

CONSUMERS' PERCEPTIONS OF ONLINE HEALTH INFORMATION CREDIBILITY: AN  
EXAMINATION OF SITE SPONSORS AND INTERACTIVE FEATURES

BY

CHIALUN LEE

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To my family

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CONSUMERS' PERCEPTIONS OF ONLINE HEALTH  
INFORMATION CREDIBILITY: AN EXAMINATION OF SITE SPONSORS  
AND INTERACTIVE FEATURES

By

Chia-Lun Lee

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With the increasing number of reading and searching online for health information, understanding how consumers assess the credibility of information is crucial from both conceptual and practical standpoints. Conceptually, Internet technologies hold great promise for improving health knowledge and behavior. Despite these exciting claims, we still know very little about how interactive Web technologies influence perceptions of health information credibility. Meanwhile, previous research has suggested that readers' perceptions of credibility may be influenced by the information source (Metzger et al., 2003). This research combines the concept of source credibility and interactive feature cues to better understand how consumers process information and how these factors jointly affect the perceptions of online health information credibility, as well as the attitude consumers have toward Web site and Web site evaluation.

To test the concept idea which discuss above, a 2 (high vs. low Web site interactivity) by 2 (government Web site and commercial Web site sources) factorial experimental design was employed. A total of 136 university students participated in the study. The results of the study indicated several important findings. First, there is a statistically significant positive correlation

between source cue, interactivity, and perceived information credibility. However, only source cue has a positive effect on perceived information credibility. Respondents considered the source of health information provided from a government Website was deemed significantly more credible than a commercial Website. This finding suggests that online users are concerned with who the message's sender is. In terms of consumer's attitude toward a Website, the study shows that both source and interactivity effect consumer's attitude toward Health Websites.

Furthermore, interactivity has a more significant influence on consumer's attitude toward Health Web sites than source cue. Additionally, increased interactivity could lead to more positive evaluations of the Website. In conclusion, the more interactive features such as navigation menus and chat rooms, the more positive participants' attitude were toward the Website and the evaluation.

## CHAPTER 1 INTRODUCTION

The purpose of this research is to determine how the interactivity of health-related Web sites and the source of health-related information affect perceptions of credibility regarding online health information. The advancement of Web-based technology has brought new and revolutionary developments to the field of health communication. With the growing number of capabilities that health care Web sites provide, consumers can access an increasingly vast store of health information. For example, one might find doctor explanations of symptoms and diseases or spin about medical practices from patients and pharmaceutical companies. Thus, consumers are increasingly using the Internet to retrieve health information. According to the Pew Research Center's Internet and American Life Project (2005), 60% to 80% of Americans have used the Internet to search for at least 1 of 16 major health topics and, as of January 2008, the Internet had become a leading source for health information (Elkin, 2008). "The Internet plays a central role in finding health information," said Veenu Aulakh, MPH, California Health Care Foundation senior program officer (CHCF, 2008).

The Internet has become a popular medium as a source for health information, and more important, it has enhanced consumer participation in health issues. Consumers not only seek health information, but they also communicate their experiences. This has led to a dramatic expansion in the health information resources available online (Cline & Haynes, 2001; Rice & Katz, 2001; Viswanath, 2005). Using various forums, contributors divulge information about the side effects of medicine and state which drugs effectively manage their conditions. Some patients even share their personal prescription drug histories online. On one hand, this allows consumers to get health care and support fairly easily. On the other hand, it exposes consumers to misinformation fairly easily. Although misinformation on social media will almost certainly be

re-posted and self-corrected by users (California Health Care Foundation, 2008), incorrect health information is still very difficult to prevent. Once inaccurate information is published on the Internet, it might keep ill people who rely on it from seeking proper care. Thus, the credibility of online health information has become of significant concern to health communication professionals and consumers; one study showed that approximately 86% of online health information users care about accuracy of information on the Internet (Pew American Life Project, 2000). With such high concern about finding credible health information, people running online health Web sites must know how to maximize the credibility perceived by their audience.

Credibility is a crucial factor in consumers' embrace and acceptance of health-related Web sites. Many studies have examined the role of various elements in predicting perceptions of Web site credibility, such as structural features of Web sites and characteristics of messages (Burkell, 2004; Flanagin & Metzger, 2000; Fogg, 2003; Fogg et al., 2001; Hong, 2006; Nettleton et al., 2004). However, few have looked into interactivity—a defining trait of the World Wide Web (Street & Rimal, 1997). Conceptually, Internet technologies hold much promise for improving health knowledge and behavior. Despite these exciting claims, we still know very little about how interactive Web technologies influence perceptions of online health information credibility. Evidence of interactive features in health communication has been provided. Therefore, when interactive features are packaged in a form of health information and disseminated via the Internet, the audience may easily consume and adopt the information. Such interactive features may also influence the persuasiveness of health messages and consumer attitudes toward a Web site. However, discussions of credibility assessments of interactive features' presence or absence from Web pages are rather scarce. This research addresses how interactivity affects perceptions of credibility regarding online health information. Along with the possible influence of

interactivity, traditional investigations into credibility have also observed that the source within and behind communication messages is principal to people's judgments of the messages they think accurate and trustworthy (Hovland, Janis, & Keelly, 1953). Indeed, a growing number of researchers have found that variations in the sources of online health information shape an individual's assessment of online health information, especially with regard to credibility. When compared to research on sources, the impact of interactivity on perceptions of credibility has been probed in various investigations of general computer-mediated communication (e.g., Burgoon, Bengtsson, Cederberg, Lundeberg, & Allspach, 2000), yet few researchers have applied analyses within an online health information setting.

With the increasing number of people who are reading and searching online health information, knowing how interactivity and sources influence consumer perceptions of credibility is pivotal from both conceptual and practical standpoints. As a result, the purpose of this study is to examine whether interactive features and site sponsors on a health Web site affect how people process and evaluate health information on that Web site and, in turn, how these features influence consumer attitudes toward online health content.

## CHAPTER 2 LITERATURE REVIEW

### **Health Information and the Internet**

Searching for health-related information has become a common activity for Internet users (Fox & Fallows, 2003). According to Meyer (1996), most health Web sites on the Internet fall into two categories: marketing services and consumer education. Survey results also indicate that more consumers are using the Internet to find and read health information than ever before. The Pew Internet and American Life Report (2009) found that the percentage of adults who have searched health information online has increased from 25% to 61% since 2000. The author of the report concluded that “this makes the act of looking for health information one of the most mainstream activities online” (Fox & Jones, 2009). Indeed, numerous readers read or search among the millions pages of online health information every day (Baker and colleagues 2003; Bard 2000; Cain and colleagues 2000; Fox and colleagues 2000; Fox and Fallows 2003; Fox and Rainie 2002; Horrigan and Rainie 2002; PSRA 2002; UCLA 2003). One reason is Internet give users an open and available 24 hours a day services form answering embarrassingly personal questions to suggesting medical treatment. Another reason is the little time doctors dedicate to their patients explaining ailments and procedures. Individuals and families are turning to the internet for information lacking during doctors visits. Thus, the Internet has rapidly become a primary source for obtaining health information and advice.

With the growing number of capabilities that the Web provides, the way in which consumers use the Internet to seek health information has changed. Online health-related applications are as plentiful as medicine itself (Sonnenberg, 1997). ICrossing, in its 2008 report, *How America Searches: Health and Wellness*, found that the major online tools used to find health information are general search engines, health portals, and social media. Consumers

usually access online health information for three main purposes: “searching directly for health information, participating in support groups, and consulting with health professionals” (Cline & Haynes, 2001).

Instead of reading health information on Web sites in a passive way, consumers can now communicate their experiences actively. For example, 36% of consumers go online to see what others say about a medication or treatment, and 14% of consumers share their knowledge of, and experience with, a medication, treatment, or health issue (Online Health: Assessing the Risk and Opportunity of Social and One-to-One Media, Jupiter Research, 2007). Communication professionals call this new movement “Health 2.0” because it allows people not only to read or search information but also to create information. Unlike the mass media which less involve feedback (Cassell and associates, 1998), the dynamics environment of Internet provides a valid channel for persuasive health communication. As Casell and associates (1998) state:

“The capacity of these resources to provide immediate, transactional feedback suggests that they can be used it realize health behavior change in a manner that is similar to interpersonal channels, while their resemblance to forms of mass media suggests an ability to do so on a larger scale than previously considered possible” (Cassell et.al.,1998,p.74).”

In addition, Internet-based sources have the capacity to disseminate health information immediately and to reach large, geographically disparate audiences. Many health communicators have used mass media as a tool to diffuse messages, increase public awareness, and enhance information exposure (Alemi & Higley, 1995). The Internet can also be integrated with other print media and mass media channels to expand the reach of public health programs and promote program effectiveness (Cassell, Jackson, & Chevront, 1998). These common features make the Internet a popular venue for health communication promotion and serve as useful tools to educate mass audiences with discerning information online. For the purpose for determining reliable online health information, the Net Foundation and Internet Healthcare Caloation have

published to help consumers judge credibility of online information online. The Internet is an ideal medium for such purposes, and moreover the incorporation of Web-based technologies into health communication strategies is making health-related promotions more effective.

### **Credibility**

The study of credibility has a long history. Much research on credibility can be divided into two overlapping classifications: studies focused on source credibility and studies examining medium credibility (Kiousis, 2001). Source credibility studies have examined how variations in communicator qualities affect the way in which people judge media messages (Austin & Dong, 1994; Hovland, Janis, & Kelley, 1953; Hovland & Weiss, 1951). Medium credibility studies have examined the channel through which the message is delivered (Kiousis, 2001; Johnson & Kaye, 1998; Newhagen & Nass, 1989; Slater & Rouner, 1996). Because research on these two categories is not distinct (Kiousis, 2001), they both need to be discussed.

#### **Source Credibility**

Information source is a powerful factor affecting information credibility. One of the first researchers to explore credibility was Carl L. Hovland. In his book, *Communication and Persuasion*, Hovland and colleagues (1953) described the credibility of individual sources as communicator credibility. This credibility has two major dimensions: expertise and trustworthiness (Hovland et al., 1953; McGuire, 1969). Expertise is defined as how well informed and intelligent a communicator is about a topic (Hovland et al., 1953) and his or her “ability to have a correct stand on the issue” (McGuire, 1969). Consumers judge trustworthiness by their perception of the communicator’s motivation to tell the truth about a topic based on the consumers’ degree of confidence in the communicator (Hovland, Jains, & Kelly, 1953). Since these findings were revealed, a variety of variables on source credibility have been examined by researchers (Gaziano & McGrath, 1986; Slater & Rouner, 1996). In McGuire’s (1985) source

valence model, attractiveness is another component of source credibility. Berlo, Lemert, and Mertz (1969) cited three qualities that message receivers use when evaluating the source of the message: safety, qualification, and dynamism. McCroskey (1966) indicated two factors, authoritativeness and character, as constructs of source credibility based on factor analysis. Although various definitions of source credibility have been found in academic research, expertise and trustworthiness have been the most widely used and applied dimensions recognized by scholars (Hovland et al., 1953; Hovland & Weiss, 1951; McCracken, 1989; Ohanian, 1990).

