

ORGANZATIONAL BLOGS AND CANCER MESSAGES: EXPERIMENTAL TESTING
OF RECIPIENT AND MESSAGE FACTORS IN INFLUENCING ATTITUDES,
INTENTION AND BEHAVIOR

By

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To my family and friends: Without your love, support, confidence, and encouragement I could not have fulfilled my dream. You have braved the challenges of the last four years with me, and I am honored to share the success of this accomplishment with you.

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TABLE OF CONTENTS

	<u>page</u>
ACKNOWLEDGMENTS.....	4
LIST OF FIGURES.....	9
ABSTRACT	10
CHAPTER	
1 INTRODUCTION	12
Need for Current Research.....	12
Role of Current Study	17
2 LITERATURE REVIEW	20
Cancer and Communication	20
Blogs	24
Blogs and Health	31
Persuasion Research.....	38
Involvement	42
Source Credibility	43
Message Quality.....	47
Elaboration Likelihood Model	48
Patient Empowerment.....	60
Health Information Seeking	62
Assessing Empowerment.....	64
Hypotheses and Research Questions.....	67
3 METHODOLOGY.....	70
Independent Variables	70
Involvement	70
Message Quality.....	71
Source Credibility	71
Ability.....	72
Dependent Measures.....	72
Attitudes	72
Consumer Empowerment.....	73
Other Dependent Measures	75
Stimuli	76
Pretesting.....	80
Participants	84
Experimental Procedure	85

4	RESULTS	91
	The Sample	91
	Independent Variable Manipulation Checks.....	92
	Hypothesis Testing	95
	Attitude toward the Treatment Message.....	96
	Attitude toward Positron Treatment	98
	Research Question Exploration	99
	Attitude toward the Organization	99
	Attitude toward the Blog	100
	Empowerment	101
	Standardized measures	101
	Information-seeking items	101
	Other Intention and Behavioral Measures	103
5	DISCUSSION	106
	Involvement	109
	Source Credibility.....	118
	Argument Strength.....	123
	Gender Differences.....	126
	Implications.....	128
	For Theory.....	128
	For Practice	129
	Limitations.....	136
	Future Research	138
	Conclusion	139
APPENDIX		
A	COVER STORY MANIPULATIONS.....	141
B	BLOG MANIPULATIONS.....	143
	LIST OF REFERENCES	145
	BIOGRAPHICAL SKETCH.....	173

LIST OF TABLES

<u>Table</u>		<u>page</u>
4-1	Participant demographic information	104

LIST OF FIGURES

<u>Figure</u>		<u>page</u>
2-1	Simplified graphic representation of the ELM developed by Petty and Cacioppo (1981, 1986)	69

Abstract of Dissertation Presented to the Graduate School
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By

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Patients with cancer are among those having the greatest need and desire for information (Shim, Kelly, & Hornik, 2006), yet considerable dissatisfaction remains regarding the amount and type of information that health professionals provide to those living with the disease (Arora et al.; IOM, 2007a). As a result, people consult other sources, with a growing number turning to social media platforms; however, little research has examined organizational e-health messages in blogs (Kim & Chung, 2007). Using the Elaboration Likelihood Model as a framework, this study sought to extend understanding in this area by investigating experimentally the message processing that occurs among consumers of novel cancer treatment messages disseminated through a blog sponsored by a health organization and their effects on attitudes, behavioral intentions, and a specific action.

Results of the experiment conducted among 152 undergraduate students show some support in a cancer treatment context for hypotheses predicted by ELM research in other contexts; however, the results are complex and not always as anticipated. Research questions considered the value of organizational blogs as a channel of health

information, whether this two-way venue provides to consumers the mutual benefit of empowerment, and the effects that involvement, argument strength and source credibility have on screening and other health behavioral intentions, and an information-seeking action.

To some extent, involvement, source credibility and argument strength each did influence some of the dependent attitude measures tested here. Among all subjects, source credibility influenced attitudes toward the message, positron treatment, and the organization, as well as overall likelihood of seeking additional information about the cancer treatment and of taking an information-seeking action. Argument strength had a stronger influence, affecting all four attitudinal measures (including toward the blog), as well as the probability of seeking additional information and of discontinuing a harmful behavior. The results have both theoretical and practical implications, and provide empirical support for speculation that theories of persuasion such as the ELM that have often been overlooked with respect to health behaviors provide an additional avenue for targeting messages that can be beneficial for both organizations and consumers.

CHAPTER 1 INTRODUCTION

Need for Current Research

Advances in medicine have been unprecedented in recent decades, bringing with them more treatments that enhance people's health and prolong their lives, even for diseases that once meant certain death. What has been slower is the recognition by health organizations and providers that caring for patients with illnesses such as cancer involves much more than treating just their bodies; it is also essential to minister to their psychosocial needs in order to ensure that the quality of their lives is the best it can be. Among these is the necessity for patients to have access to reliable, accurate, and understandable health information they can use to manage their health and illnesses, and to help them make informed decisions about care and treatment (Institute of Medicine [IOM], 2007a). Evidence suggests that barriers preventing patients from accessing needed health information results in decreased wellbeing on a variety of levels (Arora, Johnson, Gustafson, McTavish, Hawkins, & Pingree, 2002).

Patients with cancer, the second leading cause of death among U.S. adults, are among those having the greatest need and desire for information (Shim, Kelly, & Hornik, 2006), in part because of the potentially life-threatening nature of their disease, the specialized testing and treatments associated with each type of cancer, and the rapidly changing and highly complex nature of many of the associated therapies. In a report about cancer, which more than 40% of all Americans will be diagnosed with at some point in their lives, the IOM went as far as to state that neglecting to address these non-physical needs "is a failure to effectively treat that patient's cancer, plain and simple" (IOM, 2007b, p. 3). Despite this acknowledgement, considerable dissatisfaction

remains regarding the amount and type of information that health professionals provide to those living with cancer about the specifics of their individual disease, the best therapies to treat it, and the most effective ways to deal with the potential side effects of these treatments and to cope with the illness more broadly (Arora et al.; IOM, 2007a).

As a result, many cancer patients and their families take on the added responsibility of finding the information they want or need elsewhere, a growing trend in all areas of health. Studies routinely show that mass media are the primary means by which a majority of people obtain their health information (Dutta-Bergman, 2004; IOM, 2004; O’Keefe, Boyd, & Brown, 1998), and that the media “can profoundly influence health related beliefs and behaviors” (Fishman, Casarett, & Davis, 2006, p. 291). Obtaining health information is also associated with improved knowledge about cancer, and increased likelihood of undertaking healthy preventive lifestyles and obtaining some cancer screenings (Shim et al., 2006).

The Internet has become a particularly important source of health and cancer information. A survey found that 80% of the 147 million Americans who use the Internet have done so at one time to look for health or medical information, with more than half of those saying it had some effect on how they cared for themselves or someone else (Fox, 2006, 2008). There is widespread agreement, including by health care professionals and the federal government, that the Internet can provide tremendous benefits to people searching for health information (Science Panel, 1999). One example is that using the Internet seems to be related to people’s health literacy level, which is the “degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions”

(U.S. Department of Health and Human Services, 2000; IOM, 2004). A national health literacy assessment of more than 19,000 adults showed that average health literacy scores were higher among both men and women who obtained “some” or “a lot” of health information from the Internet than among those who received this amount of information from any other communication source, including health professionals (Kutner, Greenberg, Jin, & Paulsen, 2006). Studies also have shown behavior change is related to obtaining health information from the Internet, with those using it more frequently for this purpose more likely to positively modify their health behaviors (Ayers & Kronenfeld, 2007).

These days, health care organizations and companies—both legitimate and not—routinely have World Wide Web sites on which they promote their services, with cancer treatments becoming a more common topic, as evidenced by a Google search in November 2008 that returned more than 21 million results. These results include sources of health information considered to be highly credible, such as the National Cancer Institute (NCI), which topped the list of results, as well as a plethora of “sponsored links” to Web sites of unknown quality for which companies and organizations have paid for space to sell their products and services. The ubiquity of information available through the Internet and the accompanying disparate quality found there, including messages promoting health claims often not backed by scientific evidence, can be problematic, with no regulation over the data posted online and often little disclosure of the qualifications of those distributing the information or promoting the services (Berland, Elliott, Morales, Algazy, Kravitz, & Broder, 2001; Haard, Slater, & Long, 2004; Sandberg, 2005; Vivian, 2009). As health care becomes increasingly

consumer driven, with more patients becoming involved in their own care, having a significantly greater say in their treatments, and more often bypassing traditional sources of information and obtaining it directly from Internet sources (Haard et al.; Hesse, Moser, Rutten, & Kreps, 2006; Petersen, Heesacker, Schwartz, & Marsh, 2000), so too will the associated problems grow. This trend drives home the imperative for legitimate health organizations to distribute accurate, trustworthy, and comprehensible information to potential health consumers.

Similarly, there has been an explosion of “new” types of Internet communication. Weblogs, or blogs, are one such message type. They have become so widely used in recent years that they are now described as “a global phenomenon that has hit the mainstream” (Technorati, 2008, ¶2), and organizations of all types, including public and private health groups, are increasingly using them to engage, and connect and establish relationships with their consumers and publics. Blogs were initially seen mainly in the journalism and political realms (Hewitt, 2005); however, use of these online diaries has been exploding on all topics in the last few years, including those related to health. In addition to providing information, blogs create a venue for conversation and dialogue with the authors and others who are reading and commenting on the messages posted there, which is becoming increasingly important not only to consumers but to the business world (Technorati; Flynn, 2006). Said Richard Edelman, president and chief executive officer of Edelman, the world's largest independent public relations firm: “Blogs represent the best chance for companies to inform the conversation” (Technorati). Since September 2004, Edelman has been writing a blog sponsored by his company, which has 3,000 employees in 50 offices worldwide. “Conversational

branding” on blogs and other social media sites is also being discussed in public relations, marketing, and advertising contexts, and major corporations, including Walmart, General Electric, and Microsoft are using blogs to influence public opinion through internal and external blogs and bloggers (Barbaro, 2006; Flynn). In addition, the personally relevant information, social support and interactivity that blogs foster has been found to be valuable among patients, particularly those with often life-changing diseases such as cancer (Science Panel).

Considerable research has been conducted concerning the success of programs and campaigns aimed at preventing certain types of cancer by promoting healthy lifestyles and behavior changes, including eating adequate amounts of fruit and vegetables, ceasing to smoke, maintaining a healthy weight, increasing activity and exercise, and undertaking preventive screenings (McGuire, 1999). In addition, such campaigns often are developed based on theories of behavior change such as the Health Belief Model, the Theory of Reasoned Action, and the Stages of Change Model that identify the beliefs and attitudes that need to be influenced, with little, if any, consideration of how messages might be able to induce the desired outcomes (Slater, 2006). To date, these health communication campaigns have overall had relatively low levels of success in changing behavior, both in prompting people to halt unhealthy behaviors or to adopt constructive ones (Slater, 2006). Similarly, little research has examined the persuasive influence that messages from health care organizations have on potential patients, despite increased recognition that they are more actively involved as consumers in choosing their health providers, care and treatment, and where they receive care (McCullough & Dodge, 2002). Further, no research could be found

investigating the persuasive influence that cancer treatment information distributed by health organizations may have on health consumers diagnosed with the disease and who may be seeking nontraditional, novel, and/or alternative therapies, or who just want to find out about all their possible options, including those their health providers may not be aware of and/or have discussed with them. Research examining the use of blogs for disseminating health information, including cancer, is also limited (Kim & Chung, 2007), and studies investigating the persuasive influence of organizational blogs about any health-related subject, including about cancer treatments, could not be found.

Role of Current Study

Thus, the purpose of this research is to better understand the persuasive effects of online organizational e-health messages that consumers may receive about a cancer treatment in order to gain insight that will be beneficial to health care organizations, message creators, and cancer patients. More specifically, this study seeks to extend existing literature by focusing attention on a persuasive theory of message processing and the resultant message effects by investigating experimentally the roles that personal involvement, argument strength, and source credibility play in determining the extent to which consumers elaborate on cancer treatment messages disseminated through a blog sponsored by a health organization. The Elaboration Likelihood Model (ELM), a dual-processing theory of persuasion found to be predictive in other consumer contexts, is used as a framework to examine how the three variables described might affect health consumers' levels of message elaboration and the route – central or peripheral – they use to process this type of health information. This study seeks to investigate the influence these persuasive messages have on various attitudes of consumers and on their behavioral intention to seek additional information about a

cancer treatment, and to participate in cancer screening. According to the ELM, individuals for whom messages do not have high personal relevance are not motivated to think extensively about them and will tend to process information based on peripheral features, such as the credibility of the source who delivers the communication, rather than through the central route, which focuses on the cognitive processes involved in deeply thinking about issue-relevant arguments (Petty & Cacioppo, 1986). Further, although both routes can result in persuasion, experimental evidence has found the central route to have advantages, including longevity of attitude and greater likelihood of behavior change (Petty & Cacioppo, 1981, 1986). This study also will expand examination of these three variables to dependent measures that have not been investigated previously through the lens of the ELM, including attitude toward a health organization and a channel of health communication, namely blogs.

Not only will this study extend knowledge about the ELM into a new domain, increasing knowledge about its usefulness in another context, which other researchers have suggested would be beneficial (McCullough & Dodge, 2002), the understanding gained from this study also can help health organizations target their marketing and public relations messages to better meet the information needs of their various constituents. Previous research has identified both the importance of developing indepth profiles of cancer patients' differing information needs (Squiers, Rutten, Treiman, Bright, & Hesse, 2005), and the benefits that come from developing health communications that more directly target specific audiences and address these needs (Kreuter, Sugg-Skinner, Holt, Clark, Haire-Joshu, Fu et al., 2005). These advantages include increased feelings of patient control (Åsbring, & Närvänen, 2004) and enhanced

persuasion that come from matching messages to consumers' characteristics and unique message processing styles (Briñol & Petty, 2006; Kotler, Roberto, & Lee, 2002). "One of the most common findings on cancer communication has been that matching persuasive messages to people's characteristics enhances persuasion" (Briñol & Petty), reinforcing the need for and benefits of additional research in this area.

Another goal of this dissertation is to broaden understanding of health organizations' messages with respect to benefits they may confer on one of their many publics – cancer consumers – by examining one potential benefit: empowerment. The ELM does not specifically address this variable; however, the model's creators make clear that such personal dispositional variables—as well as situational variables such as distraction that will not be tested here—may play a role in the persuasive influence of messages.

CHAPTER 2 LITERATURE REVIEW

Cancer and Communication

Cancer is a substantial threat to the health of Americans. Cancers of all types are the second leading cause of mortality among adults in the U.S., accounting for 22.8% of all deaths in the U.S. in 2005, or an estimated 559,312 people (American Cancer Society, 2008). In 2008, more than 1.4 million Americans were expected to be diagnosed with cancer, with more than 565,000 people projected to die of the disease the same year (National Cancer Institute, 2008). Cancer deaths killed more people than the next five most common causes put together: cerebrovascular diseases, chronic lower respiratory diseases, accidents (unintentional injuries), diabetes, and Alzheimer's (Kung, Hoyert, Xu, & Murphy, 2008). In addition, while the incidence of heart disease and some other common causes of death have dropped in half or more since 1950, cancer deaths have dropped only slightly, from 193.9 to 183.8 deaths per 100,000 people in 2005 (ACS). Survival rates have been increasing over the past three decades, but even among those who do not die from it, cancer is a significant risk in American society, with one of every two men and women having a probability of developing some kind of cancer over their lifetimes (NCI). More than 11 million living U.S. adults have been diagnosed with cancer, including those with active disease and those who are cured (NCI).

As a result, cancer is a common topic about which people seek to obtain information. The NCI's nationwide Health Information National Trends Survey (HINTS) 2005 survey found that 52.3% of the nearly 5,600 respondents in 2005 had searched for information about cancer, an estimated 105.3 million U.S. adults, up from 47.2% in the

institute's survey two years earlier. The 2005 survey also found that in respondents' most recent search for cancer information, a far greater percentage sought this information first from the Internet (41.2%, or an estimated 49.2 million U.S. adults), compared to about one in four (25.4%) seeking it first from health care providers (NCI, 2005). In addition, the survey found that 44.6% looked for information about a specific cancer and 7.9% about treatments and cures. Other research examining cancer patients' information needs also have shown treatment information is frequently sought, with it being the most common topic of interest during certain phases of cancer care (Rutten, Arora, Bakos, Aziz, & Rowland, 2005). The HINTS survey also showed a significant percentage of people (46.1%) were strongly or somewhat concerned about the quality of the cancer information they received from all sources, and that the vast majority of respondents (89.2%) found the information they received from the Internet very or somewhat useful (NCI, 2005).

A federally appointed Science Panel (1999) report also indicated that the interactive health communication (IHC) applications possible on the Web "have great potential to improve health and wellbeing" (p. 2). The Science Panel developed the following vision for IHC: "Interactive health communication will play an essential role in enhancing health, minimizing total burden of illness, and optimizing relationships between individuals and health professionals" (p. 3). According to the report, IHC is beneficial because it has the ability to provide improved access to individual information, broader choices for users, potentially improved anonymity, greater on-demand access and support, greater interaction and social support, and enhanced dissemination and currency of information than is possible with the one-way communication typical of

traditional forms of media (Science Panel). In addition, The Panel found Internet forms of health communication could serve several functions, including disseminating information; enabling informed decision making; promoting healthy behaviors, self care, peer information exchange, and emotional support; and managing the demand for health services (Science Panel).

Along with the Internet's potential for providing significant benefits in promoting health, its negative qualities must also be considered. For example, the quality, accuracy, and understandability of health information available on the Internet varies greatly, and studies show that deficiencies are likely common, with some online health content misleading at best and harmful at worst (Berland et. al, 2001; Molassiotis & Xu, 2004; Tatsioni et al., 2003). This is particularly troubling in light of a growing body of research suggesting that people are increasingly using online information to influence their health decisions, yet many are not questioning its reliability, believing that it is trustworthy and of good quality (Molassiotis & Xu; Morris & Avorn, 2003). In addition, Cline and Noland (2002) indicated the Internet can promote risky behaviors and can itself result in "online pathologies," including "Internet addiction, disinhibition, and the replacement of face-to-face interaction with computer-based interaction" (p. 11).

Thus, cancer consumers have a need for and would benefit from access to useful, understandable and accurate information that may shed light on their conditions and/or aid them in their decision making about care and treatment (Rutten et al., 2005), especially through convenient, easily accessible routes such as the Internet. While the overall Internet audience increased modestly by about 5% between July 2007 and July 2008, the use of online health information sites swelled more than four times that,

growing 21% (comScore, 2008, September). A 2008 study by comScore, an online marketing analysis firm, found there were 189.1 million unique visitors online in July 2008, with more than 69 million visiting health information sites, including WebMD (which saw growth of 3% to 17.2 million unique visitors), Everyday Health (a 63% increase to 14.7 million), Revolution Health Network (a 182% increase to 11.3 million), and AOL Health (an 88% increase to 11.1 million). During the same period, the National Institutes of Health Web site (nih.gov) saw a significant audience decline (14%), as did MSN Health, which dropped 12.0% (comScore). Cancer was second only to pregnancy among the health conditions for which most people sought information, with the number of search queries tracked in February 2008 for each totaling 7.7 million and 8.8 million respectively (comScore, 2008, April). The next closest search was for flu information at a far distant third with 1.8 million searches.

The Internet not only provides opportunities for finding needed health information, but it is increasingly being used as a venue for health advertising. Display ad views on the health information sites tracked by comScore (2008, September) totaled more than 1.5 billion, which were seen by an estimated 54 million people. Networking and support have also become important components of the Internet as evidenced by the significant growth of Web 2.0 social software platforms that provide more dynamic and interactive venues than did the initial World Wide Web, and facilitate sharing, participation, and conversation (Giustini, 2006). The type of communication made possible by blogs, wikis, and other social networking software have become “a powerful creator of social capital” and “have evolved as part of the consumer and patient empowerment trend that has characterized the Internet age” (Hillan, 2003, p. 333–4).

According to one Internet analyst, many health sites have become “vibrant online communities rooted in sharing experiences and advice, rather than simply being one-way information resources for the consumer” (comScore, 2008, September, ¶3). One venue cancer consumers may use to seek this information, conversation, and support is by going directly to the Web site of an organization providing health services. As a result, it would be mutually beneficial to both groups in the consumer-health organization relationship to enhance understanding of persuasive organizational messages.

Blogs

Blogs were the first of the Web 2.0 social technologies (Giustini, 2006), and they have become one of the fastest growing segments of the Internet. Discrepancies abound about the number of weblogs, which are sometimes described as online diaries or personal journals, as well as how many new ones are being created each day, but there is widespread consensus about their explosive growth (Technorati, 2008). A 2008 survey of 17,000 Internet users in 29 countries found that 77% worldwide read blogs, and 45% (184 million) have started a blog, with the resulting report stating: “As a collective, the blogosphere rivals any mass media in terms of reach, time spent and wider cultural, social and political impact” (Universal McCann, 2008, p. 32). In the U.S., 60.3 million people have read a blog, with 23% doing so on a daily basis and 43% on a weekly basis. About 26.4 million have started a blog (Universal McCann). The Pew Internet and American Life Project reports that 42% of Internet users, about one in three adults, have read a blog (Smith, 2008), up from 25% in 2005 (Pew Internet, 2005). In 2008, about 11% said they read blogs on a typical day, and 12% said they had created or worked on one of their own (Smith). *The Washington Post* reported the Web contains

112.5 million blogs (Halzak, 2008), and according to its “State of the Blogosphere 2008” report, blog-tracking company Technorati found that 900,000 blog entries are posted each day, with 79% of people blogging as a form of self-expression, followed closely by those who do so because they want to share expertise and experience (73%).

Although the use of blogs, both writing and reading them, has exploded in the last several years among the general public, data suggests that organizations overall have been slower to adopt blogs as part of their professional marketing and public relations strategies (Edelman & Intelliseek, 2005; Porter, Trammell, Chung, & Kim, 2007). However, research suggests that “practitioners see the importance of blogs” (Porter et al.). In a white paper guide to the blogosphere for marketers and companies, public relations giant Edelman and Intelliseek (2005) suggested: “In a very short time, the blogging phenomenon has drastically altered the landscape and challenged traditional tenets about the control of messaging by corporations, the media, the government, marketers and company stakeholders . . . Blogging is not a passing fad...but any brand, business or organization that fails to grasp the fact may very well be” (p. 2).

Blogs, blogging, and the blogosphere (the so-called online world of blogs) have been heralded as an “information universe” (Hewitt, 2005, p. 119), “a global phenomenon” (Kumar, Novak, Raghavan, & Tomkins, 2004, p. 36), and the “single most transformative media technology since the invention of the printing press” (Drezner, & Farrell, 2004, ¶33). Various descriptions of and ideas about weblogs have been advanced, however, for the purposes of this dissertation, blogs will be technically defined by Doctorow et al. (2002) as follows:

A *blog* is a web page that contains brief, discrete hunks of information called posts. These posts are arranged in reverse chronological order (the most recent

posts come first). Each post is uniquely identified by an anchor tag, and it is marked with a permanent link that can be referred to by others who wish to link to it (p. 1, italics in original).

