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A SOCIO-COGNITIVE MODEL OF INFORMATION DISCLOSURE IN HUMAN COMPUTER INTERACTION

By

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ABSTRACT

A SOCIO-COGNTIVE MODEL OF INFORMATION DISCLOSURE IN HUMAN-COMPUTER INTERACTION

By

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This dissertation proposed and tested a social cognitive model of information disclosure in human-computer interaction. Guided by Bandura's (1991, 2001) Social Cognitive Theory (SCT), this study conceptualized personalized social cues of Web site interface as computer immediacy (LaRose & Whitten, 2000) and investigated social cognitive processes of the effects of the personalized social cues of immediacy on the likelihood of consumers revealing their personal and health information in the context of a personal health record (PHR) Web site service. In the proposed model, personalized social cues of immediacy was conceptualized as a social environmental influence which reciprocally interacts with the other two cognitive determinants of human cognition (outcome expectations and privacy self-efficacy) and human behavior (information disclosure).

The results showed that, regardless of information type (embarrassing vs. descriptive) that can be requested from PHR Web sites, consumers' exposure to high level of personalized social cues of immediacy significantly and positively motivated their disclosure intentions even when privacy self-efficacy was controlled. However, the significant direct effect of computer immediacy on the likelihood of information disclosure was not evident in the final path model involving the potential mediators of positive outcome expectations (social trust and customized service benefits) and negative outcome expectations (embarrassment and information abuse). The null relationship

between computer immediacy and information disclosure intention suggests that the effect of computer immediacy on disclosure intention is mediated by the social cognitive variables of positive and negative outcome expectations.

Overall, the results of the present study supported the application of SCT to the domain of human-computer interaction. Consistent with SCT, exposure to personalized social cues of immediacy translated positively into one's cognition toward the stimulus PHR Web site by promoting expectations of positive consequences of social trust and customized service benefits and reducing expectations of negative consequences of information abuse from the Web site at the same time. This social cognitive model of information disclosure extend the CASA model of human-computer interaction (Nass & Moon, 2000; Reeves & Nass, 1996) which suggests that humans tend to respond to the computer without making much social cognitive effort. Consequently, this dissertation may untangle the relationship between personalized social cues of immediacy and human motivation of information disclosure as a social cognitive process through which consumers consider all personal, behavioral, and environmental influences associated with their information disclosure behavior in dynamic human-computer interaction in the Internet.

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INTRODUCTION

The rapid advance of information and communication technologies, particularly the Internet, has increasingly required consumers to engage in some form of disclosure. A growing number of organizations use their Web-based technologies to collect substantial amounts of personal information about their customers (Cazier, Shao, & Louis, 2007; Dinev & Hart, 2006a, 2006b; Dolnicar & Jordaan, 2007; Hassanein & Head, 2007; Hui, Teo & Lee, 2007; Metzger, 2004; Milne, Bahl, & Rohm, 2008; Moon, 2000; Ward, Bridges, & Chitty, 2005). These Web sites not only execute a cost-effective way to advertise their products and services, but also provide interactive capacities to facilitate communication with consumers, tailor content to their needs, and collect information about their customers (Ansari & Mela, 2003; Awad & Krishnan, 2006; Kalyanaraman & Sundar, 2006; Metzger, 2004; Milne et al., 2008). In fact, many Web-based services routinely ask existing members and would-be members to submit their personal information in exchange for their customized products and services (Chellappa & Sin, 2005; Culnan & Bies, 2003; Milne et al., 2008), such as "free" personalized content (Pastore 1999), product discounts and coupons (Phelps, Nowak & Ferrel, 2000), monetary rewards (Hann, Hui, Lee, & Png, 2007; Hui et al., 2007; Milne & Culnan, 2004), loyalty program memberships (Earp & Baumer, 2003), interactions with automated agents (Berendt, Gunther, & Spiekermann, 2005), or some other form of "fair exchange" (Culnan & Bies, 2003).

In particular, health-related Web sites provide their visitors with a wide range of health and medical information and ask them to respond to self-profiling questionnaires

about their sensitive personal medical records, health habits, and sexual activities as well as personal demographics (Moon, 2000; Rohm & Milne, 2004). For example, many branded direct-to-consumer drug (DTC) Web sites (e.g., viagra.com) collect visitors' information about their personal demographics and symptoms using Web-based survey tools and site registration processes (Macias & Lewis, 2003). Once they reveal their personal information, visitors are often offered customized and tailored services, such as an assessment of the likelihood that they have a particular illness or might contract it in the future (Rohm & Milne, 2004). As such, the Internet is equipped with state-of-the-art computer technologies to integrate, access, and distribute databases containing consumers' healthcare history, preferences, and behaviors. A wide range of health organizations, including primary benefits managers, insurance companies, and health maintenance organizations (HMOs), are expected to continue to expand the use of Internet-based data collection to demand more personal and health information in the name of authentication and customized offerings (Zahedi & Song, 2008).

One of the most effective data-collection technologies for Web-based services is to utilize an intelligent computer agent[1], which can address an individual in a personalized manner and respond to that individual in some contingent fashion (Deighton, 1996; Hassanein & Head, 2007; Moon, 2000). By introducing a computer agent that enables one-to-one reciprocal interaction into their Web sites, organizations can build and

[1] Computer agents should be distinguished from avatars. While an agent is some type of mathematical or computational algorithm designed to execute a specific command that is internally formulated, an avatar can be perceived as a digitally embodied representation whose behaviors are controlled either by a human user or executed by a computational agent within the computer (Bailenson & Blascovich, 2004). In this research, computer agents are limited to the computational algorithm that enables personalized social cues using the mode of text messages.

establish a valued relationship with consumers (Deighton, 1996; Dinev & Hart, 2006a, 2006b; Gefen & Straub, 2003; Hassanein & Head, 2007; Moon, 2000). Using such personalized communication approaches, organizations not only attract their customers to their Web sites (e.g., Gefen & Straub, 2003; Hassanein & Head, 2007; Kalyanaraman & Sundar, 2006), but also gather customers' information with much ease, ranging from personal to medical and psychiatric information (e.g., Heerwegh, Vanhove, Matthijs, & Loosveldt, 2005; Joinson & Reips, 2007; Moon, 2000; Weisband & Kiesler, 1986). Consequently, personalized communication strategies demonstrate the importance of unique customer databases in today's age of the network society (cf. van Dijk, 1999).

In fact, much of the messages from Web sites highlight the social agency of the immediate and responsive computer. For example, when logged in, Web sites are programmed to address consumers' names in their welcoming salutation, notify them of the frequency of their visits, and respond to consumers' previous requests automatically. These personalized guidance and responses can provide highly interactive and immediate social cues to lessen psychological distance between Web sites and consumers. These practices mirror the traditional face-to-face data-driven direct marketing strategies that have been effective in building relationship with customers. (e.g., Dahl, Manchanda, & Argo, 2001; Doney & Cannon, 1997; Dwyer, Schurr, & Oh, 1987; Hassanein & Head, 2007; Moorman, Zaltman, Deshpande, 1994; Morgan & Hunt, 1994; Narayandas & Rangan, 2004; Swan, Bowers, & Richardson, 1999). For example, when embedded with highly interactive, immediate and personalized social cues, such systems can address consumers by name, praise them, share personal anecdotes, and respond to their requests even by possibly showing the smiling picture of the representative of the Web site.

Recent studies of Web-based survey administration show that such personalized social cues can be used to increase response accuracy and rates as well (e.g., Heerwegh et al., 2005; Joinson & Reips, 2007). These social cues can include the use of researcher photographs, information about the researcher, the use of personal salutations and questions, or URLs designed for specific individuals (Joinson & Reips, 2007). Such social qualities of the Web service can offer the opportunity to provide real-time, immediate, and responsive feedback to consumers' needs and desires. In this process, these personalized social cues of the Web site can evoke feelings of closeness and warmness that promotes the establishment of relationships between the Web site and its consumers. Consequently, through these relationship-building processes, consumers will likely respond to the Web service and release their personal and health information to it in as truthful a manner as possible.

However, it is still far less certain if the relationship-building effort using personalized social cues always facilitate consumers' willingness to disclose their personal and health information. For example, Sproull, Subramani, Kiesler, Walker, and Waters (1996) found that the effectiveness of a talking-face computer-administered interview was moderated by gender difference. In their experiment, participants expressed a more positive attitude toward a talking-face computer-administered interview than a text-based interview, but female participants wrote more about themselves in the no-talking text display condition while males wrote more in the talking computer-face display condition. Furthermore, when combined, both female and male participants responded more in the no-talking display condition than the talking display condition.

The findings may suggest that such social cues of the computer may unexpectedly decrease consumers' willingness to reveal their information under certain circumstances.

Such inverse or null relationships between personalized social cues of the interface and consumers' willingness to disclose may become more salient when they interact with the kind of information that consumers are requested to reveal. For example, Tourangeau, Couper, and Steiger (2003) found that personalized social cues in a computer interface (e.g., photographs of the researcher and personalized statements and feedback) reduced participants' willingness to answer sensitive and embarrassing questions. Similarly, in relation to online privacy concerns, Cranor, Reagle, and Ackerman (1999) found that, when requested to be disclosed, certain types of personal information were associated with different levels of comfort and sensitivity. Andreasen (1970) also noted that personalization of mail surveys may reduce participants' response rates particularly when sensitive and embarrassing information is requested.

No research has empirically examined how personalized social cues of Web site interfaces can instill psychological closeness and warmness to elicit consumers' willingness to disclose their personal and health information to the Web site. Thus, this study focuses on empirically investigating the effect of manipulating personalized social cues of a Web site interface on consumers' likelihood of disclosing information. Given that many Web sites are utilize such personalized social cues through the immediate and responsive computer agent, the current dissertation investigates whether and how personalized social cues of a Web site interface motivate consumers to reveal their personal and health information.

Specifically, this study first attempts to conceptualize the personalized social cues of Web site interfaces as computer immediacy (LaRose & Whitten, 2000) within Bandura's (1991, 2001) social cognitive theoretical framework. Then, it investigates the underlying mechanism of social cognitive processes of the effects of the personalized social cues of immediacy on the likelihood of consumers revealing their information in the context of a personal health record (PHR) Web service. Finally, it explores if the information type (embarrassing vs. descriptive) that can be requested from Web sites differently affects the social cognitive processes of the effects of the personalized social cues on consumers' willingness to disclose their personal and health information. By proposing and testing a social cognitive model of information disclosure, this dissertation seeks to explicate the social cognitive mechanisms of information disclosure in human-computer interaction.

This dissertation is structured as follows. CHAPTER 1 introduces the concept of computer immediacy and provides a theoretical foundation to propose a research model for investigating the impact of manipulating personalized social cues of immediacy on consumers' willingness to reveal their personal and health information within Bandura's (1999, 2001) social cognitive theoretical framework. From a social cognitive perspective, the concept of computer immediacy is also distinguished from other similar media concepts and theories. It also reviews previous research on information disclosure in human-computer interaction and Internet environments. Based on the review, CHAPTER 2 proposes an integrated model of information disclosure in human-computer interactions and discusses the research hypotheses derived from it. CHAPTER 3 describes the method to be used to test the research hypotheses. CHAPTER 4 presents the results of the

hypothesis testing. Finally, CHAPTER 5 provides discussions of the results presented in CHAPTER 4, followed by theoretical and practical implications of the present study. Research limitations and future study directions are also discussed.

CHAPTER 1

COMPUTER IMMEDIACY AND INFORMATION DISCLOSURE IN HUMAN-COMPUTER INTERACTION

Defining Computer Immediacy

Computers are regarded as autonomous entities (e.g., Brock & Sulsky, 1994), often described as "a well-trained English butler" who best knows consumers' needs, likes, and habits (Negroponte, 1995, p. 8). The entirely new form of social agent will handle routine communications with consumers by answering their phones, recognizing the callers' voice and responding to everything they ask. Or in some cases, the computer agent won't even ask.

The analogy of the computer as a human entity is not at all far-fetched. Indeed, it is well established that computers in particular (Reeves & Nass, 1996) and interactive technologies in general (LaRose & Bates, 1990) are capable of demonstrating personal and social characteristics of reciprocal and immediate communications with humans. Sherry Turkle's *Second Self* ethnography (1984, 1995) further suggests that computers function as extensions of ourselves. By equating the health of one's computer with personal health safety, Lee, LaRose, and Rifon (in press) also extended the issue of computer virus threats to the human domain of computers' self-protection. As the computer is an extension of the self rather than an ordinary consumer electronics device, the relevance of interpersonal social relationships between computer and human is more than metaphorical, particularly in the age of the network society (cf. van Dijk, 1999). As

a result, human-computer interaction will strongly parallel the domain of human-human relationships.

Indeed, computers are often viewed as cooperative partners (Clarke & Smyth, 1993; Johnstone, Berry, & Nguyen, 1994), coaches (Desmarais, Giroux, & Larochelle, 1993), secretaries (Bocionek, 1995), and teammates (Nass, Fogg, & Moon, 1996), particularly when computers provide positive social cues to people, such as praising them, addressing them by first name, giving prompt and frequent responses, etc. These findings suggest that people may sense a positive social environment in human-computer interactions, especially when positive, personalized social feedback is incorporated into the computer interface design (Johnson, Gardner, & Wiles, 2004).

However, conversely people also can feel betrayed by and frustrated with computers (Ceaparu, Lazar, Bessiere, Robinson, & Shneiderman, 2004; Lazar, Bessiere, Ceaparu, Robinson, & Shneiderman, 2003). They even irately express anger to the computer as well (Ferdig & Mishra, 2004), especially when computers exhibit negative social cues, such as curt messages from the computer or its network, impersonal notifications of error messages, slow network connections, abrupt refusals to perform routine tasks, delayed feedback to inquiries, etc. As such, positive (e.g., feelings of warmness, closeness, excitement, and satisfaction) and negative (e.g., feelings of isolation, frustration, alienation, and anxiousness) responses to computers can come from the computer users' experiences with the personalized social cues that computers provide (Rozell & Gardner, 2000). Subsequently, such experiences produce positive or negative expectations about the computer itself, which will influence their intentions to use the computer in the future. In this sense, only positive social experiences with personalized

social cues of the computer interface will likely promote positive social incentives to enhance the feelings of psychological closeness and warmness. Eventually, these positive social incentives will help build and develop a warm and friendly social relationship in human-computer interaction.

Immediacy in Human-Human Communication

Within traditional social psychological and interpersonal communication frameworks, such psychological social incentives to promote a close social relationship between human and computer can be termed "immediacy" (Mehrabian, 1967; Mehhrabian, 1971; Wiener & Mehhrabian, 1968), or more precisely "computer immediacy" (LaRose & Whitten, 2000) in the context of human-computer interaction. The concept of immediacy has been proposed to explain the effect of a given psychological and physical distance on closeness between communicators. Originally introduced by Mehrabian (1967), the term immediacy refers to a cluster of verbal and nonverbal communication behaviors that enhance the "directness and intensity of interaction between two entities" (p.325). That is, the more immediate the relational behavioral cues are, the closer the communicators are psychologically as well as physically. By expressing such immediate social behaviors, the participants increase the level of sensory involvement in their relationship (Burgoon, Buller, & Woodall, 1989).

The theoretical and empirical research has examined immediacy social cues as both nonverbal (Mehrabian, 1971) and verbal (Wiener & Mehrabian, 1968). Nonverbal indicators of immediacy cues may be conveyed by the combinations of eye contact, relaxed body position, body-lean behaviors, proximity, smiling and vocal expressiveness

(Burgoon, Buller, Hale & DeTurck, 1984), whereas verbal indicators may be carried by spatiotemporally indicative demonstratives, denotative specificity, selective emphasis, including use of humor, praise, asking questions that show interest and attentive listening, and subtle variations of word choice using inclusive pronouns, such as "us" or "our" (Wiener & Mehrabian, 1968). In particular, research on immediacy suggests that the verbal channel can be more effective in relational closeness because it not only directly conveys immediacy to the partners, but also may compensate for other nonverbal channels' immediacy reduction within the framework of equilibrium theory (Argyle & Dean, 1965; Wiener & Mehrabian, 1968).

In most cases, these social cues of immediacy indicate behavioral approachability that can enhance interpersonal closeness and warmth between communicators within the verbal and nonverbal cues that convey one's thoughts and feelings to another. For example, Burgoon et al. (1984) found that high level of immediacy behaviors conveyed greater intimacy, attraction, and social trust. Thus, immediacy behaviors should be understood as social behavioral cues that not only increase physical and/or psychological proximity in distance, but also contribute to perceptual involvement during interpersonal interaction (Richmond & McCroskey, 2000; Richmond, Lane, & McCroskey, 2006). Consequently, the closer two people are to each other, the more immediate their interaction.

Immediacy has been intensively studied with respect to its effects on the relationship between teacher and student in various instructional settings (e.g., Allen, Witt, & Wheeless, 2006; Christophel, 1990; Christophel & Gorham, 1995; Frymier, 1994; Gorham, 1988; Kearney, Plax & Wendt-Wasco, 1985; Kelley & Gorham, 1988;

Mottet & Beebe, 2006; Mottet, Parker-Raley, Beebe, & Cunningham, 2007; Richmond, Gorham & McCroskey, 1987; Richmond, McCroskey, Plax, & Kearney, 1986; Rodriguez, Plax, & Kearney, 1996; Zhang & Oetzel, 2006). In particular, research on immediacy has consistently found that instructors' immediacy behaviors are positively associated with positive student affect toward instructors (Chesebro, 2003; Gorham, 1988; Myers, Martin, & Knapp, 2005; Richmond, 1990; Titsworth, 2001), instructor trust (Jaasma & Koper, 1999) and credibility (Myers, 2004), and positive evaluation ratings of instructors (Abrami, Leventhal, & Perry, 1982; Schrod & Witt; 2006; Teven & Hanson, 2004).