Although little research has addressed consumers' perceptions of source credibility in an online health information environment (Dutta-Berman, 2003a, 2003b), source plays a significant role in perceptions of online health information. It can be used as a cue to determine credibility. Eysenbach and Kohler (2002) found that consumers identify source as the chief factor when determining credibility and quality of information. In their study, while evaluating a credible health-related Web site, focus group participants said they look for source first. A study also showed that 42% of participants reported rejecting a health Web site "because they couldn't determine the source of information" (Fox & Rainie, 2002, p. 6). Moreover, credible sources influence changes in opinion regarding the direction advocated by the communicator to a greater extent than do less credible sources (Hovland & Weiss, 1951). In contrast, a message attributed to a less credible source was perceived as less "fair" and "justifiable" than a message from a high credibility source (Hovland et al., 1951). Subsequent studies have yielded similar findings. Maddux and Rogers (1980) found that expert sources had greater acceptance of their statements than did inexperienced sources. When audiences perceive the source as having considerable expertise and being trustworthy, they are more likely to accept or be persuaded by the message (Marquart, O'Keefe, & Gunther, 1995; Sternthal, Phillips, & Dholakia, 1978; Wiener & Mowen, 1986).

One of the primary markers that advocates name for judging the quality of Internet-based health information is source credibility (Tu & Hargaves, 2003; Kunst, etl., 2002; Kim, Eng &Derring, 1999). While a source that is a recognized expert, who provide information with current, unbiased and no competing interests, could be judged a more reliable source. On the contrary, a source that be judged as inexpert that gave an outdated, biased and commercial interties information. Based on these standards, several characteristics can influence Web site expertise and trustworthiness. As Metzger et al. (2003) pointed out, “website expertise can be reflected in the site's informativeness” (p. 116). Several elements that convey Web site expertise are the site sponsor's reputation, the type of site sponsor, and the display of appropriate credentials. Rich and Belkin (1998) conducted in-depth interviews with 14 faculty members and doctoral students to understand their judgments about online information. Results revealed that respondents based their judgments of online information in part on two levels—institutional and individual. Users in the Rich and Belkin (1998, 2000) studies looked for Web credibility markers to replace those used for traditional print media, identifying factors such as suffixes to the URL address (i.e., .edu, .org, or .gov). Overall, nonprofit, educational, and government sources were ranked as more credible than were commercial sites (.com). In addition, Rich and Belkin’s (1998) respondents generally perceived .edu and .gov sites as providing better quality information than .com sites. In term of the domain name on credibility assessment of online health information, Kim and Stephens (2003) observed few differences in individuals’ perceptions of credibility between government sources and commercial sources. In sum, the majority of evidence from both traditional and non-traditional communication outlets suggested that source cue should influence perceived credibility.

## **Medium Credibility**

In a study examining political campaigns on the Internet, Johnson and Kaye (1998) used an online survey asking respondents to rate medium credibility based on Meyer's scale, which used dimensions of fairness, bias, depth, accuracy, and trustworthiness. They found that politically interested Web users rate both online political information and information from traditional media only "somewhat" credible. And while Johnson and Kaye found online media to be perceived as slightly more credible than newspapers, Flanagin and Metzger (2000) used an online survey to investigate the credibility of different outlets: online information, television, magazines, and newspapers. Their findings showed that respondents viewed information seen in newspapers as more credible than information found online, on television, and in magazines. Similarly, Kiouisis (2001) conducted a cross-sectional survey to explore the perceived credibility of television, newspapers, and the Internet. Results revealed that newspapers are highest in credibility for news information, followed by Internet news and television broadcasting. Kiouis's study revealed that the medium through which the message is delivered affects perceived credibility.

How consumers evaluate the credibility of online information has been discussed for a long time. Although much evidence has revealed that the Internet has more strength and power than traditional media, several scholars have questioned whether the Internet should be trusted as much as traditional media sources. The new era of online communication, Web.2.0, allows individual Web users to contribute more information than before (O'Reilly, 2005). Now anyone can access the Internet to contribute medical information on wikis, blogs, online forums, social networks, and message boards. For example, wikis allow users to collaboratively contribute and update medical information online. This not only collects the wisdom of the masses, but also enhances the potential to release inaccurate information. Traditional media sources employ

professionals to provide unbiased information and to assess accuracy. However, Web sites lack these professional gatekeepers who help define traditional media (Cline & Haynes, 2001). Thus, the credibility of online information may be distinguished from traditional media in consumers' evaluation because consumers may use different criteria according to the information presented (Newhagen & Nass, 1989).

Direct observational research in a lab setting has shown that the numbers of health consumers factoring credibility of source are limited (Kohler, 2001). In fact, consumers usually judge information quality by a variety cues. According to ELM (Petty & Cacioppo, 1986), consumers judge text credibility based on either careful evaluation of arguments in the text (the "central route") or reliance on external cues (the "peripheral route") that allow the consumer to make simple judgments about the merits of a given argument without attending to the argument itself (p. 3). Peripheral cues can include, for example, attractiveness of Web site, the type of publication in which a text appears, and author affiliations. One study found that consumers pay more attention to surface credibility markers such as Web site design (e.g., whether it appears "professional") (Eysenbach, 2008). Fogg et al. (2001) also found that two components of Web site design decreased credibility: commercial associations (advertising) and a feeling of amateurism (broken links). First, an advertising presence or absence on a Web site can influence its credibility. Comparing different Internet domain Web sites with regard to advertising, studies show that a .org site with no advertising is the most credible, followed by a .com site featuring advertising (Walther, Wang, & Loh, 2004).

Recent research has not looked at interactive features and credibility, but has combined interactive features with other factors. Sundar, Hesser, Kalyanaraman, and Brown (1998) conducted an experimental study to scrutinize how Web site interactivity affects people's

perceptions of political candidates. They found that in some cases participants' exposure to a higher level of activity (links available about the candidates) in a site led to higher perceptions of trustworthiness (often an indicator of credibility) toward candidates. Kiouisis and Dimitrova (2006) studied college students' perceptions of Web site credibility based on design elements embedded in the site. They found that source had no influence on a student's perceptions of credibility regardless of whether information came from an organizational site or news agency site. Instead, the interactivity and graphics helped create an impression of credibility among the users regardless of the source. Furthermore, the influence of interactivity on credibility assessment may be observed when participants used interactive content (Kiouisis, 2003).

Freeman and Spyridakis (2004) investigated the effect of external links and publisher contact information (a street address) on the readers' perceptions of online health information. They found that having external links to further information is an important criterion for assessing the credibility of information on a given Web site. In other study, they examined different type of contact information such as street address, email link and "Contact Us" link on the readers' perceptions of online health information (Freeman & Spyridakis, 2009). They observed that participants rated the credibility of a Web page with a "contact us" link more highly than those pages having no contact information. That is, "an article with presence "Contact Us" links were deemed significant more expert than the article without no link" (Freeman & Spyridakis, 2009, p. 162).

In sum, previous studies have demonstrated that individual elements of interactive features influence credibility assessments. With the interactive features on the Web site, it may have some influence on users' perception of perceived credibility. However, would increased level of interactive features' presence on the Web page play a role in affecting credibility? Would the

more interactive features presence on Web sites, the more credible they are? This study will discuss this possible factor.

### **Interactivity**

Interactivity has been acknowledged as the leading capability that sets the Internet apart from other media (Ha & James, 1998; Lustria, 2007). It makes the Web a dynamic medium for two-way communication, in contrast to traditional media. Also, interactivity can be useful in creating brand identity (Upshaw, 1995), facilitating online relationship marketing (Cuneo, 1995), converting consumers who are interested in becoming more interactive (Berthon, Pitt, & Watson, 1996), and exercising greater control over information seeking (Hoffman & Novak, 1996). In the past decade, scholars in mass communication have examined the nature of interactivity in computer-mediated communication. According to Rafaeli and Sudweeks (1997), interactivity is “a condition of communication in which simultaneous and continuous exchange occurs, and these exchanges carry a social, binding force.” Rogers (1995) defined interactivity as “the degree to which participants in a communication process can exchange roles and have control over their mutual discourse” (p. 314). Ultimately, Jo and Kim (2003) concluded that the common characteristics reflect mutual relational interactions between the message provider and the recipient. Taken it as whole, the identical characteristic of interactivity is its interpersonal communication. As Barnes (2001) states:

“In online social dynamics, interactivity is associated with message qualities that encourage people to respond and/ or interact with other group members. These qualities include asking questions, requesting opinions from other people, or making provocative statements. Interactivity can lead to sociability because it fosters interpersonal correspondence” (p.41).

There is no generally accepted definition of interactivity and different researchers have used different conceptualizations of interactivity (Heeter, 1989). Among previous studies, four traits of interactivity have been emphasized: the nature of the communication exchange

(Burgoon, Bonito, Bengtsson, Cederberg, Lundeberg, & Allspach, 2000; Jensen, 1998; Rafaeli & Sudweeks, 1997), system or channel features (Andrisani et al., 2001; Bezjian-Avery, Calder, & Iacobucci, 1998; Chou, 2003; Coyle & Thorson, 2001; Downes & McMillan, 2000; Ha & James, 1998; Massey & Levy, 1999), user's perceptions and/or actions (Light & Wakeman, 2001; McMillan, 2000; McMillan & Hwang, 2002; Newhagen & Cordes, 1995; Sundar, Kalyanaraman, & Brown, 2003; Tremayne & Dunwoody, 2001), and some combination of the above (Heeter, 1989, 2000; Kioussis, 2002; Liu & Shrum, 2002; McMillan, 1999; McMillan & Huang, 2002).

Many interactivity studies agree that interactivity of new communication technology can be defined along three main dimensions: two-way communication, active user control, and synchronicity (Heeter, 1989, 2000; Liu & Shrum, 2002). In the online instance, *two-way communication* refers to the ability of the medium to allow reciprocal communication exchange through feedback input devices such as e-mail, comment sections, or forms. Consumers can communicate with the system, with other users, or with content providers through two-way communication. *Active user control* refers to the ability of the medium to allow users to control the level of their information exposure and learning experience. The Internet is characterized by a "network of linked contents" (Hoffman & Novak, 1996, Liu & Shrum, 2002, p. 54), and these hyperlink tools enable the users to "customize information flow and jump from one location in the network to another" (Liu & Shrum, 2002, p. 54). *Synchronicity* refers to the extent to which input and response are simultaneous in the process of communication (Liu & Shrum, 2002). This concept is the most ambiguous of all three because, for example, while users use the e-mail function, their level of synchronicity may be low because of delayed e-mail feedback.

To define the interactivity of Web sites, most scholars emphasize the medium's interactive traits. That is, several researchers have viewed interactivity as the result of elements that are present in the site (Ghose & Dou, 1998; Ha & Lincoln, 1998; Frazer & McMillan, 1999). For example, while examining the interactivity of a Web site, the concept is usually defined as the use of hyperlinks in a site (Sundar et al., 1999). In addition, some researchers have operationalized the interactivity in terms of functional features, such as e-mail links, feedback forms, chat rooms, and audio or video downloads (Ahern & Stromer-Galley, 2000; Massey & Levy, 1999). According to a Deuze (2003) study, functional interactivity means users can communicate with each other through message board systems or direct e-mail links. This interactivity allows Web features to facilitate two-way communication tools such as e-mail links, register forms, and comment forms (McMillan, 2000a). In his later study, McMillan (2002) proposed a four-part model of cyber interactivity to analyze features of health related Websites based on perceived interactivity. Two dimensions are discussed: direction and control. The features that belong to the dimension of user control include choice, search, games, curiosity devices and links. Other features such as email, registration, survey, order/purchase, chat, bulletin boards are fall within the dimension of direction. Moreover, researchers have asserted that multimedia content is a chief indicator regarding interactivity (e.g., Sims, 1995). Bengtsson, Burgoon, Cederber, Bonito, and Lundeberg (1999), for instance, maintained that the modality aspect of interactivity means "participants have full access to a wide array of environmental, visual, audio, and verbal context cues" (p. 3).