According to Blood (2002), weblogs “first rose to prominence as a means of personal expression” (p. xiii), generally in discussions about news and politics, but they are now forums for millions of people discussing virtually any subject under the sun. In an analysis of 1.3 million blog sites, Kumar et al. (2004) identified 300 “interest clusters,” with topics as diverse as Existentialism, coastal preppies, body art, and Russian hackers (p. 37). Typically, blogs are created by individuals or sometimes small groups, but media organizations, politicians, schools and universities, and even government agencies have jumped on the bandwagon in recent years.

Typically, blog posts are informal and are published frequently and nearly immediately on the Web without oversight by an external editor, and thus they have been described as being akin to a conversation or dialogue between the writer and reader (Hourihan, 2002). Although Doctorow et al. (2002) suggest blog posts are brief, which they describe as “a screenful or less” (p. 13), these authors also point out that blog writers, unlike those involved in more traditional forms of public writing, are unconstrained by word or space limitations. Others suggest blog posts are limited only by the time and talents of their writers. Blogs are often free to start and maintain, and require almost no technical knowledge or special equipment except a computer and access to the Internet (Blood, 2002). In addition, compared with typical Web sites, time plays a significant role in blogs, as indicated by the permanent links to older archived entries and the reverse chronological order of their postings (which some suggest is not

mandatory), providing both a sense of immediacy and an expectation of frequent updates (Hourihan, 2002).

Most blogs also share several other structural elements and common formats, largely the result of free, widely available, easy-to-use blogging templates. These include titles and subtitles for the blog itself, usually set off at the top of the site, as well as those that identify the topic of each post similar to the headlines and subheads in print publications. Most blogs have a main channel, which contains its most recent posts in reverse-date order, and one to two sidebars to its left and/or right, where can be listed biographies of the writer(s), links to other blogs or web sites, calendars or other ways to reach older archived posts, or a variety of other items the primary author wishes to display.

Each post is composed of text, which is the narrative that makes up the entry, and may contain links to news articles, events, or other items on another site that are generally relevant to the topic of the post or the blog. The post text is usually followed by a time stamp (stating the time the posting was added), byline (providing the name or screen name/pseudonym of the person who posted the entry, generally the blog's primary author), a permalink (providing a permanent copy of the post in an archived page off the main blog site), and interactive feedback mechanisms, such as comments forms or suggest links. These elements allow readers to share their own thoughts as an addendum to the original entry—and to which the primary author can respond—or read the comments posted by others (Doctorow et al., 2002). Comments are not mandatory and some authors have chosen to disable them; however, for many “weblogs are unthinkable without the comments and the community of readers that comments make

visible” (Blood, 2004). About 85% of blogs worldwide contain commenting systems (Technorati, 2008). Authors also frequently include photographs, images, music, or other audio or video files on the blog sites or in the posts. Advertisements are not uncommon, particularly on free hosting services such as Google’s BlogSpot, which adds banner ads to blog pages (Doctorow et al, 2002), and with the advent of programs in which blog owners can enroll to have text and image advertisements placed on their sites for which they are paid on a per-click basis.

The text to be included in a post is typed into a blogware template, and with a single click it is automatically published on the blog site in conjunction with its associated elements. The newest post, or entry, is published on top, and as this happens, the older entries sink downward on the blog main, or home, page until they eventually are shuffled off to their permanent archived storage pages (Winer, 2003). Although the permalinks, comments, and other components have become standard, particularly since the 1999 advent of easy-to-use, automated templates and other blogging tools (Blood, 2000), two aspects of blogs have come to be widely considered fundamental facets, not only of their online identity but also of their uniqueness among web content.

First, “blogs are famed for their linkages” (Henning, 2004, p. 3) to external blogs or web pages on similar topics, content, views, or opinions, with the home page entries of eight in 10 active blogs containing at least one link to an external site. Although the origins of blogs are rooted in politics and journalism and despite their continued magnitude in these areas, the vast majority—about 90%—of these links are not to traditional news sites, indicating that bloggers are using the technology for much more

than obtaining news (Henning). Second, the blog is an unedited personal portrayal of the author, and thus the traits, qualities, and personas they project through their writing are of primary importance (Winer, 2003; Blood, 2002). Along with the comment forms and other feedback mechanisms on blogs, these key traits establish the social connections and interactions that typify blogging and provide the foundation upon which are built a myriad of virtual communities uniting people of similar interests and shared experiences (Hewitt, 2005; Hourihan, 2002; Winer).

There tends to be disagreement about when blogs debuted on the Web. Some, including Blood (2002), Winer (2001), and other pioneers of the form suggest the first blogs started in the early 1990s, while others, like Hewitt (2005), suggest it was much later in 1999. By and large, Jorn Barger, editor of one of the original weblogs is credited with inventing the term “weblog” in December of 1997 (Blood, 2000; Hewitt). That was changed in mid-1999 to “wee blog” (Blood, 2000) or “we blog” (It's the links, 2006) by another blogger named Merholz, swiftly followed by the shortened form blog (Blood, 2000; It's the links). Also generally agreed upon is that the first real growth spurt of blogging began in 1999 with the launch of free, automated blog software. A second surge started after the September 11, 2001, terrorist attacks and at the start of the war in Iraq with the “warblogs,” both spurred further by coverage of the blogging phenomenon by the mainstream media. Further expansion is often attributed to the use of blogs as political tools in the 2004 presidential election.

The size of a blog's audience can vary greatly. The so-called A-list blogs, such as Boing Boing and Engadget, have millions of readers that can rival circulation levels of mainstream media outlets, many of which have launched blogs themselves in order to

increase readership, and to better connect and open dialogue with readers (Smith, 2005). Similarly, politicians and political parties are using them to converse with voters, with both 2008 presidential campaigns hosting blogs, and more than one in four voters (27%) saying they read blogs about politics and the election. Prominent scientific journals like *Nature* also have blogs to provide their readers an opportunity to comment on published stories in a variety of fields.

In the business domain, blogs are increasingly being promoted as tools for conversing directly and interacting with new and existing customers, building and maintaining relationships, shaping public opinion, gaining trust of prospective clients, building awareness and loyalty to brands, and putting a human face on corporate America (Barbaro, 2006; Flynn, 2006; Kirkpatrick, 2005; Technorati, 2008). “The blog is an electronic communications powerhouse that is likely to have greater impact on business communications and corporate reputations than e-mail, instant messaging, and traditional market-oriented websites combined” (Flynn, p. 4). About 5,000 corporate blogs are being hosted (Halzak, 2008). Although corporate blogs posted publicly on the surface web encompass a fairly small percentage of the blogosphere, a 2005 survey found a growing number are using this platform for public relations and marketing purposes, and indicated that companies would drive the next wave of blogs and other social media tools for promoting communication with both internal and external audiences (Guidewire Group, 2005). Chief executive of Marriott International, Bill Marriott, began writing a blog as a way to communicate, and people who started on his blog clicked through to book more than \$5 million in hotel reservations (Halzak). Companies are also communicating more indirectly with consumers through blogs, and

“companies of all stripes are using blogs to help shape public opinion” (Barbaro, 2006, ¶18). For example, in an effort to polish its tarnished reputation, Walmart, one of America’s biggest companies, tapped the potential of personal blogs by supplying their authors with pro-Walmart statements and information to use on their sites (Barbaro). Research has shown that blogs provide a more effective vehicle for establishing and maintaining relationships and conveying organizations’ conversational human voice, including during times of crisis, than are more traditional public communication methods such as newsletters (Kelleher & Miller, 2006; Sweetser & Metzgar, 2007). The advantages of blogs come with potential headaches stemming from the loss of control that can accompany the unrestricted discussion for which blogs and bloggers are famous. Despite that, Microsoft’s Bill Gates has been reported as saying that blogs are fabulous for relationships (Kirkpatrick, 2005). Both personal and corporate bloggers have been positively impacted by their blogs, including an increased network of friends and other contacts, better awareness about the industry in which they are working, and new opportunities that otherwise would not have been available (Technorati, 2008).

Blogs and Health

Similarly, in the health realm, doctors and nurses, hospitals and health organizations, and patient advocacy groups are increasingly launching blogs. Researchers and physicians suggest that medical blogs “have emerged as a new connection between health professionals and the public” that “provide a new route for communicating substantial, evidence-based health information to the public” and give voices to a wider range of professionals who can reach broader audiences (Lagu, Kaufman, Asch, & Armstrong, 2008, p. 1642 and 1645). The peer-reviewed scholarly journal *Nature Medicine* has a blog called “Spoonful of Medicine: Musings on science,

medicine and politics” (<http://blogs.nature.com/nm/spoonful/>) that includes a cancer topic category.

Large governmental organizations are also using blogs as a way to provide information to and get feedback from members of the public, including about health. One of these is the U.S. Department of Health and Human Services (HHS), the government's principal agency for protecting the health of Americans and providing human services, which has a \$707.7 billion annual budget; nearly 65,000 employees; and includes more than 300 institutes, centers and programs (HHS, 2008). HHS Secretary Mike Leavitt writes a blog “as a way to foster public discussion” that “is intended to be a dynamic online conversation” with Americans about health and related issues (HHS, n.d., ¶1), such as the cost of health care, mental health, Medicare, HIV/AIDS, and various health emergencies. Other health care organizations have realized the potential of the two-way communication afforded by blogs, and as a result they have “made their way into healthcare as an efficient and effective communication tool” (Thielst, 2007), with public blogs being maintained by healthcare administrators, leaders, and consultants, including Paul Levy, president and CEO of Beth Israel Deaconess Medical Center in Boston (runningahospital.blogspot.com). Medical facilities are also integrating blogs written by patients, which provide them a way to keep friends and family informed about their progress and to receive return greetings, while also affording health professionals an opportunity to gain more in-depth insights into the personal experiences and mental, emotional, and physical states of patients than are afforded by a typical medical appointment (Hillan, 2003).

Individuals are also blogging independently about their diseases and conditions, including about such diverse topics as brain injury, eating disorders, menopause, diabetes, and manic depression, with a recent survey finding that that about 18% of bloggers write about health issues (Technorati, 2008). In launching a publication about blogs and the drug industry, market research firm Research and Markets (2006) wrote: “Driven in part by the rising cost of medical care, healthcare blogs will become more popular and influential as consumers assume greater responsibility for their own healthcare” (¶2). It has been suggested that aggregating the collective knowledge of bloggers on various health topics would be valuable for improving health and health care (Health 2.0, 2007; Oransky, 2005). For example, writing in the medical journal *Lancet Oncology*, Oransky stated his charge was to create a one-stop, authoritative cancer blog for everyone affected by cancer where patients, basic scientists, clinical researchers, and practicing oncologists could all blog on one site that would function as “a clearinghouse for researchers to post trial results that could change the way oncologists treat their patients. It would also be a place for surveillance of side effects directly from patients, and could be built on a site that is a collection of resources” (Oransky, p. 839).

Major mass media outlets also have launched blogs specifically about health and medicine, such as *USA Today's* A Better Life, which lists more than 30 medical categories including cancer; the *New York Times'* Well blog, on which one of the newspaper's editors shares his experiences coping with prostate cancer; and a CNN health blog called “Paging Dr. Gupta,” on which the network's chief medical correspondent, Dr. Sanjay Gupta, and his staff share news on health and medical

trends. The American Cancer Society also provides members of its online Cancer Survivors Network an opportunity to start a blog. And a national conference, Health 2.0, has grown up around targeting health care using Web 2.0 technologies such as blogs, wikis, mash-ups, video, and other user-generated content. The reach of these blogs differs greatly, but The Health Care Blog (2005), which *The Wall Street Journal* cites as a “must-read blog” (What the In-Crowd, 2005, ¶2), has expanded to become a group blog and grown in readership from a few each day to more than 80,000 visits in October 2008.

Despite the profound growth in this activity and its acknowledged potential in the health realm, empirical studies about health and medical blogs and bloggers is relatively limited, and scholarly research regarding cancer-related blogs and those who author and read them are lacking (Kim & Chung, 2007). When articles about health and blogs do appear in scholarly or trade publications, they are more likely to be discussed in commentary or news items rather than as the topics of original research. Discussion of blogs in relation to health is much more common in newspapers, and among the prominent ones to do so is *The Wall Street Journal*, in which Landro (2005) wrote that “blogs have become a significant new forum for healthcare consumers,” and identified several advantages weblogs possess in regard to medical matters. These included that health blogs offer a venue for self expression that can be therapeutic; afford a more personal alternative to traditional Web content; allow patients to chronicle their experiences and share them with others; provide links to the latest medical news and studies; function as an advocacy forum; and act as communities for concern, support, and reassurance (Landro).

Other media accounts about health-related blogs have identified similar creator benefits, with some accounts suggesting the therapeutic, or cathartic, effect stems not only from being able to pour out one's feelings, especially related to frustrations and challenges, but from helping others to overcome fear and uncertainty, and better deal with their own situations (Oransky, 2005; McNiel, 2006). Discussing these emotions in the kinds of revealing and intimate postings common to many blogs, especially those related to health issues, affords an outlet for feelings as well as distance from them, which may provide clarity aided by the thoughts of others who weigh in with comments (Snider, 2003).

Media reports are rarer about the benefits derived specifically by readers of health blogs, but these readers also seem to reap some benefits from them. These include that they provide a forum not otherwise available on the Web for obtaining information about medicine and disease from the patient's point of view, and provide inspiration from the stories of others, as well as consolation and strength from the knowledge that they are not alone in the struggles they may face, helpful tips about how others have dealt with their setbacks, and possibly confidence needed to persist (Harmon, 2003; Koenig, 2006; McNiel; Oransky). The virtually unlimited connections possible can create a sense of belonging to a larger social group for both blog authors and readers (Hillan, 2003), and allow those with even the rarest diseases to locate others worldwide who can provide them information about treatments, doctors, and just generally about living life with the condition (Health 2.0, 2007). These online journals also allow those who are isolated due to emotional, geographic, financial, or physical barriers overcome these

limitations, and provide venues for frank discussion with anonymity typically not available in real-world settings (Hillan).

As is the case with all Web content, there are also some disadvantages associated with health blogs, including that the experiences contained in their postings may not be representative of those of average patients; that there may be issues of legitimacy and accuracy of the information posted, including that the stories – and even the people who create them and/or the credentials they might cite – may be fictitious; and that it is potentially risky to reveal personal information publicly (Harmon, 2003; Landro, 2005). In addition, feelings of loss can occur when a weblog's posts end suddenly, especially when written by someone with a deadly disease such as cancer (Oransky, 2005). Blogs written by health professionals sometimes breach patients' privacy by revealing information that is confidential and/or identifiable (Lagu et al., 2008), and people may be more easily confused when they have so much health information, especially when it may be conflicting (Health 2.0, 2007). And because the virtual world lacks the non-verbal cues that are fundamental in face-to-face interactions, misinterpretation can occur (Hillan 2003).

Blogs also have been cited as a form of online social support for cancer patients (Hillan, 2003; Ornasky, 2005). Scientific analyses of online social support have identified some of the same benefits that have been discussed anecdotally in the popular press: gathering information, both factual and based on the experiences of others; providing social contact and support; affording a safe atmosphere in which to express questions and concerns, and which increases the ability to discuss personal problems than in-person venues allow (Kummervold et al., 2001). In addition, it has

been suggested that the online environment may bring together socially dissimilar people “by overriding differences that might alienate them from each other in face-to-face social settings (ethnicity, gender, disabilities, etc.)” (Kummervold et al, p. 63). Rak (2005) suggests that blogs function as a social space in which self-disclosures are made in order to gain readers that will develop into a community of similarly oriented, trusting, and sharing individuals. Hevern (2004) also suggests that blogs function as extended social networks in which their authors position themselves not only by the mere act of posting entries, but through the diversity of content and the varied—even oppositional—voices that are used.

Using an online survey, Kaye (2005) investigated the motivations of people who access blogs. The study, which resulted in 3,747 responses, was primarily interested in political and news blogs, and three of six motivations involved descriptions of current events, news or politics (information seeking and media checking, political surveillance, and convenience). However, the other three primary reasons for reading blogs have more broad application. They were personal fulfillment, described as “gathering information to use in discussions with others, and fulfilling various emotional needs,” social surveillance, or “learning about others’ points of view and opinions on various issues and current events,” and expression and affiliation, which is “expressing personal viewpoints and interacting with like-minded individuals”, with the last being the most common predictive motivator (Kaye, p. 84).

Rare are peer-reviewed journal articles about cancer-related blogs. However, in an exploratory study, Kim & Chung (2007) used cluster analysis of survey data to provide insight about the demographics of cancer bloggers (mainly patients and their

family members and friends) and their use and perceptions of cancer blogs. The team found that that highly educated Caucasian females were the primary group who were involved with cancer blogs, and that these bloggers on average were older (57 years), results that differed from previous blog studies. These users fell into three clusters. The largest group, consisting of 42.5% of the 113 survey respondents, included long-time cancer bloggers who also commonly sought information through more traditional channels. They more frequently used cancer blogs to express their own opinions and they were the group that received the strongest empowerment through blogs. The second largest group (33.6%) included frequent information seekers who were more likely to be novice bloggers. They felt the need to compile information and were more likely to use blogs to seek cancer knowledge. The smallest cluster (23.9%) consisted of highly motivated individuals who sought health information and were found to be the most likely to change their behaviors while using cancer blogs. They read blogs to increase their knowledge about cancer and to get timely updated information. Despite these differences, encouraging others and sharing their personal stories about cancer were the main reasons users in all three groups turned to blogs (Kim & Chung). The authors concluded that the study “suggested the use of blogs can lead cancer patients and their companions to engage in meaningful conversation and that sharing personal experiences via blogs may help patients better cope with their cancer-related health conditions” (Kim & Chung, p. 449).

Persuasion Research

Research into various aspects of the persuasion process and elements that may enhance the influence of persuasive communications are centuries old, yet a universally agreed-upon definition of the concept is lacking (Miller, 2002; Stiff & Mongeau, 2003).

There is widespread agreement, however, that persuasion is an intentional behavior whose goal is to shape emotional, cognitive, and/or behavioral outcomes, with these three components sometimes described as the tripartite model (Bagozzi, 1978; Stiff & Mongeau).

Persuasion is ubiquitous in almost all types of communication (Trenholm, 1989). However, a distinction must be, and typically is, made between the concepts of persuasion and coercion. In the former, the receiver has the ability and choice to reject the message while he or she cannot in the latter (Stiff & Mongeau), a differentiation that is particularly vital in matters of health. Numerous definitions of persuasion have been developed over the past several decades, with many explicitly articulating this difference through the inclusion of specific language, including words and phrases such as noncoercive (Trenholm, 1989), freedom (O'Keefe, 1990), free choice (Perloff, 1993), autonomous individuals (Woodward & Denton, 1992), and interactive process between sender and recipient (O'Donnell & Kable, 1982). In the health context examined here, persuasion will be regarded as “an activity or process in which a communicator attempts to induce a change in the belief, attitude, or behavior of another person or group of persons through the transmission of a message in a context in which the persuadee has some degree of free choice” (Perloff, 1993, p. 15). The long history of studies aimed at determining how messages can be made more persuasive has resulted in investigation of several aspects of the communication process best laid out by the well-known model that asks: Who (the source) says what (the message) in which channel (the medium/media of dissemination) to whom (the recipient or audience) with what effect

(which here would relate to extent of persuasiveness or influence)? (McGuire, 2000; Petty & Cacioppo, 1981; Rogers, 1994).

Attitudes and changes in recipients resulting from persuasive communications toward these factors comprise the basis of much of the research and theory in the field, with behavior considered to a lesser extent (Stiff & Mongeau, 2003). An attitude is a feeling toward some individual or object that may prompt action at a later time (Rogers, 1994). The emotional or affective component of the tripartite attitude model involves the positive, negative, or neutral feelings one has about an individual or object; the cognitive element concerns the beliefs about it; and the behavioral aspect encompasses the tendencies one has to act or not with respect to it (Bagozzi, 1978; Stiff & Mongeau). The basis of persuasion studies is the assumption that attitudes are able to influence action or behavior with respect to some object or activity (O’Keefe, 1990). The relationship is complicated; however, and a number of factors with respect to each aspect of the communication process have been shown to influence the extent of the impact a message has on recipients.

Specific source, message, and receiver variables to be experimentally investigated in this study will be described in more detail below. However, McGuire (2000) suggests that source characteristics that can increase persuasive impact include attractiveness, credibility, and similarity with respect to various demographic factors such as gender or ethnicity. Message variables having an effect include the number and format of the arguments presented, as well as the way they are presented, for example, the specific language used, and the level of humor or abstractness (McGuire). The order of the arguments in a message, the level of fear they generate, their comprehensibility, and

whether they include an implicit recommendation or an opposing argument also can impact persuasion (O’Keefe, 1990; Petty & Cacioppo, 1981). The channel used to disseminate the communication can play a role in enhancing or reducing persuasion, including the format of the message (e.g. written, aural, or visual) and the environment in which the message is received (McGuire; O’Keefe). Receiver or audience traits have varying impact in their ability to influence someone in different situations (McGuire, O’Keefe). These factors include personality variables, such as anxiety level or self-esteem, as well as ability, lifestyle, and demographics such as sex. This dissertation will experimentally manipulate the following three independent variables—involvement, source credibility, and message quality or argument strength—in order to investigate the roles they play with respect to their persuasive influence of health messages about a novel cancer treatment included on organizational blogs.

Attitudes toward a message (for example, an advertisement or news article), toward an object (often a product or service), and toward a brand or an organization promoting the message and/or product are widely measured as dependent variables in persuasion research. Assessment can be either direct, i.e. through people directly reporting their attitude, or indirect, in which attitudes are gauged without a person knowing it (Petty & Cacioppo, 1981). However, most persuasion studies rely on the former because direct reports typically provide better validity and reliability, and a greater ability to pinpoint small differences in attitudes (Petty & Cacioppo).

As a result, this research seeks to determine the influence that each of the three independent variables has on several dependent outcome measures. The first four of these dependent variables involve various attitudes, specifically those toward the blog

message about the treatment, the cancer treatment itself, the organization providing the treatment and sponsoring the blog, and the blog channel of communication. To supplement the attitude measures and provide an indication of how closely they may be associated with behavioral intentions, several additional dependent variables assess the future likelihood that one will become empowered to take action with respect to the cancer treatment discussed in the experimental blog messages. Empowerment, which has been shown to be beneficial with respect to health and medical issues, will be described in greater detail subsequently. Other behaviorally related dependent measures include those assessing the likelihood of taking action with respect to the cancer itself, and to undertaking a specific action related to the cancer treatment organization. In this research, all but the last dependent variable are assessed through self-report measures.

Involvement

The receiver trait of involvement has been considered under incongruent definitions over the course of persuasion research and has similarly been shown to have disparate outcomes in studies of it (Stiff & Mongeau, 2003; Johnson and Eagly, 1989). In order to better understand these contradictions and illuminate the role(s) that involvement plays, Johnson and Eagly (1989) conducted a meta-analysis of involvement research that subsequently defined the concept as “the motivational state induced by an association between an activated attitude and some aspect of the self-concept” (p. 293). They identified three concepts of personal involvement that affect persuasion in different ways. This included those whose involvement was activated by enduring values (called value-relevant involvement), in which cases high-involvement subjects were less persuaded than low-involvement subjects. Second, among those

who became involved as a result of their ability to obtain desirable outcomes (outcome-relevant involvement), high-involvement subjects were more persuaded by strong arguments and less persuaded by weak arguments than those having low-involvement. Third, among those whose involvement was triggered by the impression they made on others (impression-relevant involvement), high-involvement subjects were slightly less persuaded than low-involvement subjects.