Previous research also found that the personalized approach of teacher immediacy tends to involve students and teachers engaging in social exchanges and reciprocal self-disclosure (e.g., Myers et al., 2005; Aylor & Oppliger, 2003; Fusani, 1994; Jaasma & Koper, 1999; Myers, 2004; Myers, et al., 2005; Nadler & Nadler, 2000; Waldeck, 2006). In other words, if students perceive their instructors as immediate and responsive, students may be more motivated to engage in such communication with instructors beyond the classroom (Aylor & Oppliger, 2003; Jassma & Koper, 1999; Nadler & Nadler, 2000). Because the teacher-student interaction may be defined as a form of interpersonal communication (Dobransky & Frymier, 2004, Frymier & Houser, 2000; DeVito, 1986), students may interpret the instructor's immediacy as one way that the instructor welcomes students' participation, interaction, and involvement in communication. In such interpersonal relationships, trust exists and communicators manifest specific social behaviors that indicate certain levels of reliance or dependence on one another. As such, immediacy behaviors not only enhance a trusting relationship between students and

instructors, but also motivate students to communicate with their instructors for relational reasons. Thus, teacher immediacy is relevant to the current discussion in that it highlights the effects of social cues of immediacy on trust building and disclosure behaviors between communicators.

Computer Immediacy in Human-Computer Interaction

In the context of Web education, LaRose & Whitten (2000) introduced the term "computer immediacy" and suggested that the concept of immediacy can be extended to the domain of human-computer interaction. They argued that computers can be verbally and nonverbally versatile in offering a cluster of personalized social cues and such social cues can exert social environmental influences on building and enhancing social relationships with users. Drawing on Bandura's (1986) Social Cognitive Theory (SCT), they proposed that the computer behaves like a social actor that is capable of expressing a form of social interest that could evoke such feelings of closeness and warmness.

LaRose & Whitten (2000) also hypothesized that the personalized social cues of immediacy in Web sites can promote social incentives to advance a valued social rapport with users. For example, the social incentives of computer immediacy could include expressions of social approval and support (e.g., "praised my action and comments," "provided feedback on my action and comments"), indication of social interest in the user (e.g., "called on me by name"), invitation to enhance the status of the user' social affiliation thorough interaction with the computer (e.g., "invited me to visit a link only those with a higher membership status can enter"), and disclosures of personal information about the computer (e.g., "used personal anecdotes of system operation and

maintenance"). Richardson and Swan (2003) noted that such personalized social cues can provide the needed social incentives that can encourage users to engage in social interaction with Web sites and to build a psychologically safe online environment. This social role is often shared with or transferred to consumers so that it can promote a high degree of closeness and comfort that consumers desire to receive. Consequently, such personalized social cues of computer immediacy can offer strong and positive psychological social affect and build a warm and friendly Web environment that continues to motivate users to interact with Web sites.

Further, LaRose and Whitten (2000) argued that the personalized social cues of computer immediacy can reinforce consumers' outcome expectations or judgments of the likely consequences of human behavior (Bandura, 1986). That is, through interaction with more immediate social environmental cues, users can build some forms of positive social outcome expectations of social approval, support, and affiliation that should be taken into account for their future interaction with the Web site. In other words, people can assess the potential outcomes of their social behavior by directly experiencing (enactive learning) and indirectly observing others' interactions (observational learning) with the Web site. These outcome expectations of social trust can play a pivotal role when people do a self-reactive behavior while interacting with the social cues of the Web site.

However, it is important to note that such outcome expectations do not always produce positive social behavior. People can develop expectations of negative social consequences online, such as privacy violations, as well. The expectations of negative consequences can be enhanced depending upon their self-efficacy beliefs in their

capabilities of executing a course of action with the computer (Compeau & Higgins, 1995), the Internet (LaRose & Eastin, 2004), and specifically behaviors protecting against privacy invasions (LaRose & Rifon, 2007) and virus attacks (Lee et al., in press). As such, as autonomous beings, humans can interpret the meanings of social environmental cues in various social situations and regulate their social behavior by predicting the expected outcomes in advance. Clearly, this agentic perspective of computer immediacy highlights Bandura's (1991) self-regulatory mechanisms of human motivation and behavior in the domain of human-computer interaction.

Thus, the present study defines the concept of computer immediacy as the personalized social cues of Web site interfaces that enhance consumers' feelings of psychological closeness and warmness. Also, it theoretically places the concept within Bandura's (1991, 2001) SCT and seeks to explain how the social environmental influence of the computer interface interacts with human cognition and behavior. It further highlights self-regulatory mechanisms where human cognition plays a central role in moderating one's behavior when interacting with personalized social cues of the interface.

Computer Immediacy in Other Media Theories

The importance of personalized social cues of immediacy in relationship building has been also highlighted in the context of computer-mediated communication (CMC). In proposing the Social Information Processing (SIP) model, Walther (1992) argued that text-based immediacy cues are enough to initiate interpersonal impression formation (cf., Goffman, 1959) and build relational growth as nonverbal social cues do in face-to-face interaction. In other words, the lack of nonverbal cues is not necessarily detrimental to

relational development because people have inherent needs of affiliation and are likely to develop relationships with communicators based on whatever social cues are available to them in a given context. By reading existing text-based social cues more carefully, communicators can foster a warm and friendly atmosphere for promoting relational growth, given sufficient time (Walther & Burgoon, 1992), previous interaction history (Walther, Slovacek & Tidwell, 2001), and anticipation of future interaction (Walther, 1994). Thus, SIP highlighted the effectiveness of text-based social cues on relationship development.

From the social cognitive perspective, the dynamic role of immediacy in initiating interpersonal impression formation and enhancing relational growth in CMC can be extended to the domain of human-computer interaction. That is, social cues of immediacy on a Web site interface evoke psychological closeness and building relational depth as well as in human-computer interaction. For example, computer users are likely to expect social incentives from their past experience with personalized social cues of the computer and anticipate the feelings of psychological closeness and warmness from their previous experiences. Consequently, such social incentives foster relational development with the computer across time.

Computer immediacy is also implicit in the concept of social presence, which is defined as "the degree of salience of the other person in a mediated communication and the consequent salience of their interpersonal interactions" (Short, Williams & Christie, 1976, p. 65). Originally devised to describe characteristics of teleconferencing, social presence indicates the degree to which a medium facilitates awareness of the other person behind the medium during mediated communication. In fact, Short et al. (1976)

suggested that immediacy in mediated communication may create and promote the degree of the sense of "being with another" which, in turn, increases the level of intimacy (cf. Argyle & Dean, 1965) between the communicators (Short et al., 1976). Similarly, Danchak, Walther, and Swan (2001) showed that the level of intimacy was a function of immediacy behaviors while holding the level of bandwidth of the medium constant. These studies suggest that immediacy may affect intimacy directly or indirectly through social presence.

From the social cognitive perspective, however, social presence may not be a determining factor in developing social rapport between computer users and computers, particularly in the context of human-computer interaction. This is because social presence alone is not likely to provide social incentives to promote psychological closeness or warmness that would lead to a valued relationship between the medium and its users. For example, even if the computer interface creates a high degree of social presence with rich modes of text, audio and video, the mere perception of "someone is there" behind the computer would not invoke psychological closeness and warmness to develop a personalized rapport between the computer and its users. Rather it may only increase the awareness of the salient other that is simply present or absent. For this reason, social presence has been primarily examined in mediated communication that influences individuals' decisions to choose an appropriate medium when sending different types of messages to increase efficiency and satisfaction (Rice, 1993; Short et al., 1976).

Moreover, the concept of social presence seems problematic in its conceptualization and operationalization. Biocca, Harms, and Burgoon (2004) pointed out that the definition of social presence is "vague, overly broad, or circular" because it

fails to specify the boundary dimensions of the construct, often leading to confounding relationship between the correlates and effects of social presence. Besides, it is still unclear if social presence should be conceptualized and measured as a judgment about one's fleeting psychological state within a medium or a stable property of the medium. For example, while Short et al (1976) measured social presence as a property of the medium (e.g., unsociable-sociable, insensitive-sensitive, cold-warm, and impersonal-personal), Lee and Nass (2005) and Nowak (2000) measured social presence as one's fluctuating psychological state using previous indicators of intimacy, involvement and immediacy (e.g., interesting, involving, intimate, etc). As such, social presence is not only confounded with other related variables, but also inconclusive in terms of its dimensions. This unclear conceptualization further deters successful establishment of operationalization and measurement (Biocca et al., 2004).

In sum, computer immediacy provides social incentives to promote relational depth in human-computer interaction. In this regard, the present study argues that computer immediacy should be recognized as a more fundamental and legitimate construct that may directly affect the relational depth between human and computer.

Understanding Information Disclosure in Human-Computer Interaction

Information Disclosure in Human-Computer Interaction

Humans' psychological tendency to behave socially with a computer is well documented in the literature on human–computer interaction. According to the *Computers-Are-Social-Actors* (CASA) perspective, also known as the media equation, individuals treat computers as human beings as if computer machines possess human-like

identities, feelings, intentions, or motivations (Nass & Moon, 2000; Reeves & Nass, 1996). That is, people automatically apply social heuristics and rules and exhibit interpersonal social behaviors in their interactions with computers as if they were interacting with real human beings. When primary social cues of human characteristics (e.g., face, voice, gender, etc) are incorporated within the computer interface, these cues mindlessly invoke schemata inherent in human-human interaction without psychologically constructing a relevant human (Nass & Moon, 2000). From this point of view, the human-computer relationship is fundamentally social and natural.

One possible explanation for the mindless socialness of human-computer interaction is that humans are social animals who have an innate desire for a social orientation (Nass & Moon, 2000; Reeves & Nass, 1996). This evolutionary explanation bodes well when individuals interact with an intelligent computer with human-like features and capabilities, such as language exchange, turn-taking ability, and immediate interaction (Moon, 2000). Because such social cues invoke the most immediate and responsive interpersonal communication actor of the typical human-human relationship, individuals are likely to make the social attributions to their interaction with the computer automatically (Reeves & Nass, 1996). As a result, individuals tend to display socially reflexive responses to computers without consciously thinking of the computer as a machine.

Another possibility is that people tend to avoid extensive information processing and exercise convenient mental shortcuts for their mindless social orientation (Nass & Moon, 2000). In this sense, people tend to be "cognitive misers" (Fiske & Taylor, 1984), "lazy organisms" (McGuire, 1969), "economy minded souls" (Eagly & Chaiken, 1993),

and "lazy information processors" (Nass & Moon, 2000). By making immediate social attribution to the computer machine for the actual communication actor behind the computer, individuals engage in interpersonal behavior with the computer (cf. Langer, 1989) even when such social response is not rational in the given human-computer interaction (Moon & Nass, 2000; Reeves & Nass, 1996). In this process, people respond to computers in much the same way as they respond to other human beings in human-human relationships. Consequently, individuals use the same social rules and conventions of the typical human-human interaction when they assess and respond to the performance of computers.

A substantial number of experiments have demonstrated strong evidence to indicate the social formation of human-computer interaction in social domains, such as politeness (Nass, Moon, & Carney, 1999; Reeves & Nass, 1996), flattery (Fogg & Nass, 1996), gender stereotyping (Nass, Moon, & Green, 1997; Lee, Nass, & Brave, 2000), personality type (Moon & Nass, 1996), similarity attraction (Nass & Lee, 2001), and intimate self-disclosure (Moon, 2000). Similarly, recent studies found that participants exhibited greater liking of and trust in the computer agent when they interacted with a computer interface exhibiting social and communicative characteristics of praise (Bracken & Lombard, 2004) and caring (Brave, Nass, & Hutchinson, 2005; Lee, Nass, Brave, Morishima, Nakajima, & Yamada, 2007). These findings suggest that communication between humans and interactive media should be understood as a new type of interpersonal interaction as well as mediated communication (Bracken & Lombard, 2004).

Notably, based on the CASA model (Moon & Nass, 1996; Reeves & Nass, 1996), Moon (2000) applied the principle of reciprocity in disclosure exchange (e.g., Chaikin & Derlega, 1974; Cialdini, 1993). The study demonstrated that computers can elicit consumers' intimate information disclosures by revealing information about the computers to the consumers in advance. That is, people who receive disclosures from the computer are more likely to feel obligated to respond to the conversational partner of the computer. Moon (2000) further highlighted the disclosure-attraction relationship that people tend to be more attracted to those who disclose to them so that they reveal their information to the conversational partner with an equal amount and degree of intimacy of the disclosure. As a result, she concluded that computers' self-disclosure enhanced social attractiveness of the computer, which, in turn, promoted consumers' disclosures.

However, Moon (2000) may have overlooked the role of individuals' cognitive processes in enacting the self-disclosure behavior. Rather, it may have confined this domain of self-disclosure to "one notable exception" of the reciprocity effect as Moon (2000, p. 324) acknowledged in her study. In other words, it may have demonstrated just one particular social rule of the reciprocity effect that disclosure automatically begets reciprocal disclosure and emphasized the reactive process of the attraction-disclosure relationship in self-disclosure. Such process of disclosure may not always be generalized in human-computer interaction because it does not address other possible social and cognitive processes that mostly govern the extent to which it is appropriate to reveal information in general social contexts (e.g., Chaikin & Derelga, 1974; Taylor & Altman, 1975).

Indeed, Moon (2000) noted that the reciprocity effect of human computer interaction may be not be realistic because it does not address other important factors that motivate such human behavior, such as anonymity or privacy (e.g., Rosenfeld, Booth-Kewley, Edwards, & Thomas, 1996), trust (e.g., Wheeless, 1978), and the rewards and risks offered in exchange for disclosure (e.g., Altman & Taylor, 1973; White, 2004), which could influence the extent to which people are motivated to respond to computers.

In addition, she also pointed out that the study only addressed "self-disclosure dynamics under specific circumstances" where the participants automatically follow the norms of socially appropriate self-disclosure behavior due to the effect of reciprocity in a controlled, computer-based interviewing situation. The participants may have fallen back on the heuristics of their "lazy" mind (cf. McGuire, 1969; Nass & Moon, 2000) at the point in time where their self-disclosure behavior was automatically evoked in the one-shot laboratory experiment setting, free from distractions and from threats to privacy. In other words, the participants in the experiment may have had low involvement in the communication subjects and, accordingly, perceived minimal risks to privacy so that they may have ignored any differences in the consequences between their revelations to a human and to a computer.

Another possibility is that the participants may have paid more attention to the experimental manipulation in the controlled environment of the laboratory (Tourangeau at al., 2003). In an uncontrolled setting, such as the Internet, the participants could have recognized the potential consequences of risks and benefits associated with their disclosure behavior rather than the manipulation of the study itself.

Social Cognitive Processes of Information Disclosure

The self-disclosure research tradition has paid much attention to the social exchange processes where personal information disclosure is a function of the perceived potential risks as well as benefits associated with the behavior (Altman & Taylor, 1973; Collins & Miller, 1994; Cozby, 1973; Jourard, 1971). Based on social exchange theory (Emerson, 1976; Homans, 1958; Thibaut & Kelly, 1959), much of the research assumes that people decide whether or not to carry out self-disclosure based on an assessment of the interpersonal rewards and costs associated with the social act. That is, in a real world setting, disclosure entails one's social cognitive assessment of the potential positive and negative consequences associated with the social act within the context of the social relationship. In short, self-disclosure is a medium of social exchange that involves the cognitive process of balancing social benefits and costs.

For example, disclosing personal information is related to the benefit of social rapport building (Gibbs, Ellison, & Heino, 2006; Cozby, 1973; Wheeless, 1978; Wheeless & Grotz, 1976). By making a disclosure to another person, mutual understanding is increased (Laurenceau, Barrett, & Pietromonaco, 1998) and trust is established (Rubin, 1975). However, when personal information is disclosed to another, relational risk of increased vulnerability to privacy can follow as well (Cline, 1989). In other words, when disclosing people normally weigh what they will socially gain or lose associated with the result of the disclosure. Those social benefits often include the potential consequences of the social rewards of validation, control, and close relationship development (Derelga & Grzelak, 1979) and those social costs often include the possibility of social risks such as being rejected, hurt, or embarrassed by the other

communication party (Baxter and Mongomery,1996; Derlega & Chaikin, 1977). In most cases, people are likely to avoid divulging their personal information particularly when they expect high-risk of the loss of their control or being in a vulnerable position (Baxter & Montgomery, 1996; Derlega & Chaikin, 1977).

The traditional interpersonal theory of self-disclosure has been applied to the issue of consumers' information disclosure, particularly in the context of e-commerce. Much privacy research has investigated consumers' disclosure behavior based on the social exchange perspective (Emerson, 1976; Homans, 1961; Thibaut & Kelly, 1959) and has suggested that information disclosure, like other interpersonal behaviors, is engaged in and interpreted in terms of the social and economic costs and benefits of providing information.

Similarly, Laufer and Wolfe (1977) proposed a model of privacy behavior and suggested that the decision of whether or not to provide personal information largely depends on a cognitive assessment of the benefits of convenient personalized/customized services and the risks of information privacy concerns, such as transfer of their data to third parties or use of their data for marketing solicitation. In this cognitive assessment process, consumers consider the trade-off between the potential social and economic benefits and costs of interactions.

Following Laufer and Wolfe (1977), Culnan and Armstrong (1999, p.106) also argued that consumers' willingness to provide personal information involves the process of "privacy calculus" that assesses the possibility that "their personal information will subsequently be used fairly and they will not suffer negative consequences". The calculus model is rooted in the notion of fair information practices that provide individuals with

the ability to control the risks of information privacy invasions by second and third parties (Milne & Culnan, 2002). When consumers are informed by the seller's information practices that their information will not be misused, they are more willing to provide personal information. Conversely, without the assurance of such fair information practices, individuals are less likely to disclose personal information (Culnan & Armstrong, 1999).

The privacy-related risks associated with disclosure may become more evident within an e-commerce context. Indeed, the potential risk to privacy has been one of the critical barriers to consumers' willingness to disclose personal information online (Awad & Krishnan, 2006; Dinev & Hart, 2006a, 2006b; Hann, et al., 2007; Hui et al., 2007; LaRose & Rifon, 2007; Metzger, 2004). Surveys also show that consumers are very concerned about threats to their online privacy because their information can be accessed by, sold to, used for external third parties without permission (e.g., Cyber Security Industry Alliance, 2006; Milne, Rohm, & Bahl, 2004).