Taken it as a whole, the present study that discussed above indicate there is no standard definition of interactivity. However, most of them indicated that the interactivity on Internet are similar to interpersonal communication. User control, two-way communication and

synchronicity presence on a Web site serves as evidence of interactivity for interpersonal communication. Meanwhile, Downes and McMillan (2000) indicate that “communication in a computer-mediated environment is inherently interactive; however, varying levels of interactivity exist” (p.15). As noted by MaMillan and Hwang (2002), the higher interactive website was design to have more interactive features and more opportunities for interactive exchange and vice verse.

### **Interactivity and Health Communication**

For researchers of health communication, interactivity is a relatively new area. With an interest in interactivity in relation to health communication, previous studies have explored interactive media technology such as CD-ROMs, computer programs, touch-screen programs, and Internet sites (Rhodes, Fishbein, & Reis, 1997; Street & Rimal, 1997; Walther, Pingree, Hawkins, & Buller, 2005), which have contributed significantly to interactive health literature. There is ample research on various interactive media technologies being used in health communications. Meanwhile, there is increasing research interest in analyzing interactivity on health-related Web sites. Various approaches have been used to explore interactivity in health communications. For example, some researchers have used content analysis, (e.g., Keller et al., 2002; Stout, Villegas, & Kim, 2001), while others have used an experimental design approach (e.g., Lustria, 2007). The findings of previous studies have evidenced that interactivity has a significant effect on users’ comprehension and attitudes toward health Web sites (Lustria, 2007).

Meanwhile, research findings have shown that increased interactive features such as high accessibility, high user control, and personalized content can create interest in health communication as well (Prochaska, Redding, & Evers, 1997; Schacter & Fagnano, 1999; Steuer, 1992; Stout et al., 2001; Sundar, Kalyanaraman, & Brown, 2003). Beside intrigue interesting, hyperlink scholars suggest that consumers’ usage of nonlinear hypertext systems could also

enhance learning because it allows learners to freely browse the materials, assessing the system based on individual mental models (Martindale, 1991; Nelson & Paulmbo, 1992; Spiro & Jheng, 1990). In addition, the qualities of interpersonal communication on an online environment make it a persuasive channel to promote healthier behaviors (Cassel, Jackson & Cheuvront, 1998). In one study, scholars examined links between learning and interactivity of health-related Web sites. They found that health-related Web sites with interactive features can deliver messages with significant effectiveness (Stout, Villegas, & Kim, 2001). Cassell and associates (1998) in their exploration of health communication on the internet found that the Internet offers a viable channel for persuasive health communication because it allows “both parties to bring something to the exchange”(p.73).

Also, interactive features on health care Web sites lead to higher involvement by consumers (Petty & Cacioppo, 1986). Higher involvement by consumers can facilitate relationship building and problem solving, as well as learning of health information (Stout, 2001). One study showed that some interactive features, such as relationship-building tools, could not only improve the degree of user participation but also enhance user satisfaction, self-efficacy, and memory (Thomsen, 1996; Rafaeli, 1988). For example, one in four health-information seekers have joined online support groups for professional care, such as obtaining social support and medical information and exchanging experiences (Cyber Dialogue, 1998; King & Moreggi, 1998). Meanwhile, Lustria (2007) found that interactivity may play an important role in attracting health-information seekers and in maintaining their attention. Higher levels of interactivity in a health-related Web site contribute to a more positive attitude toward the Web site. In one study, Wu (2005) examined the effects of interactivity on communication

outcomes such as toward the Websites. And, it observed that perceived interactivity plays a mediating role in the effect of actual interactivity on attitude toward a Web site (Wu, 2005).

In sum, as Jo and Kim (2003) pointed out, “the intrinsic interactivity of the Web can enhance the mutual relationship and collaboration between the message (the organization) sender and the receiver (public)” (p. 202). The interactive tools present in health-related Web sites improve healthy behavior, clinical outcomes, and positive attitudes toward the Web sites (Murray & Burns, 2004, Lustria 2007).

### **Research Questions and Hypotheses**

Credibility is a crucial factor affecting how consumers embrace and accept health-related Web sites. Furthermore, perceived information credibility has been found to be a key determinant of persuasion and attitude change (Chaiken & Maheswaran, 1994; Tormala et al., 2007). Therefore, it is not surprising that consumer perceptions of online information credibility have been the subject of a great deal of discussion and empirical research in CMC (Burkell, 2004; Flanagin & Metzger, 2000; Fogg, 2003; Fogg et al., 2001; Hong, 2006; Nettleton et al., 2004). This study explored the influence of the nature of a site’s source and its degree of interactivity on consumer attitudes, their perceptions of its credibility, and their general evaluation of its effectiveness.

The nature of a source has been shown to have an influence on consumer perceptions in an online environment. Eysenback and Köhler (2002) observed that consumers identified the nature of the source as the chief factor when making determinations as to the credibility and quality of information. In that study when evaluating the credibility of a health-related Web site, focus group participants said they looked for the source first. Another study showed that 42% of participants reported rejecting a health Web site “because they couldn’t determine the source of information” (Fox and Rainie, 2002, p. 6). Research has also suggested that readers’ perceptions

of credibility may be influenced by the type of site sponsor (Metzger et al., 2003). In addition, both surveys of online information users and recommendations from various organizations regarding the evaluation of online information suggest that readers perceive information on a .gov Web site as being more credible than that on a .com Web site. Therefore, the following hypothesis is offered, based on these findings:

- **H1:** Participants viewing online health information on a .gov Web site will rate that information as being more credible than will participants viewing the same information on a .com Web site.

In addition to source cues, prior researchers have suggested that the interactive features presence on Web site affects perceived online health information credibility. Freeman and Spyridakis (2004) investigated the effect of external links and publisher contact information (a street address) on readers' perceptions of online health information. They found that having external links to further information was an important criterion for assessing the credibility of information on a given Web site. Also, participants rated the credibility of a Web page with a "contact us" link more highly than that of a page offering no contact information (Freeman & Spyridakis, 2009). A great deal of research has examined individual elements of site presentation, such as navigation, interactivity, and links, in terms of credibility assessment. However, it is unclear whether the level of interactive features on Web sites plays a role in affecting information credibility. Hence, the following hypothesis will be investigated:

- **H2:** Participants will rate health information on high interactive Web sites as being more credible than will participants viewing the same information on low interactive Web sites.

In persuasion theory, source credibility has been recognized as having a substantial influence on communication effectiveness (MacKenzie & Lutz, 1989; McCroskey, 1966; Perloff, 2003). Past research has observed that source characteristics are antecedents to attitudes. As Burgoon et al. pointed out, "Understanding a message and assigning credibility to it or its

information source are a prerequisite to message or information acceptance” (2000, p. 554).

Evidence has also confirmed that source credibility has a positive effect on message effectiveness and consumer attitude (Hovland & Weiss, 1951; Lafferty et al., 2002; MacKenzie & Lutz, 1989). Especially, a perceived unbiased source tends to be perceived as more convincing than a biased source based on its higher credibility status (e.g., Benoit & Kennedy, 1999). Because content from a .gov Web site should be perceived as more credible, it is expected that exposure to online health information from a .gov Web site will lead to more positive user attitudes toward a Web site.

- **H3:** Participants viewing online health information from a .gov Web site will demonstrate a more positive attitude toward that Web site than those viewing the same health information on a .com Web site.

Previous research has not specifically linked the interactivity literature with the small but growing body of research on audience attitude toward Web sites. However, what research there has been has found that perceived interactivity and attitude toward a Web site are highly correlated (Jee & Lee, 2002). In addition, research has also suggested that increased levels of interactivity on a Web site have a positive effect on user satisfaction; their perception of the effectiveness, efficiency, and value of a Web site; and their overall attitude toward the Web site (Thomsen, 1996; Rafaeli, 1988; Murray & Burns, 2004; Lustria 2007). These findings give rise to the fourth hypothesis:

- **H4:** High (versus low) interactivity will yield more favorable consumer attitudes toward a Web site.

If interactivity increases the perceived credibility of and enhances consumer attitudes toward a Web site, it seems reasonable that interactivity should also influence consumer’s general evaluations of the Web site. Past research has found that vivid Web sites were evaluated more positively by users (Coyle & Thorson, 2001). A Web site is the face of an organization in

the online world. For health communication professors, understanding how consumers evaluate a Web site may help them to better understand how to build a relationship with their audiences.

Thus, following the Kiouisis study (2006), it is argued here that two aspects of evaluation (usability and attitude toward the Web site) will be affected by interactivity:

- **H5:** Participants viewing online health information from a high interactive Web site will evaluate the Web site more positively in terms of usability and general attitude than those viewing a Web site with low interactivity.

## CHAPTER 3 METHODOLOGY

### **Experimental Design**

The purpose of this study was to explore how variations in site sponsors and interactivity of Web sites influenced user attitudes toward a Web site and their perceptions of its credibility. Accordingly, a 2 (site sponsors: .gov versus .com) X 2 (interactivity: high interactive Web site versus low interactive Web site) between-subjects experimental design was employed to examine those relationships.

### **Stimulus Materials and Independent Variables**

The health information participants read, obtained by permission from the Web site of the Centers for Disease Control and Prevention (CDC), covered basic information about the prevention and treatment of depression (Centers for Disease Control and Prevention, 2009)(Appendix B) . However, a fictitious Web page was created by a professional Web designer to display this information. The article was presented on a generic Web site to eliminate preconceived opinions of known health Web sites. All the conditions on the Web site, such as design of the page and content, were kept constant, except for the changes to accommodate the independent variables, as explained below.

The two main independent variables for this research were the site sponsors and interactive features. A primary focus of the research concerned the owner, or source, of the Web site. That is, will the presence of an identified name on the Web site influence how consumers judge the site? To investigate this question, the headers of the dummy sites were varied to reflect the following differences in terms of site responsiveness: health.com, and health.gov.

*Interactivity.* The Web site was especially developed for this experiment and was based on real Web sites that were reviewed before the creation of the two versions of the site used in this

study. A health Web site was professionally designed in two different versions to incorporate high and low levels of interactivity. Following Liu & Shrum (2002), the primary dimensions of technical interactivity that were explored in this study were active user control, sensory stimulation, and two-way communication.