Involvement is a variable often used in studies as a way to vary the motivation level subjects have to process messages of interest, which can be done by controlling the personal importance or relevance about the topic (issue involvement) or how consequential subjects' judgments of the topic are likely to be (response involvement) (Chaiken, 1987). When participants have enough ability to process the message and when their involvement is high, they tend to be more motivated to think more about the message, because doing so increases the likelihood of determining the message's validity (Chaiken). Results in this vein are consistent with traditional models of how persuasive information is processed (Chaiken), as well as with the aspects involving thoughtful or effortful cognitive processing in the more recent dual-processing models, the Systemic-Heuristic Model (Chaiken, 1980) and the Elaboration Likelihood Model (Petty & Cacioppo, 1981, 1986), the latter of which will be described in greater detail subsequently.

Source Credibility

The characteristics of a human source providing a message (distinguished here from those of a medium or channel through which a message is received) are key to influence, so much so that Stiff and Mongeau (2003) suggest at times they may be "the most important features of persuasive communication" (p. 103). As noted previously,

several source characteristics have been investigated; however, credibility is among the most common (O'Keefe, 1990). In studies dating back as far as the earliest modern experiments on persuasion conducted by Hovland and his colleagues, two dimensions surface frequently in studies of source credibility and have been found to adequately represent the construct (O'Keefe; Stiff & Mongeau). The first is expertise, also called competence in some studies. Defined as "the extent to which a communicator is perceived to be a source of valid assertions" (Hovland, Janis, & Kelley, 1953, p. 21), this involves the extent to which the communicator is identified as being knowledgeable and informed about the topic of the message (Stiff & Mongeau). The second dimension is trustworthiness, which is a message recipient's degree of confidence that the source will tell the truth (Stiff & Mongeau). It is important to note that neither credibility in general nor either of its two facets are characteristics of a source; rather, they are perceptions by the message recipients. In addition, although these two separate but related constructs are not typically manipulated separately in experiments, it is possible for a source to be perceived as being high in one (e.g. expertise) but low in the other (e.g. trustworthiness) (Stiff & Mongeau). Also, the actual characteristics audience members use to judge a source's credibility are likely to vary depending on the circumstance, as is the magnitude of the persuasion effected by the source (O'Keefe). Finally, when sources are cast as either high or low in credibility, those judged to be low on the ratings scales are not low in absolute terms, they are simply low relative to those who have been rated as being highly credible (O'Keefe).

As is the case in this dissertation, credibility is often effectively manipulated in studies by varying the information provided to receivers about a source's education,

occupation, training and/or experience, such that sources described as having high educational attainment or significant experience in a field, for example, are rated as having higher expertise and trustworthiness (O'Keefe, 1990). Although they will not be considered here, numerous other factors can affect receivers' perceptions of a source's credibility. These include how a source delivers a message, their speaking style, the rate at which they deliver a message, the inclusion of pieces of evidence to support their points, the stance they advocate, whether they repeat words or have articulation difficulties, and even the timing of when a source is identified (O'Keefe).

In a review that spanned five decades of research, Pornpitakpan (2004) found that source credibility has been shown in the vast majority of studies to influence changes in people's attitudes toward a wide variety of topics, with highly credible sources in general creating significantly more attitude change and improving behavioral compliance. As the previous discussion suggests, however, a significant list of factors can interact with source credibility, leading not only to varying magnitudes of influence resulting from different levels of source credibility, but also the opposite possibility that in some circumstances low-credibility sources can be more persuasive (Pornpitakpan). The factors that can interact with source credibility have been mentioned previously here and are well detailed elsewhere (Pornpitakpan; Stiff & Mongeau; O'Keefe), and thus will not be reiterated. However, findings with respect to the interaction of the three independent variables being manipulated in this study bear inclusion and will be addressed subsequently.

The ability to successfully utilize sources to present health information is of significant interest and concern because it affects not only the impact of a messages but

also perceptions of an organization more broadly. Sources serve a variety of functions in presenting health messages, including to attract attention, engage audiences, increase exposure, facilitate understanding, heighten emotional arousal, increase retention, elicit positive responses, and enhance message uptake and behavior change (Atkin, 2001; Salmon & Atkin, 2003).

Depending on the desired outcome, organizations and campaigns utilize a variety of sources. Messengers of health information often include “expert specialists,” such as doctors and researchers who can enhance response efficacy; “professional performers,” which would include public relations representatives and other traditional spokespeople who customarily speak on behalf of an organization; and “ordinary” people and “specially experienced persons,” such as patients or survivors, who share similar characteristics with the audience and can heighten self-efficacy (Atkin, 2001). It is important to note that the efficacy of a messenger is highly dependent on the situation and the audience, i.e. a source that is influential in one campaign or among one group may not be similarly effective in or with another (Atkin; O’Keefe, 1990).

Each of these source types has also been found to have drawbacks. For example, messages provided by a medical authority can be perceived as dull or overly complex, while survivor stories may be so compelling that they distract from the substance of the message (Atkin, 2001). In addition, although public relations spokespeople or representatives are widely used in organizational messages, they have been shown to be perceived as having low credibility, particularly with respect to trustworthiness (Callison, 2001). Questionable practices related to insufficient disclosure on video news releases, paying journalists to preview or promote products, soliciting bloggers to

endorse beleaguered companies through special favors, and other problematic issues likely lend themselves to such views, particularly when they surface in the media as being ethically flawed. According to Callison, “the public associates public relations with bending the truth if necessary to make the client look positive or to facilitate a cover-up” (p. 122). Likewise, journalists (Sallot & Johnson, 2006), beginning public relations students (Saunders, 1993), executives of companies who hire PR agencies (Agencyfinder survey, 2004) and even PR educators and professionals themselves (Newsom, Ramsey, & Carrell, 1993) have raised concerns about the credibility and truthfulness in the field.

On the other hand, physicians have been found to be highly credible and trustworthy sources. In a survey examining sources of health information, Avery (2010) found that doctors were perceived as the most credible among six sources, which also included journalists, public relations practitioners, private health companies’ officials, scientists, and government agency officials. Similarly, the National Cancer Institute’s HINTS 2007 found that 68.5% of respondents reported they put “a lot” of trust in the health or medical information they received from a doctor or other health professional, while just 5.3% said they trusted these sources “a little” or “not at all.” It is clear, then, that the source of health messages can have significant influence on recipients.

Message Quality

Two types of messages are often discussed in persuasion: Those that are based primarily on logic or rational appeals and those based on emotions or affective appeals. Although it is often difficult to make a distinction between the effects of these messages because there could be overlap, the quality of a communication provided to an audience is one type of rational message appeal that has been investigated (Stiff & Mongeau,

2003). “Rational arguments derive their influence from sound reasoning and the quality of the evidence that is offered in support of the conclusion,” and the idea that high-quality evidence increases influences is highly intuitive (Stiff & Mongeau, p. 129). Whether evidence is included in a message, the amount of evidence that may be provided, and the extent of the quality of the information has all been shown to have differing levels of influence, but studies have generally found there is a positive association between attitude change and evidence (Stiff, 1986). Most of these studies have looked at message or argument quality through the structure of the ELM as is being done here (Pornpitakpan, 2004), and in line with its predictions, research has consistently shown that increased quality of evidence included in a communication increases persuasion among people who are more motivated to process its content and have the ability to do so (Petty & Cacioppo, 1981, 1986; Stiff, 1986; Stiff & Mongeau).

Elaboration Likelihood Model

As noted previously, persuasion has been extensively investigated; however, consistency of results has not been a hallmark of the field. “Existing literature supported the view that nearly every independent variable studied increased persuasion in some situations, had no effect in others, and decreased persuasion in still other contexts” (Petty & Cacioppo, 1986, p. 2). Endeavoring to resolve this impediment, Petty and Cacioppo (1981) unified some of the major concepts involved in prior attitude change approaches that often were applicable only in certain circumstances into the Elaboration Likelihood Model (ELM), one of two commonly discussed dual-process models of persuasion that have been advanced along with the Heuristic-Systematic Model (HSM). These models suggest that people process information through two disparate pathways, each of which mediates persuasion differently (Chaiken, 1980; Chaiken, Duckworth, &

Darke, 1999; Petty & Cacioppo, 1981, 1986). In addition to providing a framework for organizing existing persuasion theories, the ELM systematized the multitude of variables that could influence attitudes and delineated when the different processes of persuasion were likely to come into play (Briñol & Petty, 2006; Cacioppo & Petty, 1987).

The ELM suggests the necessity for two routes results mainly because “people are motivated to hold correct attitudes,” yet the ubiquity of information that bombards them on a daily basis precludes them from pondering and carefully judging all of it (Petty & Cacioppo, 1986, p. 5). As a result, the extent to which they elaborate on any given issue or piece of information varies not only with each individual but also with each situation, and can be impacted in magnitude and direction (favorably or unfavorably) by a host of factors (Petty & Cacioppo). Part of this comprehensive scrutiny involves relating the new information derived from a message to what one already knows about a topic, and the extent to which one elaborates in this manner ranges across a continuum from a great deal to very little. Petty & Cacioppo lay out the guiding principles of the ELM in seven specific postulates, which will be discussed more generally here.

The first processing pathway, called the central route, involves using a significant amount of active, rational thought to generate one’s own opinions about the object or issue being considered (Booth-Butterfield & Welbourne, 2002; Petty & Cacioppo, 1981, 1986). The reasoning undertaken through the central route does not have to be objective, i.e. taken only from the information being communicated, it also can be colored, or biased, by past experiences, knowledge, and feelings (Petty & Cacioppo, 1986; Booth-Butterfield & Welbourne). This route integrates the message learning approaches of Hovland and colleagues; self-persuasion approaches, such as role

playing, mere thought, and the cognitive response approach; and combinatory approaches, which merge information into an overall impression, such as the Theory of Reasoned Action (Petty & Cacioppo, 1981). Similarly, this more cognitive, analytical route is similar to the systematic processing described in the HSM (Chaiken, 1980).

The second is a considerably less thoughtful pathway to attitude change, termed the peripheral route in the ELM and the heuristic process in the HSM. It focuses instead on peripheral persuasion cues, which are “factors or motives inherent in the persuasion setting that are sufficient to produce an initial attitude change *without any active thinking about the attributes of the issues or the object under consideration*” (Petty & Cacioppo, 1981, p. 256, italics in original). These factors assimilate attitude change approaches involving learned responses contemplated in models of conditioning and modeling; judgmental approaches, in which evaluations of all things including attitudes and beliefs are relative to some comparison; and attributional approaches that relate to the inferences people make (including about attitudes) based on the behaviors they hear and see (Petty & Cacioppo). These situations involve agreement based on simple cues, such as the title or trustworthiness of a source, rather than on thoughtful consideration of the information presented, and are unrelated to the merits of the message (Booth-Butterfield & Welbourne, 2002).

It is important to note that either route can result in the same attitude about an issue or object (Booth-Butterfield & Welbourne, 2002). Affect is contemplated in the ELM, and its developers conducted research attempting to measure facial muscle movement and other electrophysiological manifestations that might provide physical indications of feelings. Under the ELM, when elaboration is high, “relevant affective

states should serve as persuasive arguments or help in assessing the cogency of arguments;” however, when people are unmotivated or unable to undertake this extensive cognitive elaboration, feelings and emotions instead serve as a peripheral cue (Petty & Cacioppo, 1986, p. 214). Pleasant affect would be expected to enhance attitudes while the opposite would occur in the case of negative emotions.

It may help to provide a simple example to better distinguish the differences in the two routes, albeit one that doesn’t involve attitude change. When we are going to drive somewhere new for the first time, typically we put significantly more rational thought into how we are going to find our way there than we do for a place we have driven to many times in the past (or even once before). We often obtain information to help us, perhaps by consulting a friend who has driven to the location or contacting the place we are heading, and/or checking a map or printing turn-by-turn directions off the Internet so we are less likely to get lost or make a wrong turn. However, if we have been somewhere before, our cognitive effort is significantly less, especially if it is a place we travel to and from frequently. In such cases, we don’t use a map or directions, and often instead rely only on cues along the way, for example, recognizing a Walgreen’s store across from a Dairy Queen on a corner at which we’ll turn. There are times we may drive an entire commonly traveled distance and not remember a single specific detail from the trip, making our way entirely by the cues we see, and not realizing we are home until we are parked in the garage that we can’t remember seeing specific cars or people along the way.

Under the ELM (and the HSM), motivation level and ability to process a communication play key roles in affecting both the extent and direction (positive or

negative) of a persuasive communication. Motivation includes factors “that affect a person’s rather conscious intentions and goals in processing the message itself” (Petty & Cacioppo, 1986, p. 8), and is often investigated through variables related to the message, including how personally relevant or involving the topic is; the recipients, such as their need for cognition; and the context of the communication. Ability, which relates to a person having the necessary knowledge to understand a message and the capacity to process it, may be influenced by variables such as distraction, repetition, prior knowledge, and the complexity and/or comprehensibility of the message (Petty & Cacioppo, 1986). The elaboration likelihood contemplated by the model’s name, then, relates to the extent to which an individual is likely to be motivated and able to think carefully about a message.

If either or both of these factors are missing, i.e. a person is either unmotivated or unable to thoroughly elaborate on a message, the ELM proposes he or she will look for more superficial ways or short cuts to judge the message, such as the inclusion of an expert, a celebrity, or an attractive or likeable source; or the number of arguments included in a persuasive message (O’Keefe, 1990; Petty & Cacioppo, 1986). In such cases, attitude change occurs through the peripheral route, and as a result is relatively temporary, and typically cannot be used to predict behavior. If no such cues are present, Petty and Cacioppo suggest a recipient will either keep or regain his or her initial attitude.

On the other hand, when someone is both motivated and able to process a message, elaboration will occur. To a large degree, the extent of the elaboration—and therefore the persuasive influence—will be determined by the quality of the information

or strength of the arguments presented, such that strong, compelling arguments will lead an individual to more intense scrutiny or elaboration. In such cases, the central route to persuasion is evoked, resulting in persuasion that is more enduring, better able to predict future behavior, and less likely to be successfully counter-argued against (Petty & Cacioppo, 1986; Petty, Haugtvedt, & Smith, 1995).

A number of studies have examined the effects that the variables described previously—involvement, message quality, and source credibility—have had on persuasion within the framework of the ELM, especially their interaction. For example, as a receiver becomes more involved in an issue targeted in a message, i.e. it becomes more personally relevant to them, a source's credibility is less likely to make a difference; however, this quality has been found to make a great deal of difference for low-involved receivers (O'Keefe, 1990). This stems from the ELM postulate that highly involved people, i.e. those who elaborate a great deal on a message, are more likely to consider little outside the quality or strength of the information, while those with low involvement are likely to be equally or even more swayed by specious arguments, at least when they are received in the presence of various indicators, such as a credible source.

Such studies have been conducted in a variety of contexts. However, motivation and/or involvement in health and medical issues may be unique from other areas. For example, Braverman (2008) suggested that rather than being a situational factor, involvement in medical interventions may instead be an individual characteristic. Therefore, as this study concerns health, the discussion here will be limited to describing studies similarly geared so that more analogous comparisons can be made.

One such study was undertaken by McCullough and Dodge (2002). They examined the role these three factors played in advertisements about general hospital services. This is one of few studies found that have specifically investigated persuasive health messages that are not prevention- or detection-oriented, instead focusing on the provision of health services, and thus is more closely related to the current study than most others to be discussed.

In line with the ELM, the researchers determined that high involvement consumers rated the hospital higher and were more persuaded by advertisements containing a high quality message, i.e. those that included messages about core services, such as the availability of specialists, the range of services offered and the hospital's reputation, than were those in the low-involvement group. However, ratings of the hospital when a low-quality message was used about the hospital's non-core services, such as its comfortable atmosphere, quality multimedia systems and delicious meals, were no different among those in the high- and low-involvement groups.

With respect to source credibility, the researchers hypothesized (contrary to the ELM) that high involvement consumers would be more persuaded by a physician spokesperson than a non-physician, while low-involvement consumers would be less influenced by a physician. They proposed this counter position because they felt it impossible for consumers to make a distinction between a health care provider and the hospital services, and thus judgments of the former (which it appears were not measured in their study), would be reflected in assessments of the latter among those who were highly involved in the message. In addition, they believed this inseparability carried over to low-involvement consumers such that the physician source would elicit

negative emotions, diluting the influence this high credibility spokesperson should have among this group. What they found ran contrary not only to the ELM's predictions, but also to their own. They found that the highly involved participants rated the hospital significantly more favorably when a non-physician spokesperson was used, and low-involvement subjects evaluated the hospitals almost identically regardless of the source who presented the message. To explain the reasons why the physician and non-physician spokespeople were equally influential, the team proposed as possibilities that the information about the source was included at the end of the advertisement (source timing has been shown to make a difference in some circumstances), and that the same source picture and number of statements were used in each of the hospital advertisements tested, perhaps minimizing or nullifying the peripheral cues used by the low-involvement group.

In addition to proposing hypotheses that run counter to published research findings on the ELM (without documented evidence from alternative studies), this research could also be somewhat problematic from the perspective of the involvement manipulation. Here, two disparate situations were used, with those in the high involvement group being told to imagine they had just been told by their doctors that they had a large cyst on their knees that needed surgery. The low involvement group was told they owed a large fine for a video tape they rented and never returned (McCullough and Dodge, 2002). These scenarios were pretested to determine that they produced similar emotional states; however, evoking involvement through such different situations has been found to be problematic. In addition, injecting emotion into the experiment could confound the results, particularly as these scenarios were pre-tested

for 18 different emotions, and finding consistencies across so many variables is difficult at best. Despite these shortcomings, this study provides insight into the potential impacts of organizational persuasive messages related to health care services and a jumping off point for additional research.

Another study closely related to the current research (although considerably more complex and investigating several alternate constructs) examined whether the ELM's process-influencing variables could predict which of four decisional styles—two involving the central processing route and two the peripheral route—patients would use to make medical decisions about their cancer treatment (Petersen et al., 2000). The study used the ELM within social influence theory to investigate a number of variables, finding support for the hypotheses that the model's constructs would accurately foretell decisional style. This predictive ability was associated with both cognitive and emotional motivation, the ability to process the information, and cognitive responding, which refers to the extent to which a person produces favorable or unfavorable responses about a message. The researchers said the study was among a series of investigations aimed at increasing understanding of the ways people make health decisions so these processes might be changed in order to enhance coping, wellbeing, and other health outcomes (Petersen et al.).

The two studies described involved empirical testing of ELM constructs in treatment- and service-related contexts; however, most experimental testing of the model in the health realm has concerned prevention-oriented messages. For example, Braverman (2008) investigated the effects that involvement, message channel (text vs. audio) and the type of message (informational vs. testimonial) had with respect to

weight management communications. In part, the results showed that those who were highly motivated to improve their diets or lose weight were more effectively persuaded by informational messages, which were considered to permit the greater deliberation associated with the ELM's central processing (Braverman). The study also found that people who were unmotivated in this area, i.e. had low involvement in the weight management message, were more persuaded by testimonials, which was felt to be more likely akin to peripheral cues because of their storytelling nature, consistent with the peripheral route of persuasion. The channel results conflicted across three experiments, but in general, the audio format was more effective for testimonials, while written informational messages were more persuasive. The author cautioned that involvement was measured as an inherent quality in the issue rather than manipulated and therefore needed additional investigation, but suggested the results offered new possibilities for better targeting preventive health communication messages.

In another prevention-oriented experiment based on the ELM, Igartua, Cheng, and Lopes (2003) investigated the level of involvement and the format of short AIDS films (musical vs. dialogue) to determine the persuasive effect of HIV prevention messages, finding that involvement "does not appear to be as relevant as defended by the ELM" with respect to AIDS campaign messages (p. 524). Although they found involvement was irrelevant, they unexpectedly identified that the lower quality entertainment-oriented musical format resulted in a greater number of positive responses while the high-quality dialogue format was better liked, which the authors stated conflicted with the postulates of the ELM. However, they did indicate the study identified two routes to persuasion consistent with the ELM, with the musical format activating a peripheral pathway of

processing while the dialogue format stimulated a central pathway of processing. They concluded saying the study had clear implications for designing AIDS prevention materials that would be differently effective for audiences persuaded through each of these pathways.

In examining the effects of messages promoting regular dental flossing, Updegraff, Sherman, Luyster, and Mann (2007) found that argument quality mattered only when the message matched participants' motivational orientation (approach vs. avoidance). They suggested, in part, that health message tailoring is effective when it matches important recipient characteristics, leading them to carefully contemplate the information being communicated, as would be consistent with the ELM's central route to persuasion.

Rather than testing its constructs empirically in areas of health, additional research discusses the ELM as a framework or theoretical perspective that can be effectively used to increase the persuasiveness of health messages in a variety of prevention and other health contexts. These include nutrition (Wilson, 2007), increasing medication compliance (Horton, Minniti, Mireylees, & McEntegart, 2008), breast cancer awareness (Holt, Lee, & Wright, 2008), promotion of pre-chemotherapeutic sperm donation (Achille, Rosberger, Robitaille, Lebel, Gouin, Bultz, et al., 2006), disordered eating (Withers & Wertheim, 2004), alcohol counter-advertising, such as public service announcements and warning labels (Agostinelli, & Grube, 2002), and health promotion and follow-up for childhood cancer survivors (Absolom, Eiser, Greco, & Davies, 2004). Some other researchers have suggested integrating the ELM's process-oriented constructs with other more behaviorally focused theories in an attempt to increase the effectiveness of

persuasive health promotion campaigns, which often have limited effects, at least in the long term. Slater (2006) stated that communication interventions based solely on behavior change theories “are far from adequate as a basis for developing communication content, communication strategies, and even, in some cases, evaluation designs,” recommending joint consideration of the ELM and other theories that help explain how campaign messages may be attended to and processed (p. 156).

Another study combined the ELM and Prospect Theory with respect to exercise, widely promoted as a prevention behavior for a number of chronic health conditions. Prospect Theory holds that whether a message is framed in terms of potential gains or losses will have differential effects, and the study’s results showed that only a high credibility source and a positive/gain-framed message led to elaboration (Jones, Sinclair, & Courneya, 2003). This elaboration resulted in the most positive exercise intentions both immediately and two weeks later, and increased reports of engaging in strenuous exercise during that period. In addition, the team suggested the results indicated that noncredible sources caused people to fail to engage in elaboration.

Examinations of the ELM in the health domain seem to have increased in recent years; however, the totality of these results indicate that much work remains to be done with respect to the role persuasion can and does play in a variety of health contexts. Thus, the purpose of the current study is to augment existing scholarship by investigating the three conventional independent constructs previously discussed in depth in the ELM literature in order to determine their applicability in health communications. In addition, this research seeks to expand this research to dependent variables and/or outcomes not previously tested with respect to the ELM, including

additional attitudes, the concept of empowerment, and health behavior intentions and action.

