloggers more attractive if they were similar, they did not always perceive them to be credible, because sometimes they shared characteristics unrelated to the health issue. Readers perceived bloggers with related customization to be more credible than bloggers with unrelated customization. Readers of narrative health blogs identified more and were more likely to feel some parasocial interaction with the bloggers than readers of the non-narrative blogs.

The analysis also suggested that people might process narrative and non-narrative messages differently. Specifically, customization led to an increase in the number of thought meaning units, but only for non-narrative messages. Compared with non-narratives, narrative messages tended to elicit more positive thoughts from the readers.

CHAPTER 5

DISCUSSION

This study is one of the first systematic empirical examinations of the persuasive effects of narratives and source similarity in personal health blogs. Three overarching questions framed this project: (1) Are narrative or non-narrative health blogs more persuasive? (2) Are bloggers with related similarities more persuasive than bloggers with unrelated similarities? (3) Will the type of blogger-reader similarities make a difference in the persuasiveness of both narrative and non-narrative blogs? Through examining the health persuasion outcome of the two types of messages (narrative and non-narrative blogs), in the three types of customization conditions (No customization, Unrelated customization, Related customization), significant differences were detected on measures of health behavior intention.

Four of the hypotheses were partially supported, two were marginally supported, and 13 were not supported. Narrative health messages as compared to non-narrative health messages encouraged longer intended running duration. Bloggers who shared health-related characteristics elicited stronger behavioral intentions, longer intended running duration, and choice of the health-related gift when compared with bloggers who were similar but only on characteristics unrelated to the health issue. The difference between the effects of related and unrelated customization was stronger in the non-narrative conditions than in the narrative conditions.

Interpretation of findings

(1) Are narrative or non-narrative health blogs more persuasive? Even though the data suggested that the customization effect was stronger in the non-narrative conditions, narratives should not be written off. The narrative blogs, whether customized or not, resulted in longer intended running duration than the non-narratives. This might be due to the transportation experience, which was stronger for the narrative messages than for the non-narrative messages.

The positive details about each running experience in the narrative blogs might have helped to create an enjoyable vicarious running experience for the readers. The positive thought valence for the narrative messages provides some support for this idea. In contrast, the non-narrative messages that provided only didactic instructions may have been a less enjoyable reading experience. Readers of the non-narrative blogs had more negative thoughts than the narrative readers. The narrative readers who enjoyed the running experience in the stories, may have imagined running longer because of their pleasant reading experience (See Ryan & Deci, 2001 for a review).

Narratives also outperformed non-narratives when the health messages were not customized, or were customized with unrelated similarities. Readers in the narrative conditions expected to run longer. These findings suggest that narrative-based messages might be a good choice when health communicators are not sure which type of message to customize.

(2) Are bloggers with related similarities more persuasive than bloggers with unrelated similarities? An interesting and counterintuitive finding was that customization was not a panacea. Specifically, customized bloggers with similarities unrelated to the

health behavior were less persuasive than non-customized bloggers with no similarities in increasing readers' health behavioral intentions. These findings contrast with prior customization research of web portals (Kalyanaraman & Sundar, 2006) that suggests that higher levels of customization lead to more positive attitudes.

One explanation for the different pattern of results found in this study is that Web portals typically are information providers of a wide variety of content. When content provided through a portal is matched to each user's preference, users may perceive everything as "related." Users do not expect those portals to provide customized content in any specific area. In contrast, personal health blogs are more specialized information providers than general web portals. Health bloggers usually post about specific health topics by sharing their experiences or suggestions. Such blogs typically include a narrower range of topics than web portals. Thus, when the bloggers in this study wrote about similar personal characteristics unrelated to health issue, readers' expectations of the blog may have been violated. Readers could perceive the source as less credible or even start to actively resist the persuasive attempt of the source (See Hackett, Day, & Mohr, 2008 for a similar discussion).

Although not hypothesized, the findings suggested that unrelated similarities between the blogger and reader resulted in less identification and less parasocial interaction than the generic health messages. These patterns resembled those of credibility. (See Figures 14, 16, and 17.) We might conclude, therefore, that customization will be more effective if the similarities are perceived by each recipient as related to the theme of the message. Customization with unrelated similarities, such as favorite T-shirt color, on the other hand, may not be considered genuine customization. In

this study, comparisons between customization with related similarities and generic messages always indicated that related customized messages were more effective (Vesonen, 2007). Such patterns, however, were not observed with customization with unrelated similarities.