In its high interactive version, the site offered users the ability to customize information flow and evinced a high potential for reciprocal communication. Participants could make use of hyperlinks and browse through the information categories indicated on several navigation bars. These features allowed participants to interact with the Web site by selecting the order of information they wanted to see at each moment. This manipulation was consistent with the definition of active control (i.e., whether consumers are able to interact with the system to choose what they want to see). Similar manipulations regarding active control have been used in other studies (e.g. Lustria, 2007; Ariely, 2000; Coyle and Thorson, 2001; Sicilia et al., 2005). In addition, the high interactive version featured more response mechanisms, such as a message board/chat room, a telephone number, and an e-mail address. Overall, it used a nonlinear hypertext structure and included various navigation tools, hyperlinks, and a few interactive activities (e.g., interactive quizzes).

In contrast, participants viewing the low interactive version had minimal navigation options and fewer information categories. The site was analogous to viewing a print advertisement in which consumers are less able to control the experience. Meanwhile, the only way of communicating with the Web site was via a message board, a telephone number, and an e-mail address included at the bottom of the page. In agreement with MaMillan and Hwang (2002) the low interactive site was designed to have fewer interactive features and fewer opportunities for interactive exchange.

## **Pretest**

The purpose of the pretest was to determine whether the participants were able to perceive a significant difference in the level of interactivity. The findings of the pretest served as the basis for improving the study materials and streamlining the study instrument.

### **Pretest Sample and Instruments**

The pretest involved 22 students at the University of Florida including undergraduate and graduate students. A survey questionnaire asked respondents to evaluate the site's level of interactivity. First, the test subjects were randomly exposed to one of the two versions of a Web site – a high or low interactive version. During that time, participants were directed to explore the Web sites and read through the stimulus articles freely. Then, they were asked to answer the pretest questionnaire, a survey questionnaire which asked respondents to evaluate the site's level of interactivity. This measure used selected items from the active control and two-way communication subscales of Liu's (2003) perceived interactivity scale. Respondents were asked to signify their agreement, using ratings from 1 (*strongly disagree*) to 5 (*strongly agree*), with five items, including such statements as "I felt I had a lot control over where I wanted to go on the site," "The Web site gives visitors the opportunity to talk back." "While I was on the Web site, I could choose freely what I wanted to see" and "The Web site makes me feel like it wants to listen to its visitors". Demographic information was collected at the end of the questionnaire (Appendix C).

### **Pretest Result**

The 22 respondents, 8 males (36%) and 14 females (64%), had a mean age of 23.67 years old. Of these respondents, 17 (77.7 %) were seniors and 5 (22.3%) were graduate students. To test the effectiveness of the experimental manipulation, a t-test, with perceived interactivity as the dependent variable and level of technical interactivity as the independent variable, was

performed. As expected, the high-interactivity group rated their site as more interactive ( $M = 4.07$ ,  $SD = 0.26$ ,  $N=11$ ) compared to the low-interactivity group ( $M = 2.43$ ,  $SD = 0.46$ ,  $N= 11$ ). Results of the t-test (as shown in Table 3-1) showed that these differences were statistically significant,  $t=10.243$ ,  $P<0.05$ . This analysis shows that the high-interactivity site was indeed perceived to be more interactive than the low-interactivity site.

### **Main Study**

The main study used a 2 (site sponsors: .gov versus .com) X 2 (interactivity: high interactive Web site versus low interactive Web site) between-subjects experimental design. Web site interactivity was manipulated in the stimulus materials by offering either a high-interactive Web site or low-interactive Web site. The source cue was manipulated by using different site sponsors for the Web site: .gov and .com. The experiment employed a student sample, and participants were randomly assigned to one of four treatment conditions (Table 3-2).

### **Sample and Procedure**

Participants for the experiment were recruited from the University of Florida by means of sending invitation emails to a listserv. The advantage of this method was that it allowed students to complete the experiment at their convenience. One of a series of four links to a health-related Web site was randomly attached to each of the invitation emails. Thus, students were randomly assigned to one of the four health Web sites and allowed to browse them online (Appendix A).

The questionnaire began with an introduction that explained the purpose of the research, the estimated time needed to complete the questionnaire, and a discussion of how the respondents' confidentiality would be protected. Students who volunteered to participate in the study were informed that they were free to withdraw from the study at any time without consequences.

In the next section, participants were asked to read through the Web pages before completing the rest of the questionnaire. After reading the article, they responded to questions or measures related to information source identification, perceived credibility, interactivity, attitude toward the Web site, and Web site evaluation. The first item on the questionnaire asked respondents to write down the name of the Web page which they had just seen. “The health information is taken from the Web. The Web site is \_\_\_\_\_.” Following this item, the credibility items and attitude items were presented for completion. Ten questions asked participants to indicate on a five-point Likert-type scale their level of agreement with statements about the articles and the Web site. At the end of the questionnaire, demographic information was elicited (Appendix D).

### **Independent Variable**

#### **Web Site Interactivity**

Web site interactivity was manipulated by exposing participants to either a high or low interactive health Web site. To ascertain participants' perception of level of interactivity of the Web sites, Web site interactivity was measured in the main questionnaire in such a way as to accommodate manipulation checks by embedding Liu's (2003) perceived interactivity scale in the questionnaire. On a 5-point scale anchored by *strongly disagree* and *strongly agree* respondents were asked to signify their agreement to the following statements: “I felt I had a lot control over where I wanted to go on the site,” “The Web site gives visitors the opportunity to talk back,” “While surfing the website, I had control over what I can do on the site,” “The Web site makes me feel like it wants to listen to its visitors,” and “Overall, the Web site is interactive” (Table 3-3).

## **Source Cues**

Source cue was an independent variable, manipulated by use of two different domains for the Web sites: .gov and .com. In order to achieve the purpose of this experimental design, a question designed to check the manipulation asked respondents to identify the domain of the Web site after participants were exposed to the stimuli.

## **Dependent Variable**

### **Perceived Credibility**

A variety of indicators have been used in past studies to assess perceived credibility of a media message (Gaziano & McGrath 1986; Meyer 1988). Scholars addressing the issue have suggested that credibility is a multidimensional construct (Eastin 2001). The main focus of this study was on perceived credibility of online health information. Adopted from items developed for a study by Meyer (1988) as well as from indicators used by Eastin (2001) in his study on the credibility assessments of online health information, seven dimensions of measures were used for this study: fairness, bias, depth, accuracy, and trustworthiness, believability and factualness (Table 3-3). All have been demonstrated to be valid, reliable attributes by which to measure perceived credibility of a message (Gaziano & McGrath 1986; Johnson & Kaye 1998; Meyer 1988). As with Eastin's (2001) study, the indicators in this study were measured using Likert-type items with scores ranging from 1 to 5.

### **Attitude Toward the Web Site**

Attitude was conceptualized as an evaluative response to the stimulus material—the Web site. In this study, attitude toward a Web site was measured using a five-point semantic differential scale with regard to five questions. The items, following a study by Holbrook and Batra (1987), were anchored with *unfavorable/favorable*, *bad/good*, *dislike/like*, and *negative/positive* (Table 3-3).

## **Web Site Evaluation**

Previous studies examining evaluations of a Web site have emphasized three Web site evaluation dimensions: content, usability, and attitude towards the Web site (Fogg et al.,2002; Hallahan, 2001; Lynch & Horton, 2002). Because this study concerns how increased interactivity, rather than content, might affect users' evaluation of a health Web site, only items for measuring usability and user attitudes were used in this study. The items were as follows: "I found the Web page was clear, " "While I was on the page, I always knew where I was going, " "I found the Web site was confusing, " "I felt disoriented while visiting this Web site," and " The interactive features were easy to use during my exploration of the Web site" (Table 3-3). The general attitude of respondents toward the Web site was gauged with a single item using a seven-point scale, on which respondents were asked to rate their impression of the web site (Table 3-3).

Table 3-1. Result of T-test: perceived the level of interactivity.

		M	SD	N	T	Sig. (two-tailed)
Web site	High interactivity	2.43	0.46	11	10.243	.006**
	Low interactivity	4.07	0.26	11		

Note. \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$

Table 3-2. Conditions of the 2x2 experimental design.

		Source cue	
		.gov Web site	.com Web site
Web site interactivity	High	Group (1)	Group (2)
	Limited	Group (3)	Group (4)

Table 3-3. Construct measurement summary

Variables	Scale items
Interactivity	1. I felt I had a lot control over where I wanted to go on the site
	2. While surfing the Web site, I had control over what I can do on the site.
	3. The Web site makes me feel like it wants to listen to its visitors
	4. The Web site gives visitors the opportunity to talk back.
	5. Overall, the Web site is interactive.
Credibility	1. Accurate
	2. Biased
	3. Believable
	4. Trustworthy
	5. Fair
	6. Satisfactory
	7. Useful
Attitude	1 The Web site was favorable.
	2 The Web site was positive.
	3. I enjoyed exploring the site.
	4. I would like to visit the site again in the future.
	5. I had good impression of the Web site.
Evaluation	1. I found the Web page was clear.
	2. While I was on the page, I always knew where I was going.
	3. I found the Web site was to be confusing.
	4. I felt disoriented while visiting this Web site.
	5. The interactive features were easy to use during my exploration of the Web site.

## CHAPTER 4 RESULT

### **Analysis Summary**

This section provides an overview of the statistical methods and parameters employed to analyze the proposed hypotheses and explore the research questions. SPSS 17.0 was used for the statistical analysis.

An independent sample t-test was employed to explore H1 (source cue-information credibility), H3 (interactivity-information credibility), H2 (source cue-attitude), and H3 (interactivity-attitude). In addition, a regression analysis was run to explore the relationship between perceived source cue, interactivity, and attitude toward the Web site. To test Hypothesis 5, an ANOVA was performed to determine whether level of interactivity affected users' Web site evaluation. Then, independent simple t-tests were used to compare the mean differences between the groups in pairs. The first section following provides descriptive statistics for all respondents involved in the experiment. The second section following is devoted to addressing the results as they related to the hypotheses.

### **Profile of Participants**

The study sample included 136 university students comprised of 56% (n=76) males and 44% (n=60) females. The respondents ranged in age from 18 to 36 with a mean age of 24.24 years old. All respondents subject to analysis in this experiment were graduate or undergraduate students at the University of Florida. Most respondents were graduate students (55.1%), and the remainders were undergraduates. In terms of academic classification, 9 (6.6%) were sophomores, 14 (10.2%) were juniors, 38 (27.9%) were seniors and 75 (55.1%) were graduate students.

The 136 participants were randomly assigned to one of four conditions (Table 4-1). Of the respondents, 34 were in the low interactive Web site and .com source group, 34 were in the high

interactive Web site and .com source group, 34 were in the low interactive Web site and .gov source group, and 34 were in the high interactive Web site and .gov source group.

### **Manipulation Check**

To test the effectiveness of the experimental manipulation, a manipulation check regarding perceived level of interactivity was performed. As expected, the high-interactive groups rated their sites as more interactive ( $M = 3.91$ ,  $SD = 0.51$ ,  $n = 63$ ) compared to the low-interactive groups ( $M = 2.90$ ,  $SD = 0.69$ ,  $n = 63$ ). Results of the independent sample t-test (as shown in Table 4-2) showed that these differences were statistically significant,  $t = -9.363$ ,  $P < .05$ . Consistently with the results of the pretest, the manipulation check for perceived level of interactivity demonstrated that the manipulation was successful.