Patient Empowerment

Empowerment has been a rather loosely defined concept encompassing a range of intertwined factors. As this study deals with issues of health, it will deal with the more narrowly defined concept called patient empowerment, a description employed only to differentiate it from other types of empowerment and not intended to imply that all health consumers are patients, an important distinction. For the purposes of this research, patient empowerment is conceptualized as the ability to take control of or influence the situation in which one finds oneself (Nyatanga & Dann, 2002). It includes the processes one utilizes to gain this power (Nyatanga & Dann), which often involves gathering information and resources and using them in order to gain as much knowledge as possible in order to help deal with an illness (Bulsara, Styles, Ward, & Bulsara, 2006) and to promote informed decision making (Williams, 2002).

Discussion of patient empowerment has grown over the past several decades with changes in the health care system, including increased patients rights, competition among health providers, and organization and government promotion of personal responsibility for health and wellness; as well as an explosion in easy access to health and medical information (Roberts, 1999). It requires the active involvement of patients in order to increase control over the various environments and situations in which they find themselves, and is often considered to even the power level between patients and providers in health care relationships (Marks, Murray, Evans, Willig, Woodall & Sykes, 2006; Roberts). Although this can have negative consequences (e.g. it can inappropriately remove responsibility from health providers in some circumstances), it is

widely recognized that patient empowerment provides a variety of advantages to health care consumers and is desirable (Marks et al; Roberts). However, it is noteworthy that like the lack of consensus about its definition and ways to measure or evaluate it, health consumers have vastly disparate ideas about what it means to be empowered (Roberts).

The benefits of patient empowerment have been found to be significant, particularly among those who are facing chronic and/or life-threatening diseases. In general, patient empowerment improves health such that those without it are less healthy, which often relates to various sociodemographic variables such as race, ethnicity, and gender (Roberts, 1999). Surveys have likewise found that health consumers value involvement and empowerment, and recognize that their ability to be empowered depends both on their access to information, as well as to their ability to establish and maintain effective relationships with their health providers (Magee, 2003). In the U.S., 91% of survey respondents said that health consumers today asked more questions, made more choices, and actively evaluated benefits and risks more than patients did a decade ago. In addition, 80% felt they needed to more actively manage their own health (Magee).

In a qualitative investigation specifically among cancer patients, the desired outcome of empowerment was not related to increased survival, but instead to the desire to achieve a positive attitude, increased acceptance of the disease and determination to cope with it, and enhanced feelings of control over it (Bulsara, Ward, & Joske, 2004). Attempts to develop a tool to measure patients' levels of empowerment have been undertaken, with suggestions that health professionals may use it to help

assess patients' ability to cope with, manage, and make decisions about their illness and associated issues. Among the common themes found in developing the 28-item patient empowerment measure were having sufficient resources to handle their illness, and sufficient and relevant information related to the illness (Bulsara et al., 2006).

Health Information Seeking

Healthy People 2010, which outlines U.S. government priorities for improving health among Americans, states: "Information is a critical element of informed participation and decisionmaking, and appropriate, quality information and support services for all are empowering and democratic" (HHS, 2000, p. 10–11). Obtaining information and using it to gain knowledge about health and disease has been shown to have a number of benefits, including improved self-efficacy, positive changes in health behavior (Rimal, Flora, & Schooler, 1999), and increased health literacy (Speros, 2005), the latter of which has been shown to be linked to a number of personal and societal benefits. These include enhancements in perceptions about the status of one's personal health, as well as decreased health care costs, improved ability to share in making decisions about care, and reduced use of health care services (IOM, 2004; Speros, 2005). Better informed patients tend to participate more in making decisions about their care and are more satisfied with treatments, which also correlates to broad-ranging functional improvements (Ramanadhan & Viswanath, 2006). Despite these known benefits, however, patients consistently report that they are not receiving adequate amounts and types of information from their health care providers (Chen & Siu, 2001), and so they must seek information from other sources.

The Internet is one of those sources, and although numerous studies have examined the quality of health information found there, the results have been conflicting

due to significant variation in the type, quality, and methodology employed. Regardless, cancer patients have been found to be especially active in searching for health information, especially through the Internet, to supplement the information they receive from their providers (Chen & Siu, 2001; Huang & Penson, 2008). Doing so has been found to have a number of benefits. For example, in a study of men with prostate cancer, Broom (2005) found the Internet's use as a source of health information and support provided feelings of empowerment and control over health conditions and decision-making by enabling patients to actively seek information. It also minimized risk by decreasing reliance on medical professionals and limiting inhibitions, which promoted safe disclosure of sensitive information that may otherwise cause embarrassment or humiliation in face-to-face situations.

Similarly, Sharf (1997) investigated the ways in which a community developed among participants in an online breast cancer discussion group. In addition to promoting the sharing of information and experiences, this list provided social and psychological support without the geographical and scheduling constraints associated with in-person groups. Participation resulted in empowerment and the ability for patients to benefit from the knowledge of others in meeting new challenges. Additional advantages to seeking health information on the Internet include increased ability to cope with the disease (Damian & Tattersall, 1991), decreased anxiety and other mental health disturbances (Rainey, 1985), improved communication (Johnson & Adelstein, 1991), and enhanced better decision making and satisfaction (Luker, Beaver, Leinster, Owens, Degner, & Sloan, 1995; Cawley, Kostie, & Capello, 1990).

Assessing Empowerment

Just as the concept of empowerment has been defined differently by professionals and is perceived uniquely by individual patients, it has similarly been measured in a variety of ways. Often such measurements involve assessing empowerment as a psychological characteristic or disposition related to perceptions about control of health in general or specific situations, including assessments of locus of control and self-efficacy.

Locus of control relates to a general cross-situational belief about the extent to which individuals believe that they can control events that affect them. With respect to health issues, the levels of control range from believing that events are entirely controlled by one's own behavior and actions to feeling these events are determined by powerful others, fate or chance (Wallston, Wallston, & DeVellis, 1978). Self-efficacy, on the other hand typically relates to relatively defined situations and activities. A key component of Bandura's social cognitive theory, self-efficacy is a person's belief about whether he/she can successfully institute a positive change in behavior and resist regressing in that action over time, for example undertaking an exercise or diet program (Bandura, 1977; Prochaska, DiClemente, & Norcross, 1992). Observational learning, social experience, and rewards play heavily into the concept.

As noted, both of these concepts relate to psychological beliefs, either innate and relatively constant or dependent on the situation. As conceptualized in this study and by others, however, becoming empowered moves beyond these types of emotional states (Bulsara et al., 2004). It assumes that taking charge of one's health depends not only on the specific situation but on active participation in it, including by acquiring as much knowledge as possible in order to help deal with an illness and promote informed

decision-making (Bulsara et al., 2006; Nyatanga & Dann, 2002; Roberts, 1999; Williams, 2002). A number of potential measures were considered to assess empowerment in this study, including self-efficacy and locus of control; however, such dispositions, which typically are examined as independent variables, did not capture the active, information-seeking aspect of the concept as identified here.

Past empirical research investigating actions associated with becoming empowered is somewhat rare. Some studies have looked at empowerment as an outcome variable in assessment of educational materials targeted to specific health issues, such as preoperative education for orthopedic patients (e.g. Johansson, Nuutila, Virtanen, Katajisto, & Salanterä, 2005). More commonly, research has examined the effectiveness of interventions designed to increase empowerment among patients by increasing their ability to ask questions of their health providers (Roberts, 1999). In a meta-analysis, Edwards, Davies and Edwards (2009) sought to identify external influences on the information exchange and shared decision-making that occurs during consultations between providers and patients, with empowerment among the latter group among the identified outcomes (along with disempowerment and non-empowerment). These outcomes were significantly influenced by patients' motivation to seek and engage in information and to appraise it in advance of a consultation with a health provider.

Such operationalizations fail to investigate potentially empowering activities outside the health setting and therefore may be too narrow (Roberts). What transpires inside action the health care setting, e.g. in patient-provider interactions, is intimately tied to what occurs outside of it, e.g. information gathering by health consumers

(Roberts, 1999). In order to capture the active nature of empowerment and to broaden the scope of empirical examinations about it to one of these external situations, this study therefore operationalized the concept through a series of three dependent variables that attempt to assess the degree of empowerment to seek additional information that might occur as a result of being exposed to online health messages about a serious cancer risk. These measures involved two standardized measures found in the literature associated with control and health information seeking, and four additional items assessing subjects' likelihood of taking further steps to gather additional information from various listed sources.

The standardized scales employed were Health Information Orientation (Dutta-Bergman, 2004) and Perceived Behavioral Control (Ajzen, 2006). HIO is conceptually defined as the extent to which an individual is willing to look for health information (Dutta-Bergman). PBC is a measure proposed by Ajzen as one of the constructs of the Theory of Planned Behavior (along with behavioral beliefs and normative beliefs), which can "serve as a proxy for actual control and contribute to the prediction of the behavior in question" (p. 1). These measures were selected because they most closely approximated the empowerment linked to active use of health information and resources (Åsbring & Närvänen, 2004; Bulsara et al., 2006; HHS, 2000; Magee, 2003; Nyatanga & Dann, 2002).

Specifically, this study attempts to examine health information seeking empowerment that might arise from exposure to organizationally sponsored blogs. Kumar et al. (2004) state: "We expect blogs to remain a pervasive phenomenon on the Web, and fascinating insights into the sociology of bloggers can be divined from the

analysis of the structure and content of blogspace” (p. 39). Thus, the purpose here is to provide insight into the aspect of blogspace that deals with organizational blogs related to cancer treatment by attempting to better understand the applicability of the ELM and some of its main constructs in this context. This was accomplished by empirically testing a series of hypotheses and answering four research questions in order to extend theoretical research on persuasion and ELM into the new realm of cancer treatment messages and to new attitudes and other dependent variables, including empowerment, preventive health activities, and a specific behavior. The results of this research also have practical implications in assisting organizations to better target messages to health consumers, who will mutually benefit.

Hypotheses and Research Questions

Previous research on the ELM would suggest the following hypotheses, which will be investigated in this study:

- H1. When a message about cancer treatment contains strong arguments, highly involved consumers will evaluate *the message* more favorably than will those who are low in involvement.
- H2. When a message about cancer treatment contains weak arguments, consumers who are low in involvement will evaluate *the message* more favorably than will those who are highly involved.
- H3. When a highly credible source accompanies a message about cancer treatment, consumers who are low in involvement will have a more favorable attitude toward *the message* than when a less credible source is used. Highly involved participants' attitudes toward the treatment message will be relatively unaffected by source credibility.
- H4. When a message about cancer treatment contains strong arguments, highly involved consumers will evaluate *the cancer treatment* more favorably than will those who are low in involvement.
- H5. When a message about cancer treatment contains weak arguments, consumers who are low in involvement will evaluate *the cancer treatment* more favorably than will those who are highly involved.

H6. When a highly credible source accompanies a message about cancer treatment, consumers who are low in involvement will have a more favorable attitude toward *the cancer treatment* than when a less credible source is used. Highly involved participants' attitudes toward the treatment will be relatively unaffected by source credibility.

The ELM has not previously been used as a framework to test as dependent measures either attitude toward an organization, attitude toward an organizational blog or consumer empowerment to seek health information, or with respect to health behavioral intentions or actions of the kind discussed here. Therefore hypotheses cannot intelligently be made and thus the following research questions are appropriate:

RQ1: What effects do involvement level, argument strength, and source have on attitudes toward a cancer treatment organization?

RQ2: What effects do involvement level, argument strength, and source have on attitudes toward an organizational blog as a channel of cancer treatment communication?

RQ3: What effects do involvement level, argument strength, and source have on personal feelings of empowerment to seek health information?

RQ4: What effects do involvement level, argument strength, and source have on behavioral intention to seek thyroid cancer screening? On intention to stop using mobile phones? On a person's direct action to take informational material?

As stated, predictions about the outcomes for the previously untested attitudinal and empowerment measures cannot be made, thus research questions were proposed. However, Figure 2-1 contains a simplified graphic representation of the ELM that attempts to more clearly depict how both the independent and dependent variables being investigated here may fit within the context of the Model.

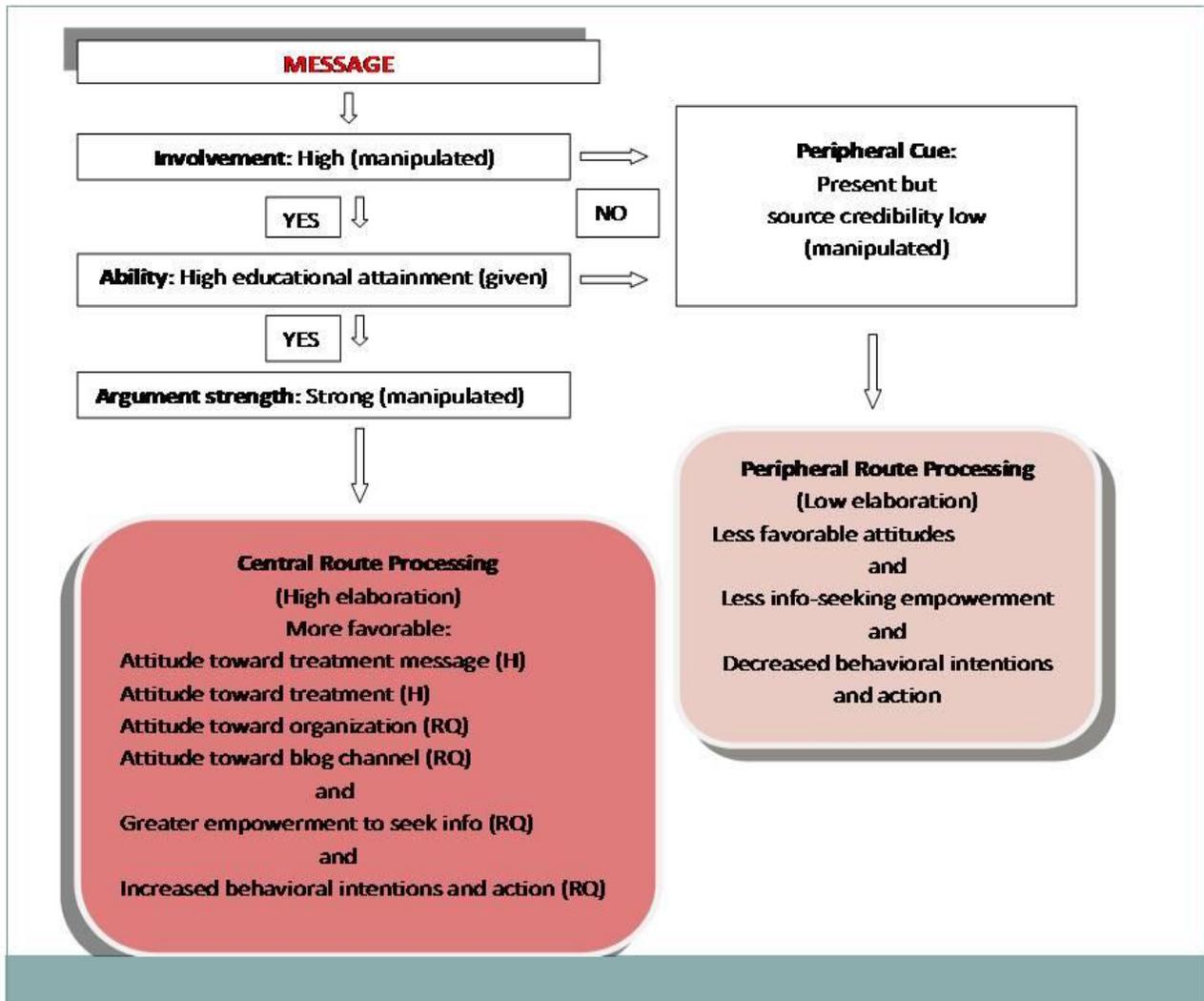


Figure 2-1. Simplified graphic representation of the ELM developed by Petty and Cacioppo (1981, 1986). The representation shows how the independent and dependent variables being investigated in this experiment may fit within the context of the Model. An “H” following the name of the dependent variable signifies that at least one hypothesis was proposed based on past research findings. An “RQ” indicates the measure has not been previously tested within the ELM framework and so a research question was posed.

CHAPTER 3 METHODOLOGY

This study tested the previously stated hypotheses and examined the research questions posed using the Elaboration Likelihood Model of persuasion as a framework. A 2 (involvement: low vs. high) x 2 (message strength: weak vs. strong) x 2 (source credibility: low vs. high) between-subject post-test only experimental design was utilized. This experiment was conducted to identify the influence that each of these three independent variables had on a number of dependent outcome variables that involved several attitudinal measures, feelings of empowerment, and behavioral intention and action, all of which will be described subsequently.

Independent Variables

Involvement

Involvement in the cancer scenario, i.e. the issue of getting cancer from cell phones that was described in the cover story news release, was assessed using a three-item measure. It asked respondents to rate the information on the following seven-point semantic differential scale: important/unimportant, means a lot to me/means nothing to me, not needed/needed (Lord & Burnkrant, 1993). The two cover story news release involvement manipulations can be seen in Appendix A.

Although not typical, an assessment of involvement in the experimental blog message itself also was conducted using a scale previously employed by Lord, Lee & Sauer (1994, 1995). This manipulation was checked by asking participants to respond to the statement: "While reading the cancer treatment information included on the blog, I was . . ." on each of four, seven-point scale items. These items included the following three semantic different measures: very uninvolved/very involved, concentrating very

little/concentrating very hard, and paying very little attention/paying a lot of attention.

The fourth item asked respondents to rate on a seven-point Likert-type scale, ranging from strongly agree to strongly disagree, the statement: "I carefully considered the information in the blog about the therapy."

Message Quality

A manipulation check of argument strength/quality was measured. Participants were asked: "How much do you feel you LEARNED about positron treatment from the blog you read? They were asked to respond to the question by rating their extent of learning on a scale of 1 (practically nothing) to 5 (a great deal)." The scale had previously been used by O'Keefe, Boyd, & Brown (1998).

Source Credibility

A manipulation check of source credibility was evaluated by two combined scales, expertise and trustworthiness, traits which have been most commonly discussed in the literature and measured with respect to credibility. The scales used here are modified from those developed by Ohanian (1990), and consist of two sets of bipolar adjectives (11 items total) rated on a seven-point scale responding to the statement: "The writer of the blog is . . ." The five trustworthiness bipolar adjectives were:

undependable/dependable, dishonest/honest, unreliable/reliable, insincere/sincere, and untrustworthy/trustworthy. The six adjective pairs measuring expertise were: not an expert/expert, inexperienced/experienced, unknowledgeable/knowledgeable, unqualified/qualified, unskilled/skilled, and untrained/trained. Ohanian also used a five-item attractiveness scale when rating celebrity endorsers, which was not used here because the sources in the experimental materials were the same person, in the same background and pose, and having the same facial expression; thus, the ratings of

attractiveness would have been expected to be equally distributed across this random population regardless of other factors. In the literature, the separate measures of trustworthiness and expertise are most commonly assessed jointly, i.e. as an overall mean credibility score calculated by combining the two subscales, which is what will be done for the purposes of this dissertation. However, examining these measures separately in future studies may be warranted to increase understanding of health messages.

Ability

In addition to involvement, which indicates the personal importance of a message, another factor that determines the route used to process a persuasive message is one's ability to process a communication. In this study, this factor was presumed to be high across the population. This assumption was made because all participants had achieved above-average education levels, such that they all were high school graduates and had completed at least some college.

Dependent Measures

Attitudes

In order to gauge attitude toward the treatment message, participants were asked to describe their perceptions about the quality of the information presented in the blog information on a three-item, seven-point semantic differential scale. The scale consisted of the following bipolar phrases: very weak/very strong, not very convincing/very convincing, and not very powerful/very powerful. The measure had been previously used by Gürhan-Canli & Maheswaran (2000).

Attitude toward positron treatment was assessed using a seven-point semantic differential scale previously used by Stayman and Batra (1991). Participants were asked

to rate their responses on each of four items to the statement: “If you were told you had thyroid cancer from using a cell phone, using positron treatment would be . . .” The items were useless/useful, not beneficial/beneficial, low quality/high quality, and worthless/valuable.

Attitude toward the organization (Positron Treatment and Research Institute) was determined using a seven-point semantic differential scale. The scale included the following five bipolar adjectives: undependable/dependable, dishonest/honest, unreliable/reliable, insincere/sincere, and untrustworthy/trustworthy. It was developed by Trifts and Haubl (2003).

Attitude toward the blog channel was measured using a scale adapted from Homer (1995). Participants were asked to respond to the statement “The blog was . . .,” rating each of seven qualities on a seven-point Likert-type scale anchored by “strongly disagree” and “strongly agree.” The qualities were: believable, interesting, informative, well-designed, easy-to-follow, attention-getting, and useful.

Consumer Empowerment

For the purposes of this study, empowerment was conceptualized as the ability to take control of one’s situation (Nyatanga & Dann, 2002). It includes the processes utilized to gain this power and using them in order to gain as much knowledge as possible in order to help deal with an illness and to promote informed decision-making (Bulsara et al., 2006; Nyatanga & Dann, Williams, 2002). As a result, this concept was operationalized using three scales used to measure the active process of gathering information and resources.

Health Information Orientation (HIO) was measured here using a seven-item Likert-type scale ranging from strongly agree to strongly disagree, with the responses

assessing an individual's willingness to look for health info and to educate her/himself about health issues in general (Dutta-Bergman, 2004). The items were: "I make a point to read and watch stories about health," " I really enjoy learning about health issues," "To be and stay healthy it's critical to be informed about health issues," "The amount of health information available today makes it easy for me to take care of my health," "When I take medicine, I try to get as much information as possible about its benefits and side effects," "I need to know about health issues so I can keep myself and my family healthy," and "Before making a decision about my health, I find out everything I can about the issue."

The second standardized scale was Perceived Behavioral Control (PBC), which Ajzen (2006) proposed as one of the constructs of the Theory of Planned Behavior (with behavioral beliefs and normative beliefs), as a measure that can "serve as a proxy for actual control and contribute to the prediction of the behavior in question" (p. 1). This four-item scale, with two items measuring capability and two items measuring controllability on seven-point semantic differential scales, are meant to capture people's confidence that they are capable of performing the behavior under investigation. As prescribed, the four items used in this study followed example statements provided by Ajzen and were developed based on the behavior of interest, which here was operationally defined as becoming knowledgeable about treatments for thyroid cancer. The four items and their associated bipolar adjectives used in this experiment were: "For me to become knowledgeable about treatments for thyroid cancer would be," impossible/possible; "If I wanted to, I could become knowledgeable about treatments for thyroid cancer," definitely true/definitely false; "How much control do you believe you

have over becoming knowledgeable about treatments for thyroid cancer?” no control/complete control; and “It is mostly up to me whether or not I become knowledgeable about treatments for thyroid cancer,” strongly agree/strongly disagree. The first two items related to capability and the last two to controllability.

The remaining four empowerment items assessed behavioral intention related to seeking additional information specifically about positron cancer treatment for thyroid cancer from cell phones from each of four different sources. Each statement was measured on seven-point scales using the two bipolar adjectives “unlikely/likely” and “improbable/probable” (Grossbart, Muehling, & Kangun, 1986). The four statements said: “If you were told you had thyroid cancer from using a cell phone, please rate the extent to which you would” a) “seek additional information about proton therapy from other sources beyond the blog;” b) “write comments or questions to the blog author asking for additional information;” c) “ask your physician about proton therapy as a possible treatment;” and d) “contact the Positron Treatment and Research Institute, which sponsored the blog, for additional information.”