In the online privacy literature, several studies have focused on the relationship between privacy concerns and information disclosure (Awad & Krishnan, 2006; Dinev & Hart, 2006a, 2006b; Hann, et al., 2007; Hui et al., 2007; LaRose & Rifon, 2007; Metzger, 2004). Dinev and Hart (2006a) refined the calculus model (Culnan & Armstrong, 1999) and argued that consumers tend to maximize the difference of such costs and benefits of providing information online. They found that perceived risk of privacy violations decreased consumers' willingness to provide personal information to transact on the Internet.

In focusing on consumer and retailer relationships in particular, Culnan and Bies (2003) also argued that individuals disclose personal information if they perceive that the overall benefits of disclosure are at least balanced by, if not greater than, the assumed risk of privacy invasions. They further argued that people are more likely to accept the loss of privacy that accompanies any disclosure of personal information as long as an acceptable level of risk accompanies the benefits" (Culnan & Bies, 2003, p. 327). Milne & Culnan (2004) also noted that consumers' information disclosure behavior are said to be weighed in relation to monetary benefits and to privacy concerns (Milne & Culnan, 2004). Similarly, McKnight, Choudhury, and Kacmar (2002) and Malhotra, Kim, and Agarwal (2004) found that the risk of privacy violations was related to perceived uncertainty and the disclosure of personal information.

Personal health record (PHR) services on the Internet also raise serious concerns about privacy (Rothstein & Talbott, 2006; Sprague, 2006; Peel, 2007). Due to the vast amount of personal information PHRs contains and the absence of federal laws guaranteeing consumers' right to privacy, PHRs are an attractive target for data mining (Sprague, 2006; Peel, 2007). Numerous third parties such as health-related corporations, government agencies, employers, insurers, and banks can access and use individuals' PHRs (Peel, 2007). In addition, insecure Internet connections for remote access, ingenious hackers, careless clerks, and technical limitations for individuals to limit the scope of disclosures of their health information based on the type of information needed by the third party further threaten privacy issues in the PHR domain (Rothstein & Talbott, 2006; Sprague, 2006).

It is important to note that privacy risks raised in the PHR domain may go beyond the privacy risks in the e-commerce context. The consequence of privacy issues in the PHR context can be adverse and multi-dimensional. The PHR is often a longitudinal record that contains disparate reports and wide-ranging health conditions including sensitive health information (e.g. mental health, genetic test results, sexually transmitted diseases, HIV antibody status, sexual history, history of abortions and other reproductive matters, domestic violence, and drug and alcohol abuse) (Rothstein & Talbott, 2006). When such sensitive health information is accessed without individuals' consent and misused, the individuals may experience embarrassment, humiliation, shame, anxiety, and depression (Rothstein & Talbott, 2006). Further, the individuals may lose opportunities in their life: people with stigmatized or costly illnesses may become incapable to obtain insurance or employment (Rothstein & Talbott, 2006; Peel, 2007).

As such, disclosures of personal information online can be very consequential. Unlike the "unreal" controlled setting of many human-computer interaction experiments (e.g., Moon, 2000), people disclose their personal information within "real" natural situations where they interact with Web sites on the Internet that have a far greater capacity to spread information to both strangers and intimates who can harm people in very serious ways. In this sense, the Internet possesses the capability of collecting, storing, and distributing consumers' personal information from individual computers that do not necessarily evoke these potential threats to privacy.

It is important to note that consumers' willingness to disclose their information online involves their assessment of the positive outcomes of customization benefits and social trust as well (Awad & Krshnan, 2006). For example, marketers not only offer their

customized and personalized products and services to motivate consumers' information disclosure (e.g., Chellappa & Sin, 2005; Culnan & Bies, 2003; Milne, Bahl, & Rohm, 2008) but also as attempts to build a trusting relationship with consumers that can positively influence consumers' information disclosure (e.g., Bart, Shankar, Sultan, & Urban, 2005; Dinev & Hart, 2006a; Metzger, 2004; Earp & Baumer, 2003; Norberg, Horne, & Horne., 2007). In this sense, consumers' disclosures should be positively related to their assessment of the positive outcomes of the benefits of social trust associated with their disclosure behavior.

In particular, consumers' expectations of social trust toward Web sites may be an important determinant for their information disclosure. Metzger (2004) noted that such expectations of trust have a particularly important role in facilitating disclosure of information in the Internet because social cues are reduced and any physical social contact is replaced by computer-mediated communication. In short, the more consumers expect a trusting relationship with Web sites, the more willing consumers may be to disclose their information.

Previous research found that trust is positively related to consumer's information disclosure behavior (Bart et al., 2005, Dinev & Hart, 2006a; Earp & Baumer 2003; Gefen, Karahanna, & Straub, 2003; Metzger, 2004; Milne & Boza, 1999; Norberg et al., 2007; Schoenbachler & Gorden, 2002). For example, Norberg et al. (2007) found that when consumers' trust toward a Web site was salient, consumers were willing to provide personal information. Schoenbachler and Gorden (2002) and Dinev & Hart (2006a) also found trust increased consumers' willingness to provide personal information. Similarly, Earp and Baumer (2003) viewed the status of a company's brand name in relation to trust

and found that consumers were likely to disclose personal information to well-known companies. Gefen et al. (2003) also demonstrated the effect of a set of trust beliefs (including a vendor's honesty, caring for customers, and predictability) on an individual's intention to disclose information to complete an online transaction. These findings suggest that dynamic trust building between consumers and Web sites is highly critical for promoting consumers' information disclosure because it affects consumers' expectations that Web sites will provide the necessary conditions of social trust, such as competence, benevolence, and integrity (e.g., Gefen et al., 2003) to rely upon and their subsequent intention to provide their information. In this sense, consumers' information disclosures should be understood as a decision to carry social risks as well as rewards, particularly in the Internet.

In summary, parallel to the basic premise of the CASA (Nass & Moon, 2000; Reeves & Nass, 1996) perspective, the concept of computer immediacy assumes that humans respond to computers in the same manner as they would toward other people, especially when the computers manifest their personalities with a minimal set of social cues (Nass & Moon, 2000; Reeves & Nass, 1996). In other words, humans socialize with the computer, just as they would with another human, without much cognitive effort when their social behavior is socially evoked by social cues of the computer interface.

However, at the same time, the concept of computer immediacy also assumes that humans can be mindful of potential positive and negative consequences associated with their social behavior, particularly when they interact with Web sites on the Internet. In such online environments, consumers tend to cognitively assess the potential positive (e.g., social trust and customization benefits) and negative consequences (e.g., privacy

violations) of the disclosure behavior that could be very consequential to themselves in the future. Thus, consumers' likelihood of information disclosure in human-computer interaction on the Internet may have to be understood as a social behavior requiring social cognitive efforts beyond the automatic social response to the computer itself.

Based on this reasoning, this dissertation extends the CASA model of human-computer interaction and proposes a social cognitive model of information disclosure in human-computer interaction. Specifically, this model seeks to address the question of whether the computer-mediated personalized social cues of the Web site interface that manifest immediacy can elicit consumers' information disclosure behavior.
In this sense, the domain of information behavior in human-computer interaction on the Internet may be beyond the initial social response to the computer itself that has been suggested in the CASA model.

CHAPTER 2

INTEGRATED MODEL OF INFORMATION DISCLOSURE AND HYPOTHESES

A Social Cognitive Perspective of Information Disclosure in Human-Computer Interaction

The present dissertation extends the CASA model of human-computer interaction (Nass & Moon, 1996; Reeves & Nass; 1996) and proposes that information disclosure in human-computer interaction should be understood as a social cognitive process that underlies reciprocal interactions among human cognition, behavior, and social environment influences.

This study applies Bandura's (1991, 2001) Social Cognitive Theory (SCT) to the domain of human-computer interaction and tests a model of information disclosure behavior that describes human motivation for disclosure as socio-cognitive processes that involve three major causal factors of social environmental influences, cognitive factors, and social behavior. In the proposed model, it is expected that information disclosure in human-computer interaction will be a function of personalized social cues of computer immediacy as well as consumers' cognitive evaluation of the benefits and risks associated with information disclosure behavior. In the model, information disclosure will also be directly influenced by consumers' self-efficacy judgment of their capabilities to cope with the potential risks of online privacy. Originally defined as the belief "in one's capabilities to organize and execute the courses of action required to produce given attainments" (Bandura, 1997, p. 3), self-efficacy has been recognized as an important

factor affecting human motivation to exert a course of behavior. The judgment of having self-efficacy to cope with the risks of privacy will also directly influence the benefit and risk perceptions associated with information disclosure.

SCT also highlights the moderating role of human cognition in human behavior. That is, human agents intentionally make things happen through their actions by exercising forethought, reflecting on their behavior, and applying self-reactive influences (Bandura, 2001). Unlike the conventional stimulus-response model of motivation for human behavior, this agentic perspective emphasizes the importance of cognitive guidance as an influence of behavior. In this sense, the triadic reciprocal casual model is mediated by humans' self-regulatory capabilities to reflect on their behavior.

In fact, using the triadic reciprocal causation model, SCT claims that human motivation for behavior is largely determined by mutual interactions of behavior, cognition, and social environmental influences (Bandura, 1991). In the present context of information disclosure in human-computer interaction, the three interdependent factors are consumers' information disclosure (behavior), their assessment of the likely positive and negative consequences of the disclosure behavior and their perceived ability to manage their personal and health information (cognition), and personalized social cues of immediacy that the Web site interface provides (social environmental influences)

In SCT, two primary cognitive mechanisms that have been proposed to motivate human behavior are outcome expectations and self-efficacy judgments (Bandura, 1991). Outcome expectations are defined as the perceived likely consequences of performing a behavior. In addition, outcome expectations provide both incentives and disincentives for determining a course of behavior. In other words, people tend to judge the likely

outcomes of a behavior before engaging in the behavior because the potential consequences can provide incentives or disincentives to guide future behavior. In particular, positive outcome expectations provide incentives that promote people's future behavior whereas negative outcomes expectations provide disincentives that discourage such future behavior. As such, outcome expectations focus on the potential consequences of social behavior within SCT.

This incentive system of outcome expectations can be external (e.g., social and economic risks and benefits) as well as internal (e.g., personal risks and benefits). For example, consumers' online information disclosure may lead to negative consequences of third-party disclosures such as spam attacks, identify theft, or phishing, , which may evoke social and economic consequences of consumers' embarrassment and information abuse due to privacy violations by others online. Indeed, the potential risk of privacy violations has been found to deter consumers' willingness to disclose personal information online (Awad & Krishnan, 2006; Dinev & Hart, 2006a, 2006b; Hann, et al., 2007; Hui et al., 2007; LaRose & Rifon, 2007; Metzger, 2004).

At the same time, however, consumers' disclosures online may be followed by positive economic consequences of customized service benefits for convenience and consumers' expectations of positive social consequences of trust between consumers and Web sites (e.g., social affiliation and support), particularly when the Web sites recognize consumers' names and other personal and health information. For example, marketers not only tailor their customized service benefit offerings to facilitate the likelihood of consumer's information disclosure (e.g., Chellappa & Sin, 2005; Culnan & Bies, 2003; Milne, Bahl, & Rohm, 2008), but also to build social trust thereby motivating consumers'

information disclosure (e.g., Bart et al., 2005; Dinev & Hart, 2006a; Metzger, 2004; Earp & Baumer, 2003; Norberg et al., 2007). As such, consumers' disclosures should be positively related to their assessment of the positive outcomes of customization and social trust associated with their disclosure behavior. Previous research found that trust is positively related to consumer's information disclosure behavior (Bart et al., 2005, Dinev & Hart, 2006a; Earp & Baumer 2003; Gefen, Karahanna, & Straub, 2003; Metzger, 2004; Milne & Boza, 1999; Norberg et al., 2007; Schoenbachler & Gorden, 2002).

Such positive and negative outcome expectations may be shaped by our experiences with our behavior and other social environmental influences (Bandura, 1991). In other words, people can develop positive (e.g., social trust and customized service benefits) or negative outcome expectations (e.g., embarrassment and information abuse due to privacy violations) through their actual disclosure behavior (enactive learning in social cognitive terms), through their observation of others' disclosure behavior (observational learning), or by persuasive messages about the incentives or disincentives associated with their disclosure behavior (verbal persuasion). Consequently, such direct and indirect influences contribute to the formation of the outcome expectations of benefits and risks, which, in turn, affect information disclosure behavior in human-computer interaction.

In fact, consumers' willingness to reveal their information online involves their assessment of the positive and negative consequences of their specific information disclosure to Web sites that they interact with (Awad & Krshinan, 2006). It is recognized as equally important to highlight the benefits as well as risks associated with information disclosures (Culnan & Bies, 2003; Ward et al., 2005; LaRose & Rifon, 2007; Rifon,

LaRose, & Choi; 2005). For example, marketers not only provide customized service benefits to enhance consumers' willingness to disclosure their information, but also present privacy seals, such as TRUSTe and BBBOnline, to lessen the perceived risks of privacy violations associated with consumers' disclosure. Applying this reasoning to the present context of online disclosure behavior, the following hypotheses are proposed:

H1: Consumers' willingness to reveal their information will be negatively related to their expectations of the negative consequence of embarrassment

H2: Consumers' willingness to reveal their information will be negatively related to their expectations of the negative consequence of information abuse

H3: Consumers' willingness to reveal their information will be positively related to their expectations of the positive consequence of social trust

H4: Consumers' willingness to reveal their information will be positively related to their expectations of the positive consequence of customized service benefits.

In SCT, self-efficacy is another key factor influencing how a person engages in behavior. Along with outcome expectations, it is regarded as another self-evaluative form of judgment about one's capabilities to execute a task. Thus, it should reflect the degree to which individuals are confident about executing a behavior with the skill they have rather than the measure of the skill that they possess. In this sense, those who perceive themselves to be highly efficacious with reference to a particular task will be more likely to invest sufficient levels of effort to achieve successful outcomes than those with low levels of self-efficacy.

In the present context, this cognitive construct should be privacy coping self-efficacy, an assessment of one's capability to cope with the potential risk of privacy violations associated with consumers' disclosure of personal and health information. Previous studies demonstrated that privacy self-efficacy is a causal antecedent to the motivation to reveal information. (LaRose & Rifon, 2007; Rifon, LaRose, & Choi, 2005; Lee et al., in press). The greater consumers' confidence in their privacy protection behaviors, the more likely they will be willing to reveal their personal and health information. Based on this reasoning, the following hypothesis is stated:

H5: Consumers' willingness to reveal their personal and health information will be positively related to their privacy self-efficacy.

It is also important to note that self-efficacy is also regarded as a direct predictor of outcome expectations. Such relationship demonstrates the causal relationship among the cognitive constructs within SCT. Previous research on the use of computer (Compeau & Higgins, 1995), the Internet (LaRose & Eastin; 2004), video games (Lee & LaRose, 2007), and online protection behaviors (LaRose & Rifon, 2007; Rifon, et al., 2005; Lee et al., in press) suggest that the stronger a person's self-efficacy judgment, the more likely he or she is to attempt to achieve the desired outcomes, whereas the weaker a person's self-efficacy, the less likely he or she is to try to achieve the desired outcomes.

In the current context, this means that privacy self-efficacy should be positively related to the expectation of positive consequences associated with information disclosure whereas privacy self-efficacy should be negatively related to the expectation of negative consequences associated with information disclosure. In other words, consumers with

high privacy self-efficacy are more likely to believe that they will develop and maintain positive social outcomes of trust towards a Web site they interact with and receive customized service benefits. At the same time, those with high privacy self-efficacy are more likely to be confident in protecting themselves from potential privacy violations so that they are less likely to be embarrassed and their personal and health information is less likely to be abused. Thus, the following hypotheses are formally proposed:

H6: Consumers' privacy self-efficacy will be negatively related to their expectations of the negative consequence of embarrassment.

H7: Consumers' privacy self-efficacy will be negatively related to their expectations of the negative consequence of information abuse.

H8: Consumers' privacy self-efficacy will be positively related to their expectations of the positive consequence of social trust.

H9: Consumers' privacy self-efficacy will be positively related to their expectations of the positive consequence of customized service benefits.

A Social Cognitive Model of the Effect of Computer Immediacy on Information Disclosure

The present study specifically focuses on the social cognitive process of how socio-environmental influences of computer immediacy cues affect the likelihood that consumers will disclose their personal and health information. It is expected that computer immediacy provides social incentives that promote social relationships with consumers, in turn motivating disclosures. For example, when consumers experience personalized social cues of immediacy that a Web site offers, they are likely to perceive

psychological closeness and warmness evoked by the interface. Then, exposures to the personalized social cues of immediacy will likely lead consumers to develop a keen sense of social affiliation with the Web site and feel that the Web site wants them as their members.

From the social cognitive perspective, personalized social cues of computer immediacy may signify social acceptance by offering social incentives that consumers inherently desire to receive as they do in human-human interaction. Such social cognitive influences can instill a sense of social trust that leads to meaningful interaction between consumers and Web sites. Through the social cognitive process, consumers may develop expectations of greater social trust towards the Web site, which will, in turn, likely induce consumers' disclosures. Consequently, such relationship-building process will motivate consumers to reveal their information to the Web site. This assumption is consistent with Bickmore & Cassell's (2001) idea that a computer agent can promote positive social expectations and thereby promote a trusting relationship between the computer agent and its user. As a result, consumers' expectations of social trust evoked by computer immediacy will likely motivate consumers to disclose their personal and health information.

It is important to note that such social outcome expectations may parallel the traditional concept of trust between consumers and marketers "as the expectancy of customer to rely upon database marketers to treat the consumer's personal information fairly" (Milne & Boza, 1999, p.8). Such trust perception is based on consumers' expectations that marketers would not abuse their information without permission.

Particularly in Internet research, the concept of trust has been extended to the concept of e-trust between consumers and Web sites (Gefen, et al., 2003).