In addition, a manipulation check for source cue was also conducted to check for potential problems related to respondents not exploring the Web site before answering the questionnaire. Among the 136 respondents, about 93% ( $N = 126$ ) could correctly identify the topic of the health information and the name of the Web site through the main page. The data from 10 participants who misidentified the source and the topics of the stimulus articles were eliminated from the subsequent analysis; thus, the total valid sample was 126.

Of the valid sample, 31 were in the low interactive Web site and .com source group, 32 were in the high interactive Web site and .com source group, 32 were in the low interactive Web site and .gov source group, and 31 were in the high interactive Web site and .gov source group (Table 4-3). To further test the proportion of undergraduate and graduate students in each group was no significant difference, a chi square test was conducted. The result showed that the percentage of participants that were undergraduate students did not differ by graduate students,  $\chi^2 (3, N = 126) = 0.98$ ,  $p = .81$  (Table 4-4).

## **Reliability Checks**

In order to ensure the internal reliability of the independent and dependent measures used in this study, a reliability analysis was conducted for each construct which addressed perceived source credibility, usability, and interactivity as well as the users' attitude toward the Web site.

A Cronbach's alpha was conducted to evaluate whether the items within each index had high internal reliability. The Alpha is a coefficient that indicates how well items measuring the same characteristic correlate with one another (Hon & J. E. Grunig, 1999). Generally, reliability coefficients over .90 are considered "excellent," over .80 are considered "very good," and values over .70 are perceived as "adequate" (Kline, 1998).

The results (as shown in Table 4-5) for the major constructs showed that the reliability of each variable was satisfactory, and that the scales were internally consistent. Regarding the independent variables, items under the category of interactivity showed a Cronbach's alpha in excess of  $\alpha=.90$ . The dependent variables, including information credibility (Cronbach alpha=.85), usability (Cronbach alpha=.89), and attitude toward the site (Cronbach's alpha=.92), were also confirmed to be reliable constructs. The factor structure and item means and standard deviations appear in Table 4-5.

## **Sample Analysis**

The sample population for this study consisted of 136 university students. Of these, questionnaires collected from 126 were deemed valid, yielding various numbers of respondents for each condition. Among the respondents, 99.3 % (n = 124) reported using computer for more than one year, and 71 % (n = 90) of respondents reported having been Internet users for six years or more. In addition, about 69% percent (n = 86) of respondents reported spending 2-5 hours getting general information from the Internet every day (Table 4-6).

In terms of general usage of the Internet for health information, a sizeable portion of respondents (44 %, n = 56) reported using the Internet to look up health information a few times a year. A total of 31 % (n = 39) of respondents reported using the Internet for that purpose about once a month, 11% (n= 14) reported doing so about once a week, and 4 % (n= 5) reported doing so more than once a week. Only 10% (n=12) of respondents reported that they never used the Internet to look up health information (as shown in Table 4-6).

## **Research Questions and Hypothesis Testing**

### **Effect of Source Cue and Interactivity on Perceived Credibility**

- **H1:** Participants viewing online health information on a .gov Web site will rate that information as being more credible than will participants viewing the same information on a .com Web site.

An independent sample t-test was employed to measure the difference in credibility mean scores from the two sources. The credibility mean score of the .gov Web site (M=3.76, SD=0.44, n=63) was significantly higher than that of the .com Web site (M=3.43, SD=0.56, n=63), suggesting that the health information from the .gov Web site was perceived as being more credible than that from the .com Web site ( $t=-3.73$ ,  $P<.05$ ) (Table 4-7). Therefore, Hypothesis 1 was supported.

- **H2:** Participants will rate health information on high interactive Web sites as being more credible than will participants viewing the same information on low interactive Web sites.

The next set of results examined interactivity in terms of its influence on perceived credibility of online health information. The research question asked whether different levels of Web site interactivity would affect user perceptions of information credibility. An independent sample t-test showed no significant differences attributable to interactivity ( $t=1.33$ , n.s.) (Table 4-8). Thus, Hypothesis 3 was not supported.

### **Effect of Source Cue and Interactivity on User Attitudes**

- **H3:** Participants viewing online health information from a .gov Web site will demonstrate a more positive attitude toward that Web site than those viewing the same health information on a .com Web site.

In order to understand source cue effect on user attitudes toward a Web site, Hypothesis 2 predicted a more positive attitude toward a health Web site in which content was coming from a government Web site ( $M=3.36$ ,  $SD=0.69$ ,  $n=63$ ) as opposed to a commercial Web site ( $M=3.08$ ,  $SD=0.70$ ,  $n=63$ ). An independent sample t-test was performed to explore how the two groups differed in terms of mean scores concerning attitude. The t-test showed that the data supported Hypothesis 2 ( $t=-2.25$ ,  $P<.05$ ) (Table 4-9).

- **H4:** High (versus low) interactivity will yield more favorable consumer attitudes toward a Web site.

To examine the effect of interactivity on attitude, an independent sample t-test was performed to compare the attitude mean difference between the high and low interactive groups. The results indicated that respondents' attitude mean score was significantly higher for the high interactive health Web site ( $M=3.53$ ,  $SD=0.43$ ,  $n=63$ ) than for the low interactive health Web site ( $M=2.91$ ,  $SD=0.69$ ,  $n=63$ ) (Table 4-10). Therefore, Hypothesis 4 was supported ( $t=-5.48$ ,  $p<.05$ ).

### **Effect of Interactivity on Web Site Evaluation**

- **H5:** Participants viewing online health information from a high interactive Web site will evaluate the Web site more positively in terms of usability and general attitude than those viewing a Web site with low interactivity.

With regard to Hypothesis 5, interactivity would influence two aspects of Web site evaluation: usability and general attitude toward the Web site. Specially, it was predicted that exposure to high interactivity Web site would lead to more positive evaluations of the Web site. An ANOVA was performed to determine the correlation between the two constructs. The hypothesis

was supported for both usability [ $F(1, 124) = 21.64, p < .001$ ] and general evaluation of the Web site [ $F(1, 124) = 22.46, p < .001$ ]. Table 4-11 and Table 4-12 display the ANOVA results.

In particular, t-tests were performed to determine how the level of interactivity differently affected usability and general attitude mean scores. Results showed that the means for usability for a high interactive web site were significantly higher ( $M = 5.36, SD = 0.85, n = 63$ ) than for a low interactive web site ( $M = 4.54, SD = 1.10, n = 63$ ) ( $t = 4.65, P < .001$ ) (Table 4-13).

A second t-test was performed to examine the effect of the different levels of interactivity on users' overall impression of the Web site. The results suggested that the overall impression of the high interactive Web site ( $M = 3.68, SD = 0.76, n = 63$ ) was significantly higher than of the low interactive web site ( $M = 3.05, SD = 0.81, n = 63$ ) ( $t = 4.54, P < .000$ ) (Table 4-14). In sum, increasing interactivity seems to have stronger impact on Web site evaluation.

### **Additional Finding**

Pervious results revealed that both source cue and interactivity significant related consumers' attitude toward the Web sites. To further explore the suggested causal relationships between the proposed independent and dependent variables, simple linear regression analyses were employed to examine how source cue and interactivity predicted perceived attitude toward Web sites. Table 4-15 summarized how the two constructs were related to consumer attitudes toward the Web sites. The regression coefficient showed a positive correlation between source cue, interactivity and attitudes, and the relationship was statistically significant,  $R^2 = .237, F(2, 123) = 19.126, p < .05$ . The results were consistent with previous independent simple t-tests. Moreover, the regression coefficient showed Web site interactivity (Beta-.445) was stronger predictor influence on consumers' attitude toward Web site than source cue (Beta -.205).

Table 4-1. Random assignment of participants in each condition.

	.gov Web site	.com Web site	Total
High interactivity	N=34	N=34	N=68
Low interactivity	N=34	N=34	N=68
Total	N=68	N=68	N=136

Table 4-2. Result of T-test: perceived the level of interactivity.

	M	SD	N	t	Sig. (two-tailed)
High interactivity	3.91	0.51	63	-9.36	.000***
Low interactivity	2.90	0.69	63		

Note. \*p<.05, \*\*p<.01, \*\*\*p<.001

Table 4-3. Valid sample in four conditions.

	.gov Web site	.com Web site	Total
High interactivity	n=31	n=32	n=63
Low interactivity	n=32	n=31	n=63
Total	n=63	n=63	n=126

Table 4-4. Cross tabulation of four conditions and academic classification

Academic classification	Groups				X <sup>2</sup>	P
	Low.com	High.com	Low.gov	High.gov		
Undergraduate	14	16	13	12	0.98	.81
Graduate	17	16	19	19		

Note. \*p<.05, \*\*p<.01, \*\*\*p<.001

Table 4-5. Reliability Check

Variable	Mini	Max	Mean	Cronbach's alpha
Web site interactivity	3.32	3.50	3.41	.90
Perceived credibility	3.44	3.80	3.60	.85
Usability	4.73	5.19	4.94	.89
Attitude toward the web site	2.79	3.50	3.22	.92

Table 4-6. General usage of Internet

	Frequency	Percent
Years for being an internet user		
A year ago	2	0.7%
Two or three years ago	9	6.9%
Four years ago	12	9.1%
Five years ago	13	9.3%
Six years or more	90	71%
Total	126	100%
Average hours on getting information from the internet everyday		
1	23	18%
2-5	86	69%
6-10	13	10%
More than 10	4	3%
Total	126	100%
Usage of internet to look up medical information		
Never	12	10%
A few times a year	56	44%
About once a month	39	31%
About once a week	14	11%
More than once a week	5	4%
Total	126	100%

Table 4-7 Result of T-test: source cue- information credibility.

		M	SD	N	T	Sig. (two-tailed)
Source cue	.com	3.43	0.56	63	-3.73	.012*
	.gov	3.76	0.44	63		

Note.1. *Dependent variable: information credibility*

2. \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$

Table 4-8 Result of T-test: Interactivity-information credibility

		M	SD	N	T	Sig. (two-tailed)
Interactivity	High (web site)	3.66	.51	63	1.33	.n.s
	Low (web site)	3.54	.54	63		

Note.1. *Dependent variable: information credibility*

2. \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$

Table 4-9. Result of T-test: source cue-attitude

		M	SD	N	T	Sig. (two-tailed)
Source cue	.com(web site)	3.08	.70	63	-2.25	.026*
	.gov (web site)	3.36	.69	63		

Note.1. *Dependent variable: consumer attitude toward Web site*

2. \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$

Table 4-10. Result of T-test: Interactivity-attitude

		M	SD	N	T	Sig. (two-tailed)
Interactivity	Low (web site)	2.91	.69	63	-5.48	.000***
	High (web site)	3.53	.58	63		

Note.1. *Dependent variable: consumer attitude toward Web site*

2. \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$

Table 4-11 Effects of Source &amp; Interactivity on Perceived Usability

Source of variation	Sum of squares	df	f	Significance
Source	.09	1	.09	N.s
Interactivity	21.00	1	21.64***	.000
Source*interactivity	.29	1	.30	N.s

Note.  $N=126$ , \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$

Table 4-12 Effects of Source &amp; Interactivity on general attitude toward Web site

Source of variation	Sum of squares	df	f	Significance
Source	12.92	1	7.07	N.s
Interactivity	21.00	1	22.46***	.000
Source*interactivity	2.22	1	3.86	N.s

Note.  $N=126$ , \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$

Table 4-13. Result of T-test: Interactivity-usability

		N	SD	M	T	Sig.
Interactivity	Low (web site)	63	1.10	4.54	4.65	.000***
	High (web site)	63	.85	5.36		

Note.1. *Dependent variable: usability*

2. \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$

Table 4-14. Result of T-test: Interactivity-general attitude

		N	SD	M	T	Sig.
Interactivity	Low (web site)	63	.81	3.05	4.54	.000***
	High (web site)	63	.76	3.68		

Note.1. *Dependent variable: general attitude*

2. \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$

Table 4-15. Regression analysis of consumer attitude toward the Web site

Dependent variable: attitude toward the web site								
	R	R <sup>2</sup>	Adjusted R <sup>2</sup>	F	Sig.	Beta	T	Sig.
model	.49	.24	.23	19.14	.000***			
Perceived source cue						-.22	-2.61	.010*
Perceived interactivity						-.46	-5.61	.000***

Note. 1. \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$

## CHAPTER 5 DISCUSSION AND CONCLUSION

The chapter begins with a summary of the present study, followed by a detailed analysis of conclusions related to the hypotheses. Next, a discussion of the implications for theoretical and practical perspectives is provided. Finally, the chapter concludes with limitations and recommendations for future research.