Other Dependent Measures

Two additional behavioral intention items and one actual behavior also were assessed. The behavioral intention items related to likelihood of attending a health screening and of discontinuing an unhealthy behavior. The specific questions were: “UF is considering offering thyroid cancer screening to its students for a modest cost. If they did, how likely would you be to have this screening,” and “If you were diagnosed with thyroid cancer, how likely would you be to give up using your cell phone?” The actual behavior item involved participants’ specific action to take or not a sheet of contact

information for the Positron Treatment and Research Institute organization that provided the positron treatment and sponsored the experimental blog.

Stimuli

Involvement was manipulated through a cover story in the form of a news release detailing a fictitious research study by Harvard University cancer researchers that found a link between cell phone use and thyroid cancer in college students. The cover story for the high involvement group stated that head and neck scans found that more than one-third of university students 18–22 who participated in the study had small- to moderate-sized tumors, the majority of which were cancerous, while the low involvement story suggested the thyroid cancer was detected in a much smaller percentage (1 of 1,000) of college students. The cover story was described to participants as an as yet-to-be-released news release that had been sent by Harvard to cancer treatment organizations nationwide to allow them to prepare to respond to questions by the public after the news was released. Participants also were told that one of those cancer treatment organizations contacted communication faculty researchers at the University of Florida asking for assistance in evaluating information contained on blogs the organization created in response to this news to determine how to best present information about its treatment to the public. This deception was necessary in order to a) help ensure participants were unaware that it concerned their persuasibility, b) adequately manipulate involvement in the issue of cancer in a college-age population, which has traditionally been hard to engage in this topic because it is considered a disease that occurs among older people, and c) to minimize demand characteristics. The only other differences between the two cover story manipulations related to the severity of the threat, e.g. the low involvement story stated the link

between thyroid cancer and cell phones was “miniscule” and that its occurrence was “extremely rare.” The high involvement cover story described these same aspects as a “significant” link and “a serious health threat.” Both stories also included a histogram titled “Lifetime probability of occurrences” and comparing thyroid cancer from cell phones (the bar height of which differed based on the low- versus high-involvement scenario), lightning strikes, and heart disease.

The second set of stimuli included the organizational blog manipulations. Participants were each exposed to one of four different experimental blog messages about the cancer treatment formatted on commercially available blogging software. The four different blog message manipulations were based on combinations of source credibility (high vs. low) and argument strength/quality (strong vs. weak), as described further below. The format of the blog messages were identical in terms of organization name, size and location of logo and source photo, blog title, format of text, number of arguments, etc., with the conditional differences noted below.

Each blog contained the following items described previously as being typical of most blogs. These included a header with the name of the treatment organization sponsoring the blog (Positron Treatment and Research Institute) and the logo of the blogging software used (Blogger) along with the email address that was created for the source of the post (JoyceMarshall.PTRI@gmail.com). The main channel contained a dated page-long message, or post, under the title “Positron Treatment for Thyroid Cancer” along with a small graphic intended to look like a positron logo, and the traditional last line identifying the writer and the time the comments were posted. The main posting included an introduction, which was the same for each of the four

conditions, related to recent news about cell phones causing thyroid cancer and indicating that positron treatment is “one of the newest and most promising tools in use today” for treating it. This was followed by a section listing five bulleted advantages to positron treatment. Depending on the condition, these advantages contained either five strong/high-quality or five weak/low-quality statements.

For the purposes of this study, strong statements were operationalized to be those that related to the technology associated with the positron treatment and its curative properties, while the weak arguments involved aesthetic aspects of the city or the Institute and other issues distantly related to the treatment itself, such as social support (McCullough & Dodge, 2002). Other ELM studies have operationalized argument strength/quality in different ways; however, the distinction chosen here adhered to the operational definition used in the only other empirical test of organizational health messages that was found and so was felt to be the most appropriate.

The positron treatment was fictitious, with its name and the organization name fabricated solely for the purpose of this experiment. However, the information in the blogs’ main posts contained messages about a real cancer treatment, and all of the messages about it were true and were based on publicly available information. The real name of the treatment was not used in the experimental materials in order to prevent any potential familiarity or other issues. The final paragraph of the main post, which was the same for all conditions solicited comments and/or questions, providing a “comments” link for those wishing to respond via the blog, as well as telephone numbers for those preferring to call.

The source manipulations, consisting of either a physician (high credibility), or a public relations spokesperson (low credibility) source/author, were contained in the blogs' right sidebar. These "sources" were not a real doctor or spokesperson. In order to limit confounding of the source variables as much as possible with respect to attractiveness, ethnicity, gender and other personal attributes, the same person and name (Joyce Marshall) were used for both the physician and PR spokesperson. However, in addition to the titles/descriptions accompanying the photos, the woman was dressed differently in each photo to provide appropriate cues to their different roles (lab coat and stethoscope for the physician and suit jacket for the public relations representative). This section included, from top to bottom, a head shot photograph of the source/author and two text boxes, one above the photo that included her name/title and a degree or certification (Dr./MD or APR [Accreditation in Public Relations]) and one below containing a position description (cancer specialist or public relations representative); a blogroll listing "Helpful Links," including for the Positron Treatment and Research Institute, the National Cancer Institute and Harvard University Cancer Research Institute; and a blog archive listing the current post.

Thus, the four blog conditions were: high credibility physician source with strong/core service relevant message, high credibility physician source with weak message/non-core service related message, low credibility public relations representative with strong/core service message, and low credibility public relations representative with weak/ non-core service related message. The four blog manipulations can be seen in Appendix B.

Pretesting

The experimental materials were pre-tested to improve the likelihood of developing an effective and credible cover story and successful manipulations of the independent variables (Aronson, Ellsworth, Carlsmith, & Gonzales, 1990). A total of 177 participants were involved in the pre-testing, which was done in groups ranging from 16 to 65 people. Participants were told the testing was part of a project evaluating health messages, which College faculty had been asked to assist with by a cancer treatment organization. In all cases, completion of the survey questionnaires was followed by an informal group discussion, during which questions were posed to participants to elicit their thoughts or feelings about the cover story, source, arguments, instructions, etc. depending on the pretesting being conducted. The discussion sessions were recorded with the subjects' knowledge and consent, and notes were taken by the researcher, which were used to make subsequent modifications.

Four between-subject pretests were conducted to test the involvement manipulation cover stories, with revisions made between each pretest in an effort to increase the mean differences in involvement level to the greatest extent possible and to decrease possible confounds. As noted previously, the cover story manipulations were identical with the exception of the words or phrases intended to evoke either high or low levels of involvement in the issue (relative to each other), which was getting thyroid cancer from cell phones.

The first pretest included two conditions, one intending to stimulate high involvement and the other to induce low involvement, with the distinctions related to a) age of the "victim" described, b) the percentage of the victim population found to be afflicted with thyroid cancer, and c) the length of time victims had used their cell phones.

Specifically, the low involvement scenario stated that cancerous thyroid tumors were found in 1% of older adults 55 and older who had used cell phones for a decade or more, while the high involvement condition stated that these tumors were found in one-third of college-age students 18–22 no matter how long they had used cell phones (i.e. even with short-term use). Among the 25 participants, means for the high involvement condition ($M = 24.23$) were higher than for the low involvement condition ($M = 23.50$), with internal reliability of .76. However, means even among those in the low group showed relatively high levels of involvement, which was unexpected as research has shown that adolescents often fail to feel vulnerable to negative health outcomes and underestimate the magnitude of the risks to which they are exposed (e.g. see Johnson, McCaul, & Klein, 2002).

As a result, changes were made to the cover stories and an additional condition was added for the second pretest. The changes involved removal of references to the length of cell use, as well as quoted comments by a person in the vulnerable age group that related to worry/lack of worry about the research findings described. A second low-involvement condition was added which substituted college- age students 18–22 for the 55+ population. Among the 24 subjects who participated, the mean among the high involvement group ($M = 23.50$) was higher than among both low involvement groups ($M = 20.25$ for the 55+ population described in the manipulation and $M = 20.38$ for the college population). Internal reliability for the four items was .79. Only a small mean difference between the two low-involvement conditions was found; therefore, the condition involving the middle-age group was eliminated in all future testing to decrease potential confounding.

An additional modification was made in advance of the third pretest in an attempt to further differentiate mean involvement levels between the low- and high-involvement groups. Clarifying phrases were added to the conditions to further describe the likelihood of the thyroid cancer-causing occurrence. The high involvement condition added that it was a serious health issue, while the low involvement story indicated the likelihood was extremely rare, roughly equivalent to getting hit by lightning. Thus pretest involved 17 subjects, with means showing that those who received the low involvement cover story reported lower involvement levels ($M = 21.91$) than did those who received the high involvement story ($M = 25.00$). Internal reliability for the four-item measure was .64, which increased to .82 with removal of the relevance item.

Subsequently, several additional modifications were made to the two cover story manipulations for the fourth pretest. In the low involvement manipulation, the percentage of students found to have thyroid tumors was decreased from 1% to “1 in 1,000.” Adjectives were added to the lead sentences of both cover stories to qualify the cell-phone thyroid cancer link (“miniscule” and “significant”). In addition, histograms titled “Probability of occurrences” were added at the end of the story/bottom of the page for each manipulation. The histograms depicted a three-way comparison between thyroid cancer from cell phones, getting struck by lightning and heart disease, with the bar height for thyroid cancer varying depending on the low/high condition. Fourteen subjects participated. Means on the four-item involvement measure were higher among those who received the high involvement condition ($M = 23.0$) than among the low involvement group ($M = 20.25$). Internal reliability for the four items was .47, which

increased to .64 if the relevance item was deleted. Means among the three-item measure (excluding relevance) were $M = 17.33$ and $M = 14.25$ respectively.

The ANOVAs for both the three- and four-item involvement measures were not significant among the relatively small pretest sample sizes; however, the differences between the high- and low-involvement means increased between the first and last pretest, approaching significance. As a result, just one additional change was made to both cover story conditions before use in the final experimental data collection. The histogram titles were changed to “Lifetime probability of occurrences” in order to more accurately reflect the likelihood of heart disease risk.

Within subjects pretesting also was conducted among 101 participants to determine characteristics of the arguments/statements that were to be used in the experimental blog. In total, 38 arguments were pretested for strength/quality, in addition to their believability, comprehensiveness, complexity and familiarity (Petty & Cacioppo, 1986). As noted previously, high-strength arguments related to the curative properties of the treatment, while low-strength statements involved elements that were more aesthetic (McCullough & Dodge, 2002). All of the statements were true. In the first of three argument pretesting sessions, each of 72 subjects evaluated half of the arguments for either strength or the other four traits in order to prevent fatigue and decrease the likelihood of indiscriminate responses. An average strength rating was calculated for each statement, which was used to identify the highest and lowest quality statements. Means on the other four factors also were calculated, and the arguments having the 10 highest and 10 lowest means that also were roughly equivalent in the levels of each of the four criteria were identified for further pretesting (Petty & Cacioppo,

1986). An additional 29 subjects rated these 20 arguments on four items: strength, persuasiveness, understandability and complexity. In order to prevent confounding of the results, the five strong and five weak statements/arguments used in the blog message were ascertained by taking the five highest quality and five weakest statements that also were roughly equivalent on mean levels of understandability and complexity.

Between subjects pretesting of the two sources (PR spokesperson and doctor) also was conducted among 25 subjects. It is worth noting that this source pretesting session and others conducted early on in the pretesting process included only measures for a single independent variable. Later pretesting included multiple variables and more closely followed the procedure to be utilized in the actual experimental testing in order to identify and resolve any issues that may have surfaced as problematic. This process also explains the disparity between the number of subjects participating in the pretesting and the numbers among whom each variable was tested.

Participants

A total of 331 undergraduate students 18 years and older from a large Southeastern university participated in the study to receive extra credit. Of these, 177 were involved in pre-testing the experimental materials, and the remaining 154 participated in the main experiment. Students were selected to participate because they are more readily accessible than other populations, and researchers have found similar responses between college students and non-students. For example, in an experiment investigating variables similar to the ones proposed in this study with respect to hospital advertising, McCullough & Dodge (2002) found no significant differences in responses between college students and employees of a financial institution. In addition, because

young adults of this age are often difficult to engage in health related issues as discussed previously, this experiment was devised to render students as stakeholders by identifying a health threat that was anticipated to evoke current interest among this population.

Experimental Procedure

Participants were recruited for the actual experiment through three specific classes. In order not to divulge the true purpose of the experiment and help ensure experimental realism, individuals were told the extra credit involved assisting to evaluate health marketing messages. Two of the three classes were large introductory advertising lectures (different sections of the same course), and the other was a large lecture mass communication course. Both courses, but particularly the latter, draw majors from throughout the university.

The experimenter developed a detailed script for the data collection sessions that was read to each group, and she personally conducted all of the sessions in order to limit, to the greatest extent possible, any potential confounding among the various groups by different language, explanations, moderator, etc. The instructions were standardized so that all participants could come to a similar understanding of what the research was about and what their responsibilities would be, and to ensure that all questions participants had were answered before the start of the experiment (Aronson et al., 1990). Because of a timed thought-listing measure (described below) and the need to debrief participants at the end of the data collection due to the deception involved, it was necessary for all of them to progress from section to section simultaneously. Therefore, the experimenter read all of the instructions aloud from the script and as printed in the data collection booklets. With the exception of the thought-

listing measure, participants were provided as much time as they needed to finish each section, and the testing did not proceed until it was verified that everyone had finished. In order to help ensure participants who worked more quickly stayed involved in the subject, all papers and other materials were required to be removed from the desk tops and put away (including cell phones, laptops, newspapers, notebooks, etc.). Participants were told these materials could not be accessed during the entirety of the session and were provided an opportunity to leave the session before it started if they were unable to comply.

Twelve sessions were held over the course of a week in two different classrooms having similar setups, with group sizes ranging from 8 to 21. Limited availability required the use of two classrooms, and the sessions were held at various times in order to accommodate as many students as possible who wished to receive extra credit. The entire procedure took about 60 minutes, including 45 minutes to describe the experiment, obtain consent and work through the booklets, and the remainder for debriefing and questions. The researcher noticed no indications of participant fatigue during the sessions (e.g. participants pulling out other materials or talking to others) and in all cases the participants involved completed the entire contents of both booklets, despite being told they could discontinue answering the questions at any point. In addition, although written comments on the debriefing forms were rare, there were none indicating the experiment was too long or uninteresting. Among the handful of comments included stated: "The experiment was fascinating," "Great experiment!" and "Good job, I did not see that coming," suggesting the trial was engaging. However, that was not the case across the board. One subject who was discontented with the process

despite the forewarning wrote: “Waste of time to not allow students to work at own pace and instructor reading directions not necessary.”

Subjects were randomly given a pre-numbered packet of experimental materials. The materials were placed into the envelopes prior to being numbered, and the researcher had no knowledge of which condition was placed into each envelope. The eight conditions were run simultaneously, with each session including as many of them as possible, decreasing potential confounds. The researcher also was blind to the condition that each participant received so that she could not intentionally (or otherwise) influence participants in certain conditions to behave in desired ways. The order of the experimental procedure in each data collection session was the same: introduction to the process, consent signing and form collection, random distribution of envelopes containing experimental materials, completion of questionnaire booklet 1, completion of questionnaire booklet 2, collection of envelopes containing experimental materials, debriefing, and collection of the signed debriefing forms, which allowed subjects an opportunity not to have their responses used.

The experimental materials were contained in two booklets. Booklet 1 was 11 pages (including the cover) and contained the following substantive items: a) an overview of the study and instructions about the news release cover story, b) a cover story involvement manipulation (low or high), c) a series of post-cover story questions, including those that functioned as a manipulation check of cover story involvement, two recall questions related to information contained in the cover story, and measures of fear and personal cancer risk (the latter two of which were collected as pilot data and will not be discussed in this dissertation), d) an introduction to and instructions for the

experimental blog message, e) the experimental blog message about the novel cancer treatment, and e) a thought-listing measure.

Thought listing is “a procedure for measuring and categorizing a person’s cognitive responses to a persuasive message” (Petty & Cacioppo, 1981, p. 252). Participants were asked to spend five minutes recording in their own words everything that went through their minds as they read the cancer treatment blog without going back to examine it. More specifically, they were asked to list all the thoughts and feelings they had about anything as they read the blog, and also were asked to identify whether each of these thoughts or feelings was positive, neutral, or negative by putting a +, 0, or – after each statement (Cacioppo & Petty). The resultant comments were scored and analyzed with respect to the total number of thoughts listed overall, and the number of positive vs. negative thoughts. The ELM suggests those who are highly involved will generate more thoughts overall; thus, this was used as a manipulation check of involvement in the blog message. In addition, favorable, or pro-attitudinal, thoughts result in enduring persuasion while negative, or counter-attitudinal, thoughts may have a so-called “boomerang” effect, with the individual instead diverging from whatever is being advocated in the message (Petty & Cacioppo).

Booklet 2 contained the final series of questions and written instructions for answering them. Throughout the experiment, the researcher read the instructions aloud to participants, who could read along with read them in their booklets. The booklet 2 questions included the dependent measures, including those measuring attitudes about the message/information, the treatment, the organization, and the blog; as well as how empowered they felt, including to seek additional information about the treatment, and

several behavioral intentions. It also included manipulation check items to test involvement in the blog message, source credibility, and message quality/strength. Most measures employed in this study had been utilized in prior published literature and had reliability measures well above minimum levels. These scales/measures were carefully selected for their high intercorrelations in order to improve reliability (Cook & Campbell, 1979).

In addition, the random assignment of participants to the eight conditions eliminated many threats to internal validity (Cook & Campbell, 1979). Most other threats that randomization does not rule out (e.g. multiple testing occurrences, and compensatory equilibrium, compensatory rivalry, demoralization that result from some groups receiving less desirable) were not factors in this experiment as no differentially desirable treatments were included, and only a single testing occurrence was used. Only one participant accepted an offer not to have his/her responses used, which was made during debriefing. In addition, although a few subjects didn't answer all the questions in the booklets (3), all of them answered at least 90%, thus differential mortality also was not an issue.

Demographic and other baseline information questions were also included at the end of booklet 2. In addition to usual demographic information such as age, gender, year in school and major, other information was collected, including personal cellular telephone use, personal experience with cancer, familiarity with positron treatment and the Positron Treatment and Research Institute, and participants' beliefs about the purpose of the study. Most of these items were collected via check-off items; however, participants also were asked to write short answers to identify their relationship to family

members or close friends who had been diagnosed with cancer, their perceptions about the study's purpose, and their majors. None of the participants correctly identified the purpose of the study as assessing their persuasibility.

At the conclusion of the experiment, all participants were thoroughly debriefed about the fictitious nature of the mobile phone research cited in the cover story. They also were provided an opportunity to ask questions about the study (both in a groups setting and on a one-on-one bases). Printed background information about cell phone use and brain cancer was described to participants and made readily available for anyone who was interested to pick up and take with them when they left the testing site. After all questions had been answered and the debriefing forms collected, the participants were thanked for their participation and dismissed. The entire procedure took about 60 minutes, including 45 minutes to describe the experiment, obtain consent and work through the booklets, and the remainder for debriefing.

CHAPTER 4 RESULTS

The Sample

In total, 154 undergraduate university students participated in the experiment. They represented 41 majors and included those in their first (15.8%, n=24) through fifth years of college (n=3). Two sets of responses were removed, one because the participant requested it in writing as allowed on her debriefing signature form, and the other because the subject wrote that she knew the cover story was false after having been diagnosed with thyroid cancer four months earlier. As a result, the data set used for a majority of the analyses consisted of 152 subjects' responses.

Just under two-thirds were women (64.5%, n=98). The majority were white (61.2%, n=93), approximately equal to that of the university undergraduate population overall (62.5%), and their average age was 19.9 years. As is the case in the university population as a whole, Hispanics accounted for the second-largest ethnic group in this study, followed by blacks/African Americans. Those majoring in advertising comprised 19.7% (n=30) of the total, while other majors each consisted of less than 10% (most were less than 5%). A more complete demographic breakdown is shown in Table 4-1.

All respondents reported using a cell phone regularly. The mean number of times cell phones were used per day for calling people was $M = 8.24$, $SD 7.06$, with a median of 6.0 and a range 1--50. On average, participants spent 2.28 hours per day calling people ($SD 2.87$), with the median 1.5 hours and the daily range from less than one hour to 24 hours. A majority (89.5%, n=136) indicated they had previously read a blog about any topic, with more than half (56.6%, n=86) reporting they had read a blog whose primary purpose was to talk about health or medical issues.

More than three-quarters of subjects reported prior experience with cancer. Four (2.6%) had been personally diagnosed with the disease (including the subject who had thyroid cancer) dating back to four months, and one, three and 10 years earlier. However, no participant reported ever receiving radiation treatment (the treatment described on the experimental blog was a type of radiation). In addition, 76.3% (n=116) reported that a member of their family or a close friend had been diagnosed with any type of cancer. Subjects were asked to list the people they knew who had been diagnosed with cancer, and the number of relationships listed (e.g. grandfather, best friend, next-door neighbor, etc.) ranged from one (40.9%, n=56) to six (1.5%, n=2). Where possible, these relationships were further classified for analysis into immediate family members (which were operationally defined in this study as parents, step-parents, or siblings). Among the 139 responses where the type of relationship could be ascertained (some participants instead listed types of cancer rather than relationship), one in five (20.86%, n=29) identified an immediate family member, with the vast majority of these subjects (86.2%, n=25 of 29) indicating they had had one immediate family member with cancer, while four (13.8%) reported two such close relationships.

None of the subjects correctly identified the purpose of the experiment. In addition, as expected, mean familiarity ratings were low on the two-item, seven-point familiarity scale (14 points total). The mean ratings for the fictional positron treatment were $M = 2.59$, $SD 1.800$, and for the Positron Treatment and Research Institute were $M = 2.58$, $SD 1.71$.

Independent Variable Manipulation Checks

Manipulation checks were conducted on each of the three independent variables: involvement in the cover story, source credibility, and argument strength. As described

below, the ANOVAs for these checks all found the expected main effects and were successful. Unexpected effects also were found as noted subsequently. Internal reliability analyses also were conducted for the multi-item measures used to assess involvement in the cover story and source credibility. Cronbach's alphas for these two measures were greater than .80, and all item-total correlations were greater than 0.30, which is above the level needed to provide good support for internal consistency reliability (Morgan, Leech, Gloeckner, & Barrett, 2004). A qualitative thought-listing measure was used, in part, as a manipulation check of involvement in the experimental blog message about the cancer treatment.

The involvement manipulation check was conducted immediately after participants received the news release cover story manipulation and before participants had been exposed to the source or to the arguments. The ANOVA revealed the expected simple main effect of manipulated involvement level (low and high) on participants' involvement in the cover story, $F(1, 142) = 25.75, p < .001, \eta = .39$. The means showed that participants who read the high involvement news release were more involved in the issue ($M = 18.48$) than were subjects who received the low involvement release ($M = 15.86$). No other main or interaction effects were significant.