However, the concept of trust has suffered from theoretical and operational confusion (e.g., Hosmer, 1995, McAllister, 1995; Shapiro, 1987). Essentially, there is not an agreed upon definition of trust (Mayer, Davis, & Schoorman, 1995; Perry & Mankin, 2004). For example, Gefen et al. (2003) reviewed 43 papers that offer different conceptualizations of trust and identified four core conceptualizations of the construct. The most popular definition of trust involves specific beliefs in the integrity, benevolence, and ability of another party (Gefen & Silver, 1999). A second conceptualization involves a general belief in consumers' willingness to depend on another party based on optimistic expectations of the party's morally correct behavior (Hosmer, 1995), often leading to trusting intentions (McKnight, Cummings, & Chervany, 1998). A third conceptualization involves psychological affect in the form of feeling confident and secure in the other party (Rempel, Holmes, & Zanna, 1985). A fourth conceptualization involves a combination of these definitions.

Notably, all these involve vague and imprecise conceptualizations of trust that may possibly confound the measures of two important social cognitive constructs - social outcome expectations and self-efficacy. In social cognitive terms, trust should be construed as specific social expectations about the positive consequences of social affiliations with and support from a specific Web site that would eventually promote consumers' willingness to disclose their information to the Web site. From the social cognitive perspective, matching outcome expectations to a specific target behavior is crucial for validating a theoretical model with explanatory power. Thus, it is expected

that personalized social cues of computer immediacy will increase expectations of positive social outcomes of trust and increase the likelihood of personal disclosure. Here, it is proposed that there is a causal relationship between social trust, more properly conceived as expected positive social consequences of social trust, and consumers' information disclosures.

H10: Consumers who view a Web site with high computer immediacy cues will report stronger expectation of social trust than consumers who view a Web site with low computer immediacy cues

Once the relationship between social outcome expectations of social trust are established through consumers' interaction with the Web site, consumers may further form another positive outcome expectation; namely, that they can rely on the computer agent to quickly respond to and customize their requests. For example, many Web sites provide customers with personalized services and products, but require consumers to register in order to access them. When personalized social cues promote feelings of social closeness and warmness and are explicitly presented by the Web site interface, consumers will recognize the uniqueness of personalized social cues and expect that those cues will likely create a sense of technological congruence between the consumers and the Web site. In turn, this will likely induce positive outcome expectations of customized service benefits. Based on this reasoning, the following hypothesis is stated.

H11: Consumers who view a Web site with high computer immediacy cues will report stronger expectations of customization benefits than consumers those who view a Web site with low computer immediacy cues

Personalized social cues of computer immediacy can also affect consumers' assessment of the risks of privacy violations (e.g., embarrassment and information abuse) associated with information disclosure (Awad & Krishnan, 2006; Dinev & Hart, 2006a, 2006b; Hann, et al., 2007; Hui et al., 2007; LaRose & Rifon, 2007; Metzger, 2004). In other words, as consumers experience immediacy cues on a Web site, they tend to feel psychological closeness with and warmth from the site, and develop some degree of social relational depth with the Web site. Such positive social outcome expectations may not only reduce the social risk of embarrassment as a consequence of revealing their private and embarrassing information as it would in human-human interaction, but also mitigate the economic risk of privacy violations if their valued personal information is abused. Although previous studies found that Web sites' privacy statements generally comply with FTC guidelines and assure consumers' privacy (Milne & Culnan 2002; Peslak, 2005), these statements do not provide adequate information about the potential positive and negative ramifications of the risks associated with the sharing of personal information (LaRose & Rifon, 2007).

However, computer immediacy may not always lessen consumers' assessment of the amount of risk associated with their online information disclosures. In fact, it might intensify their expectations of negative consequences. In particular, it is more likely that consumers' expectations of embarrassment can be heightened when the topic of information requested to be disclosed is sensitive and embarrassing. In fact, in traditional communication situations it is often more difficult to relinquish private and intimate information to close friends and family than to strangers (Rubin, 1975). This proposition that individuals may not always relinquish intimate information to those with whom they

are in close relationships may be applied to the domain of human-computer interaction. For example, Moon (1998) found that people were less likely to disclose personal information to geographically adjacent computer servers than distant servers because they felt more vulnerable to nearby servers.

Several previous studies of interpersonal communication indicated that development and maintenance of close relationships is strongly related with topic avoidance and privacy regulation (e.g., Afifi & Burgoon, 1998; Afifi & Guerreo, 2000; Argyle, Trimboli, & Forgas, 1988; Baxter & Wilmot, 1985; Petronio, 1991, 2000; Petronio, Ellemers, Giles, & Gallois, 1998; Rawlins, 1992; Rollof & Ifert, 1998, 2000; Rosenfeld, 1979). Afifi and Guerrero (2000) defined topic avoidance as purposefully concealing information on a particular topic from a partner and argued that this interpersonal process reflects people's attempt to protect their face as a function of their appraising of the degree of self threat posed by communicating about the topic. For example, when individuals have close relationship with others, some topics are often considered "taboo" and commonly avoided for self or relational protection reasons. These avoidance topics include past relationships, sexual experiences, outside-relational activities, and negative-life experiences (Afifi & Guerreo, 2000; Baxter & Wilmot, 1985; Rawlins, 1983). Baxter and Wilmot (1985) also argued that people tend to conceal these kinds of information from close others because they often desire to protect themselves from the other's humiliation, shame, and conflict. Similarly, Altman (1993) also argued that one of the primary reasons for avoiding topics from the other was due to self-protection against the fear of humiliation. These findings may imply that such reluctance may be specific to certain types of information and may occur as a function of the

perceived depth of the relationship between the two parties (Argyle et al, 1988; Barrell & Jourard, 1976; Rosenfeld, 1979; White, 2004).

Recently, White (2004) argued that the type of information (sensitive embarrassing information v. descriptive privacy-related information) is closely related to the two types of potential disclosure-related risks (embarrassment and information abuse) and found that the information type moderated the effects of consumers' relationship perceptions with marketers on the potential consequences of embarrassment and information abuse. Specifically, when consumers were requested to disclose descriptive information about themselves, the relational depth between consumers and marketers reduced the negative outcome expectations of information abuse associated with the disclosures. However, when consumers were asked to reveal embarrassing information about themselves, the relational depth between consumers and marketers increased the negative outcome expectations of embarrassment associated with the disclosures.

Similarly, Matthews, Derlega, and Morrow (2006) noted that two types of self-disclosure are differently related to two types of information: descriptive disclosure of private facts versus relational self-disclosure of personal feelings or opinions (e.g., Derlega, Metts, Petronio, & Margulis, 1993; Morton, 1978). As such, conceptually, descriptive information is more concerned with individuals' private facts and embarrassing information is more concerned with individuals' feelings or opinions. When online privacy concerns are taken into account, Cranor, Reagle, and Ackerman (1999) also found that consumers demonstrated different levels of comfort when asked to reveal certain types of personal information associated with different levels of sensitivity. Specifically, they found that consumers were more comfortable when providing some

personal information (e.g., their favorite television show, age, full name, email address, or postal address) than when revealing others (e.g., health information, phone numbers, income level, or credit card numbers). Milne (2000) also found that some personal information (e.g., telephone numbers) was more private and sensitive than others (e.g., purchase behaviors). Earp and Baumer (2003) also indicated that consumers were more willing to reveal less sensitive information (e.g., their gender and age) than more sensitive information (e.g., their identification numbers). These findings may suggest that the information consumers are requested to reveal online should be related to the level of sensitivity or privacy concerns.

In social cognitive terms, information type might be an indicator to activate consumers' self-observation system in the self-regulatory mechanism of human behavior (Bandura, 2001). In the process, consumers can be attentive to their own self-disclosure behavior (self-observation), judge their self-disclosure behavior in relation to social standards or norms (normative judgmental process), and adjust their behavior to the social environment by regulating their heightened state of attentiveness to positive (e.g., feelings of warmness and satisfaction such as social trust and customized benefits) and negative (e.g. feelings of anxiousness and frustration stemming from social embarrassment and privacy violations) responses to Web sites (self-reactive influences). Consequently, corresponding degrees of expectations of potential consequences can be matched to information disclosure of different types of information.

Guided by the logic of the studies discussed above, this dissertation predicts that the type of information (embarrassing vs. descriptive) may moderate the effect of perceived psychological closeness evoked by computer immediacy on negative outcome

expectations of embarrassment and information abuse in the domain of human computer interaction. In other words, consumers may experience heightened risks of being embarrassed when requested to reveal their sensitive and embarrassing information to a Web site that approaches consumers with many personalized social cues of immediacy. This is because embarrassing information may be more likely to be associated with the relational risk of unwanted judgment and opinions of personal information by others. Conversely, descriptive information may be more likely associated with economic risk of unwanted misuse of personal information by other parties (e.g., Derlega, Metts, Petronio, & Margulis, 1993, Mathews, Derlega, & Morrow, 2006; Morton, 1978). Thus, when consumers are requested to reveal embarrassing information, consumers who visit a Web site with high immediacy will perceive greater expectations of negative consequences of embarrassment than those who visit a Web site with low level of immediacy. Also, when consumers are requested to reveal their descriptive information, consumers who browse a Web site with a high level of personalized social cues will demonstrate lower expectations of the negative outcome of information abuse than those who browse a Web site with lower levels of personalized social cues. Based on this, the following hypotheses are formally stated.

H12: When requested to reveal embarrassing information, people in the high computer immediacy condition will report greater expectations of negative consequences of embarrassment than those in the low computer immediacy condition

H13: When requested to reveal descriptive information, people in the high computer immediacy condition will report lower expectations of negative consequences of information abuse than those in the low computer immediacy condition

Computer immediacy is also likely to affect the likelihood of consumers disclosing their personal and health information. Drawing on Bandura's (1991, 2001) SCT, LaRose & Whitten (2000) argued that a cluster of personalized social cues can play the role of a social agent in promoting social relationships by evoking feelings of closeness and warmth. The social environmental influences of personalized social cues of immediacy can motivate consumers to reveal their personal and health information. From this perspective, we expect that computer immediacy acts as a social incentive to motivate consumers' self-disclosures. Based on this reasoning, it is logical to predict that computer immediacy will positively affect consumers' intention to disclose their information to Web sites.

H14: Consumers who view a Web site with high computer immediacy are more likely to reveal their information than those who view a Web site with low computer immediacy.

In the current context, the effect of immediacy on consumers' motivation to disclose information should be understood as a social cognitive process that involves the reciprocal interactions of their information disclosure behavior, their cognitive evaluation of the benefits and risks of that behavior, and the social environmental influences of computer immediacy. From this social cognitive perspective, the present study also attempts to explicate the underlying mechanism of disclosure in human-computer interactions. Specifically, in accordance with Bandura's (1991, 2001) SCT, this study proposes that positive and negative outcome expectations mediate the direct effect of computer immediacy on consumers' disclosure intentions. By focusing on the mediating

role of one's expectations about the likely consequences of disclosure behavior online, this study predicts that the positive effect of computer immediacy on information disclosure intentions will be mediated by the proposed social cognitive variables of positive and negative outcome expectations.

H15: The effect of personalized social cues of computer immediacy on self-disclosure intention will be mediated by consumers' positive and negative outcome expectations.

In an attempt to test the direct and indirect relationships as hypothesized above, this study proposed a structural model (See Figure 1) that integrates the social cognitive variables of the underlying mechanisms of self-disclosure in human-computer interaction. In the proposed model, self-disclosure intentions are directly and indirectly affected by positive (social support and customized benefits) and negative (embarrassment and information abuse) outcome expectations, privacy self-efficacy, and computer immediacy.

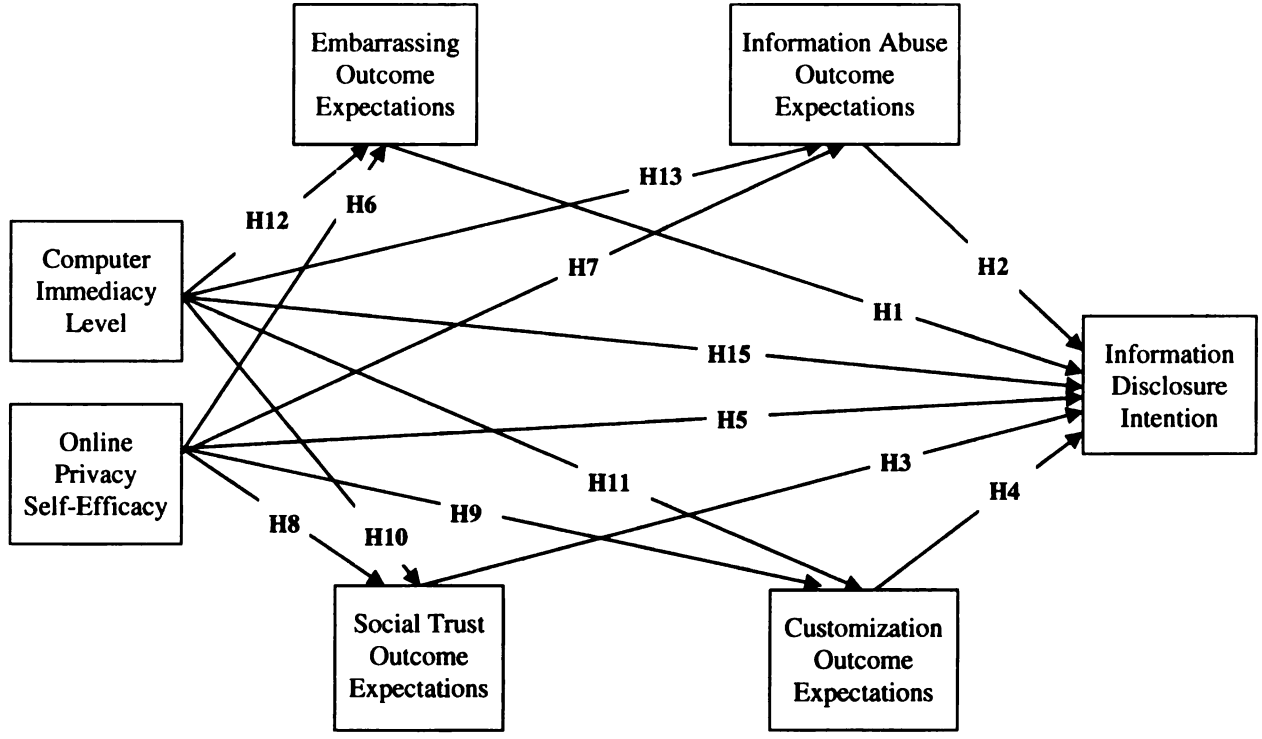
In summary, the original contribution of this dissertation is that it uses the social cognitive framework to conceptualize personalized social cues of Web site interfaces as computer immediacy and explicates the underlying social cognitive mechanisms of the effect of computer immediacy on consumers' willingness to disclose their information in the domain of human-computer interaction. By integrating existing theories of information disclosure, this dissertation empirically tests the effect with respect to consumers' cognitive assessment of the benefits and risks associated with their information disclosures as well as their judgment of self-efficacy to cope with the potential risk of online privacy. In this sense, the social cognitive model of information

disclosure may extend the CASA model of human-computer interaction (Nass & Moon, 2000; Reeves & Nass, 1996) that suggests that humans tend to respond to the computer interface without making much social cognitive effort.

This social cognitive model of information disclosure may be also differentiated from the social exchange perspective of information disclosure in that it assumes reciprocal interactions of the possible factors of social environmental influence (personalized social cues of immediacy of Web site interface), human cognition (privacy self-efficacy and outcome expectations) and human behavior (information disclosure). Because the social exchange perspective of information disclosure primarily views individuals' social actions only as a function of reward, punishment, and the aggregate outcomes associated with their disclosures, the social exchange perspective may not be appropriate when applied to a dynamic social environment such as the Internet. In such an online environment, consumers not only assess potential positive and negative consequences, but also actively process the potential impact of social environmental influences of personalized social cues on their self-regulatory capacities to predict, control, and manage the outcomes of their information disclosures. Consequently, this dissertation seeks to untangle the relationship between personalized social cues of immediacy and human motivation of information disclosure as a social cognitive process through which consumers consider all personal, behavioral, and environmental influences in the dynamic environment of the Internet.

Figure 1

Proposed Research Model



Note: H14 is tested using analysis of covariance (ANCOVA) technique.

CHAPTER 3

METHOD

The objective of this research is to propose a socio-cognitive model of information disclosure in human-computer interaction and to investigate the underlying social cognitive processes of the effect of computer immediacy on consumers' willingness to disclose their personal and health information. The study design is further detailed in this chapter via a discussion of the experimental method used. Specifically, this section focuses on issues related to the research design, participants and their recruitment, stimulus material development, and measures used in the study. Data were collected in an online experimental setting that controlled for unwanted intervening factors and observing the relations among the independent, mediating, and dependent variables.

Research Design

An online experiment was conducted. The online experiment was chosen because it was considered to be a natural setting where individuals are commonly requested to disclose their personal and health information. In addition, participants are hardly independent in a lab setting that requires them to disclose their personal and health information with other participants present.

A 2 x 2 mixed factorial design was conducted. Since this research specifically focused on the effects of the level of personalized social cues of immediacy (low or high)

and the type of information (embarrassing or descriptive) that can be requested from Web sites, it considered these two variables as the treatment factors. In other words, the two levels of personalized social cues of immediacy was the between-subjects factor and the two types of information was the within-subjects factor.

In the mixed factorial design, participants were randomly assigned to either the low immediacy or high immediacy treatment conditions. In each condition, they were asked to complete the experiment and to fill out a follow-up online survey questionnaire about their intentions to reveal their embarrassing and descriptive personal and health information. Here, embarrassing information items were more concerned with the social disclosure consequence of unwanted impressions to others and included sexually transmitted disease history, mental illness history, and medical condition, such as obesity, diabetes, and high blood pressure. On the other hand, descriptive information items were more concerned with the social disclosure consequence of unwanted information solicitation and abuse, and included social security number, health insurance policy number, and doctors' names and phone numbers. To avoid possible order effects, the display order of the types of information requested was randomized.