(3) Will the type of blogger-reader similarities make a difference in the persuasiveness of both narrative and non-narrative blogs? This study suggests that not only should the right aspects be identified for customization, customization should be also conducted in an environment that will maximize its persuasive potential. Non-narratives turned out to be a better environment than narratives. The data consistently indicated that the differences in intended running duration and gift selection between different customization types were stronger in the non-narrative conditions than narrative conditions. Although similarity between the readers and characters may help to increase transportation (Green, 2004), the graph of the transportation score (Figure 7) indicated that, customization, no matter whether unrelated or related to the health theme, only slightly increased transportation.

Apparently readers do not have to be similar to the characters to be transported by a narrative. Other aspects of the narrative, such as the description of the background, the development of the plot, or the outcome of the characters, may increase transportation. This probably explains the appeal of many literary masterpieces across time and cultures. Such a finding is also consistent with Slater and Rouner's (2002) proposition that customization may be less important than emotional involvement with the characters as a result of narrative transportation.

On the other hand, when messages were non-narrative, consistent with the framework of the Elaboration Likelihood Model (Petty & Cacioppo, 1986b), customization was expected to increase personal involvement and increase central processing (See Petty, Wheeler, & Bizer, 2000). In this study, some evidence existed for this explanation in that readers in both customized conditions (i.e., when bloggers shared either related or unrelated similarities with the readers) had a significantly higher number of meaningful thought units than those in the generic conditions. As a result of central processing, readers may have scrutinized the message with more sensitivity to their similarity with the blogger than readers of narrative messages, who were more transported. This might help explain the relatively sharper slopes for the non-narrative conditions as compared to the narrative conditions. (Figure 7.)

No significant findings were obtained regarding changes in attitude toward running, self-efficacy, and intended running frequency. A closer examination of the pre-test attitude, $M = 5.17$, $SD = 1.00$, and self-efficacy, $M = 5.51$, $SD = 1.08$, showed that both were much higher than the pre-test measures of the other variables. This suggested that the population might have already had positive attitudes toward running. Future studies might benefit from focusing on less well-known health activities to which the population has yet to form an attitude.

As for self-efficacy, it is known that people have a tendency to over-estimate their capacity to achieve some goal (See Gist & Mitchell, 1992 for a review). Although the blog exposure significantly increased self-efficacy, there might still be a ceiling effect, preventing the detection of significant differences in the post-test conditions.

The intended running frequency measure may also have suffered from a ceiling effect. Most of the questions regarding running in the questionnaires were worded as “running ... at least 4 days per week” to make the desired frequency of the health behavior seem reasonable. Although the mean of the pre-test measure was only 2.89, $SD = 1.07$, the four days per week in the questions might have produced a ceiling effect by suggesting that four days was enough. Indeed, the post-test measure of intended number of days to run was less than four, $M = 3.41$, $SD = 1.00$.

Theoretical implications

(1) Difference between narratives and non-narratives: This study demonstrated that people process narrative and non-narrative messages differently. On one hand, the data suggest that customization may increase the number of meaningful thoughts readers have as they read non-narrative blogs. This is consistent with the Elaboration Likelihood Model’s prediction that as personal relevance increases, people are more likely to process messages centrally (Kreuter, Strecher, & Glassman, 1999). Interestingly, although the amount of customization, or matched similarities, was equal between related and unrelated customization conditions, related customization produced more meaning units than unrelated customization. This suggests that relatedness should be considered as another type of information that increases perceived personal relevance.

On the other hand, it is important to note that the number of meaning units in the narrative conditions was not different from the number generated in the non-narrative conditions, even with the introduction of related customization. This offers further support that the Elaboration Likelihood Model may not be an appropriate model to explain narrative’s influence. As can be seen in Figure 8, in the customization conditions,

narrative messages produced fewer thoughts than the non-narrative messages. According to the ELM, fewer thoughts indicate less effortful processing, or peripheral processing. Peripheral processing should result in less stable persuasion. The narrative messages in this study, however, resulted in marginally longer intended running duration than the non-narrative messages.