The ANOVA for the 11-item overall source credibility manipulation check (consisting of trustworthiness and expertise) revealed an expected main effect of source, $F(1,144) = 12.21, p = .001, \eta = .28$. Means showed that participants rated the PR source as significantly lower in credibility ($M = 43.89$) than the physician ($M = 50.68$). An unanticipated effect of argument strength also was also found, $F(1,144) = 37.19, p < .001, \eta = .45$. Participants exposed to the strong arguments rated the

source as significantly more credible ($M = 53.21$) than did those who received the weak arguments ($M = 41.36$). No other significant effects were found. As expected, separate ANOVAs for the split credibility measure, i.e. for the five-item trustworthiness measure and for the six-item expertise measure likewise found effects based on source and argument strength; thus, they will not be detailed separately.

As noted, extensive pretesting of the arguments was conducted, which yielded significant mean differences between the five strong and five weak arguments/statements used in the blog. Therefore, verification of the argument strength manipulation was assessed with a single item rated on a seven-point scale ranging from practically nothing to a great deal. It asked: "How much do you feel you learned about positron treatment from the blog you read?" (O'Keefe, Boyd, & Brown, 1998). A significant main effect of argument strength, $F(1,144) = 122.06$, $p < .001$, confirmed that participants who read the blog containing the strong arguments reported they learned significantly more about the treatment ($M = 4.42$) than did subjects who received the weak arguments ($M = 1.88$). No other main or interaction effects were found.

A thought-listing activity was used, in part, as a manipulation check of involvement in the blog message about the treatment. The ANOVA for the total number of thoughts and/or feelings listed about the treatment message found no significant main effect of involvement, such that involvement in the issue had no significant influence on the extent to which the blog message about the treatment generated thoughts or feelings among the participants. No other significant main or interaction effects of source credibility and argument strength were found.

With respect to the number of positive thoughts generated after reading the blog, the ANOVA found a simple main effect of involvement on positive thoughts, $F(1,144) = 8.67$, $p = .004$, $\eta = .24$. The means showed the unexpected finding that lowly involved participants generated more favorable thoughts and feelings ($M = 2.14$) than did those who were highly involved ($M = 1.47$). A second main effect of argument strength on number of positive thoughts also was found, $F(1,144) = 19.01$, $p < .001$, $\eta = .34$. The means showed that participants who read the strong arguments generated significantly more positive thoughts and feelings ($M = 2.31$) than did those exposed to the weak arguments ($M = 1.31$). No other significant effects were found. The ANOVA for the number of negative thoughts generated found a simple main effect of argument strength, $F(1,144) = 16.31$, $p < .001$, $\eta = .32$. The means showed subjects who received the weak arguments generated more negative thoughts ($M = 3.37$) than those reading the strong statements ($M = 2.09$).

Hypothesis Testing

Cronbach's alpha for attitudes toward the treatment message, treatment, organization and blog, and for the empowerment measures devised for this study (which related to obtaining additional information about the cancer treatment from various sources) were all .90 or above. Inter-item correlations for the attitudinal measures toward the message, the treatment and the organization all were higher than .30. The alpha for the seven-item standardized Health Information Orientation (HIO) empowerment measure was .83, with two correlations falling below .30. The four-item Perceived Behavioral Control (PBC) measure showed low internal reliability at .48. It appears this is likely related to two of the four items being reversed in the questionnaire, which was not the case with most of the other items, including two pages of questions

leading up to the PCB measure. For example, several people rated as maximally “possible” their ability to become knowledgeable about cancer treatments for thyroid cancer, but “definitely false” in the similar reversed question that immediately followed.

Analyses of the dependent variables including the sociodemographic information (gender, race, age, daily cell phone use, and family history of cancer) as covariates found no effects except in one case, verifying that the findings were due to manipulations of the independent variables rather than to individual differences. The one case where this was not confirmed was with respect to the effect gender had on attitude toward the treatment, $F(1,141) = 6.51$, $p = .012$, $\eta^2 = .21$, a small to medium effect. A t-test showed that males rated the treatment significantly more favorably ($M = 21.74$) than did their female counterparts ($M = 19.18$).

Attitude toward the Treatment Message

The ANOVA for the dependent measure assessing attitude toward the treatment message found an expected effect of argument strength, $F(1,143) = 117.49$, $p < .001$, $\eta^2 = .67$, a much larger than typical effect. Means showed that subjects who received strong arguments rated the message more favorably ($M = 13.17$) than did those who were exposed to the weak message ($M = 6.63$). A second effect of source also was found, $F(1,143) = 9.00$, $p = .003$, $\eta^2 = .24$. Participants assigned the doctor source responded more positively to the message ($M = 10.80$) than did those assigned the PR source ($M = 8.99$).

As expected, a significant two-way interaction was found between source and involvement on attitude toward the treatment message, $F(1,143) = 7.47$, $p = .007$, $\eta^2 = .22$. Among low involvement participants, a simple main effect of source was found,

$F(1, 74) = 11.22, p = .001, \eta = .36$. For subjects low in involvement, the message associated with the doctor was rated more favorably ($M = 12.19$) than the message associated with the PR source ($M = 8.70$). Among highly involved subjects, there was no difference in perceptions of the treatment message as a function of source.

The first three hypotheses dealt with participants' attitude toward the treatment message. The first proposed that highly involved consumers who receive a message about a cancer treatment containing strong arguments will evaluate the message more favorably than will those low in involvement. This was not supported. Both high and low involvement groups rated the strong messages similarly ($M = 13.20$ and 13.14 respectively).

A second related hypothesis posited that a weak treatment message would lead low versus high involvement consumers to evaluate the message more favorably. Means showed when the treatment message contained weak arguments, low involvement participants did rate the message more favorably than did those who were highly involved. However, the difference was not statistically significant ($p = .09$); therefore, H2 was only partially borne out.

A third hypothesis stated that low involvement subjects will rate a message more favorably when it is associated with a high as compared to a low credibility source, while high involvement subjects will be unaffected by source credibility. As predicted, low involvement participants who received the high-credibility source treatment message rated it more favorably than did those receiving a message from a low-credibility source. In addition, attitudes toward the treatment message among highly involved subjects were unaffected by the source. Thus, H3 was fully supported.

Attitude toward Positron Treatment

For the measure assessing overall attitude toward positron treatment, the ANOVA showed two significant main effects. The first was related to source credibility, $F(1,143) = 5.71$, $p = .018$, $\eta^2 = .19$, a small to medium effect. Means showed that subjects who received the blog containing the high-credibility physician source reported more favorable attitudes toward the treatment ($M = 21.26$) than did those exposed to the low-credibility PR spokesperson ($M = 19.14$). Attitude toward the treatment was also influenced by argument strength, $F(1,143) = 60.03$, $p < .001$, $\eta^2 = .54$, a much larger than typical effect. Means showed those exposed to the strong arguments had more favorable attitudes toward the treatment ($M = 23.63$) than did those who received the weak arguments ($M = 16.77$). No other effects were found.

The second set of hypotheses addressed attitude toward the positron treatment, with H4 proposing that a message about the treatment containing strong arguments would lead highly involved consumers to evaluate the treatment more favorably than will those who are low in involvement. This study found no interaction effects between involvement and argument strength; thus H4 was not proven.

H5 asserted that weak arguments in a cancer treatment message will result in low involvement consumers evaluating the treatment more favorably than will those who are high in involvement. And while the means showed that the less involved subjects did tend to rate the treatment more favorably than did more involved subjects ($M = 17.78$ and 15.65 respectively), the difference was not statistically significant ($p = .13$), providing only partial support for this hypothesis.

The final hypothesis dealt with the influence of source credibility on attitude toward the treatment. It was proposed that low involvement consumers will have more

favorable attitudes toward the treatment when the source is high as compared to low in credibility. Attitudes of high involvement subjects were expected to be unaffected by the source. Across all subjects, source did have a significant effect on attitude toward the positron treatment; however, this did not depend on involvement level. Therefore H6 was not supported.

Research Question Exploration

Four research questions also explored attitudes that have not previously been examined within the framework of the ELM. Specifically these questions addressed how involvement, source credibility, and argument strength influenced attitudes toward a cancer treatment organization and toward an organizational blog. These questions also addressed feelings of empowerment, behavioral intention concerning cancer screening and mobile telephone use; and a behavior involving taking a specific action related to obtaining additional information about the treatment and/or the organization.

Attitude toward the Organization

RQ1 considered the effects that involvement level, argument strength, and source had on attitudes toward a cancer treatment organization called the Positron Treatment and Research Institute. The ANOVA identified two significant main effects. There first was an effect of source, $F(1,143) = 6.74$, $p = .010$, $\eta^2 = .21$, a medium effect. Means showed that subjects viewing the doctor source had a more positive attitude toward the organization ($M = 23.38$) than did those who saw the PR source ($M = 21.12$). A second significant main effect of argument strength also was found, $F(1,143) = 39.98$, $p < .001$, $\eta^2 = .47$, a large effect. Means showed that those who read strong arguments reported significantly more favorable attitudes toward the organization ($M = 25.00$) than did those who read weak arguments ($M = 19.49$).

The analysis also revealed a significant two-way interaction between involvement level and source, $F(1,143) = 10.31, p = .002, \eta^2 = .26$, a medium or typical effect. A simple main effect of source was found for those low in involvement, $F(1,74) = 17.23, p < .001$. Among low involvement subjects, the high credibility physician source created more favorable attitudes toward the organization ($M = 25.2$) than did the low credibility PR source ($M = 20.1$). No simple source effect was found for high involvement subjects. No other two- or three-way interactions were found.

Attitude toward the Blog

The second research question explored the influence of involvement level, argument strength, and source on attitudes toward an organizational blog as a channel of cancer treatment communication. The analysis showed that argument strength had an effect on attitude toward the blog, $F(1,143) = 75.87, p < .01, \eta^2 = .59$, a much larger than typical effect. Means showed that those receiving the strong arguments were significantly more likely to rate the blog favorably ($M = 39.73$) than did those receiving weak arguments ($M = 27.27$). In addition, involvement level had a marginally significant effect on attitude toward the blog, $F(1,143) = 3.83, p = .05, \eta^2 = .16$, a small effect. Means showed that high involvement subjects rated the blog less favorably ($M = 32.10$) than did low involvement subjects ($M = 34.90$).

A significant two-way interaction on attitude toward the blog was found for involvement level and source, $F(1,143) = 6.37, p = .013, \eta^2 = .21$. A simple main effect of source was found for those low in involvement, $F(1,74) = 7.74, p < .01, \eta^2 = .27$, a medium effect. For low involvement subjects, the high credibility source created more positive attitudes toward the blog ($M = 38.03$) than did the low credibility source ($M =$

32.43). Among those who were highly involved, the simple effect was insignificant ($M = 30.83$ for the doctor and $M = 32.54$ for the PR source).

Empowerment

RQ3 contemplated the influence of involvement level, argument strength, and source on personal feelings of empowerment. Empowerment was assessed using two standardized measures that related to health information – Health Information Orientation (HIO) and Perceived Behavioral Control (PBC). In addition, a series of items operationalized to measure behavioral intention to seek additional information about positron treatment from several sources were also used to measure empowerment.

Standardized measures

ANOVA showed no significant main or interaction effects with respect to the standardized HIO measure. In addition, there was minimal variance in the average responses to the seven items in this measure, with the grand mean $M = 35.0$ and the upper and lower bounds 33.8 and 36.2. On the overall four-item PBC measure, ANOVA identified a single main effect of involvement, $F(1,144) = 5.01$, $p = .027$, $\eta^2 = .18$, a small to medium effect. The means showed that highly involved individuals perceived they had slightly more behavioral control (measured with two items each of capability and controllability) ($M = 24.37$) than did those with low involvement ($M = 22.97$). No other significant main or interaction effects were found.

Information-seeking items

Analyses were conducted of each of four empowerment questions relating to intention to seek additional information about positron treatment from four different sources of information beyond the experimental blog: any source, respondents' personal physicians, the Positron Treatment and Research Institute, and from the blog

author, i.e. the source of the information. In addition, an overall empowerment score was computed for each participant by summing the scores on these four measures.

The ANOVA for the likelihood of seeking additional information about positron treatment from any source found a simple main effect of source, $F(1,143) = 5.48$, $p = .021$, $\eta^2 = .19$, a small to medium effect, with the means showing that those who were exposed to the high-credibility source were more likely to say they would seek additional information ($M = 13.15$) than were those who received the low-credibility source ($M = 12.22$). No other significant effects were found.

On the likelihood of participants asking their personal physician about the treatment, a main effect of argument strength was found, $F(1,143) = 5.09$, $p = .026$, $\eta^2 = .18$. The means showed the strong arguments resulted in a greater likelihood of asking one's doctor about the treatment ($M = 12.63$) than did the weak arguments ($M = 11.52$). No other significant effects were found.

Two main effects were found with respect to the likelihood participants would contact the Positron Treatment and Research Institute about its treatment. A main effect of source was found, $F(1,143) = 4.48$, $p = .036$, $\eta^2 = .17$. The means showed that the high credibility doctor source resulted in a greater probability of contacting the organization ($M = 9.82$) than did the low-credibility PR source ($M = 8.44$). A second main effect of argument strength also was found, $F(1,143) = 4.35$, $p = .039$, $\eta^2 = .17$. The means showed that those who received the strong arguments were more likely to say they would contact the organization ($M = 9.81$) than were those who got the weak arguments ($M = 8.45$). No other significant effects were found.

There were no significant effects for the measure asking the extent to which subjects would write comments or questions to the blog author. The grand mean for the measure was $M = 7.58$. Finally, on the summed empowerment measure, a main effect of source was found, $F(1,143) = 5.11$, $p = .025$, $\eta^2 = .18$. The means showed the doctor source resulted in greater information seeking empowerment ($M = 43.36$) than did the PR source ($M = 39.59$).

Other Intention and Behavioral Measures

The final research question explored the effects that involvement level, argument strength, and source have on behavioral intention and behavior. The behavioral intentions measured likelihood of seeking thyroid cancer screening and ceasing to use mobile phones. The influence these factors had on a subjects' direct action to take informational material also was examined.

There was a significant main effect of involvement on the likelihood of obtaining screening for thyroid cancer, $F(1,144) = 10.70$, $p = .001$, $\eta^2 = .26$, a typical effect. The means showed that those receiving the high involvement cover story were more likely to say they would be screened for thyroid cancer ($M = 10.42$) than did those receiving the low involvement release ($M = 8.60$). A significant main effect of argument strength on likelihood of giving up cell use also was found, $F(1,143) = 10.20$, $p = .002$, $\eta^2 = .26$. The means showed that those who read the weak arguments were more likely to give up using their cell phones if diagnosed with thyroid cancer ($M = 8.76$) than were those who received the strong arguments ($M = 6.71$).

On the behavior activity, 31.6% ($n=48$) of subjects overall kept the contact information sheet about the fictitious Positron Treatment and Research Institute identified in the experiment. To investigate whether high vs. low involvement, high vs.

low source credibility and strong vs. weak arguments had effects on whether or not subjects took the contact sheet, a chi-square statistic was used. The Pearson chi-square results show that high vs. low source credibility had a significant difference on whether participants took the form, ($\chi^2 = 4.79$, $df = 1$, $N = 152$, $p < .03$). Those receiving the high credibility source are more likely than expected to take the contact form than those viewing the low credibility source. Phi, which indicates the strength of the association between the two variables is $-.178$, considered a small effect size (Morgan et al., 2004). Chi-square analyses revealed there were no differences on taking the form based on either involvement level or argument strength.

Table 4-1. Participant demographic information

Variable	N	%
Age (years) M = 19.93 Range: 18-28	152	100
Gender		
Female	98	64.5
Male	53	34.9
Race		
White	93	61.2
Black or African America	13	8.6
Hispanic	29	19.1
Asian	7	4.6
Other	10	6.6
Year in school		
1 or freshman	24	15.8
2 or sophomore	46	30.3
3 or junior	44	28.9
4 or senior	35	23.0
5	3	2.0
Major		
Advertising	30	19.7
All 40 others	122	<10.0 each
Cell phone use for calling		
Times a day M = 8.24 Range: 1 to 50	151	

Hours a day	152	
M = 2.28		
Range: 0 to 24		
Read any blog?		
No	16	10.5
Yes	136	89.5
Read health/medical blog?		
No	65	42.8
Yes	86	56.6
Family/friend w/cancer?		
No	36	23.7
Yes	116	76.3
Immediate family w/cancer*		
No	110	72.4
Yes	29	27.6
*Among 139 w/ identified family relationships		

CHAPTER 5 DISCUSSION

This research sought to examine empirically the applicability in a health context of a theory of persuasion that has been widely tested and found to be predictive in other consumer areas, particularly with respect to attitudes toward products, brands, and advertising messages. Health has traditionally not been identified as consumerist; however, the trend toward doing so began about a decade ago in response to fears that managed care was resulting in limits on freedom and control in health decisions by patients and health providers (Schneider & Hall, 2009). The turn to consumer-driven health focuses on stronger consumer choice and putting decision-making in the hands of individual patients, rather than by health plans, employers, and health care providers (Robinson & Ginsburg, 2009). Similarly, patient-focused or consumer-centered health care and communication have been frequent topics of debate and discussion, most recently with regard to health reform, with a considerable body of research suggesting such approaches improve key health outcomes (Epstein, 2000; Stewart, et al., 2000). Unprecedented access to information, especially through the convenient, cheap, and limitless world of the Web and Internet, has fueled the trend toward more health consumerism. This ubiquity of information amplifies the needs by both health organizations and consumers to be able to fight the significant message clutter and enable the former to more effectively reach their target audiences and the latter to obtain the accurate, timely, and understandable information they desire.

As a result, this experiment examined the applicability of one approach which recognizes the magnitude of communications to which people are exposed and establishes factors that help predict the way they are likely to process the information

given they are unable to carefully scrutinize it all. Specifically, it investigates the Elaboration Likelihood Model of persuasion with respect to messages about a novel cancer treatment appearing on organizational blogs in order to determine how and when each of its two processing routes come into play. In order to do so, it tests six hypotheses that would be predicted by past research investigating the ELM in other consumer contexts, and investigates four research questions exploring variables that previously have not been examined within this framework. These research questions intended to consider the value of organizational blogs as a channel of health information, whether this two-way venue provides to consumers the mutual benefit of empowerment with respect to information gathering/seeking, and the effects that message and personal factors have on both behavioral intentions and action.

Results of the various analyses show some support in the cancer treatment context investigated here for the hypotheses predicted by other ELM research; however, the results are complex and not always as anticipated. H1 and H2 proposed that involvement and argument strength would interact to jointly affect attitude toward the message about the treatment; however, this was only partially borne out among lowly involved participants and not to a statistically significant degree. Argument strength did have a robust influence on attitude toward the treatment message among participants overall, but unexpected was that this influence was not dependent on participants' levels of involvement. As predicted by the ELM, H3 accurately hypothesized that involvement level and source would interact to jointly affect attitudes toward the message about the treatment. H4 and H5 also found only partial support for the effect of argument strength on attitude toward the treatment, and only among lowly

involved subjects and not to a significant extent. H6 considered involvement level and source credibility, which had no joint effect on ratings of favorability toward the cancer treatment as predicted by the ELM.

This model suggests that highly involved or motivated subjects who also have the ability to process a communication (which was presumed here based on educational attainment and prior testing of the comprehensibility and understandability of the messages) will cognitively elaborate on a message and work to understand it, which is associated with central route processing (Petty & Cacioppo, 1981). If these highly involved subjects perceive the arguments in the message to be strong and compelling, their scrutiny will cause them to think favorable thoughts that lead to enduring attitude change and/or persuasion. Numerous studies have shown these positive thoughts translate to favorable attitudes about brands, products, and messages, particularly advertising. Alternatively, those who are low in involvement/motivation will not elaborate on or analyze the message (or will consider them only slightly or to a much lesser degree), instead looking to other non-issue relevant persuasive cues such as source credibility. While this peripheral route to persuasion can result in attitude change, it is relatively temporary, typically lasting only as long as the cue(s) remains “salient” (Petty & Cacioppo, p. 263).

Prior research has not investigated within the ELM framework attitudes toward the blog as a channel of health communication or toward a health organization providing a cancer treatment, which were therefore posed for examination in this study through research questions. However, surmising from the prior explanation of the ELM and past research, the presence of strong arguments could be expected to result among highly

involved subjects in elaboration and favorable attitudes toward the blog channel and the health organization, while among those low in motivation a highly credible source would instead act as the predominant attitudinal factor. These ELM tenets did hold among lowly involved subjects in this study, such that those who received the highly credible physician source held significantly more favorable attitudes toward both the organization and the blog than did those who viewed the PR representative. However, argument strength had a strong significant effect among all participants, but not differentially among highly involved subjects as might have been predicted.

To some extent, involvement (which here is a situational recipient factor) and the message attributes of source credibility and argument strength each did influence some of the dependent attitude measures tested here. Among all subjects, source credibility influenced three of the four attitudinal measures (toward the message, positron treatment, and the organization), as well as overall likelihood of seeking additional information about the cancer treatment and of actually taking a specific information-seeking action. Argument strength had an even stronger influence, affecting all four attitudinal measures (including toward the blog), as well as the probability of seeking additional information from some sources and of discontinuing a harmful behavior, which here was using a cell phone after being diagnosed with thyroid cancer.

Involvement

“Personal involvement has long been recognized as a primary factor that influences persuasion” (Braverman, 2008, p. 667), and in determining the routes individuals use to process information (Petty & Cacioppo, 1981, 1986). For the most part here, however, subjects’ attitudes were not dependent on their levels of involvement in the issue presented here – which measures personal importance or

relevance and motivation to process the information – with respect to marketing/public relations messages about a novel cancer treatment. This result seems to reinforce findings in a preventive health context related to AIDS campaign messages that involvement may not be as significant a predictor of attitudes in health contexts as it has been found to be in other consumer areas (Igartua, Cheng, & Lopes, 2003).

Among all participants, involvement levels had significant effects on the empowerment measure of Perceived Behavioral Control and on the behavioral intention to obtain cancer screening, as well as a marginal influence on attitude toward the blog channel. As would be predicted by the ELM, among low-motivated individuals, involvement also jointly influenced with source credibility subjects' perceptions of the message, the organization, and the blog. However, no similar combined expected influence of argument strength was found among those who were highly motivated.

This may relate at least in part to difficulties explicating the concept of involvement and of manipulating and measuring it. As discussed previously, involvement has received a significant amount of investigation, particularly as it relates to consumers and products, and to theories of persuasion such as the ELM. In this study, involvement was operationally defined to reflect personal importance and meaning; however, various studies have operationalized the concept differently (Braverman, 2008). Thus, despite this host of research, involvement is a complex concept that is still not well understood in many contexts, including in health and medicine. The notion of health is similarly multifaceted, complicating the issue further. This suggests that a great deal of investigation—empirical and otherwise—is required to unravel the threads that intertwine the complicated pattern these concepts jointly create.