Participants and Procedures

A total of 252 individuals were contacted and recruited by an established online marketing company (www.zoomerang.com). Specifically, all participants were recruited opt-ins during Web site registrations and were contacted through online announcements and email contacts. Then, they were directed to visit a newly created personal health

record (PHR) Web site for the experiment (www.e-medfile.com), and were randomly assigned to one of the two experimental conditions.

Two different versions of the e-medfile Web site were created to reflect the two experimental conditions, namely low and high levels of personalized social cues of computer immediacy. These Web sites were created to reflect the two levels of immediacy manipulation.

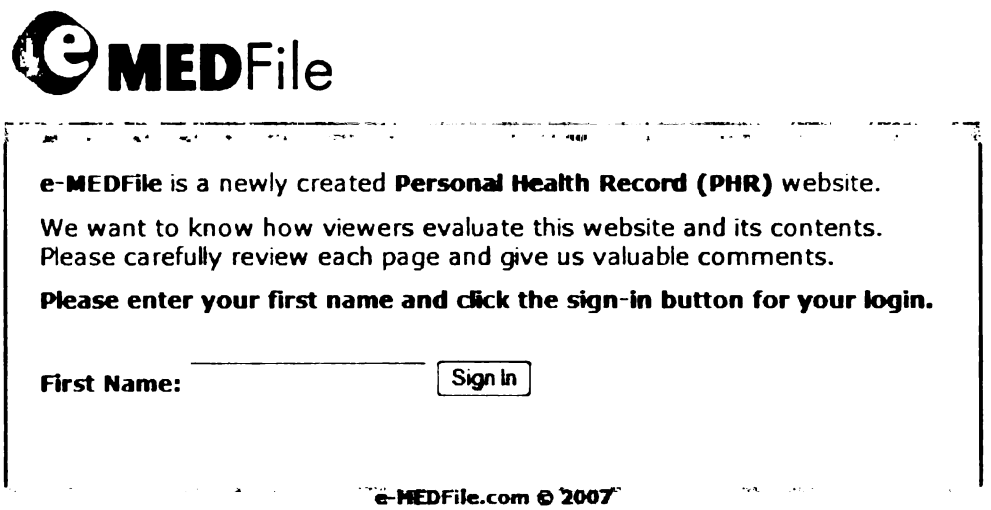
With the help of a random assignment program placed in the log-in page, half of the participants were randomly assigned to the low-immediacy manipulation condition and the other half to the high-immediacy condition. In order to control for gender effects, participants were also randomly assigned to each condition in terms of participants' gender. Specifically, in order to recruit the same number of male and female participants for each condition, female participants were first recruited until the number of the participants reached a desirable and equal sample size for each condition. When 63 female participants visited each condition of the Web site and finished filling out the online survey, the same number of male participants were recruited for the experiment and asked to visit each condition and fill out the online survey. As a result, 63 male and 63 female participants were assigned to the high immediacy condition of the Web site and the same number of male and female participants was assigned to the low immediacy condition. Therefore, each condition contained equal numbers of males and females. In total, 252 participants participated in the experiment.

Upon visiting the stimulus Web site, participants were first given brief instructions instructing them to browse the Web site and evaluate it by filling out an online survey. The instruction page explained that the study concerned the evaluation of a

newly launched personal health record Web site (www.e-medfile.com). The instruction page also informed participants that the Web site would ask them to fill out an online survey upon completion of browsing the Web site. When the participants were asked to read a consent form, they indicated their voluntary participation by clicking a "next" button at the bottom of the page. The moment when the participants clicked the button, they were automatically and randomly assigned to the log-in page of one of the two treatment conditions of computer immediacy (high vs. low). When participants were directed to a registration page of the Web site, each was asked to provide his or her first name to the Web site as a registration process for study participation (See Figure 2).

Figure 2

A Screenshot of the Log-in Page of the E-Medfile Web Site



When they typed in their first names, they clicked a 'Sign In' button and went to the first page of the Web site. After the participants browsed and experienced the Web site, they were asked to fill out a post-test online survey questionnaire that collected their perceptions of the Web site. Once participants finished the questionnaire, they were directed to a debriefing page thanking them for their participation.

Most participants were white Caucasian (87.3%), followed by Black (4.8%), Hispanic (4%), Asian (3.6%) and others (.3%). Participants' ages ranged from 18 to 66 and the median age was 42 years (M = 41.2, SD =13.1). The sample of adult Internet participants is considered appropriate for this experiment because it represents individuals with some degree of Internet literacy.

To motivate participation in the study, the online marketing company has a point-incentive system for participants. Participants can accumulate points and use them for redemption for such incentives as a can-opener, a MP3 music download, a $10 discount certificate on Greyhound, and others depending on how much they have accumulated in redemption points.

Stimulus Material

A Web site (www.e-medfile.com) was created to contain personal health record (PHR) services and served as the stimulus material for this dissertation. The e-medfile Web site introduces what the online PHR service is and demonstrates how Internet users can use the PHR service to store and access their personal health and medical record. The site contained 12 pages: a log-in page to the site, one greeting page, two basic

introductory pages about the site and its PHR services, seven PHR topic pages, and one interactive review session page.

In order to ensure that experiment participants went through the Web site, each Web page was equipped with a hyperlink that required them to go to the next page or go back to the previous page at the bottom of the page. For example, Figure 3 shows the Web site's greeting page.

Figure 3

A Screenshot of the Greeting Page of the E-Medfile Web Site

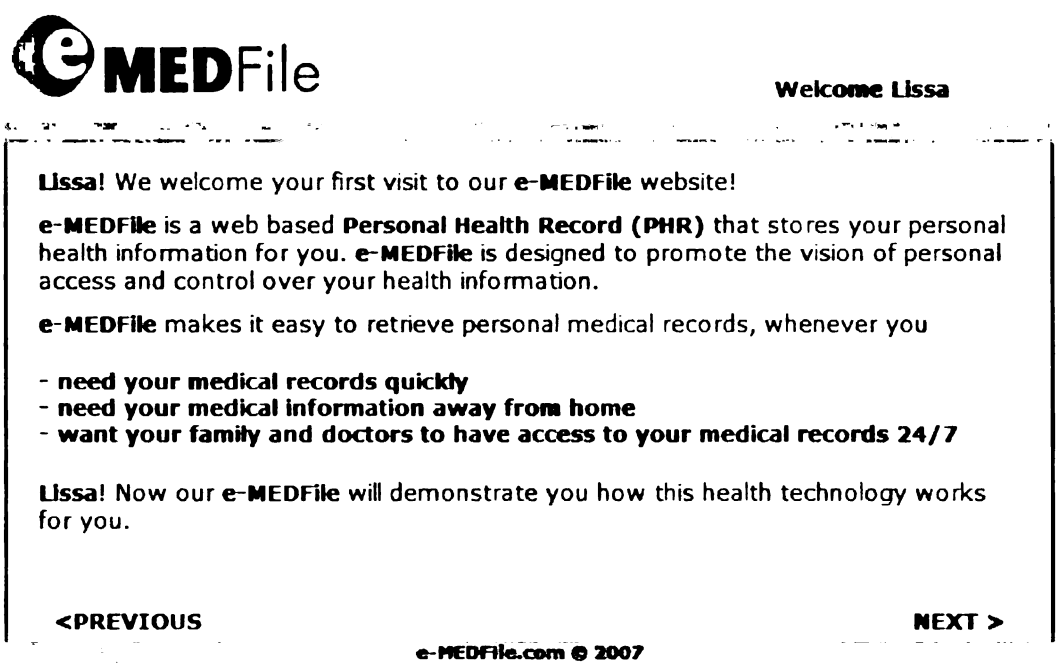
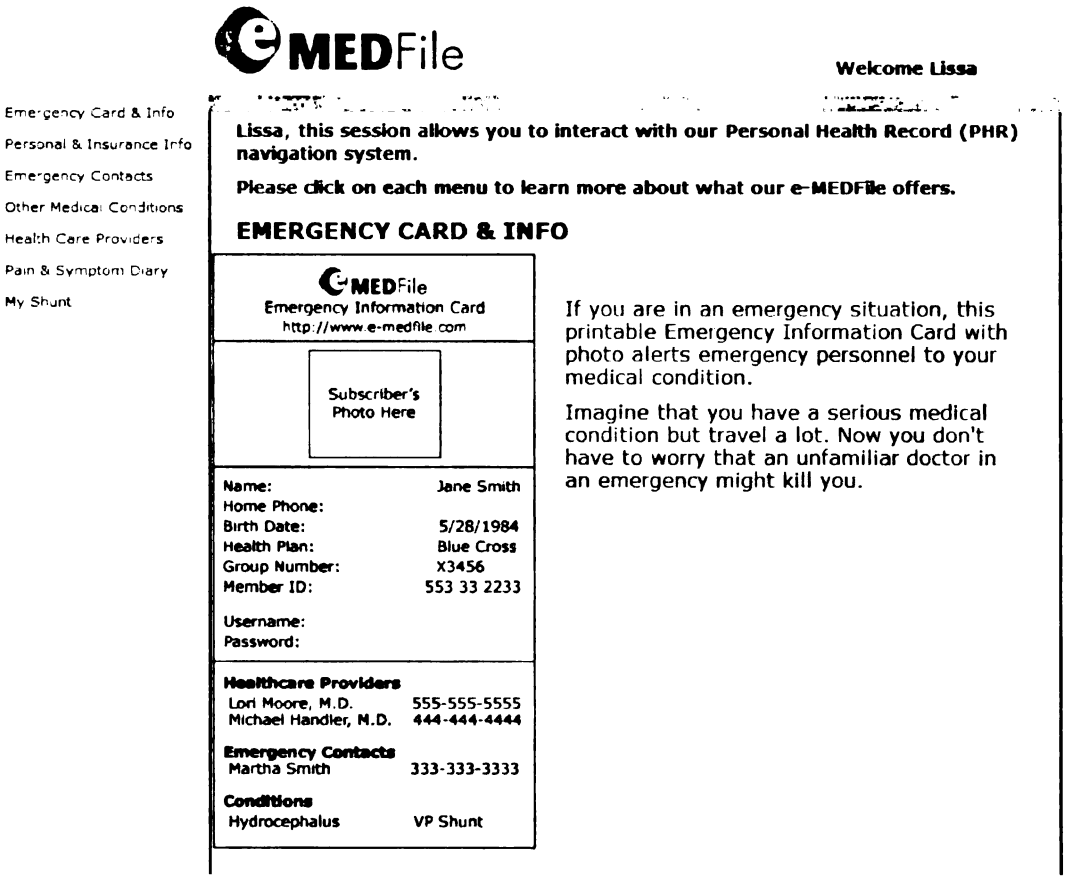


Figure 4

A Screenshot of the Navigation Page of the E-Medfile Web Site



Next, the seven PHR topic pages were presented in a two-column layout. The left column has a demo navigation system featuring the seven PHR service categories including *emergency card & info, personnel & insurance info, emergency contacts, any other medical conditions, health care providers, pain & symptom diary,* and *my shunt.* Specifically, the left-hand navigation system allowed the participants to interact with the e-medfile PHR services so that users could get to know the services, such as entering and creating a printable emergency card with a photo, personal and health insurance

information, emergency contact information, medical condition history, healthcare provider information, a pain and symptom diary, and shunt information (See Figure 3). Appendices A-1 through A-7 show the seven topic pages.

After the seven PHR topic pages, the Web site featured a brief interactive review session for participants to check their general knowledge about the PHR services. Content for the site was drawn and adapted from existing PHR Web sites, such as www.followme.com (See Appendix B).

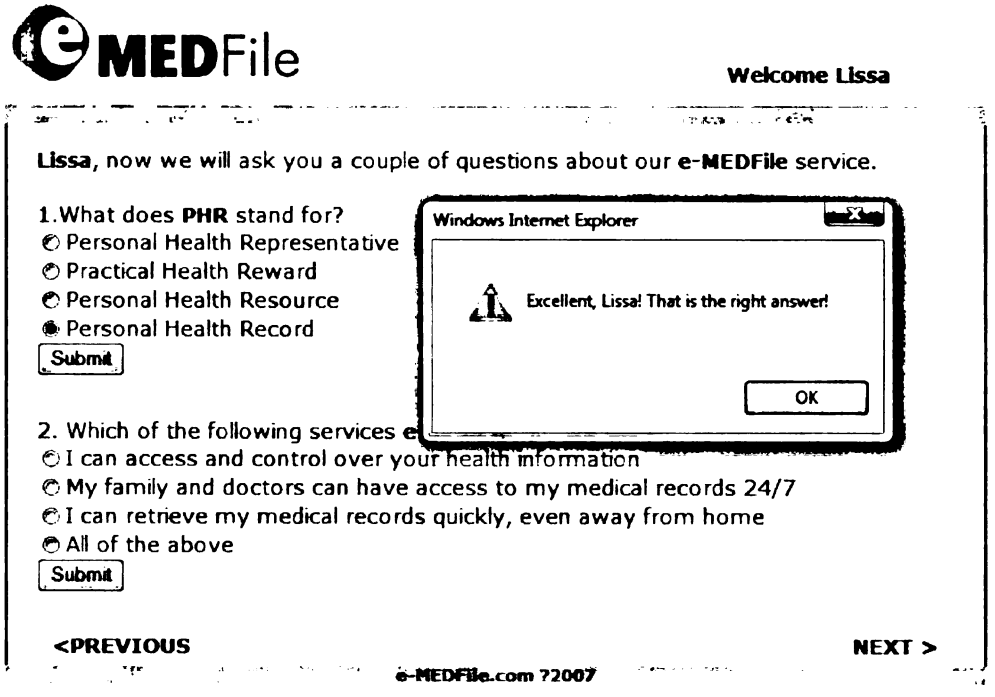
Two Levels of Immediacy Manipulation

Two versions of the Web site were created to reflect the two levels of computer immediacy (low vs. high). In other words, all features and contents were identical in the two versions of the e-medfile Web site, except for the immediacy manipulation. In the high immediacy condition, participants were recognized at the top of the page upon logging in with their first names. They were also personally greeted with their first name on the right at the top of the page and in a welcoming salutation message on the main text page (e.g., Welcome Lissa; Lissa! We welcome your first visit to our e-medfile Web site!) (See Figure 3). The greetings and appropriate social cues of immediacy tailored for each participant continued throughout all pages of the Web site. In the low immediacy condition, participants were not recognized on any pages of the Web site.
Also, in the high immediacy condition, the interactive review session page demonstrated appropriate social cues of immediacy. Following Bracken and Lombard (2004)'s manipulation of a "parsing" computer in their study of its effects on children's learning, , participants received praise (e.g., Excellent, Lissa! That is the right answer!) or

encouragement (e.g., Try again, Lissa. You can do it!) from the Web site about their performance in the session (See Figure 5). However, in the low immediacy condition, participants did not receive praise or encouragement, with the Web site remaining neutral in addressing participants' performance in the interactive review session (e.g., That is the right answer or Try again).

Figure 5

A Screenshot of the Interactive Review Page of the E-Medfile Web Site



Types of Information Manipulation

A Web-based questionnaire was also created and linked to the stimulus e-medfile Web site. Six questionnaire items in the online survey represented two within-subject

experimental conditions, in which participants were asked to indicate their intention to reveal both embarrassing and descriptive personal and health information. Based on a pretest administered to 40 undergraduate students at a large Midwestern university, three question items were selected for each information type. The three embarrassing information items asked about focused on intention to reveal 1) mental illness history, 2) sexually transmitted diseases history, and 3) medical conditions, such as obesity, diabetes, and high pressure. The three descriptive information items asked about participants' intention to reveal their 4) social security number, 5) health insurance policy number, and 6) doctors' names and phone numbers.

Measurement

Dependent Measure

Information Disclosure Intention. The primary dependent measure of information disclosure intention was utilized. To measure an individual's intention to disclose their personal and health information, participants were asked to rate the likelihood of revealing each information item in the hypothetical profile to e-medfile.com. The measurement item was adapted from LaRose and Rifon (2007)'s information disclosure intention, using a 7-point likelihood scale with 1 representing *very unlikely* and 7 representing *very likely*.

Potential Mediating Measures

When discussing the effect of computer immediacy, four possible intervening variables, namely negative outcome expectations of 1) embarrassment and 2) information

abuse, and positive outcome expectations of 3) social trust and 4) customization benefits, were identified. Questions pertaining to each of these variables were included in order to empirically verify whether these variables mediated the relationship between computer immediacy and self-disclosure intention.

Negative outcome expectation of embarrassment. Participants rated the perceived likelihood of the negative consequence of embarrassment occurring as a result of providing information requested by the e-medfile Web site. Two items were adapted from White (2004), consisting of a seven-point Likert type scale ranging from 1 for *very unlikely* and 7 for *very likely*. The items included 1) revealing this information to the Web site I just worked with will be embarrassing; and 2) revealing this information to the Web site I just worked with will make others evaluate me negatively. The two items were combined to form the scale for the negative outcome expectation of embarrassment. This measure exhibited a high degree of internal consistency for each information type, ranging from .88 to .97 (Cronbach's alpha = .91 for mental illness history; .93 for sexually transmitted diseases history; .88 for medical condition; .96 for social security number; .95 for health insurance policy number; and .97 for doctor's name and phone number).

Negative outcome expectation of information abuse. Participants rated the perceived likelihood of the negative consequence of information abuse occurring as a result of providing information requested by the e-medfile Web site. The two items adapted from White (2004) using a seven-point Likert type scale ranging from 1 for *very unlikely* and 7 for *very likely*. The items included 1) revealing this information to the Web site I just worked with will lead others to misuse my information without my permission

and 2) revealing this information to the Web site I just worked with will result in an increase in phone or mail or e-mail solicitations. The two items were combined to form the scale for the negative outcome expectation of information abuse. This measure demonstrated a high degree of internal consistency: 77 to .93 (Cronbach's alpha = .87 for mental illness history; .93 for sexually transmitted diseases history; 92 for medical condition; .77 for social security number; .90 for health insurance policy number; and .92 for doctor's name and phone number).