The thought valence analysis (Figure 9) further complicates the distinction between narratives and non-narratives. As was seen in that analysis, narratives in general produced more positive thoughts than non-narrative messages. This may be because the non-narrative messages were written in a didactic form offering a laundry list of 15 suggestions for beginning runners. The participants could have felt as if they were being “talked at,” which generated negative feelings toward the blogger and the subject. This pattern could be explained by psychological reactance theory (J. W. Brehm, 1966; S. S. Brehm & Brehm, 1981), which posits that reactance will occur when people perceive that their freedom to choose their own attitudes and behaviors is threatened. People may feel less threatened by narratives and thus, less resistant to the messages as they are free to use their imagination to get lost in the stories.

In light of this reasoning, the negative valence for narrative messages in the unrelated customization condition was unexpected. Although it was not statistically significant, the trend suggested that readers of narrative messages still sensed that the similarities were not related to the health behavior, which might help explain less perceived source credibility, less identification, less para-social interaction, but not fewer meaning units and even slightly more transportation. In other words, participants might have had some qualitatively different thoughts about the message without investing much

cognitive effort. The lowered evaluation of the blogger and the decreased level of interaction with the blogger did not affect their level of immersing themselves into the story world. This adds to Green's (2004) suggestion that people can still be transported even when the portrayal of the character is not entirely positive and when their interaction with the character is not smooth.

(2) Difference between related and unrelated customization: In response to Kreuter and colleagues' (2000) suggestion, this dissertation's exploration of customization went beyond "Does it work?" to "When and what works best?" The findings of this study support the idea that customization will work best when it is applied to appropriate aspects of the desired behavior in the right context. In this study, the customization of unrelated similarities in non-narrative messages resulted in a kind of "boomerang" effect when compared with messages with no similarities.

Coupled with the interaction effect found for related and unrelated customization in narrative and non-narrative messages, this study offers an explanation for the small and non-significant effects found in many customized public health intervention projects. For example, in this study, customization overall did not significantly affect post-test behavioral intentions. In other words, customization as traditionally manipulated "failed" to work. When health-related and health-unrelated customization was differentiated, however, health-related customization worked.

Different from portal customization that typically offers more content "preferred" by each audience member (Kalyanaraman & Sundar, 2006), the health blogger customization in this study actually offered more content "belonging" to each audience member. In other words, personal preferences define what a person *likes* while personal

characteristics define what a person *is*. If graphed on a schematic diagram of the self, personal characteristics would be located closer to the central self-concept than personal preferences.

Accordingly, the difference between related and unrelated customization could be rephrased into the difference in distance between customized aspects of the self. An examination of the top five most related and unrelated characteristics in Table 4 suggested a similar pattern: more of the characteristics respondents said were related to the health issue were personal characteristics (e.g., exercise frequency) rather than personal preferences (e.g., favorite weather) while many more of what they said were unrelated characteristics were personal preferences (e.g., favorite book) rather than personal characteristics (e.g., hair color).

The essence of customization in health communication is the “match” between the health messages and each recipient (Briñol & Petty, 2006). This study demonstrated that to be effective, the “match” must go beyond superficiality to be well integrated with the persuasive messages that appeal to central aspects of the self.

To sum up, this study distinguished between narrative and non-narrative processing with empirical evidence of meaning units and thought valence, reiterating the necessity of using different theoretical frameworks to explain persuasive mechanisms and pathways. This study also helps to further explicate the essence of customization. Customization may be most effective when the matched attributes are close to the message recipient’s true self.

Practical implications

Several useful insights for health communication can be drawn from this study. The first concerns the medium in which health information is delivered. Personal health blogs may be an effective health communication medium in encouraging people to form healthy habits. In this project, one exposure to one blog post significantly increased six measures of health attitudes and behavioral intentions. Health communicators should be able to create some algorithm to identify and categorize health bloggers along a series of dimensions and then carefully match the blogs with individual users according to their unique health-related characteristics. A technologically advanced adaptive website interface could be used to automatically generate different health pages to match each of its unique visitors.

The second implication concerns the message design process. Related customization has been found in this study to be the most effective in producing health change while unrelated customization might even backfire. Health communicators should be extremely careful selecting appropriate characteristics on which to create customized health messages. When resources are too limited to effectively evaluate the most appropriate characteristics for customization, creating a generic transporting narrative message may be the most cost-effective solution. Although this study suggested that related customization generally performs better in non-narrative messages, narrative messages have a unique edge. In this study, narrative blog readers were less likely to resist the persuasive intent—they generated more positive thoughts, and more favorable perceptions of the source—than those who read non-narrative messages.