This study attempted to move existing literature forward in that endeavor by exploring personal feelings of involvement in a potentially life-threatening health issue. Statistically significant differences in mean involvement level were obtained through the final cover story manipulations. However, even the participants who received the low involvement condition (which stated the probability of getting thyroid cancer from cell phones was less likely than getting struck by lightning), had a relatively high mean level of involvement. This was unexpected as research shows that people, adolescents in particular, often fail to feel vulnerable to negative health outcomes and underestimate the magnitude of the risks to which they are exposed (e.g. see Johnson, McCaul, & Klein, 2002; Weinstein, 1984). Informal discussions with participants during pretesting suggest this unanticipated high involvement level may have been at least partially related to the saturation of mobile phones in society (100% in this study and at least 83% of adults nationwide [Rainie, 2010]) and to the absolute reliance on these devices, particularly by those in this college-age cohort and/or this age group overall (Rainie & Keeter, 2006; Rausch & Edwards, 2008). Comments written on the qualitative thought listing portion of the experimental questionnaire revealed this also to be the case among at least some of these subjects.

Another likely factor relates to the cover story identifying that cancerous tumors were found in college students, not in middle-age or older people where they are more expected. Health promotion programs and materials commonly suggest ways to avoid the likelihood of cancer by decreasing risk and/or adopting healthy behaviors, e.g. quitting smoking to decrease lung cancer risk. Here however, the cancer risk is relatively immediate, occurring in young adulthood, while the onset of many other

cancers, including lung cancer associated with smoking, typically is much more gradual and does not manifest itself until late middle- or older age. Research has shown that feelings of risk susceptibility and vulnerability do predict health behavior (e.g. Weinstein, 1984); however, young adults may not perceive these slow, ongoing risks as applicable or pertinent so early in their lives, which may help explain why involvement in this study's more immediate cancer threat was relatively high across all participants.

Also potentially associated with the unexpectedly high involvement rates across all participants was that despite the relatively young average age of the sample, more than three-quarters indicated they had experienced a close encounter with cancer through a family member or friend. In addition, four participants (of 153) had been personally diagnosed with cancer at some point in their lives. Although this absolute number is small, this amounts to 2.6% of the sample, substantially above the national mean prevalence for this age group. National Cancer Institute data show about 11.4 million people alive in 2006 had been diagnosed with some form of cancer sometime in their lives (NCI SEER, n.d.). The estimated prevalence among young adults is low, ranging from 0.16% among those 10- to 19-year-olds to 0.27% among 20- to 29-year-olds. Thus, the prevalence among the pool of subjects in the experiment under discussion was at least 10 times higher than the national average. The reasons for this are a mystery, particularly since cancer incidence in Florida, which is the home state for about 82% of the students at the university where the experiment was conducted, is lower than nationally (NCI state, n.d.).

Further complicating the concept of involvement in this study was that although analyses of the manipulation check of involvement in the cover story revealed a

statistically significant difference, much of that difference may have been eroded after participants read the blog containing the positron treatment message. The thought listing activity for total number of thoughts unexpectedly showed that involvement level had no significant individual or joint influences with source credibility and argument strength on the total number of thoughts generated as would have been predicted by the ELM. Involvement level did play a significant role in influencing the number of positive thoughts; however, lowly involved participants unexpectedly generated more favorable thoughts than their highly involved counterparts. In addition, the joint differences with source credibility and argument strength that would have been predicted by the ELM did not occur in the context investigated in is study. A three-item rating assessing participants' involvement, concentration and attention to the message on the blog likewise showed that that level of involvement in the issue of getting thyroid from cell phones also was unrelated to involvement in the treatment message itself. Only argument strength—regardless of involvement level or source—affected how much subjects perceived they attended to the treatment message. Argument strength will be discussed further subsequently; however, it is notable that only the message factor of argument strength showed significant influences on the number of qualitative positive and negative thoughts generated overall, such that those receiving the strong arguments generated more positive and fewer negative thoughts than did those receiving the weak arguments.

The reasons for these unanticipated results related to the blog message can only be surmised, but given the overall high levels of involvement may relate to disappointment or displeasure with the content of the information about the cancer

treatment. Evidence to support this supposition stems from relatively moderate mean ratings on measures gauging extent of perceived learning from the blog and from attitudes toward the treatment message ($M = 4.42$ of 7 and $M = 13.12$ of 21 respectively even among those receiving the strong arguments and resulting in the highest ratings). These means were considerably lower than those obtained in pretesting, where the five strong arguments used in the blog received considerably higher ratings of strength and persuasibility ($M = 5.81$). This could have been due to the within groups testing in which subjects rated both strong and weak arguments together, which may have made the strong seem to be more powerful in comparison to the weak ones. In addition, moderate assessments of believability (one of seven items used to assess treatment message attitudes) also may have contributed to possible dissatisfaction with the messages ($GM = 4.43$). Thus, future studies should take these factors into consideration.

A high level of involvement on its own also was associated with significantly higher perceived behavioral control; however, potential difficulties with participants' ratings on these items (described previously) make it difficult to discuss any real significance in these findings. Involvement alone also played a role in influencing intention to participate in a cancer screening. Although not specifically predicted by the ELM, this finding is expected given that behavior research and theories show that personal relevance and motivation often are linked to and/or predictive of a variety of positive health behaviors.

Involvement also had a marginal effect ($p=.05$) on attitude toward the blog; however, it was opposite what might have been presumed based on past persuasion research. Subjects who were highly involved rated the blog significantly less favorably

than did those of low involvement. This finding is particularly surprising in light of past research which has shown that individuals who are highly involved in their health tend to engage in seeking health information from active-oriented channels (Dutta-Bergman, 2004). Such channels include print sources of information such as newspapers and magazines, as well as the Internet. Prior studies have not specifically examined attitudes toward a blog with respect to these recipient and message factors and so cannot provide any insight. However, it is possible that highly motivated individuals in this study may have perceived the blog to be a less appropriate, less active, and/or less biased venue for obtaining important cancer information. This may stem from the fact that blogs are much more informal than many other forms of Internet communication and traditionally have been written by individuals sharing specific points of view and strong opinions. The moderate overall believability of the blog may lend credence to this notion. The findings might also have to do with the arguments on the blog, as even the true and strongest ones were rated as being only moderately persuasive, which will be discussed in greater detail subsequently.

These results might also point to the fact that involvement in an issue, defined by Chaiken (1980) as personal importance or relevance about a topic and measured here and elsewhere as such, may not adequately embody the concept of motivation with respect to serious—and perhaps other—health issues. This is at least partially supported in this study by the fact that analyses of the initial standardized four-item involvement measure used in pretesting showed the “relevance” item had low internal reliability in conjunction with the other items (importance, meaning and need), thus the relevance item was removed from the measure for the actual experimental data

collection. Involvement in the issue of getting thyroid cancer from cell phones as manipulated and tested here was most closely related to Johnson and Eagly's (1989) concept of outcome-relevant involvement, which relates to people becoming involved as a result of their ability to obtain desirable outcomes, which here likely related to successfully treating thyroid cancer caused by cell phones. As they predict with this type of involvement, high-involvement subjects were more persuaded than low-involvement subjects by strong arguments about the cancer treatment and less persuaded by weak arguments. However, the desire for favorable outcomes even in life-threatening situations may not provide enough motivation to change habitual behaviors in the short term, as evidenced by the relatively small percentage who said they would give up using a cell phone even if they were diagnosed with cancer specifically caused by it.

This research confirms that involvement is complex. This may be especially true with respect to health issues, as was the case here. Braverman (2008) suggests that in medical contexts, "involvement may be more of an individual rather than a situational factor (p. 668), which she tested by measuring—rather than manipulating involvement as was done in this experiment—subjects' inherent feelings of personal involvement and need for cognition on three topics. As a result, it is difficult to make comparisons between the studies. However, together they raise the possibility that involvement in health issues may rely upon or relate to, at least partially, more innate personal characteristics, or beliefs or feelings that arise from individual experience. For example, Kidd, Hubbard, O'Carroll and Kearney (2009) found that patients' perceived control influenced their being actively involved in caring for themselves, such that those with high perceived control felt active involvement in their own care was more positive and

necessary than did those having low perceived control. The proposal that health involvement is a personal trait also relates more closely to the concept put forth by Johnson & Eagly (1989) of value-relevant involvement, which is involvement activated by enduring values.

Data collected in this study on health information orientation (HIO) and perceived behavioral control (PBC) that were used as standardized dependent measures of empowerment also may be (and have been in other studies) employed as independent variables gauging natural personal traits that may act as stand-ins for the manipulated variable of involvement. Here, when re-analyzed as independent variables in place of involvement, the ANOVAs showed that neither HIO nor PBC had any significant main or interaction effects on any of the four dependent attitudinal measures. However, this may relate to other factors, including when the ratings on these measures were collected in the course of the experiment, possible misreading of some PBC items (described previously), and relatively small differences in mean HIO scores among all participants.

Great care was taken to identify through the literature an involvement measure that had high internal reliability in a number of studies and best operationalized the concept of issue involvement as conceptualized in this study. However, it is possible that did not end up to be the case, which may be a limitation of this study. Future research should investigate experimentally other variables that can be used as a stand-in for motivation, including those that have already been tested, such as need for cognition, as well as those that have not.

This experiment reiterates past findings that more research is needed to better understand the concept of involvement and how to best measure it, particularly with

respect to health and cancer communication more broadly. This could include examining these concepts to determine whether these findings are borne out with regard to a “real” health risk, such as human papillomavirus (HPV); in populations of varying ages; in relation to both short- and long-term health risks; and with respect to involvement in other health contexts where it is situationally manipulated as well as measured as an innate personal trait.

Source Credibility

In the context examined here, feelings of involvement did not always exhibit a joint influence with source credibility; however, this message cue did emerge as playing a role in several of the attitudes among those for whom the cancer issue was of lower importance. Specifically, attitudes toward the treatment message, the organization, and the blog channel all depended to a large degree on these lowly involved participants’ perceptions about the trustworthiness and expertise of the source providing the message, with perceptions of high source credibility resulting in more favorable attitudes. These source characteristics had no influence on attitudes among those who were highly involved in the issue. As predicted by research in other contexts, this set of findings indicates that processing of cancer treatment information also followed the tenets of the ELM. However, these results conflict with those conducted in another health context. McCullough and Dodge (2002) found no differences in attitudes toward an advertised hospital among low involvement subjects based on the spokesperson used, while a non-physician spokesperson was more influential than a doctor among highly involved subjects. As a result, the researchers suggested that hospital advertising need not be reliant on using physicians, who often have negative attitudes about advertising, as sources of information.

In addition to the persuasiveness of source credibility in conjunction with recipient involvement, the type of source also influenced alone participants' attitudes overall on three of four measures, as well as with respect to health information-seeking empowerment, and a related behavior. Specifically, the physician source was more persuasive among subjects overall, such that those who received the message from this source reacted more positively to the message, the treatment, and the organization, which falls in line with what would be expected based on prior source credibility research. Those who viewed the physician also felt more empowered to seek additional health information, which might be expected, although empirical evidence could not be found confirming this. The implications of this finding are especially relevant in public relations, which seeks to establish and maintain mutually beneficial relationships with its various constituencies (Grunig, 1993; Hon & Grunig, 1999; Ledingham, 2003), as well as with respect to most nontraditional media channels, where the lines between marketing and PR have blurred and organizations are increasingly communicating directly with consumers (Scott, 2009).

Also notable for health organizations is that subjects in this study who received the treatment message from the high credibility physician source were more likely to physically take a document citing contact information about the organization providing the treatment than were those who viewed the low-credibility PR source. This behavior of taking (or not) this contact information, which would be desired by an organization, provides a more explicit way to quantify individuals' desire for more information about the treatment and/or the organization and its staff and facilities than are indications gleaned from behavioral intention measures such as the ones measured in this study.

Qualitative comments in this study as well as broader research on source credibility suggest those who received the doctor spokesperson may have felt less anxious about either getting thyroid cancer from cell phones and/or more comfortable about the treatment and/or the organization, while the less credible PR spokesperson might have caused more anxiety about these things, which may have resulted in the latter being less apt to desire the information and/or take the contact document, at least in the short term.

Much past research on persuasion and source credibility would suggest the influence of a high credibility source would lead to a greater propensity for taking the document. However, a behavioral action of this kind has not been described in prior persuasion research, so it is worth noting that these findings do not fall in line with the previously mentioned ELM-based experiment on hospital advertising. McCullough and Dodge (2002) found that highly involved subjects rated the hospital significantly more favorably when they received the ads featuring a non-physician spokesperson (specifically a woman identified as Mrs. Wells pictured holding a baby) than from a doctor (identified as Dr. Wells), prompting the authors to speculate that subjects may have perceived the non-physician to be more candid. However, that was likely not the case here, as ratings of trustworthiness alone (without expertise) showed that overall participants felt the doctor source was significantly more trustworthy than the PR spokesperson who functioned as the non-doctor source.

Although this does not provide direct insight into the findings of this study, the hospital advertising experiment raises questions about the use of general public or non-professional sources in persuasive health communications. Testimonials from such

sources have been found to be more persuasive among lowly involved consumers, with conjecture that the reason is because a non-professional person is easy to identify with and that such messages are likely to appeal more to emotions than to rational thinking (Braverman, 2008). As a result, these elements function as peripheral cues for those who elaborate little on the information. Future research should investigate experimentally the use of non-professional spokespeople, such as a patient who has been diagnosed with the disease under investigation, in conjunction with professional sources in order to better identify the health contexts and channels in which each source would be most effectively utilized. For example, Braverman found that audio testimonials were more persuasive than those in written format. Although blogs are typically a much less formal channel of communication than are other traditional written forms of media (including Web sites) and may seem to lend themselves to the testimonial or to a patient as a spokesperson, Braverman's results indicate this may not be the case, at least on written blogs and where there is a desire to promote elaboration on messages and central processing.

The current research investigated professional sources and their credibility as the peripheral cue; however, there is some evidence to suggest that other cognitive shortcuts, e.g. likeability and/or attractiveness, may have also had some influence. As described previously, both sources were identical with the exception of their titles and clothing in order to ensure that only the identified cue was involved and to minimize the influence of other attributes. Such factors should have been equally distributed across both sources and in all eight conditions due to the randomization used in this study; however, some participants did address in their qualitative thought-listing comments

that the source looked mean, stern, or unhappy, and some suggested she should have been smiling. Surprising was that such comments were not articulated during source pretesting discussions among 25 participants. The differences between the photos used in pretesting and those used in the actual materials were seemingly minor, such that the pretesting materials included larger, color photos only without text (the only text was the title and description that accompanied it), versus smaller, black-and-white photos on the blog, which were accompanied by the message text and other content previously described. In addition, participants involved in pretesting did not receive the cover story manipulation prior to assessing the sources' credibility as was the case during the experiment, which might have affected subjects' perceptions and/or expectations. It is also important to mention that additional characteristics, such as gender and/or race, may play a role in participants' general perceptions of sources and/or may influence their feelings about their expertise. This was not found to be the case in this study, i.e. there were no significant differences in ratings of the Caucasian female source's expertise based on gender or race of the participants. However, this may differ depending on the context and the population, suggesting more direct comparisons of such source characteristics are needed in organizational health communications.

As predicted by the ELM and other persuasion research, source credibility was shown to be highly influential both alone and in conjunction with involvement. However, the results here conflicted with other similar research in the context of health. What is clear is that getting a better handle on these source issues is crucial, particularly with respect to which traits or elements might function as cues, in which situations, with

respect to what sources, and in what channels. Therefore, additional empirical research is needed in this area.

Argument Strength

Argument strength surfaced as the most influential independent variable in the serious health context analyzed here, irrespective of involvement or relevance, or the credibility of the source. Among all participants, strong arguments shaped attitudes toward the message, the positron treatment, the organization, and the blog, as well as with respect to empowerment to seek additional information from one's doctor and from the treatment organization, and intention to give up using a cell phone. On all four of the attitude measures, these effects were significantly larger than typical.

However, the ANOVAs showed none of the interaction effects with involvement level that would have been predicted or might have been extended from past ELM research. This model predicts that those who are highly involved in the issue will be motivated to scrutinize the message, and so will be more influenced by strong arguments than will those who do not elaborate on the information. The ELM also would predict those receiving the low involvement scenario would be relatively oblivious to and unconcerned with the arguments, instead basing their attitudes on easy shortcuts, including source factors of the type already discussed, and other cues such as the total number of arguments (the idea that more arguments is perceived as better). However, this was clearly not the case here.

Some insight into this occurrence can be gained through the comments on the qualitative thought listing activities. A number of subjects who received the low involvement cover story and the weak arguments on the blog commented about the lack of substantial information about the treatment itself, indicating it instead contained

frivolous messages about the location and aesthetics of the treatment facility. Not surprising was that such comments were more common among those who received the high involvement/weak argument condition. Anecdotally, many of these comments across those in both involvement groups expressed considerable anger and frustration that this was the case. Strong arguments also led to much higher levels of believability with respect to the blog.

Together, these quantitative and qualitative findings seem to indicate that most individuals are to some extent motivated to examine arguments relating to a serious and relatively immediate health threat of the kind described here. Further, this may provide evidence that those who are typically unmotivated to think deeply about a message may be pushed to do so in these kinds of situations. Past ELM research has similarly found that a highly credible source can lead to such unexpected inducements among highly motivated subjects in certain scenarios (Heesacker, Petty, & Cacioppo, 1983).

These inferences seem reasonable in light of the results here; however, other explanations also merit discussion. First, the fact that this was such an extremely serious and relevant health issue among participants overall as described previously may have triggered perceptions that the weak arguments seemed thoughtless and flippant in comparison, even among those of low involvement who typically would pay little attention to the actual content of the messages. Qualitative comments to this effect were reported, and although this would typically not be the case under the ELM among lowly involved or motivated individuals, there seems to be a distinct difference with respect to messages dealing with serious health issues such as cancer, indicating a critical need for further research to better understand these results.

Such sensitivities to argument quality of the kind that surfaced here could potentially have significant adverse effects on health organizations and also could be detrimental to health consumers. This is of particular concern in light of ELM research showing that weak arguments provided to highly motivated individuals could cause them to mentally rehearse unfavorable thoughts, resulting in their resisting, rejecting, or even opposing the message or point of view being advocated, creating a boomerang effect that persists and will be difficult to be changed by other efforts (Petty & Cacioppo, 1981). This study suggests that to some extent this also might be the case among some lowly involved individuals with respect to cancer information and possibly other health communications.

The intention to give up using a cell phone if diagnosed with the thyroid cancer also was highly related to argument strength; however, in the opposite direction than might have been expected. Those who read the weak arguments were significantly more likely to say they would give up using their cell phones if diagnosed with thyroid cancer than were those who received the strong arguments, running counter to prior research. The reason for this could be because the strong arguments, which contained information about the curative properties of the treatment, provided reassurance that getting thyroid cancer was not a death sentence and could be treated with few side effects. This reassurance was verified anecdotally in some of the comments cited in the thought-listing exercise. On the other hand, the weak arguments likely provided no such reassurance, as they related to the facility and other issues, such as the quality of the area and center, and companionship with other patients.

Also of note is that although argument strength had much larger than typical effects on all four attitude measures and on perceptions of learning, overall the arguments were rated as only moderately strong, persuasive, and believable. This was the case although they were true and had been rated during pretesting to be much stronger on average. This is likely due at least in part to a desire for the inclusion of cure rates associated with the treatment and other statistics, as identified in some of the qualitative comments. This suggests that, despite overarching misunderstanding of statistical data and the easy ability to distort such facts, consumers expect such information to be presented with respect to health matters, particularly major conditions like cancer. Such statistics are difficult to quantify in broad-based health communications because of the vastly differing nature, types, and staging of cancer and disparate patient profiles; however, finding ways to incorporate such information seems to be important to cancer information consumers. Doing so might enhance favorable attitudes about treatments and the organization providing them. It also might improve perceptions of believability, as well as feelings of empowerment among health consumers, particularly among central processors who elaborate on such information. This lends further support for the presumption that such perceptions are highly subjective and as such, health messages require significant formative research in order to adequately address these issues.

Gender Differences

The majority of the socio-demographic variables, including gender, race, age, daily cell phone use, and experience with cancer had no distinct influence on any of the dependent measures. However, gender was shown to have some effect on subjects' attitudes toward the treatment, such that males viewed the treatment significantly more

favorably than did females. This difference may have been the result of chance alone; however, other research may shed light on this unexpected finding. For example, although women tend to be greater seekers of health information in general than are men (NCI, 2005), studies have found that health information needs vary by gender. Squiers et al. (2005) found that female callers to the NCI's Cancer Information Service were less likely than males to inquire about specific treatment information, with their information needs instead relating to more general cancer information as well as to screening and social support. Seale, Ziebland, & Charteris-Black (2006) found similar gender differences in cancer patients participating on online forums, with men's concerns focusing on treatment information, medical personnel and procedures, while women were more concerned with broader issues, including the impacts of illness, and emotional support. Seale (2005) also found gender differences with respect to the kinds of things men and women take into consideration when making decisions about cancer treatment, finding evidence that popular cancer Web sites on the Internet reinforce these distinctions. These findings suggest that women may be less involved in obtaining information about treatments for cancer, which in turn could diminish their attitudes about a specific cancer treatment, as was the case here with positron treatment. However, other studies have found that treatment information is among the most commonly sought by cancer patients regardless of gender or other socio-demographic factors (e.g. Metz et al., 2003). Therefore, gender differences deserve greater exploration with respect to cancer and other disease-related treatment information, and warrant consideration by those involved in developing health information.

Implications

For Theory

This study suggests that the ELM's predictions about differential processing of information based on involvement level via the central and peripheral routes do have applicability with respect to a persuasive communication about a serious or potentially life-threatening health issue. First, it provides direct evidence in a health context supporting past research in other areas that peripheral cues such as source credibility have a significant effect on attitudes toward a persuasive message among people who are less involved in the issue under discussion. In addition, it extends past ELM research by showing support for the fact that such cues also can positively influence attitudes that people with low involvement levels have toward a health organization and to an organizational blog as a channel of health communication.

This study also provides indirect support for ELM-predicted central processing among those who are highly involved in a serious health issue. As is the norm in this type of experimental research, the analyses of variance on the dependent variables were computed using the manipulated involvement level (high and low), and significant differences in mean involvement levels between these two groups were verified based on the manipulation check measure. However, it can be argued from a theoretical standpoint that overall the participants in this study were all highly involved, having mean involvement levels on the high end of the measurement scale. As a result, the data were re-analyzed using a median split of subjects' self-reported level of involvement in the issue (which often functions as the break point for high and low involvement level in empirical studies of the ELM) based on the three-item involvement manipulation measure (importance, meaning and necessity with median = 17.5). These

results showed that argument strength and involvement did interact to predict attitude toward the treatment message and toward the treatment itself. The means of the simple effects test among only highly involved subjects (based on the median split) showed they reacted much more favorably toward both when they received the strong arguments than when they received the weak as would be predicted by the ELM.

Because the involvement scores were so high overall and argument strength surfaced as such a robust factor among all participants, this joint effect of involvement and argument strength also was present to a lesser extent among the lowly involved. Regardless, these results provide evidence that the dual-processing ELM performs as expected and indicates it has the ability to effectively predict the factors that lead to persuasion in this health context; therefore, more research is warranted to explore the use of the Model with respect to cancer messages and those about other health issues. As suggested by Slater (2006) and others, examining the ELM in conjunction with other theories that focus more heavily on health behaviors would be especially beneficial with respect to health issues.