Positive Outcome Expectation of Customization Benefits. Using a seven-point scale ranging from 1 for *very unlikely* and 7 for *very likely*, participants rated the perceived likelihood of positive consequences occurring as a result of providing personal information requested by the e-Medfile Web site. The two items included 1) revealing this information to the Web site I just worked with will result in better customer service; 2) revealing this information to the Web site I just worked with will result in quick access to personalized service. The two items were combined to form the scale for the positive outcome expectations of customization benefits. This measure showed a high degree of internal consistency for each information type that was requested to be hypothetically disclosed from the e-medfile Web site, ranging from .77 to .94 (Cronbach's alpha = .87 for mental illness history; .90 for sexually transmitted diseases history; .94 for medical condition; .77 for social security number; 89 for health insurance policy number; and .93 for doctor's name and phone number).

Positive Outcome Expectations of Social Trust. Using the same seven-point Likert type scale ranging from 1 for *very unlikely* and 7 for *very likely*, participants rated the perceived likelihood of positive social consequences associated with the use of the e-

Medfile Web site. Specifically, adapted from Gefen et al.'s (2003) e-trust items, participants were asked to rate whether the Web site that they had just worked with would 1) be trustworthy, 2) be willing to support them, 3) give advice in their best judgment, 4) have good intentions toward them, and 5) be sincere. The five items were combined to form the scale for the positive outcome expectations of social trust. This measure demonstrated a high degree of internal consistency (Cronbach's alpha = .87)

Control Measure

Online Privacy Self-Efficacy. Using a seven-point scale ranging from 7 for strongly agree to 1 for strongly disagree, privacy self- efficacy consisted of three items that measured a respondent's perceived ability to protect their own privacy on the Internet. Adapted from LaRose and Rifon (2007), the three items included 1) I am able to protect myself against the release of personal information; 2) It is easy to figure out which sites you can trust on the Internet; 3) I am confident that I can protect my privacy online. The three items were combined to form the privacy self-efficacy scale. This measure demonstrated a high degree of internal consistency (Cronbach's alpha = .91).

Manipulation Check Measures

Computer Immediacy Manipulation. Three items were created to check the effectiveness of the immediacy level manipulation. Participants were asked to rate whether the Web site that they had just worked with was 1) warm, 2) friendly, and 3) intimate. These three questions were measured on the same 7-point scale with 1

representing *strongly disagree* and 7 representing *strongly agree* (Cronbach's alpha = .80).

Information type Manipulation. Two items were used to check the effectiveness of the manipulation of the information type requested by the e-medifle Web site. Adapted from White (2004), the type of consumer information should reflect either potentially embarrassing kinds or privacy-related descriptive personal or health information that can be requested from a PHR Web site such as e-medfile.com. Six items were selected on the basis of a pretest administered to 40 undergraduate college students who received extra-credit for their participation. Based on the pretest, three embarrassing items (e.g., sexually transmitted diseases, mental disease, and medical conditions such as obesity, diabetes, and high blood pressure) and three privacy-related descriptive items (e.g., social security number, insurance policy number, doctor's names and phone numbers) were selected for the main experiment. To examine the information type manipulation, this study used the measures of *negative outcome expectations of embarrassment* and *information abuse* and asked the participants to rate the perceived negative consequences differently associated with their disclosure intention for their embarrassing and descriptive information that can be requested by the PHR Web site.

Preparation for Data Analysis

An exploratory factor analysis was conducted upon the measure of information disclosure intention regarding the six pieces of information (mental illness history, sexually transmitted diseases history, medical conditions, social security number, health insurance policy number, and doctor's names and phone numbers). The factor analysis

yielded two factors accounting for 81% of the variance. The three items (mental illness history, sexually transmitted diseases history, and medical conditions) loaded under the first factor labeled "embarrassing information disclosure intention" and the other three items (social security number, health insurance policy number, and doctor's names and phone numbers) loaded under the second factor labeled "descriptive information disclosure intention." The three items for each factor were combined to form the scales for the two types of information disclosure intention. Each scale exhibited a high degree of internal consistency (Cronbach's alpha = .90 for embarrassing information disclosure intention and .86 for descriptive information disclosure intention).

Since the scope of the research hypotheses may be attributable to differences associated with the types of information that may be requested from the e-medfile Web site, the proposed research model was tested using two path models of the two types of information disclosure intention: one for embarrassing information disclosure intention and another for descriptive information disclosure intention. The exploration of the two path models allowed examination of the theorized moderating role of information type in influencing consumers' intention to reveal their personal and health information.

Data Analysis

First, ANOVA and paired samples t-tests were performed to check manipulations of the immediacy level and information type, respectively.

Then, Pearson product-moment correlations were calculated to examine bivariate relationships between the variables of interest using SPSS 16.

Next, with AMOS 8.0 and using maximum likelihood estimation, path analyses were employed to test the hypotheses in the proposed research model. The path analysis technique was chosen not only to examine the proposed direct and indirect relationships of the hypotheses, but also to demonstrate whether or not the current data support casual associations in the proposed model as theorized.

While testing the proposed research model, Analysis of Covariance (ANCOVA) tests were also performed to examine the main effect of the immediacy level and information type manipulations on information disclosure intention, with online privacy self-efficacy as a covariate. By controlling for the effect of online privacy self-efficacy on information disclosure intention, the ANCOVA test investigated the main effect of the computer immediacy manipulation on information disclosure intention.

Finally, following Baron and Kenny's (1986) suggestions for testing mediating effects, a mediation analysis was employed to test whether the effect of computer immediacy on consumers' willingness to reveal their personal and health information was mediated by the negative outcome expectations of embarrassment and information abuse and positive outcome expectations of social trust and customized benefits. The next chapter presents research findings using these analysis methods.

CHAPTER 4

RESULTS

Manipulation Checks

Computer Immediacy Manipulation

Computer immediacy was manipulated at two levels, high and low. To assess the effectiveness of the manipulation, respondents were asked to rate the immediacy level of the stimulus personal health record Web site (www.e-medfile.com) using the previously validated three-item scale described in the previous section (Cronbach's alpha = .80). As expected, a one-way analysis of variance (ANOVA) revealed a statistically significant effect for the manipulation ($F(1, 250) = 24.797, p < .001$). Specifically, participants' perceived immediacy scores were significantly higher when the high computer immediacy manipulation ($M = 5.20$, $SD = .93$, $n = 126$) was presented than when the low immediacy manipulation ($M = 4.61$, $SD = .96$, $n = 126$) was presented on the e-medfile Web site. These results were interpreted as successful manipulation of computer immediacy.

Information Type Manipulation

As adapted from White (2004), the type of information was manipulated to reflect either potentially embarrassing or descriptive personal or health information that can be requested from the stimulus PHR Web site. Based on the pretest, three embarrassing items (e.g., sexually transmitted diseases history, mental illness history, and medical

conditions, such as obesity, diabetes, and high pressure) and three descriptive items (e.g., social security number, insurance policy number, doctor's names and phone numbers) were selected for the main experiment. As shown in Table 1, a series of paired samples t-tests compared the means of two related variables for one single group of participants and revealed that they would expect that disclosing the three embarrassing information items would be more likely to make them embarrassed whereas the three descriptive information items would be more likely to lead to participants' information being abused if requested to disclose such information from the e-medfile Web site. These results were interpreted as successful manipulation of information type.

Table 1

Paired Samples T-Tests for Information Type Manipulation

Information requested	Outcome expectations	Mean	*SD*	*t*-value	P-value
Sexually Transmitted Diseases History	Embarrassment	**4.37**	1.53		
	Information abuse	3.70	1.44	$t(251) = 8.01$	$p < .001$
Mental Illness History	Embarrassment	**4.24**	1.39		
	Information abuse	3.74	1.50	$t(251) = 6.02$	$p < .001$
Medical Condition	Embarrassment	**3.76**	1.49		
	Information abuse	3.56	1.42	$t(251) = 2.34$	$p < .05$
Social Security Number	Embarrassment	2.66	1.46		
	Information abuse	**4.57**	1.47	$t(251) = -17.29$	$p < .001$
Health Insurance Policy Number	Embarrassment	2.39	1.42		
	Information abuse	**4.18**	1.63	$t(251) = -15.69$	$p < .001$
Doctor's Name and Phone Number	Embarrassment	2.36	1.43		
	Information abuse	**3.34**	1.63	$t(251) = -10.92$	$p < .001$

Hypothesis Testing

Tables 2 and 3 show each matrix of Pearson product-moment correlation coefficients for the variables related to information disclosure intentions of the two types of information (embarrassing and descriptive information), respectively. Specifically, Table 2 shows that embarrassing information disclosure intention was positively associated with computer immediacy ($r = .26, p < .001$), online privacy self-efficacy ($r = .31, p < .001$), social trust outcome expectations ($r = .40, p < .001$) as well as customization benefit outcome expectations ($r = .33, p < .001$), and negatively related to embarrassment outcome expectations ($r = -.38, p < .001$) and information abuse outcome expectations ($r = -.55, p < .001$). On the other hand, Table 3 shows that descriptive information disclosure intention was positively related to computer immediacy ($r = .29, p < .001$), online privacy self-efficacy($r = .34, p < .001$), social trust outcome expectations ($r = .37, p < .001$) as well as customization benefit outcome expectations ($r = .39, p < .001$), and negatively related to embarrassment outcome expectations ($r = -.18, p < .001$) and information abuse outcome expectations ($r = -.61, p < .001$).

Path analyses were conducted to examine the social cognitive processes of how computer immediacy would influence the likelihood that consumers disclose their personal and health information. Since the research hypotheses might be affected by the types of information that can be requested from the e-medfile Web site, two path models were tested: one for disclosure intentions of embarrassing information and another for disclosure intentions of descriptive information.

The model fit indices indicated an adequate fit with the data for the path models of disclosure intention for embarrassing information (AGFI = .913, CFI = .984, RMSEA

= .085 (90% C.I.:.028 – .146) and for descriptive information (AGFI = .924, CFI = .983, RMSEA = .075 (90% C.I.:.009 – .137). Although the chi-square test statistics were statistically significant for the model of embarrassing information disclosure (χ^2 = 11.225, df = 4, p = .024) and for the model of descriptive information disclosure (χ^2 = 9.668, df = 4, p = .046), this is to be expected due to the relatively large sample size (Kline, 1998). The two final models explained 35 % of the total variance in disclosure intention for embarrassing information and 45% of the total variance in disclosure intention for descriptive information. Figure 6 and Figure 7 demonstrate the results of path analyses for the proposed model, with all paths reporting standardized coefficients. All the research hypotheses, except for H14, were tested from the final models.

Table 2

Pearson Product-Moment Correlation Coefficients of the Variables Related to Embarrassing Information Disclosure

Variable	1	2	3	4	5	6	7	Mean	SD
1. Embarrassing Information Self-Disclosure Intention	1.00							4.40	1.60
2. Computer Immediacy	.26**	1.00						.50	.50
3. Online Privacy Self-Efficacy	.31**	.11	1.00					4.0	1.42
4. Social Trust Outcome Expectations	.40**	.29**	.37**	1.00				4.74	.99
5. Customization Benefit Outcome Expectations	33**	.27**	.30**	.47**	1.00			4.54	1.04
6. Embarrassment Outcome Expectations	-.38**	-.01	-.14*	-.20**	-.16**	1.00		4.06	1.24
7. Information Abuse Outcome Expectations	-.55**	-.32**	-.28**	-.37**	-.25**	64**	1.00	3.73	1.34

Note: *Significant at the .05 level. **Significant at the .01 level.

Table 3

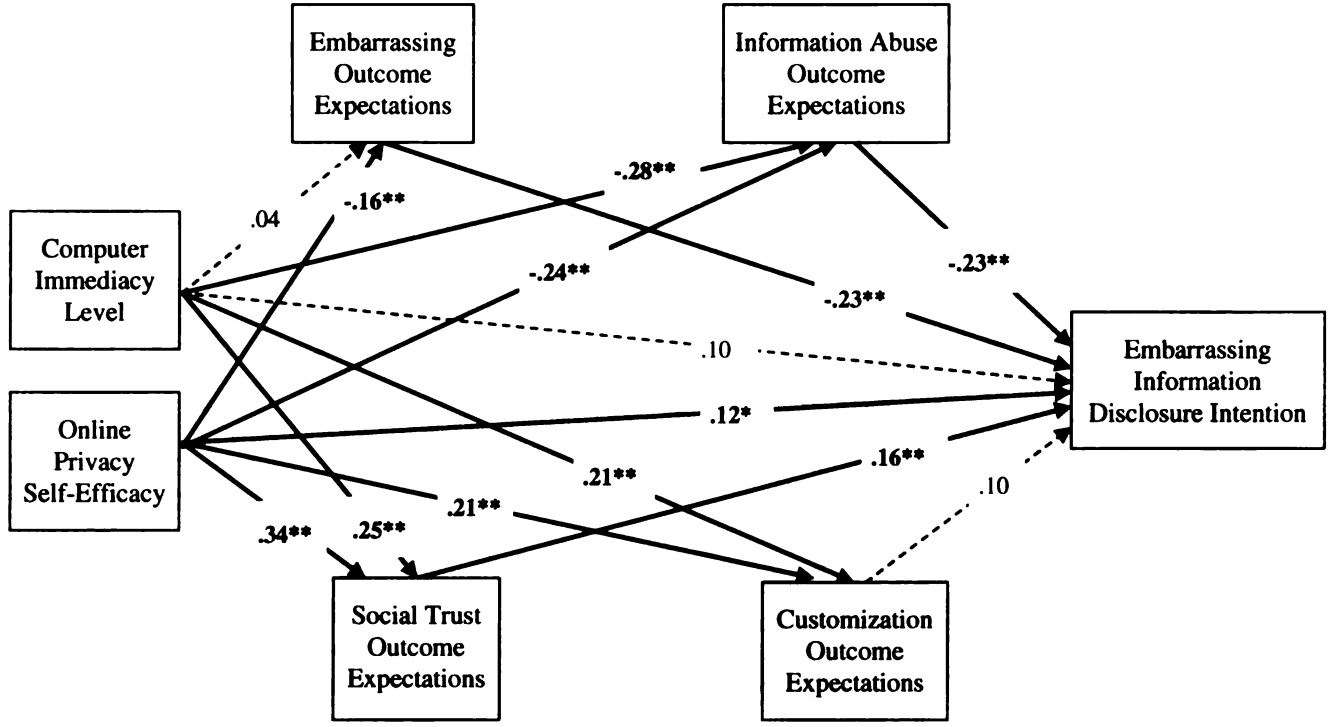
Pearson Product-Moment Correlation Coefficients of the Variables Related to Descriptive Information Disclosure

Variable	1	2	3	4	5	6	7	Mean	SD
1. Descriptive Information Self-Disclosure Intention	1.00							3.86	1.58
2. Computer Immediacy	.29**	1.00						.50	.50
3. Online Privacy Self-Efficacy	.34**	.11	1.00					4.0	1.42
4. Social Trust Outcome Expectations	.37**	.29**	.37**	1.00				4.74	.99
5. Customization Benefit Outcome Expectations	.39**	.20**	.28**	.39**	1.00			4.27	1.21
6. Embarrassment Outcome Expectations	-.18**	-.04	-.08	-.14*	-.04	1.00		2.47	1.30
7. Information Abuse Outcome Expectations	-.61**	-.26**	-.22**	-.29**	-.20**	41**	1.00	4.03	1.36

Note: *Significant at the .05 level. **Significant at the .01 level.

Figure 6

Results of Standardized Path Analysis for the Proposed Model of Embarrassing Information Disclosure



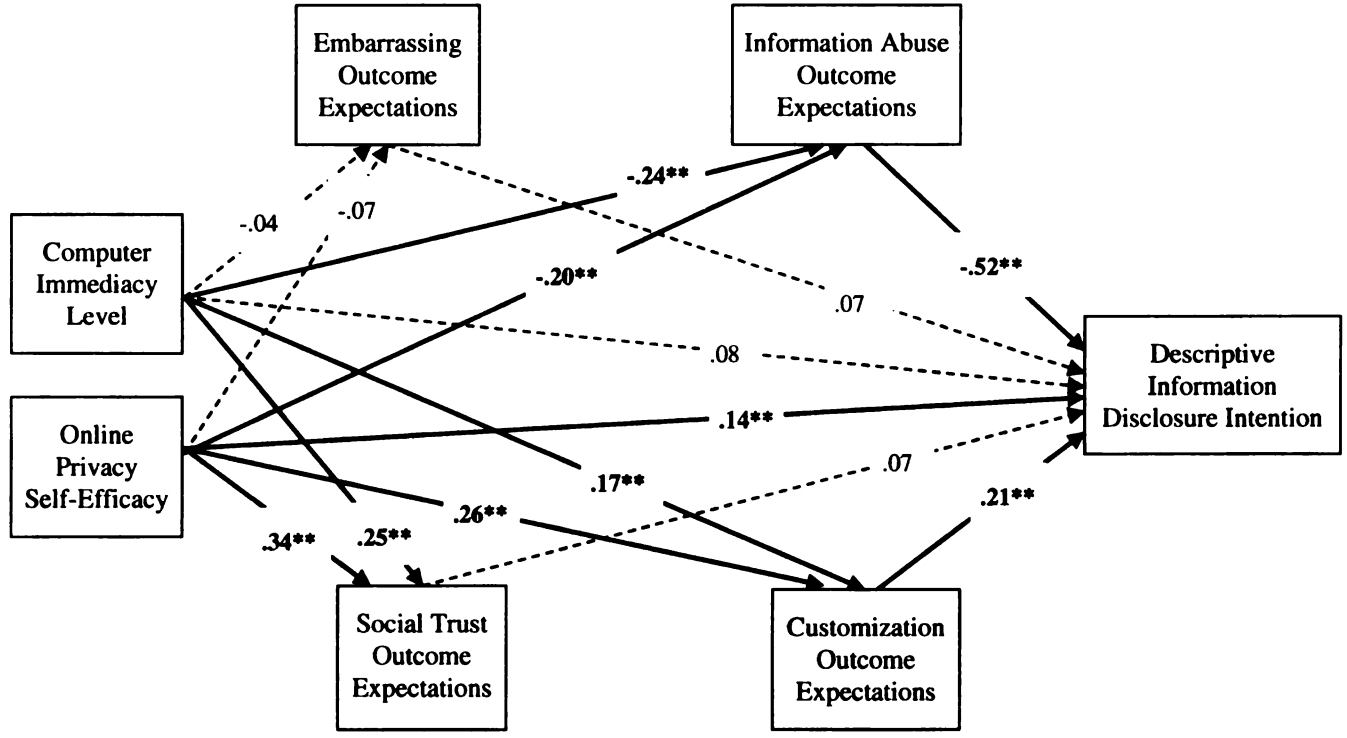
Note: -----▶ indicates non-significant paths
——▶ indicates significant paths

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

$\chi^2 = 11.225$, $df = 4$, $p = .024$, AGFI = .913, CFI = .984, RMSEA = .085 (90% C.I.: .028 – .146)

Figure 7

Results of Standardized Path Analysis for the Proposed Model of Descriptive Information Disclosure



Note: -----▶ indicates non-significant paths
——▶ indicates significant paths

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

$\chi^2 = 9.668$, $df = 4$, $p = .046$, AGFI = .924, CFI = .983, RMSEA = .075 (90% C.I.: .009 – .137)

H1 predicted that participants' expectations of negative consequences of embarrassment would be negatively related to their intention to disclose their personal and health information to the e-medfile Web site. The hypothesized negative effect of negative outcome expectations of embarrassment on disclosure intention was significant at the .001 significance level when participants were requested to reveal embarrassing information about themselves ($\beta = -.23$, $p < .001$). However, the effect was not significant when participants were requested to reveal descriptive information about themselves ($\beta = .07$, $p > .10$). Thus, H1 was partially supported.