### **Summary**

The present study combined the concept of source credibility and interactive feature cues to better understand how consumers process information and how these factors jointly affect the perceptions of online health information credibility, as well as the attitude consumers have toward Web site and Web site evaluation. One focus of this research was to investigate how consumers respond to two different sources of information and form attitudes toward the Web sites. Two distinct sources of information were examined in this study, including .gov and .com. Another focus of this study was to explore the influence of Web sites' interactivity. Past studies have examined individual elements of site presentation such as navigation, interactivity, and links, in terms of credibility assessment. However, little research has empirically addressed the key issues of the overall level of interactivity and its effect on perceived credibility, attitude toward a Web site, and evaluation. Therefore, both source cue and the level of interactivity were simultaneously examined in this study.

An experimental design was employed to test the concept idea which discuss above. Participants were exposed to health information attributed to a source form either a .gov or .com website. The Websites they explored were also portrayed as either from a company with high interactivity or one with limited interactivity. A professional Web designer created a fictitious Web site. This study sought to clarify how consumers' perceived information credibility,

attitudes toward a Web site, and Web site evaluation were influenced by their assessments of interactivity and source cue.

The results of the study indicated several important findings. First, there was a statistically significant positive correlation between source cue and perceived information credibility. The finding indicated that source cue has a positive effect on perceived information credibility. In other words, respondents considered the source of health information provided from a government Web site was deemed significantly more credible than a commercial Web site. This finding suggested that online users are concerned with who the message's sender is. In terms of consumer's attitude toward a Web site, the study showed that both source and interactivity effect consumer's attitude toward Health Web sites. Furthermore, interactivity had a more significant influence on consumer's attitude toward Health Web sites than source cue. Additionally, increased interactivity could lead to more positive evaluations of the Web site. In sum, the more interactive features such as navigation menus and chat rooms, the more positive participants' attitude were toward the Web site and the evaluation.

From the health communication perspective, this study allows for greater understanding of the source cue and interactive features on health Web sites. This study could inform the work of scholars interested in examining information credibility of health Web sites as well as aid in understanding the strategic use of interactive features in maintaining positive attitudes. As concern for finding credible online health information grows (Pew study & American Life Project, 2000), knowing how consumers determine the credibility of health Web sites and building a positive consumer attitude toward organizations will garner more importance.

### **Overview of Hypothesis**

To better understand the findings, each of the five hypotheses is discussed in detail based on the results of this study.

Hypothesis 1 was supported. The data showed that source cue was significantly related to perceived information credibility. These results contrasted with those of previous studies, which observed a positive impact of identify source on determined credibility and quality of information (Eysenbach & Kohler, 2002). Participants who received the health message from a government Web site evaluated the message to be more trustworthy, believable, or accurate than the health message from a .com Web site. Due to the lack of publication controls on the Web, users may look for trustworthy credibility markers such as a reputable institutional as a source. Following by the Elaboration Likelihood Model (Petty & Cacioppo, 1986), readers judge the information's credibility by learning on the peripheral cues such as sponsorship of a site when they have less motivated, personal relevance, and knowledge about a given topic. Therefore, a positive relationship between source cue and perceived information credibility might be more easily observed when respondents encounter an unfamiliar topic. Since the stimulus articles in this study presented a health topic related to depression, the effect of a source cue might be a main factor in shaping message receivers' evaluations of perceived information credibility.

Hypothesis 2 anticipated that Web site interactivity predicts perceived information credibility; however, this was not supported. There was no difference in credibility between highly interactive Web sites and limitedly interactive Web sites. This finding was surprising because they run counter to what the literature predicted. Although previous research has suggested a positive association between perceived credibility and interactive features, the simple independent t-tests in this study indicated that for both source cue and interactivity, only source cue significantly predicts perceived information credibility. This would tend to indicate that the participants didn't consciously consider interactive features' presence on the health Web site as an important factor in their determination of information credibility. Instead, the source

cue plays a more important role. In addition, whether participants use the interactive features on the Web site or not may influence their perceptions of credibility assessment. The influence of interactivity on credibility assessment may be observed when participants used interactive content (Kiouisis, 2003).

Hypothesis 3 stated that the source is positively related to consumer attitude about the Web site. Consistent with the body of extant literature, companies with highly credible sources indeed yielded positive consumer attitudes compared to those with lowly credible sources (Hovland & Weiss, 1951; Lafferty et al., 2002; MacKenzie & Lutz, 1989). The present study confirmed the effects of site sponsors on perceived credibility and attitude toward Web sites in the field of health communication. Specifically, the government Web site would be perceived as users who possess higher levels of determining information credibility. Thus, the higher perceived information credibility can lead to more favorable attitudes toward a Web site.

Regarding Hypothesis 4, it was found that interactivity is positively related to attitudes toward the Web site. Based on extensive regression analyses, the results demonstrated a strong and highly predictable relationship between perceived interactivity and consumer attitude toward the health Web site. It was consistent with previous study, the more interactive features that present, such as navigation menu, hyperlink, and chat room, the more positive participants' attitudes improved toward the health Web site (Lustria, 2007).

Hypothesis 5 explored the effect of interactivity on Website evaluation. The data showed that interactivity was significantly related to Website evaluation. Highly interactive Web sites lead to a higher rating of evaluation than limited Web sites. The hypothesis was supported by both usability and general evaluation of the health Web site. This implies that interactivity may play an important role in evaluating different aspects of Web sites as well as creating a more

positive impression of the health Web site. In sum, a highly interactive Web site affects not only the attitude toward the Web site, but also impacts the Web site evaluation.

### **Conclusion and Implication**

Different factors in predicting perceptions of online health information credibility have long been of interest to scholars and marketers. Grounded on a proposed concept that considers both source and Web site interactivity cues applied by consumers to evaluating information and forming attitudes, this study provided empirical results about the differences in perceived credibility across different genres of Web sites.

One of the important findings in this study is that there is a difference in perceived credibility between a health message coming from a government Web site or a commercial Web site. It highlighted and tested several relationships among important different source cues and their connections to persuasion. Previous research has showed that users generally consult only the most popular site or sites of health-related information found through general Internet search engines (Morahan-Martin, 2001). When there is a variety of health information available from different Internet sources, it isn't easy for consumers to discern the difference between highly credible and incredulous sources of health information. However, this study's findings indicated that when evaluating health information on the Internet, users did take source credibility into greater account. Participants who received the health message from a government Web site consider the information more credible than from a .com Web site. This implies that government Web sites reflect a trustful provider in seeking out high-quality information on the Internet.

Another meaningful finding, this research contributed to understanding of the attitude change process based on both sources and interactivity cues. The result demonstrated that consumer attitude is highly related to Web site interactivity. Meanwhile, attitude could be changed positively by providing information from highly credible sources. It builds positive

attitudes between corporations and consumers depending on the perceived trustworthiness and expertise of a given source. From a theoretical standpoint, this study provides an additional explanation of how these two factors influence information processing and attitude formation. Furthermore, this represents the most important contribution toward our understanding of interactivity's effects in previous interactivity study.

In terms of relevant, practical implications, companies pay lots attention to establishing and maintaining a positive corporate image in the online environment. This study's findings showed that increased Web site interactivity also impacts perceived usability and general evaluation of the health Web site. Participants tend to evaluate a health Web site with more interactive features as easier to use, better organized, and more functional. This implies that interactivity may play an important role in attracting health-information seekers and in maintaining their attention. In other words, it seems that a health Web site with highly interactive functions lead to a more positive impression and engagement among the users. Therefore, the presentation of Web site becomes a focal point if organizations seek to elicit favorable attitudes from or build long-term relationships with customers and other stakeholders. For health communication practitioners who try to create positive images online, increasing the interactive features on the Web page may be a good way to achieve their goals.

In summary, the credibility of online health information has become of significant concern to health communication professionals and consumers. Many studies have examined the role of various elements in predicting perceptions of information credibility in the online environment (Burkell, 2004; Flanagin & Metzger, 2000; Fogg, 2003; Fogg et al., 2001; Hong, 2006; Nettleton et al., 2004), but little research has empirically addressed the key issues of source cue and interactivity in terms of credibility and its effect on attitude toward a Web site. To

bridge such a gap, this study attempted to empirically examine the effects of different source cues and interactivity on perceived information credibility and attitude toward a Web site. In addition, the present study tested whether the level of interactivity can improve the evaluation of a Web site. The results yielded inspiring conclusions that a government Web site could serve as an effective communication resource to foster trust. Moreover, the results indicated that taking advantage of more interactive features in the Website has beneficial effects on the consumers. Finally, overall Website evaluation seems to have important implications for health communication practitioners because those overall perceptions are likely to increase organizations' positive image in the online environment.

### **Limitations and Future Research**

Despite the implications, there are some limitations worth consideration in the present study. An experimental design is appropriate for this research; it allows controls for variables regarding source credibility and interactive features, and thus enables the researcher to observe the effect of interactive features and perceived source expertise on information credibility. The employment of real-world health information in the experiment provided external validity. However, using a fictitious Website to display it did not truly resemble those actually encountered by respondents in the natural condition. Thus, one might argue that the perceived credibility and subsequent attitude change based on these materials cannot be applied to real-world situations. Future studies should attempt to replicate the study employing real health Web sites. Also, scholars recommend triangulation for studying new media (Williams, Rice & Rogers, 1998), and other methodology should be adopted for future research in this area. For example, qualitative designs (e.g. interviewing), could be consider an alternative approach to better understand the way consumers search for health related information and to clarify the difference in perceived information credibility among different sources.

Moreover, the study finding confirmed a significant relationship between the level of interactivity and participants' attitudes toward health Websites. However, Interactivity here was narrowly defined by actor control (navigation menu and hyperlink) and two-way communication (feedback forms, chat room and e-mail), and yet did not include all the possible features that could make Websites truly interactive such as modality content (e.g., Sims, 1995), audio or video downloads, register devices, etc. Future analysis should continue to investigate the impact of interactivity on assessments of credibility by enhancing the level of Web site interactivity. Also, it is unclear what feature attracts and engages users most. It is also needed to examine what particular features of Web sites contribute to more positive attitudes towards the site for future research.