For Practice

The results of this experiment provide several lessons that might help health message developers increase the effectiveness of the communications they have with their constituencies. First, this study supports with empirical evidence the theory that people process health information differently and elaborate on messages to varying degrees. In doing so, it verified that the strength or quality of the information being presented and the source used to do so can help better target health messages to the specific ways people process this type of information depending on how personally important the information is perceived to be or how motivated a person is to process the

information. This supports numerous other studies showing that targeted health information is more persuasive and effective at increasing patients' feelings of control (Åsbring, & Närvänen, 2004; Briñol & Petty, 2006; Kotler, Roberto, & Lee, 2002). It further suggests these three linked factors, as well as the ELM more broadly, can help guide the targeting and development of health messages, particularly in ways that will help promote elaboration on them and central processing. Doing so will better ensure recipients of these messages counter with fewer arguments against them and that the position advocated will last for a longer time, i.e. will be more likely to result enduring persuasion (Petty & Cacioppo, 1981, 1986).

In addition, regardless of how involved one is in a health issue, it appears from this study that there may be a decline in the feelings of personal importance or motivation once people are actually exposed to a persuasive message. Here, subjects appeared to pay less attention to and/or concentrated to a lesser degree on the actual treatment message than might have been anticipated based on the broader involvement in the issue that preceded their coming in contact with the information. This tendency may be more pronounced among members of the general public who typically do not analyze a single message as was done in this experiment, but instead may be seeking, digesting, analyzing, and processing multiple resources during their information-gathering efforts or may instead be coming in contact with information serendipitously. It may be particularly true among those, unlike the college student participants in this study, who do not have experience handling many messages about a subject, including elderly and disadvantaged populations. This phenomenon also may be manifested to an even greater degree with respect to health messages. Research shows searches for health

information often are conducted by family members or friends of those afflicted with a disease or disorder, and these “secondary” parties may be less motivated to process specific messages despite high personal relevance in the health issue more broadly. Likewise, patients diagnosed with a serious or life-threatening disease such as cancer may be less motivated to process particular messages, especially in the early stages of the disease when they are more apt to gather a plethora of information (Squires et al., 2005). In conjunction with this apparent decline in motivation to process information, the ability to do so also plays a significant role and must be taken into consideration, especially in the early stages after a diagnosis when health consumers may be in shock or disbelief.

It is important for health message developers to recognize this potential attenuation in motivation to process health messages, and to note that it may be mitigated by the strength of the arguments used, as was the case here. This indicates that creating strong or high quality messages with respect to health issues is imperative, regardless of a person’s level of involvement or motivation. Noteworthy is that strength and quality (which might include believability) are highly dependent on recipients’ perceptions rather than any inherent factors in the arguments themselves, such as truth. One way health organizations might increase the quality, strength, and believability of health information is by utilizing where possible understandable, well-explained quantitative data and statistics, especially related to prognostic indicators and treatment cure rates. These findings confirm the crucial need for testing of health information before it is broadly utilized in order to ensure recipients perceive that these messages contain strong, high-quality arguments, which are also comprehensible and believable.

The source factor of credibility also was highly influential alone as well as in tandem with the level of one's involvement in the health issue, indicating that source of information is extremely important when dealing with a potentially life-threatening medical issue like cancer treatment. As a result, organizations producing cancer communications should ensure messages and information are presented by a credible spokesperson regardless of whether recipients are highly involved or not. Although this may seem to contradict the well-documented finding that targeted messages are more effective, according to the ELM, those who are very motivated to elaborate on a message are relatively unaffected by the source of the information (as was verified here). In addition, sources perceived as highly credible by those who normally would not closely examine or think deeply about information have been shown to increase scrutiny of persuasive messages (Heesacker, Petty, & Cacioppo, 1983). Thus employing a highly credible spokesperson, as perceived by receivers who are unmotivated to process a message, will help ensure the highest level of persuasiveness among the greatest number of recipients.

The channel used to disseminate the communication can play a role in enhancing or reducing persuasion (McGuire, 1999; O'Keefe, 1990), and there is reason to believe based on this study's results that organizational blogs can be a valuable tactic for delivering targeted health and cancer information to audiences. This is the case provided the messages contain what recipients believe to highly credible sources and strong arguments, as noted above. The vast majority of participants—nearly nine of 10—had read blogs, providing additional evidence this is a communication channel people of this age group are familiar and comfortable accessing. This study's sample

reported considerably heavier reading of general blogs than the 40% to 49% found in the 18–29 age group nationally (Jones & Fox, 2009). This difference could be due, at least in part, to the growing inclusion of blogs in university courses, which several respondents alluded to in their questionnaires. This generation also has been found to be the most likely to say the advent of blogs has been a positive change in the media landscape (Pew Research, 2009), indicating they may be more apt to make blogs a routine part of their media menu, and may expect to be able to access through them the specific information, resources, and answers they are seeking.

In addition, more than half of respondents stated they had read a blog specifically about health. Blogs usually do not spontaneously emerge as a result of the searches most typically done for health information through Google and other general search sites (Eysenbach & Köhler, 2002; Fox & Jones, 2009), indicating people in this group are specifically seeking such information from this channel. The respondents' medical blog use also is higher than that of adults nationwide, with a national survey finding that 41% of Internet using "e-patients" nationwide (i.e. those who seek health information online) reported having read someone else's experience about health or medical issues on a blog specifically (Rainie, 2009). Despite their relatively young age and low risk of health issues, the 18- to 29-year-olds in Generation Y are among the most likely of any age group to seek health information via the Internet (72%), followed closely by 71% of 30-49 year-old group (Fox & Jones). No data was gathered in this study about the reasons those who accessed health blogs did so or the kinds of information they were seeking, but these results indicate the channel could provide a worthwhile means for organizations to connect with those looking for health information.

The use of social networking sites for providing and gathering health information is currently not widespread with just over one-third of adults having accessed these channels; however, data show these sites are growing in popularity. Provided blogs contain credible sources and strong arguments, this channel has the added benefit of empowering health consumers to want to obtain more information from a variety of sources, including their own health care providers and the organization sponsoring the blog. This lends support for the notion that this venue has the capability to engender mutual beneficial health communications and relationship building. Relationships that are perceived as beneficial to individuals result in their enhanced satisfaction, cooperation, support and loyalty; decreased resistance, conflict, and complaints; and increased likelihood of affecting behavior changes, and ultimately of achieving an organization's goals (Hon & Grunig, 1999; Ledingham, 2003). However, much additional research is warranted to further ascertain the potential of and classify blogs and other social networking platforms as health communication tools.

Three additional concepts may be applicable to future investigations of organizational e-health blog messages and so will also be briefly discussed. They are uses and gratifications; interactivity; and media involvement, including parasocial interaction and parasocial relationships. Although not identified initially by its current term, uses and gratifications was among the earliest media study approaches to view audiences as active and gratification-seeking rather than as a passive group on which media had direct effects (Baran & Davis, 2003). Uses and gratifications, an approach used often in research related to the Internet and World Wide Web and employed by Kaye (2005) in investigating motivations of general weblog users, is defined as

“focusing on the uses to which people put media and the gratifications they seek from that use” (Baran & Davis, p. 256). It presumes that users have certain motivations for accessing media, and that they are aware of these and actively seek out the types of media they need to satisfy these needs (Kaye). Thus, it follows that readers of cancer blogs, including those who seek information about cancer treatments and/or the organizations and health professionals who provide them, are likely to be deliberately pursuing these sites because they fulfill some need or desire.

The interactivity possible on blogs, where both senders and receivers of information “can contribute equally to formation of an ever-evolving message” (McMillan, 1999, p. 377) affords the two-way communication channel that is so valuable in health communication. Numerous formal definitions have been advanced of interactivity, as have criteria for identifying it, however, Jensen (1998) states it is “a measure of a media’s potential ability to let the user exert an influence on the content and/or form of the mediated communication” (p. 201). This interactivity boosts involvement, which is seen as particularly beneficial in promoting health, where informational interventions aimed at behavior change have generally had poor outcomes (Neuhauser & Kreps, 2003). By their very nature, blogs promote conversation or dialogue, and thus are likely to be highly interactive (McMillan). Similarly, Doctorow et al. (2002) stated: “Blogging is a collaboration between readers and writers” (p. 6). Users who comment on blog posts have the ability to control, at least to some degree, subsequent commentary by the primary author as well as the overall messages other readers of the blog take from it.

Another construct that relies on media users as active participants is media involvement (as distinguished from the more general concept of involvement described above with respect to persuasion and the ELM). It broadly refers to the “how audience members relate to individuals depicted in and through the mass media” (Brown, Basil, & Bocarnea, 2003, p. 45), whether they be characters being portrayed, or stars or celebrities themselves. Most of the research in this area has involved the repeated exposure viewers have to characters and stars through television, and has spawned the two related notions of parasocial relationships – “the imaginary relationship” between the two, and parasocial interaction, which involves the actual “process of relating,” to a media personality, for example as friends (Brown et al., p. 46). The latter concept in particular has been since demonstrated with a variety of types of celebrities and media, and “can induce measurable effects on audiences” (Brown et al., p. 46). Although scholarly research in these areas has focused on involvement or identification with celebrities, these concepts may be likewise be relevant in relationships between readers of blogs and their creators/sources/authors for general blogs as well as those geared toward cancer. Anecdotal media accounts suggest that many users tend to read the same blogs repeatedly, and this was verified in a study by comScore (2005), and therefore these readers may become knowledgeable about the person who is writing the blog and involved in their online lives. This is also evidenced by some comments posted to blog entries, particularly those providing advice, encouragement, reassurance, or support.

Limitations

There are a number of limitations to this experiment, and the recognition of these should help refine future research efforts. Some of these have been discussed

previously, including the relatively high overall involvement levels, the fact that even the strongest arguments were perceived as only moderately persuasive and believable despite their truth and accuracy, and that the photographs of the source made her seem unsympathetic and unapproachable to some participants, which is particularly problematic on a two-way communication channel such as a blog.

Other limitations include that the subjects received black-and-white hard paper copies of the blogs rather than viewing them in the online, color format in which they would typically be viewed. Using the easily recognizable Google blogging tool Blogger to create the blogs provided a prompt or cue to participants that the format was a blog rather than a static World Wide Web page. However, doing so also may have affected the credibility of the manipulations if they were viewed as less legitimate or believable as a result.

Longitudinal testing to determine how enduring were the persuasive effects also was not possible because of the nature of the involvement manipulation and the ease of further investigation by participants of the connection between cell phones and thyroid cancer after they left the experimental setting. This is an important component in testing the ELM to determine whether the predicted benefit of central processing by those who elaborated on the messages to a greater extent did in fact result in attitudes and behavioral intentions that were more likely to remain over time. In addition, while an actual behavior measure was included, it is difficult to make any predictions about what taking—or not—the contact sheet for the treatment organization actually might have meant with respect to behavior. Future research should devise alternative ways to assess behavior that requires actually performing some specific information-seeking

action, such as texting to a number that purportedly will result in an organization automatically sending additional information.

Wherever possible, significant steps were taken control the potential confounding variables in this study, and randomization of the manipulations and participants, and simultaneous inclusion of all conditions in each setting should have minimized any differences between the various groups. Despite these attempts, it is not possible to control all potentially confounding factors in an experimental setting. Finally, this study also utilized a convenience sample of university students, and although the manipulations were such that this group became a stakeholder public in the information, this precludes generalizations beyond the population here. However, this research provides key insights into the use of the ELM in a health context and provides direction for additional research in this area.

Future Research

Throughout the discussion of this research, suggestions have been made concerning potential areas for future research. These included those related to involvement, source credibility, and argument strength, with respect to the dependent variables investigated here as well as in others of interest. Testing in other populations, particularly those who are at various stages of cancer, and settings, and with respect to other nontraditional media channels such as Facebook and Twitter would be beneficial.

Another area that should be further examined is the role that organizational blogs may be able to play in health communication. This study extended past persuasion research by looking at the mutual beneficiality of health messages not only to a sponsoring organization but also to those who read them, an area that in the past may have been considered to be in conflict with the goals of persuasion studies. This benefit

to audiences has been foremost in public relations communications, but is becoming increasingly important in marketing and to organizations more broadly, especially with the advent of new technologies and platforms that provide users complete control over when, where, how and even whether they will receive the information organizations wish to provide.

This research looked at one indicator of the quality of an organization-public relationship called control mutuality (Hon & Grunig, 1999) through the blog's ability to empower readers to want to seek additional information and gain knowledge about the cancer treatment. Further research exploring this concept should be undertaken, as well as into other indicators of exchange relationships. These are trust, satisfaction and commitment, or the degree to which parties believe that the relationship is worthwhile to continue. Additional empirical research testing constructs of the ELM and other successful models of persuasion in combination with behavior change theories also would be advantageous, for example, the Health Belief Model elements of severity, susceptibility, barriers and benefits.

Conclusion

This research provides empirical support for speculation that theories and models of persuasion such as the ELM that have often been overlooked in past research involving health behaviors provide an additional avenue for targeting messages that can be beneficial for both organizations and consumers. This is good news in light of research suggesting that many health campaigns based solely on theories of health behavior change have been inadequate (Slater, 2006). The ELM, which can identify how messages are processed and under what conditions they might be successful, has clear implications for designing health information for individuals persuaded through

each of the two routes. This insight can help boost the effectiveness of health materials, both when the ELM is used alone as well as in conjunction with health behavior-based constructs.

In addition to providing support for use of the ELM in health campaigns and extending the dependent variables on which it has been tested, this research also extends the use of experimental methodology in the field of public relations. Experimentation is the most rigorous methodology; however, it is rarely used in public relations research (Boynton & Dougall, 2006). Advancing the use of experiments can provide the field with additional possibilities for evaluating and measuring the effect of their activities.

APPENDIX A

News release

Study links cell phones to thyroid cancer

CAMBRIDGE, MASS – Harvard University researchers say they have found a miniscule link between cell phones and thyroid cancer in college students.

In one of the largest study of its kind to date, fewer than 1 in 1,000 of the nearly 10,000 college-age students aged 18 to 22 who participated were found to have small-to moderate-size thyroid tumors. The tumors were all found in those who used cell phones. The study, funded by the National Institutes of Health, found none in those who had never used mobile phones.

Doctors associated with the study caution the chances of most people getting thyroid cancer from cell phones is extremely rare. The likelihood is roughly equivalent to getting hit by lightning.

Whether electromagnetic radiation from mobile phones can cause cancer has been a topic of much investigation and debate by doctors and scientists.

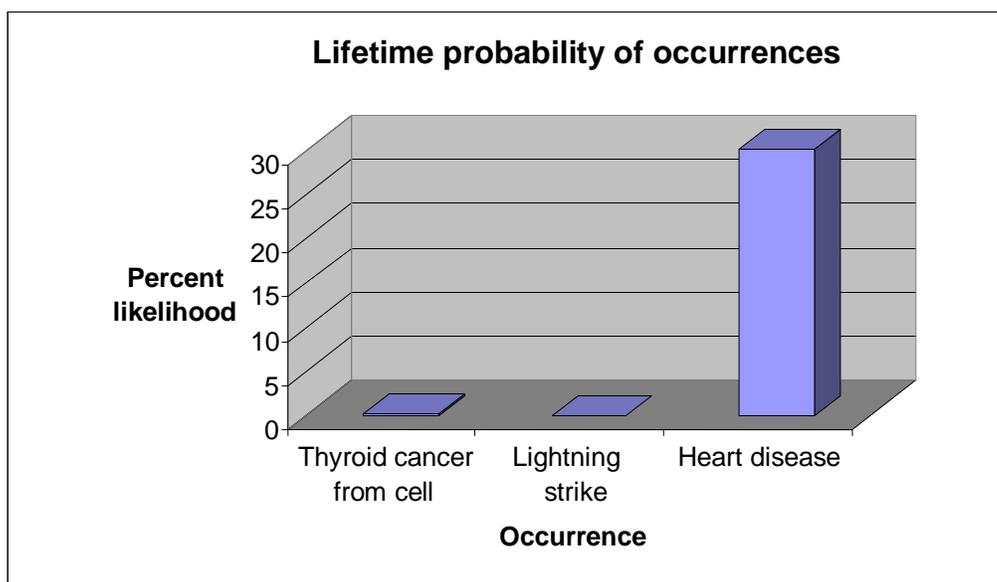
Certain factors predispose some people to thyroid tumors, but causes have not previously been identified. The thyroid is a gland at the base of the throat that makes hormones that help control heart rate, blood pressure, body temperature and weight. Currently, about 100,000 people a year are diagnosed with thyroid tumors. The U.S. Surgeon General's Office says these new findings suggest that number may increase slightly.

The tumors were detected through head and neck scans done as part of the study. None of the students had symptoms of any problems and received the scans only because they agreed to participate in the study. The researchers conducted the scans after a prior study they'd done showed mobile phone use triggered changes in the head and neck that potentially encouraged the growth of tumors.

The study's results have not yet been published in a peer-reviewed medical journal, but the Harvard scientists who conducted the research said they didn't want to wait the year or more that process can take because of the concern for college-age students.

"We wanted people to have this information so they can make changes," said Dr. Ronald Herberman, who heads Harvard's Cancer Research Institute. "We shouldn't wait for a published study to come out, but err on the side of being safe."

The researchers, who are continuing their investigation, are advising that young adults should keep their cell phones away from their faces, and use the speakerphone feature or a wireless headset.



Study links cell phones to thyroid cancer

CAMBRIDGE, MASS – Harvard University researchers say they have found a significant link between cell phones and thyroid cancer in college students.

In the largest study of its kind to date, which was funded by the National Institutes of Health, more than one in three of the nearly 10,000 college-age students aged 18 to 22 who participated were found to have small- to moderate-sized thyroid tumors. The tumors were all found in students who used cell phones. The study found no cancerous tumors in those who had never used mobile phones.

Doctors caution these are preliminary results but if they hold in additional testing, it signals a serious health issue. Currently, about 100,000 people are diagnosed with thyroid tumors every year, but they say these new findings suggest that number will “explode.”

Whether electromagnetic radiation from mobile phones can cause cancer has been a topic of much investigation and debate by doctors and scientists.

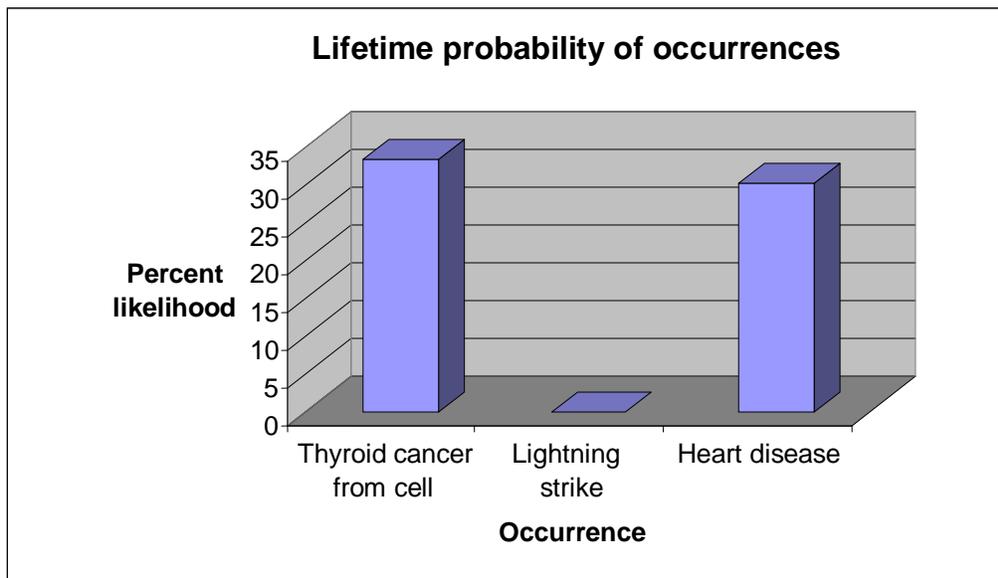
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APPENDIX B

Blog Manipulations

Manipulation 1: High credibility source with weak arguments

Manipulation 2: High credibility source with strong arguments

Manipulation 3: Low credibility source with weak arguments

Manipulation 4: Low credibility source with strong arguments



Positron Treatment and Research Institute

WEDNESDAY, SEPTEMBER 23, 2009

➤ Positron Treatment for Thyroid Cancer



The recent news that cell phones can cause thyroid cancer has some people looking for answers about what their options for treatment might be if they or

someone in their family is diagnosed with it. Until recently, the treatment of cancer was often just as frightening as being diagnosed with it, but it doesn't have to be that way. Positron Treatment is one of the newest and most promising tools in use today, especially for cancers of the head and neck, including thyroid cancer.

Positron Treatment has several advantages:

- The Positron Treatment and Research Institute is located in Miami, a major city that affords natural beauty, history and cultural events, including art galleries, museums and sporting events.
- Miami is also known for sunshine, warm weather and nearby beaches, all of which make the time you'll spend here more enjoyable.
- Many group opportunities are arranged to try new restaurants with other patients and their families.
- The Institute has a beautifully decorated reception and waiting area, with coffee, tea and other beverages always available.
- Patients can attend group lunches and dinners that provide occasions to meet and socialize with others.

We know you may have questions, and we're here to answer them. Please leave a comment or question by clicking the comments link below. If you would like a reply from us, or to have your comments posted for others to read, please leave your name and email address. Or you can call us at 305-243-1000, or 800-545-2292 outside of Miami.

We look forward to hearing from you.

Posted by Joyce Marshall at [3:58 PM](#)

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Dr. Joyce Marshall, MD



Cancer Specialist

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Positron Treatment has several advantages:

- It kills cancer with significantly less damage to normal, healthy tissue than traditional radiation.
- Higher doses of treatment can be focused directly on the tumor for greater success with lower risk of side effects.
- Dosages are customized for each patient, delivering the perfect amount of treatment.
- It can deliver highly effective doses of treatment with minimal side effects, so the risk of damage to non-cancerous tissue is decreased.
- The treatment is provided by cancer specialists in the Positron Treatment and Research Institute's Department of Radiation Oncology, which has a 30-year history of treating cancer patients and conducting research.

We know you may have questions, and we're here to answer them. Please leave a comment or question by clicking the comments link below. If you would like a reply from us, or to have your comments posted for others to read, please leave your name and email address. Or you can call us at 305-243-1000, or 800-545-2292 outside of Miami.

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BIOGRAPHICAL SKETCH

Paula Rausch received a Bachelor of Arts in communication, graduating with honors from the University of North Florida in Jacksonville. She also holds an Associate of Science degree in nursing from Minneapolis (Minnesota) Community College. She spent seven years as a professional reporter covering government, politics, health, business, and other beats for three Florida newspapers, during which time she won several journalism awards. She worked for the University of Florida in communication-related positions before pursuing her graduate studies at the UF College of Journalism and Communications beginning in the fall of 2004. She entered the College's doctoral program in Fall 2006, jointly pursuing a Certificate in Public Health at the UF College of Public Health and Health Professions. During her graduate education, Rausch was involved in a number of international communication pursuits, including conducting research in Nicaragua and Ethiopia, and serving as a program assistant and instructor for UF study abroad programs in Italy, Greece and Spain, and France. She was awarded a health communication fellowship at the National Cancer Institute (NCI), part of the National Institutes of Health, in Bethesda, Maryland, where she spent her final six months as a doctoral student. After she graduates with her Ph.D. in August 2010, Rausch will join the staff of the NCI Office of Communications and Education as a Communications Program Manager in the Communications Planning and Coordination Branch.