A message with both narrative and non-narrative elements might be most effective. The narratives may help readers to reduce the initial psychological reactance to the persuasive message by transporting them into the narrative world. Once the audience is “on board,” an appropriately customized non-narrative message could be delivered. Customization, when done correctly, is able to expand the feeling of interpersonal communication (Beniger, 1987). Narrative messages can help the audience envision or rehearse potential health benefits, which could go along with more directly educational messages delivered through non-narratives. The effective melding of narrative and non-narrative messages could help maximize the persuasion effect.

The theoretical and practical implications of this study are not limited to only the personal health blogs. Technological development allows a richer media environment and format in which health communicators can work. As long as the health communicators are able to collect appropriate personal information from the users and integrate the personal information seamlessly with the health media, they can also extend customization of narrative and non-narrative messages from the textual media to interactive multi-media, or even virtual environments.

Limitations

In this study, the blogger’s characteristics were customized as similarities. In real life, it would be hard to match every health blogger to every individual reader. Even if some characteristics can be matched in one post, the perceived customization may not be carried on to the next as the blogger writes new posts. A potential solution is to create virtual agents who pretend to be human bloggers to write customized health blogs. This is

still limited by the development of technology and available resources. The public may lose their trust in health blogs if they find out that the blogs are not written by real people.

According to O'Keefe (2002), similarities between the readers and the source will not always lead to enhanced persuasion, because customization could be a highly complex concept. For example, if perceived from different dimensions, there would be no similarity between any two entities. What is it about the blogger that the readers perceive as similar? Besides, studies have also indicated that the self concept is highly volatile and can be easily changed by priming (Gardner, Gabriel, & Lee, 1999). In fact, in the pretest, participants were first asked about their health behavior and then about their personal characteristics. The questions' order effect might have primed their judgments about their characteristics. Perhaps health communicators should adapt to this by either customizing more intrinsic and stable characteristics or effectively priming the audience into a desired state and providing a matched message.

While the pre-test questionnaire took less than the expected time to complete, it still required participants to answer more than 130 questions for at least 20 minutes. The general public may be reluctant to devote such time and energy to provide personal information. Health communicators therefore, must devise alternative reasonable plans to collect personal information without rousing suspicion or fatigue.

Although steps were taken to minimize the association between the pre-test questionnaire and the post-test questionnaire were made, some participants still became suspicious of the connection and might have resisted the persuasion as a result. Too many unique and personal characteristics similar in the bloggers and readers might have stimulated suspicion.

As Green (2008) argued, the narrative materials created by psychological researchers are usually not as transporting as those written by professional writers. Indeed, even after numerous revisions by several professional writers and health educators, the narrative blogs used in this study produced only slightly more transportation than the non-narrative blogs. The setting of this study might also have contributed to the lack of transportation. In almost all of the data-gathering sessions for this study, several students came in 3~10 minutes late. As they signed in and were told to walk to their assigned computers, they might have disturbed those who had just started to read the blogs. Such distraction would be especially troublesome for those in the narrative conditions. Thus, to fully make use of the narrative format's persuasive potential, attention should be paid to creating highly involving narratives that invoke vivid mental imagery not easily disturbed by external distraction. Short of this, audiences should be encouraged to read the health messages in a quiet setting.

The lack of transportation in this study could also suggest that personal health blogs, no matter whether written as narratives or non-narratives, may not generate much transportation. Different from previous persuasion studies that compared narratives and non-narrative messages, this project controlled for the content, length, and the type of information and presented the messages as personal blogs. Future studies could explore other forms of messages.

The finding of non-narratives' superiority over narratives in encouraging participants to pick health-related gifts over monetary compensation, albeit being statistically non-significant, was somewhat counterintuitive. A closer examination of the

blog prototypes showed that this might be due to the ways of presenting information related to the socks in the narrative and non-narrative blogs.

Compared to narratives, which tried to incorporate the introduction of the socks seamlessly into Kerry's story, the non-narrative messages about the socks were presented directly as imperatives. Since the main theme of the blogs was to encourage readers to start running, the narrative version had to give the socks a lesser role in the whole story to make sure it went well with the story. On the other hand, the non-narrative version offered a total of 15 suggestions. The suggestion about the socks was in the second place. Compared with the other 14 suggestions, this piece was the longest: the range of lines for the other 14 suggestions was only three to five. For the socks, eight lines were written. Therefore, the message of the socks might have stood out and suggested subconsciously to the readers that it was important and that they should take them. Future studies should avoid such unintended emphasis in non-narrative messages.