Furthermore, the data showed participants who received the health message from a government Website did evaluate the message to be more credible than the health message from a .com Website. The commercial Web site was a relatively low-credibility assessment because of the implied commercial self-interest of the site sponsors (Wather, Wnag & Loh, 2004). However, there are various types of Web sites available on the Internet for providing health information. For example, users would probably be more likely to visit sites recommended by peers; it is known that educational Websites receive more referrals among students (Metager, 2002). It would be interesting to explore perceived information credibility based on the various sponsors of Websites such as .org and .edu.

It must be noted that the student sample do not represent the whole population. Although students are the heaviest groups of Internet users (Eastin, 2001), who use the Internet as their information sources than other subject groups, they can only reveal a narrowed scope of consumer perceptions and behaviors. Their perceptions of credible online health information are

also different from that of people from other generations; this is another limitation of this research. Therefore, the results of present study cannot be generalized beyond this specific population. Replicating the present study with more representative samples could enrich future studies. In addition, future studies would be valuable to test the impact of interactivity levels on perceptions of credibility and positive attitudes in a more heterogeneous sample. Different characteristics (e.g. age, race, socioeconomic status, educational attainment), may directly or indirectly affect performance in online environment.

Because the consumers' judgment of credibility builds on a complex environment, other conditions should be considered. For example, user factors such as the purpose and motivation for information search, prior knowledge, and Internet experience also influence the perceptions of credibility during an evaluation (Fogg et al., 2003). While consumers search or surf for the online health information, they may perceive the content of Web sites differently; their motivation may influence those using interactive applications, which may facilitate or impede perceptions of credibility.

Kahle and Homer (1985) found that the level of involvement with the issue influences participants' processing of the information and evaluation. To illustrate, factors having to do with site content and source were relevant to judgments of site credibility, whereas factors such as audience will likely be equally important in assessment of the credibility of health website. Thus, future studies concerned with the influence of source and interactive feature should also consider the control of the audience factors.

In conclusion, the results of this study suggest several areas for future research. Studies should continue to investigate the impact of source cue and interactivity on assessments of online health information credibility. Increasing understanding of the ways that consumers determine

the quality of online health information will help publishers produce a more trusted and accepted messages.

# APPENDIX A WEBSITE LAYOUT



Figure A-1. High interactive health Web site layout for government source.  
[http://www.cise.ufl.edu/~yystsai/Dora/highgov/What\\_is\\_depression.html](http://www.cise.ufl.edu/~yystsai/Dora/highgov/What_is_depression.html)



Figure A-2. Limited interactive health Web site layout for government source.  
<http://www.cise.ufl.edu/~yystsai/Dora/lowgov/2.html>

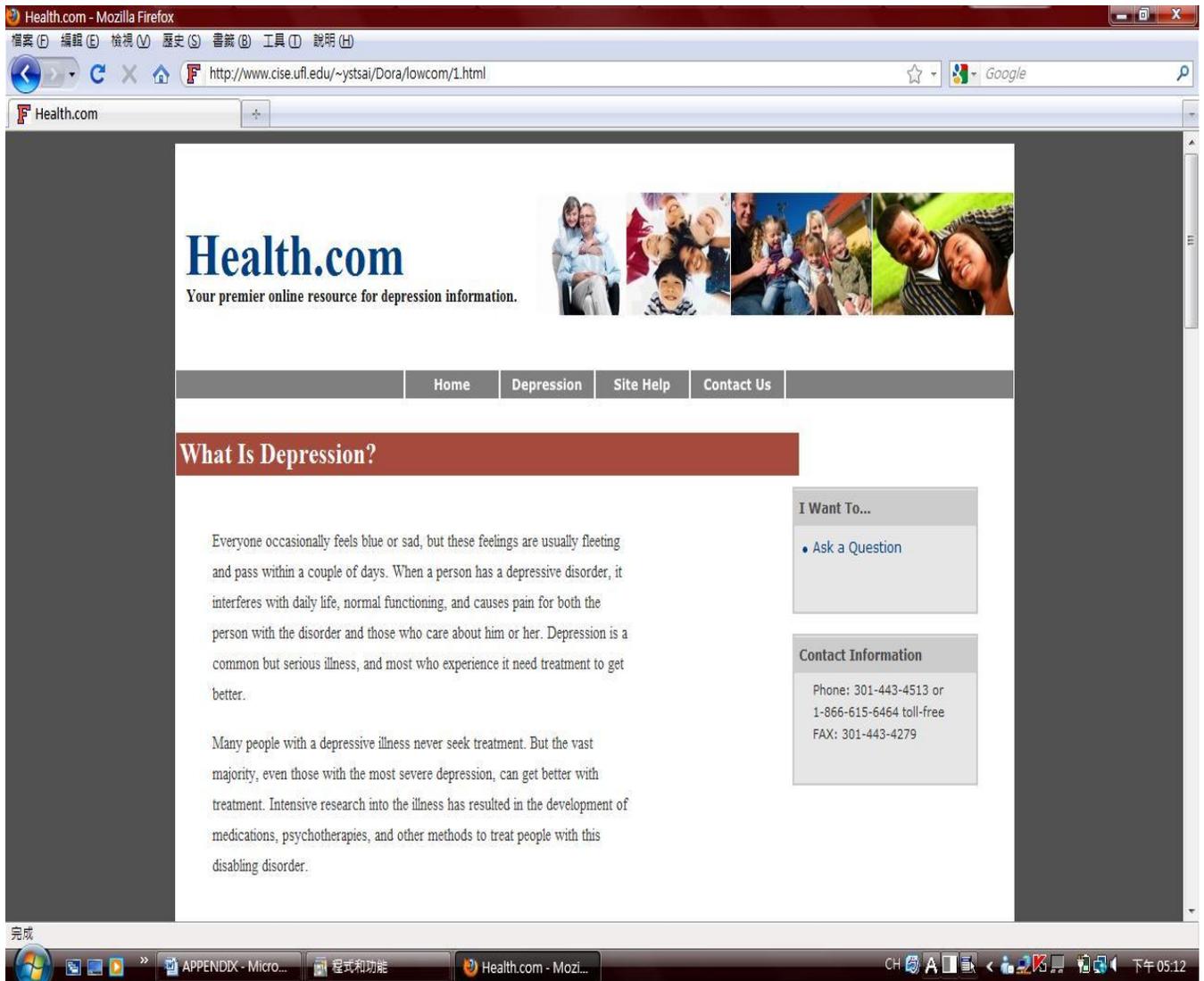


Figure A-3. High interactive health Web site layout for commercial source  
[http://www.cise.ufl.edu/~yystsai/Dora/highcom/What\\_is\\_depression.html](http://www.cise.ufl.edu/~yystsai/Dora/highcom/What_is_depression.html)

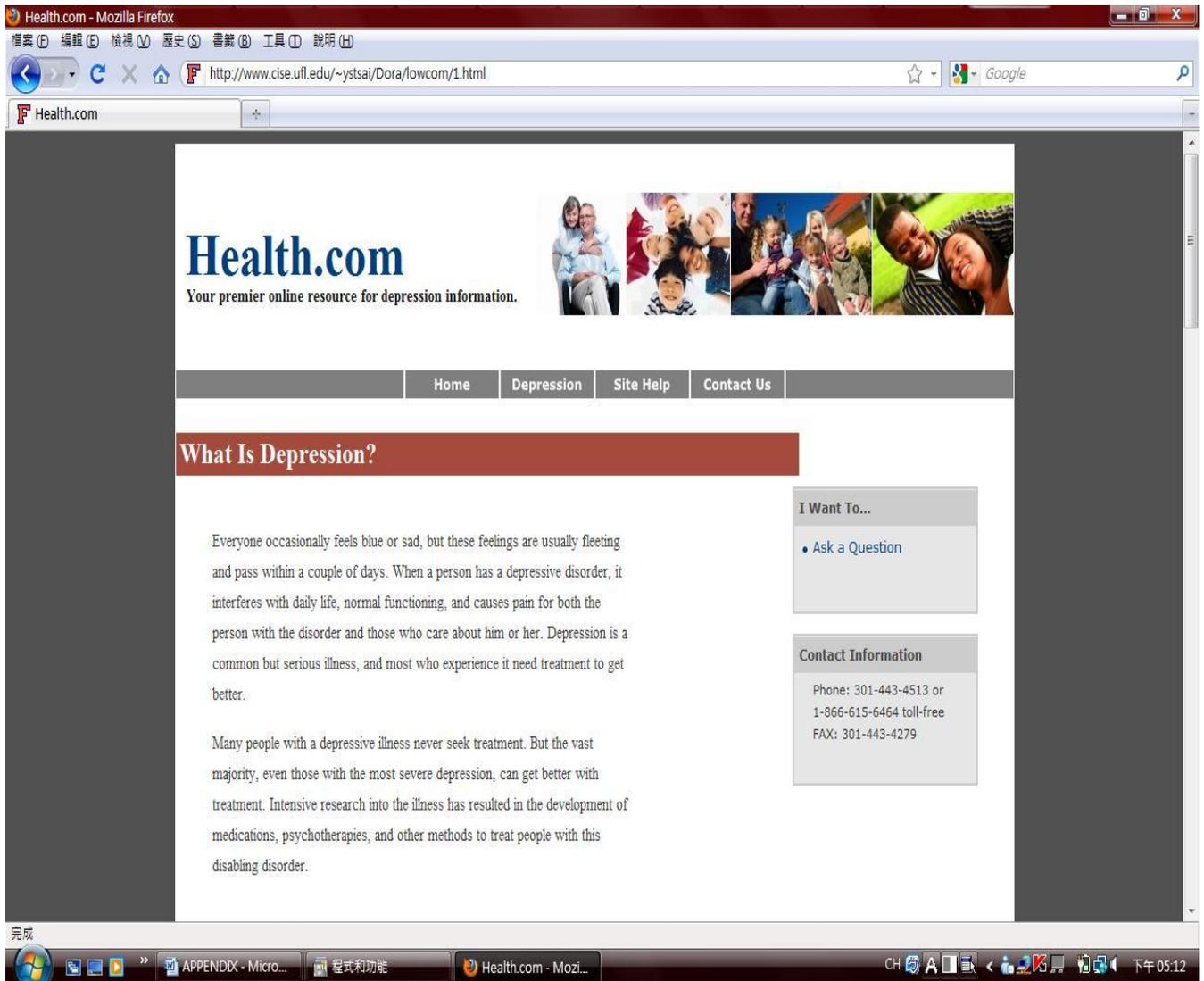


Figure A-4. Limited interactive health Web site layout for commercial source.  
[http://www.cise.ufl.edu/~yystsai/Dora/lowcom/What\\_is\\_depression.html](http://www.cise.ufl.edu/~yystsai/Dora/lowcom/What_is_depression.html)

APPENDIX B  
HEALTH INFORMATION POST ON WEB SITE: DEPRSSION

**Centers for Disease Control and Prevention (CDC, 2009)**  
**What Is Depression?**

Everyone occasionally feels blue or sad, but these feelings are usually fleeting and pass within a couple of days. When a person has a depressive disorder, it interferes with daily life, normal functioning, and causes pain for both the person with the disorder and those who care about him or her. Depression is a common but serious illness, and most who experience it need treatment to get better.