H2 predicted that participants' expectations of negative consequence of information abuse would be negatively associated with their intention to reveal their information to the e-medfile Web site. As expected, negative outcome expectations of information abuse were negatively associated with disclosure intention for both embarrassing ($\beta = -.23$, $p < .001$) and descriptive information ($\beta = -.52$, $p < .001$). Thus, H2 was supported.

H3 predicted that participants' expectations of positive consequences of social trust would be positively related to their intention to disclose their information to the e-medfile Web site. As predicted, participants' positive outcome expectations of social trust with the e-medfile Web site promoted their disclosure intention when they were requested to reveal embarrassing information ($\beta = .16$, $p < .01$). However, the positive effect of positive social outcome expectations on disclosure intention was not significant when participants were requested to reveal their descriptive information ($\beta = .07$, $p > .10$). The results suggest a noticeable difference in the relationship between positive outcome

expectations of social trust and disclosure intention, depending on information type. Thus, H3 was partially supported.

H4 predicted that participants' expectations of positive consequence of customization benefits would be positively associated with their intention to reveal their information to the e-medfile Web site. Unexpectedly, depending on information type, the results revealed a noticeable difference in the relationships between positive outcome expectations of customization benefits and disclosure intention. Specifically, the hypothesized positive effect of positive outcome expectations of customization benefits on disclosure intention was not significant for the embarrassing information ($\beta = .10$, $p > .05$), whereas the corresponding effect was significant for the descriptive information ($\beta = .21$, $p < .001$). Thus, H4 was partially supported.

H5 predicted that online privacy self-efficacy would promote participants' intention to reveal their personal and health information. As expected, online privacy self-efficacy was positively related to disclosure intention for both the embarrassing ($\beta = .12$, $p < .05$) and the descriptive ($\beta = .14$, $p < .05$) personal and health information. The results indicated that those with high privacy self-efficacy had greater intentions to reveal their information to the e-medfile Web site than those with low privacy self-efficacy, regardless of the information type. Thus, H5 was supported.

H6 predicted that participants' high online privacy self-efficacy would lower their expectations of negative consequences of embarrassment. However, depending on the information type, there was an evident difference in the relationship between privacy self-efficacy and negative outcome expectations of embarrassment. Specifically, the hypothesized negative effect of privacy self-efficacy on negative outcome expectations of

embarrassment was significant only when participants were requested to reveal their embarrassing personal and health information ($\beta = -.16$, $p < .01$), whereas the corresponding effect was not significant when participants were requested to disclose their descriptive information ($\beta = -.07$, $p > .10$). Thus, H5 was partially supported.

H7 predicted that if participants have high online privacy self-efficacy, they will have lower expectations of negative consequences of information abuse by the e-medfile Web site. As hypothesized, the results showed that privacy self-efficacy had a negative effect on the negative outcome expectations of information abuse for both the embarrassing information ($\beta = -.24$ $p < .001$) and the descriptive information ($\beta = -.20$, $p < .001$). Thus, H7 was supported.

H8 predicted that participants with high online privacy self-efficacy would report greater positive outcome expectations of social trust than those with low privacy self-efficacy. As expected, the positive effect of privacy self-efficacy on positive outcome expectations of social trust was significant for both the embarrassing information and the descriptive information ($\beta = .34$, $p < .001$). Thus, H8 was supported.

H9 predicted that if participants have high online privacy self-efficacy, they will expect that they would receive customized benefits from the e-medfile Web site. As predicted, privacy self-efficacy was positively associated with positive outcome expectations for both the embarrassing information ($\beta = .21$, $p < .001$) and the descriptive information ($\beta = .26$, $p < .001$). H9 was thus supported regardless the information type.

H10 predicted that participants who viewed the version of the e-medfile Web site with high levels of personalized social cues of immediacy would report greater expectations of social trust than those who viewed the version with low levels of

immediacy. As expected, the hypothesized positive effect of privacy self-efficacy on expectations of social trust was significant for both the embarrassing information ($\beta = .25$, $p < .001$) and the descriptive information ($\beta = .25$, $p < .001$). Thus, H10 was supported.

H11 predicted that participants who browsed the version of the e-medfile Web site that had high levels of personalized social cues of immediacy would report greater expectations that they will receive customized benefits from the Web site than those who browsed the version with low levels of immediacy. As predicted, computer immediacy was positively associated with expectations of customization benefits when participants were requested to reveal their embarrassing information ($\beta = .21$, $p < .001$) and descriptive information ($\beta = .17$, $p < .001$). H11 was thus supported regardless of the information type.

H12 predicted that participants who viewed the version of the e-medfile Web site featuring high levels of personalized social cues of immediacy would report greater expectations of negative consequences of embarrassment than those who viewed the version with low levels of immediacy. However, the hypothesized positive effect of computer immediacy on the expectations of embarrassment was not significant for either the embarrassing information ($\beta = .04$, $p > .10$) or the descriptive information ($\beta = -.04$, $p > .10$). Thus, H12 was not supported.

H13 predicted that participants who browsed the version of the e-medfile Web site having high levels of personalized social cues of immediacy would report lower expectations that their information will be abused than those who viewed the version with low levels of immediacy. As predicted, computer immediacy was positively associated with expectations of customization benefits when participants were requested

to reveal their embarrassing information ($\beta = -.28$, $p < .001$) and descriptive information ($\beta = -.24$, $p < .001$). H13 was thus supported.

H 14 predicted that the participants who viewed the version of the e-medfile Web site having high computer immediacy would be more willing to reveal their personal and health information than those who viewed the version with low immediacy.

A mixed design 2 x 2 analysis of covariance (ANCOVA) test was performed to examine the effects of the immediacy level and information type manipulations on the two types of disclosure intention while controlling for the effect of privacy self-efficacy. The results of the ANCOVA test showed significant main effects of the immediacy level ($F(1, 249) = 22.76$, $p < .001$ and $\eta^2 = .08$) and information type ($F(1, 249) = 6.040$, $p < .05$ and $\eta^2 = .02$) on information disclosure intention. In addition, no interaction effect of the immediacy level and information type on disclosure intentions was found. The results indicated that participants who browsed the Web site in the high immediacy condition were more likely to disclose their embarrassing and descriptive information than those who visited the Web site in the low immediacy condition. The results also indicated that participants who browsed both high and low immediacy PHR Web sites were more likely to disclose their embarrassing information than their descriptive information. Another independent effect of the subjects' online privacy self-efficacy on the disclosure intention was also found ($F(1, 249) = 34.66$, $p < .001$ and $\eta^2 = .12$) in the analysis. Table 4 summarizes the appropriate means of the dependent measures across experimental conditions.

Table 4

Means and Standard Deviations for Information Disclosure Intentions by Computer Immediacy and Information Type Conditions

	"Immediacy Level"	
	Low Immediacy	High Immediacy
"Information Type"		
Embarrassing Information		
Sexually Transmitted Diseases	3.84 (1.95)	4.55 (1.67)
Mental Disease	3.67 (1.93)	4.63 (1.61)
Medical Conditions	4.46 (1.71)	5.28 (1.35)
Mean	**3.99 (1.69)**	**4.82 (1.39)**
Descriptive Information		
Social Security Number	2.59 (1.62)	3.51 (1.80)
Insurance Policy Number	3.53 (1.85)	4.40 (1.70)
Doctor's Contact Numbers	4.08 (1.90)	5.06 (1.57)
Mean	**3.40 (1.59)**	**4.32 (1.44)**

Note: Means are computed based on the information disclosure intentions being measured on a 7 point scale with 1 representing *very unlikely* and 7 representing *very likely*. Standard deviations are in parentheses.

H15 predicted that the direct effect of computer immediacy on self-disclosure intentions would be mediated by the social cognitive mechanisms of self-disclosure involving positive and negative outcome expectations. Following Baron and Kenny's (1986) suggestions for testing mediating effects, it was expected that the mediation analysis would show the hypothesized direct effect of computer immediacy on consumers' willingness to reveal their personal and health information should become non-significant after controlling for the potential mediators of negative outcome expectations of embarrassment and information abuse and positive outcome expectations of social trust and customized benefits.

First, the direct paths from computer immediacy to embarrassing and descriptive information disclosure intentions were examined in the absence of the other mediators.

The path coefficients indicated that both direct paths to embarrassing information disclosure intentions ($\beta = .27$, $p < .001$) and descriptive information disclosure intentions ($\beta = .29$, $p < .001$) were significant.

However, when combined with the other mediators in the original path models, the significant direct effects of computer immediacy on disclosure intentions were no longer significant when participants were requested to reveal both embarrassing ($\beta = .10$, $p > .05$) and descriptive personal and health information ($\beta = .08$, $p > .05$). Thus, the relationship between computer immediacy and the dependent variable of information disclosure significantly attenuated when the other mediators were incorporated in the model. The results established support for mediation and H15 was supported.

In addition, the path analyses found that the personalized social cues of the Web site affected participants' willingness to reveal their embarrassing information only through their expectations of the negative consequences of information abuse and of the positive consequences of social trust, whereas the personalized social cues of the Web site influenced participants' intention to reveal their descriptive information only through expectations of negative consequences of information abuse and of positive consequences of customization benefits. Table 5 shows the summary of the hypothesis testing.

In summary, path analyses showed that privacy self-efficacy, an important determinant affecting disclosure intention, not only directly affected the decision to engage in some form of information disclosure but also indirectly affected it by instigating the assessments of benefits (e.g., social trust and customized services) and risks (e.g., embarrassment and information abuse) associated with information disclosure behaviors. Path analyses also demonstrated that consumers' exposure to personalized

social cues of computer immediacy enhanced their expectations of positive consequences of social trust and customization benefits and reduced their expectations of negative consequences of information abuse at the same time. Further, such outcome expectations directly motivated the likelihood that consumers will reveal their personal and health information. However, the influence of computer immediacy on the likelihood of disclosure was not evident in the final path model, suggesting that the direct effect of computer immediacy on disclosure intention should be mediated by the social cognitive variables of positive and negative outcome expectations while controlling for the effects of privacy self-efficacy.

Table 5

Results of Hypothesis Testing

Hypothesis	Hypothesized Direction	Results
H1	Negative effect of embarrassment on disclosure intention	Partially supported
H2	Negative effect of information abuse on disclosure intention	Supported
H3	Positive effect of social trust on disclosure intention	Partially supported
H4	Positive effect of customization benefits on disclosure intention	Partially supported
H5	Positive effect of privacy self-efficacy on disclosure intention	Supported
H6	Negative effect of privacy self-efficacy on embarrassment	Partially supported
H7	Negative effect of privacy self-efficacy on information abuse	Supported
H8	Positive effect of privacy self-efficacy on social trust	Supported
H9	Positive effect of privacy self-efficacy on customization benefits	Supported
H10	Positive effect of computer immediacy on social trust	Supported
H11	Positive effect of computer immediacy on customization benefits	Supported
H12	Positive effect of computer immediacy on embarrassment	Not supported
H13	Negative effect of computer immediacy on information abuse	Supported
H14	Main effect of computer immediacy on disclosure intention	Supported
H15	Indirect effect of computer immediacy on disclosure intention	Supported

CHAPTER 5

DISCUSSION

This dissertation proposed and tested a social cognitive model of information disclosure in human-computer interaction. Guided by Bandura's (1991, 2001) Social Cognitive Theory (SCT), the present study attempted to develop a theoretical framework for understanding and predicting the social cognitive mechanisms of information disclosure in human-computer interaction within the context of personal health record (PHR) Web site services.

Specifically, first, this dissertation sought to develop the concept of computer immediacy (LaRose & Whitten, 2000) and establish its existence in the context of information disclosure in human-computer interaction. Secondly, it investigated the social cognitive processes of how the personalized social cues of immediacy on a Web site interface would affect consumers' willingness to disclose their personal and health information through positive (social trust and customization benefits) and negative (embarrassment and information abuse) outcome expectations associated with their interaction with and their information disclosures to the Web site. Finally, this dissertation explored how information type (embarrassing vs. descriptive information) requested from the Web site would moderate the social cognitive processes of the effect of computer immediacy on consumers' likelihood of revealing their personal and health information.

This dissertation started by conceptually defining computer immediacy as personalized social cues of a Web site interface that enhance feelings of psychological closeness and warmness between the Web site and its consumers. From the social cognitive perspective, computer immediacy was also theoretically distinguished from other similar media theories including social information processing (Walther, 1992), social presence (Short, Williams, & Christie, 1976), and CASA (Computers-Are-Social-Actors) model of human-computer interaction (Nass & Moon, 2000; Reeves & Nass, 1996), in that it is was regarded as a social environmental influence of the Web site interface which reciprocally interacts with the other two cognitive determinants of human cognition (outcome expectations and privacy self-efficacy) and human behavior (disclosure). This proposition highlights humans' self-regulatory mechanisms where cognition plays a central role in moderating behavior when people interact with the personalized social cues of computer immediacy.

Social Cognitive Process of the Effect of Computer Immediacy on Information Disclosure Intention

Overall, the results of this study provide empirical evidence for the existence of computer immediacy in human-computer interaction. First, the statistical significance on the manipulation check of computer immediacy confirmed that Web users were able to discriminate between the different levels of personalized social cues that the manipulation of computer immediacy elicited. The results reported here provide some of the first empirical evidence for the existence of computer immediacy in the domain of human-computer interaction.

Further, the results of the present study confirmed that the application of Bandura's (1991, 2001) SCT to the domain of human-computer interaction can be a promising theoretical framework for understanding how the social environmental influence of personalized social cues of immediacy can influence consumers' likelihood of revealing their personal and health information to Web sites. That is, consistent with SCT, exposure to personalized social cues of immediacy translated positively into one's cognition toward the stimulus e-medfile Web site by promoting expectations of the positive consequences of social trust and customization benefits and reducing expectations of the negative consequences of information abuse from the Web site at the same time. Further, such outcome expectations directly motivated consumers' willingness to reveal their information, which confirmed the outcome expectations of human cognition as one of the main cognitive components affecting human-computer interaction. Consequently, personalized social cues of immediacy triggered the social cognitive self-regulatory mechanisms of information disclosure in human-computer interaction where consumers can cognitively process the social environmental influence of immediacy cues and evaluate the potential positive and negatively consequences associated with information disclosure in the Internet.

Consistent with prior research on online privacy protection behavior (LaRose & Rifon, 2007; Rifon et al., 2005; Lee et al., in press), this study upheld a basic tenet of the social cognitive model of online privacy protection behavior: that privacy self-efficacy is another important determinant affecting disclosure intention directly and indirectly. That is, consumers' belief in their self-efficacy to protect their online privacy not only directly influenced their decision to engage in some forms of disclosure online but also indirectly

affected them by instigating the assessments of benefits (social trust and customized services) and risks (embarrassment and information abuse) associated with their disclosures. By demonstrating the established causal links of the direct and indirect relationships between privacy self-efficacy, outcome expectations, and information disclosure intention, the current study highlighted the importance of privacy self-efficacy as another important cognitive component in understanding self regulatory mechanisms in online privacy protection behaviors.

The present study also showed that, regardless of whether the information requested is embarrassing or descriptive in nature, exposure to a high level of personalized social cues of immediacy significantly and positively motivated information disclosure intention toward the stimulus e-medfile Web site, even after controlling for the effects of privacy self-efficacy. However, the direct influence of computer immediacy on the likelihood of information disclosure was not evident in the final path model which involved the potential mediators of positive and negative outcome expectations. The null relationship between computer immediacy and information disclosure intention in the final model suggests that the effect of computer immediacy on disclosure intention is mediated by the social cognitive variables of positive and negative outcome expectations. As such, the mediating role of outcome expectations on the influences of consumers' exposure to personalized social cues on their willingness to reveal personal and health information was apparent.