In this study, the participants read only one experimental blog. The post-test measure was taken immediately after their message exposure. Delayed post-test measures might identify different attitude change patterns. Similarly, when health bloggers post their personal health information in more than one post over time, repeated exposure to these blogs may have different psychological and behavioral effects.

Behavioral intentions rather than measures of actual exercising behavior were collected. It is possible that behavioral intention does not lead to actual behavior change (Ajzen, Brown, & Carvajal, 2004).

Future research

In this dissertation, some of the first empirical explorations on narratives and customization and their interplay in health persuasion were initiated. Future research in this area could follow several different paths.

First, more research is needed to replicate the present findings with different media across different platforms among different populations. These studies should benefit from multiple research methodologies in more naturalistic settings. In this research, personal information was collected through an online survey and the post-test attitude change was also measured by an online survey. More naturalistic approaches could be adopted to observe participants' behavior change. For example, electronic pedometers could be attached to each participant to observe any actual increase in the level of physical activities. BMI could be measured on a regular basis as a health outcome.

Another line of inquiry should focus on the ideal amount of customization in narrative and non-narrative persuasion. A major limitation for many customization projects is that except for Kalyanaraman and Sundar's (2006) study, most of the customization studies stop at a binary level—customization either exists or not. Customization could and should be treated as an ordinal variable with more levels or even an interval-level variable when the specificity of measurement is available. For example, six characteristics were customized in this project while maybe only three would be sufficient to produce the desired outcome. More fine-tuned studies should be conducted to identify the minimum yet effective number of similar characteristics necessary for customization.

These studies should also examine other topics beyond physical activities. Running was the healthy activity focused on in this study. It is quite possible that some other forms of health behavior may call for different persuasion strategies. For example, there are many differences between illness-detecting (e.g., mammography) and health-affirming (e.g., flossing) behaviors. Their interaction with customization would not only require the related aspects to be customized but also in an appropriate (e.g., positive or negative) message frame (Rothman & Salovey, 1997).

Similarly, research has shown that people also preferentially attend to arguments that highlight abstract features instead of concrete features when attitude objects are temporarily distant instead of near (Fujita, Eyal, Chaiken, Trope, & Liberman, 2008). In this study, almost all customized aspects were concrete and only health behaviors in the near future were examined. More research is needed to explore the feasibility of customizing abstract personal characteristics for health outcome in the distant future. For example, when developing customized health messages to encourage women to get HPV vaccines, health communicators should customize more concrete personal characteristics for females who are currently sexually active while more abstract personal characteristics for females who will not be sexually active in the near future. In other words, time frame may exert some independent influence on customization, which needs to be taken into consideration.

Future research should also take age into account. For example, for children and young adults, pure non-narrative health messages may not work no matter how customized they are. On the other hand, if the narrative messages are beyond the level of comprehension of younger children, their persuasive effect will be weakened.

Understanding what works best in which condition with what population will surely help to advance health communication theory and practice.

Two types of customization, related and unrelated customization, were contrasted in this study. It was possible to compare their effects because participants had offered enough unique personal characteristics for customization to start with. In real world interventions, such personal characteristics might not always be readily accessible. Even when they are available, highly related characteristics may still be too few to be used for message creation. In such situations, health communicators may have to identify all available characteristics whether related or unrelated to the health issue at hand.

Customization did not seem to make much of a difference across narrative messages. This might be because customization was realized through superficial matching of concrete personal characteristics between the readers and the bloggers. As discussed before, reader's emotional attachment to the bloggers, or the characters, might play a bigger role in explaining narrative's persuasive effect than superficial matching. Two research questions to take up in the future: Is it possible to customize some narrative elements so readers can form different emotional attachments with the characters? Will such customization make a bigger difference in a non-narrative or narrative message?

To conclude, in this study, two types of messages, narrative and non-narrative, and two types of customization, related customization and unrelated customization, were distinguished. Their interaction was explored in health blogs. The results suggested that both narrative and customization could be powerful health communication tools if utilized appropriately.

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