Many people with a depressive illness never seek treatment. But the vast majority, even those with the most severe depression, can get better with treatment. Intensive research into the illness has resulted in the development of medications, psychotherapies, and other methods to treat people with this disabling disorder.

**What Causes Depression?**

There is no single known cause of depression. Rather, it likely results from a combination of genetic, biochemical, environmental, and psychological factors.

Research indicates that depressive illnesses are disorders of the brain. Brain-imaging technologies, such as magnetic resonance imaging (MRI), have shown that the brains of people who have depression look different than those of people without depression. The parts of the brain responsible for regulating mood, thinking, sleep, appetite and behavior appear to function abnormally. In addition, important neurotransmitters-chemicals that brain cells use to communicate-appear to be out of balance. But these images do not reveal why the depression has occurred.

Some types of depression tend to run in families, suggesting a genetic link. However, depression can occur in people without family histories of depression as well. Genetics research indicates that risk for depression results from the influence of multiple genes acting together with environmental or other factors.

In addition, trauma, loss of a loved one, a difficult relationship, or any stressful situation may trigger a depressive episode. Subsequent depressive episodes may occur with or without an obvious trigger.

**What Are The Symptoms of Depression?**

People with depressive illnesses do not all experience the same symptoms. The severity, frequency and duration of symptoms will vary depending on the individual and his or her particular illness

Symptoms:

- Persistent sad, anxious or “empty” feelings
- Feelings of hopelessness and/or pessimism
- Feelings of guilt, worthlessness and/or helplessness
- Irritability, restlessness
- Loss of interest in activities or hobbies once pleasurable, including sex
- Fatigue and decreased energy
- Difficulty concentrating, remembering details and making decisions
- Insomnia, early-morning wakefulness, or excessive sleeping
- Overeating, or appetite loss
- Thoughts of suicide, suicide attempts
- Persistent aches or pains, headaches, cramps or digestive problems that do not ease even with treatment

### **How Can I Help a Friend or Relative Who Is Depressed?**

If you know someone who is depressed, it affects you too. The first and most important thing you can do to help a friend or relative who has depression is to help him or her get an appropriate diagnosis and treatment. You may need to make an appointment on behalf of your friend or relative and go with him or her to see the doctor. Encourage him or her to stay in treatment, or to seek different treatment if no improvement occurs after six to eight weeks.

Help a friend or relative:

- Offer emotional support, understanding, patience and encouragement.
- Engage your friend or relative in conversation, and listen carefully.
- Never disparage feelings your friend or relative expresses, but point out realities and offer hope.
- Never ignore comments about suicide, and report them to your friend’s or relative’s therapist or doctor.
- Invite your friend or relative out for walks, outings and other activities. Keep trying if he or she declines, but don’t push him or her to take on too much too soon. Although diversions and company are needed, too many demands may increase feelings of failure.
- Remind your friend or relative that with time and treatment, the depression will lift.

APPENDIX C  
INSTRUCTIONS TO SUBJECTS

Dear Student:

My name is ChiaLun Lee and I am a graduate student working under the supervision of Dr. Lee. You are being asked to participate in an experiment designed to examine consumers' responses to online health information. You will be asked to view a Health Web site and to indicate your thoughts and feelings about the Web site. This research project was designed solely for research purposes and no one except the research team will have access to any of your responses. All responses will be kept confidential. The survey is anonymous.

Your participation in this project is voluntary. You do not have to answer any question(s) that you do not wish to answer. Please be advised that you may choose not to participate in this research, and you may withdraw from the experiment at any time without consequence. Non-participation will not affect your grade. There is no direct benefit or compensation for participation. This experiment will take approximately 20 minutes during your regularly scheduled class time. There are no anticipated risks associated with participation.

If you have any questions or comments about this research, please contact chialun, lee, college of Journalism and Communications, University of Florida, 352-870-3426/buzz1020@ufl.edu. Questions or concerns about research participants' rights may be directed to the UFIRB office, Box 112250, University of Florida, Gainesville, FL 32611-2250; phone 392-0433.

Sincerely,  
Chialun Lee

Agreement:

I have read the document stating the procedures to be used and followed in this study. I AGREE to participate in the study

**PLEASE CLICK ON NEXT BELOW IF YOU AGREE WITH THE ABOVE INFORMATION.**

APPENDIX D  
QUESTIONNAIRE FOR PRETEST

INTRODUCTION

Thank you for taking time to participate in this study. The purpose of this research is to check if consumers can perceive a significant difference in the level of interactivity on a Website. Please read the following questions carefully, and check one choice from the scale that best describes your thoughts or feelings. Your answers will be used only for statistical purposes and will remain strictly confidential. Thank you!

Section 1. How do you agree/disagree with the following statements?

1. I felt that I had a lot of control over my experiences at this web site.  
Strongly disagree (1) (2) (3) (4) (5) (6) (7) Strongly agree
2. While I was on the Web site, I could choose freely what I wanted to see.  
Strongly disagree (1) (2) (3) (4) (5) (6) (7) Strongly agree
3. While surfing the website, I had control over what I can do on the site.  
Strongly disagree (1) (2) (3) (4) (5) (6) (7) Strongly agree
4. The Web site makes me feel like it wants to listen to its visitors  
Strongly disagree (1) (2) (3) (4) (5) (6) (7) Strongly agree
5. The Web site gives visitors the opportunity to talk back.  
Strongly disagree (1) (2) (3) (4) (5) (6) (7) Strongly agree

Section 2. Demographics

1. Gender: ( ) Male ( ) Female
2. Age: \_\_\_\_\_
3. Current level of education:  
( ) Freshman ( ) Sophomore ( ) Junior  
( ) Senior or post-baccalaureate ( ) Graduate Student

Thank you very much for your participation!

APPENDIX E  
QUESTIONNAIRE FOR EXPERIMENT GROUP

INTRODUCTION

Thank you for taking the time to answer the questions in this survey. I'd like to get your opinions on the online health information you just read. Please circle the number that best describes your thoughts or feelings. Your answers will be used only for statistical purposes and will remain strictly anonymous to the extent provided by law. Please read the instructions and questions carefully.

**Section 1. Please answer the following questions.**

1. The health information is taken from the Web. Please identify the name of Web site.  
Health.gov [ ] Health.com [ ] Not Sure [ ]
2. What is the health information discussed in the Web site?  
Diabetes [ ] Depression [ ] Breast Cancer [ ]

**Section 2. Evaluation of Credibility**

**Please evaluate the health information you just read about the following statements.**

1. The health information presented in this Web site was accurate.  
Not at all accurate (1) (2) (3) (4) (5) Very accurate
2. The health information presented in this Web site was biased.  
Complete bias (1) (2) (3) (4) (5) No bias
3. The health information presented in this Web site was believable.  
Not at all believable (1) (2) (3) (4) (5) Very believable
4. The health information presented in this Web site was trustworthy.  
Not at all trustworthy (1) (2) (3) (4) (5) Very trustworthy
5. The health information presented in this Web site was fair.  
Not at all fair (1) (2) (3) (4) (5) Very fair
6. The depth of the health information was satisfactory.  
Strongly disagree (1) (2) (3) (4) (5) Strongly agree
7. The health information presented in the Web site was useful.  
Not at all useful (1) (2) (3) (4) (5) Very useful

**Section 3. Your Opinions about the Web site**

**After reading the health information, please evaluate how you feel about Web site by circling a number on each of the scales below.**

8. The Web site was favorable.  
Strongly disagree (1) (2) (3) (4) (5) Strongly agree

9. The web site was positive.  
Strongly disagree (1) (2) (3) (4) (5) Strongly agree
10. I enjoyed exploring the site.  
Strongly disagree (1) (2) (3) (4) (5) Strongly agree
11. I would like to visit the site again in the future.  
Strongly disagree (1) (2) (3) (4) (5) Strongly agree
12. I had good impression of the Web site.  
Strongly disagree (1) (2) (3) (4) (5) Strongly agree

#### **Section 4. Your Reactions to the Website**

**How do you agree/disagree with the following statements?**

13. While I was on the Web site, I could choose freely what I wanted to see.  
Strongly disagree (1) (2) (3) (4) (5) Strongly agree
14. While surfing the website, I had control over what I can do on the site.  
Strongly disagree (1) (2) (3) (4) (5) Strongly agree
15. The Web site makes me feel like it wants to listen to its visitors  
Strongly disagree (1) (2) (3) (4) (5) Strongly agree
16. The Web site gives visitors the opportunity to talk back.  
Strongly disagree (1) (2) (3) (4) (5) Strongly agree
17. Overall, the Web site is interactive.  
Strongly disagree (1) (2) (3) (4) (5) Strongly agree

#### **Section 5. Evaluation of the Website Continues...**

**How do you agree/disagree with the following statements?**

18. I found the Web page was clear.  
Strongly disagree (1) (2) (3) (4) (5) (6) (7) Strongly agree
19. While I was on the page, I always knew where I was going.  
Strongly disagree (1) (2) (3) (4) (5) (6) (7) Strongly agree
20. I found the Web site was to be confusing.  
Strongly disagree (1) (2) (3) (4) (5) (6) (7) Strongly agree
21. I felt disoriented while visiting this Web site.  
Strongly disagree (1) (2) (3) (4) (5) (6) (7) Strongly agree
22. The interactive features were easy to use during my exploration of the Web site.  
Strongly disagree (1) (2) (3) (4) (5) (6) (7) Strongly agree

#### **Section 6. Please answer the following question.**

1. About how many years have you been an internet user?

- A year ago [ ]
  - Two or three years ago [ ]
  - Four years ago [ ]
  - Five years ago [ ]
  - Six years or more [ ]
2. What is the average number of hours you spend on getting news or information from the Internet everyday?
- 0 [ ]
  - 1 [ ]
  - 2-5 [ ]
  - 6-10 [ ]
  - more than 10 [ ]
3. Have you ever use the Internet to look up medical information?
- Never [ ]
  - A few times a year [ ]
  - About once a month [ ]
  - About once a week [ ]
  - More than once a week [ ]

**Section 7. Demographics**

- 1. Gender Male [ ] Female [ ]
- 2. Age \_\_\_\_\_
- 3. What is your current class standing?
  - [ ] Freshman
  - [ ] Sophomore
  - [ ] Junior
  - [ ] Senior or post-baccalaureate
  - [ ] Graduate Student

THANK YOU VERY MUCH FOR YOUR PARTICIPATION!

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## BIOGRAPHICAL SKETCH

Chia-Lun Lee was born in Taoyuan, Taiwan. In 2007, she obtained her Bachelor of Art in Mass Communication degree with specialization in journalism from Ming Chuan University, one of the most prestigious colleges of mass communication in Taiwan. She joined the graduate program of the College of Journalism and Communication at the University of Florida in fall 2008. In summer 2010, she received a Master of Art. in Mass Communication with specialization in public relations. During her graduate studies, she focused on online media, health communication and corporate social responsibility. After graduation, she plans to continue her public relations career in Taiwan by becoming involved in practical areas of public relations.