The results extend the CASA model of human-computer interaction (Nass & Moon, 2000; Reeves & Nass, 1996) suggesting that humans socialize with computers without much cognitive processing effort so that social behavior is automatically evoked

by the computer itself. The present results of the study suggest that consumers can also be mindful of the potential positive and negative consequences of providing their information to specific Web sites on the Internet. In other words, consumers are not always mechanically responsive to a Web site's social cues when enacting their information disclosures. Rather, they can often actively process the social environmental cues of the Web site interface and cognitively assess the consequences of their information disclosures and make a self-reactive decision particularly when they have to deal with the potential risks of privacy invasions and benefits of social trust and customized service offerings in the Internet. Thus, consumers' likelihood of disclosures in human-computer interaction on the Internet may have to be understood as a human behavior that requires social cognitive effort beyond the automatic social response to the computer itself.

The social cognitive explanation of information disclosure in human-computer interaction on the Internet should be differentiated from Moon's (2000) CASA perspective of the reciprocal process of disclosure exchange between a computer and its user. She (2000) confines the domain of disclosure to one particular social rule - the reciprocity effect that disclosure automatically generates reciprocal disclosure based on the reactive process of the attraction-disclosure relationship. However, the social cognitive model of information disclosure highlights the possible interactions of social environmental, cognitive, and behavioral factors that may reciprocally determine consumers' information disclosures in a more dynamic human-computer interaction on the Internet. As such, Moon's (2000) model of the reciprocity effect in disclosure exchange may not be applicable to the domain of human computer interaction on the

Internet in situations where consumers actively assess other important determinants of information disclosure, including privacy invasions (e.g., Dinev & Hart, 2006a; Hann, et al., 2007; Rosenfeld et al., 1999), customized service benefits (e.g., Chellappa & Sin, 2005; Milne, et al., 2008), social trust (e.g., Metzger, 2004; Norberg, et al., 2007; Wheeless, 1978), the rewards and risks offered in exchange for disclosures (e.g., Hui et al., 2007; White, 2004), and privacy self-efficacy (e.g., LaRose & Rifon, 2007; Lee et al., in press) .

It is important to note that the current social cognitive model of human-computer interaction agrees with the CASA perspective in terms regarding the computer as a social actor. However, the social cognitive model does not conceptualize a person as one who always engages in social behaviors as dictated by the computer's social cues.

Moderating Role of Information Type in the Social Cognitive Processes of the Effect of Computer Immediacy on Self-Disclosure Intention

In exploring the theoretical linkage of the social cognitive variables of computer immediacy, online privacy self-efficacy, outcome expectations, and information disclosure intentions in the path models, this study found that, depending on the information type, consumers' expectations of positive and negative outcome expectations differently mediated the effect of computer immediacy on information disclosure intention..

Specifically, the path analyses showed that, when consumers were requested to disclose their descriptive information, privacy self-efficacy, positive outcome expectations of customized service benefits, and negative outcome expectations of

information abuse were found to be significant predictors of the intention to disclose descriptive information. However, positive outcome expectations of social trust and negative outcome expectations of embarrassment had no significant effect on the intention to disclose embarrassing information. These findings suggest that consumers are not likely to reveal embarrassing information about themselves unless they feel confident in their privacy protection behavior, they expect that they will receive social support and trust from the Web site, and they believe that they will not be embarrassed and their information will be not be abused after revealing the information. Also, the findings suggest that consumes are not likely to reveal their descriptive information unless they feel confident in their privacy protection behavior, they expect that they will receive greater benefits of customization services from the Web site, and they believe that their information will be not be abused after revealing the information.

Similarly, the results of the path analyses also confirmed that, depending on the information type, exposure to the personalized social cues of immediacy differently affected consumers' intention to reveal their personal and health information through different types of mediators.

Specifically, when consumers were requested to reveal their embarrassing personal and health information, the effect of computer immediacy on disclosure intention was evident by the increased level of expectations of social trust. However, when requested to reveal their descriptive information, the effect was evident by the increased level of expectations of customized service benefits instead. The findings may suggest that consumers' exposure to a high level of personalized social cues may activate corresponding expectations of positive outcome expectations (social trust or

customization benefits) specifically linked to the two different types of information when requested to disclose. For example, consumers are more likely to reveal their embarrassing information when they expect that they can be socially supported from the Web site than when they expect they can receive customized service benefits from the Web site's customization services. In contrast, consumers are more likely to reveal their descriptive information when they expect that they can receive customized service benefits from the Web site than when they expect that they can receive social trust from the Web site. The results suggest that consumers' expectations of social trust may be more important in predicting their willingness to reveal their embarrassing information whereas their expectations of customized service benefits may be more critical in predicting their willingness to reveal their descriptive information. In this sense, the different types of information may be significantly related to their corresponding positive outcome expectations

In social cognitive terms, such discrepancies in the two path models may suggest that the information type may have differently instigated the self-regulatory mechanisms of human motivation for information disclosure (Bandura, 1991). Specifically, the two different types of information may have motivated consumers to selectively attend to the different types of risks and benefits associated with their own disclosure intentions (self-observation), judge their disclosure intentions in relation to social norms (normative judgmental process) related to the different types of information, and adjust their disclosure intentions to social environmental cues of Web sites by regulating their heightened psychological states depending on the information type, (self-reactive

influences). In this sense, the two different types of information may have activated different social cognitive processes of information disclosure

However, when the negative outcome expectations of embarrassment and information abuse were taken into consideration, only the expectations of information abuse mediated the effect of computer immediacy on disclosure intention, regardless of the information type. Specifically, as expected, when requested to reveal descriptive information, personalized social cues of immediacy were significantly related to the expectations of information abuse. However, when requested to reveal embarrassing information, such immediacy cues were not significantly related to the expectations of embarrassment. Instead, they were significantly associated with the expectations of information abuse. The findings suggest that, regardless of the information type, consumers' expectations of information abuse were more important than their expectations of embarrassment in predicting their willingness to reveal information.

One possible explanation of the null relationship between computer immediacy and negative outcome expectations of embarrassment is that risks of information abuse were so consequential to participants' information disclosures that the risks may have overridden the risk of embarrassment even when requested to reveal embarrassing information. ,

Another possibility is that revealing embarrassing personal and health information was not embarrassing enough to instigate the potential negative consequences of embarrassment. The participants may have perceived that they could relinquish their embarrassing information to the stimulus e-medfile Web site because the health-oriented nature of the stimulus Web site may have reduced the participants' perceived potential

risks of embarrassment in advance so that the participants may have not formulated the negative consequences of social embarrassment as originally intended by the personalized social cues of the Web site interface. This explanation may be consistent with the results indicating that participants were more likely to disclose embarrassing information (M = 4.40, SD =1.60) than their descriptive information (M = 3.86, SD =1.58) to the e-medfile Web site (t (251) = 6.031, $p < .001$).

Implications

Theoretical Implications

Thus, the results of the study not only provide an overall picture of the social cognitive processes involved in the effect of personalizes social cues of immediacy on consumers' willingness to reveal their persona and health information in the domain of human-computer interaction, but also shed light on the social psychological antecedents for disclosure behaviors in this area.

Specifically, the results suggest that personalized social cues of computer immediacy is an important concept in understanding information disclosure in human-computer interaction on the Internet, where consumers can actively process the social environmental cues of immediacy and cognitively assess the potential to impact their potential positive and negative consequences associated with their information disclosures. This social cognitive perspective extend the CASA perspective (Nass & Moon, 2000; Reeves & Nass, 1996) suggesting that humans respond to the computer interface without exerting much social cognitive processing effort. In this sense, computer immediacy should be recognized as a psychologically significant variable that

influences consumers' willingness to reveal their information. Given that outcome expectations mediate the relationship between computer immediacy and information disclosure, the appeal of immediacy cues may go beyond simply attracting consumers' initial attention and response to a Web site. The promise of the evolving relationship between the Web site and its consumers motivates consumers' interaction with the site and helps develop and build social their relationships, especially over a period of time.

These considerations prompt a more dynamic conceptualization of personalized social cues of computer immediacy, whereby the social cues not only provide personalized information but also anticipate users' interests and needs, and proactively service such needs. In this sense, this construct of computer immediacy should be regarded as an important aspect of users' interaction with Web sites and may contribute to a better understanding of how and why consumers are willing to reveal their information.

Practical Implications

While the question is of obvious theoretical importance for understanding the social psychological mechanisms of personalized social cues and the related decision making processes of information disclosure, the findings of the study are also of practical significance to those who are interested in promoting consumers' information disclosures on PHR Web sites as well as for those who are charged with online personal and health data management systems.

Clearly, the results suggest that those who are in charge of consumers' data management on PHR Web sites should concentrate their efforts on utilizing personalized

social cues of the interface to promote consumers' disclosure behavior regarding their personal and health information. Based on the current results, technical solutions offered by personalized social cues of computer immediacy may help encourage disclosures by enhancing positive outcome expectations of social trust and customization benefits and reducing negative outcome expectations of information abuse. In other words, personalized social cues of computer immediacy may function to minimize the perception of the risks of privacy invasions while enhancing the perceived benefits of social trust and customized service benefits.

However, from the consumers' perspective, there are also potential downsides of privacy violations if Web sites abuse the personalized social cues of immediacy and misuse consumers' information. As Web sites capitalize on the use of personalized social cues for collecting consumers' information, consumers should be increasingly wary of giving out their information online. Given that the issue of privacy may be even more troubling, Web sites may have to be required to ensure consumers' privacy by participating in privacy seal programs such as TRUSTe and developing efficient privacy warning statements that clearly describe their privacy policies (LaRose & Rifon, 2007).

In addition, the present findings suggest that PHR Web sites' interventions aimed at increasing consumers' privacy self-efficacy beliefs are likely to yield more reliable effects in eliciting their personal and health information. In other words, perceptions of privacy protection efficacy could become a tool for encouraging consumers' disclosure behavior.

Three basic approaches are required to increase self-efficacy (Bandura, 1997): verbal persuasion, anxiety reduction, and progressive mastery. In the current context,

verbal persuasion might be implemented through conventional information campaign strategies targeted to PHR Web site users, making them aware that their privacy protection is guaranteed by the Web site and instructing them in the ways that the Web site implements protection measures.

Another approach of enhancing self-efficacy is to employ anxiety reduction strategies that might focus on the relief of stress immediately prior to revealing personal and health information. For example, to novice consumers, disclosing sensitive and embarrassing personal and health information is stress-inducing. Perhaps their anxiety may be reduced by tailored messages indicating how their information has been easily secured by consumers' minimal efforts in utilizing an interactive data management system on the PHR Web site. Further, PHR Web sites can offer the possibility of tailoring messages to consumers who tend to perceive high risk of information abuse associated with their personal and health information disclosures. Based on the current results, messages aimed at those who have previously experienced privacy violations can present a potentially high payoff opportunity of receiving customization services from the Web site, thus reducing such anxiety.

Finally, as the term implies, progressive mastery can build self-efficacy through accomplishment of a series of successively difficult tasks related to personal health record data management on PHR Web sites. For example, when novice consumers enter, remove, and update their information by themselves on the Web site, they have to learn all the complicated tasks of PHR data management. Thus, progressive mastery is a role for help desk personnel who could be instructed to walk users through the data management system rather than having users do it all on their own or doing it all for them.

An interactive curriculum session that provides contextual help for concerned and frustrated PHR Web site users would represent such an approach. Such progressive mastery could be maximized by the use of an avatar, a digitally embodied visual and aural mode of representation (Bailenson & Blascovich, 2004), that can interactively guide consumers through the PHW Web site in a highly personalized manner.

Limitations and Future Research

This dissertation created a personal health record (PHR) Web site and examined how personalized social cues of a Web site interface would influence consumers' willingness to reveal their personal and health information. However, the present research is subject to several limitations that require further investigation.

First, this study recognizes that the utilization of Internet users as participants might be a concern that limits the generalizability of the results. Although an established online marketing company used their panels to recruit participants for the current study through their online announcements and contacts, this sampling method may have posed problems of imprecise and unreliable response rates. It is also very likely that the recruited participants might have had higher privacy self-efficacy, higher disclosure intention, and lower negative outcome expectations of embarrassment and information abuse than ordinary Internet users because the participants are accustomed to revealing their information and opinions to a variety of online surveys and experiments whenever requested. They may have already surrendered their privacy by agreeing to participate in the panel for this study. However, when considering that PHR Web site services are not familiar to other types of participants (e.g., college students), the sample of the current

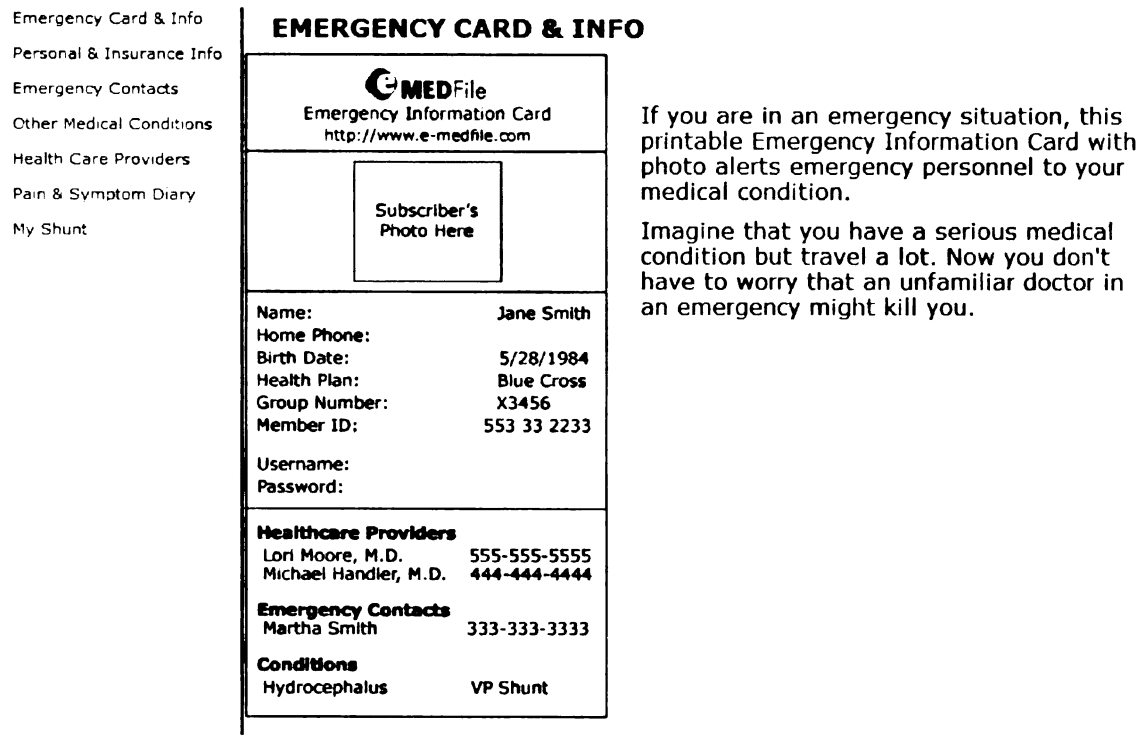
research participants whose ages range from 18 to 66, with a median age of 42 years, can be considered as an appropriate place to start. These participants can represent adult Internet users who could be early adopters of PHR Web site services with some degree of Internet literacy.

Second, the specific PHR Web site employed in this study may be not the most ideal type for investigating the moderating roles of information type in the social cognitive processes of the effect of personalized social cues on disclosure intention. Since PHR Web sites are generally designed to promote consumers' willingness to reveal personal and health information that is inherently sensitive, judgmental, and embarrassing, the use of the stimulus Web site might have confounded the potential interaction effects of computer immediacy and information type on consumers' disclosure intentions and their expectations of potential consequences associated with their information disclosures. Under such circumstances, the nature of the health-oriented stimulus PHR Web site might have actually led the participants to a heightened state of involvement with the benefits of providing their health information. By recognizing the benefits associated with the PHR Web site, participants' actual negative outcome expectations of embarrassment associated their information disclosures may have been mitigated and their subsequent disclosure intentions associated with their embarrassing information may have increased. In this respect, future studies may attempt to employ other online Web sites (e.g., portals, online stores) as a potential stimulus, which could control for participants' levels of involvement with the Web site which may influence outcome expectations and disclosure intention associated with the information type in advance.

Another limitation of this study is that the personalized social cues of computer immediacy were manipulated using only text. This constraint with respect to the textual mode of personalized social cues may have mitigated the effects of personalized social cues of immediacy on the negative outcome expectations of embarrassment and information abuse. The focus of this study was to investigate how the initial difference induced by the levels of immediacy is carried over to consumers' disclosure intentions. Thus, only the textual mode of computer immediacy on the stimulus Web site was controlled for across the conditions. However, considering that visual and verbal modes of personalized social cues (e.g., an avatar with voice) can play a critical role in inducing computer immediacy in the current Web environment, a systematic empirical investigation of such extensions to the other sensory modes of computer immediacy may provide additional insights into the effect of computer immediacy on consumers' willingness to reveal their personal and health information in future research.

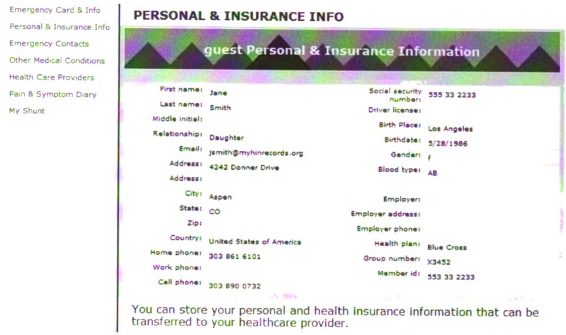
Finally, this study used information disclosure intentions instead of actual disclosure behavior as a dependent variable based on the assumption that behaviors are strongly predicted by intentions (Ajzen & Fishbein, 1980). Since this study instructed the participants to evaluate the newly launched PHR Web site, it was somewhat unrealistic to ask them to reveal their personal and health information. However, it should also be noted that intentions do not always predict behavior, especially in the domain of human-computer interaction on the Internet where consumers are particularly concerned with privacy violations. It is often reported that consumers are very concerned about for their privacy, but they still disclose personal information even for small benefits (Norberg et al., 2007). As such, consumers' concern for privacy does not always determine their

behavior, a phenomenon often labeled the "privacy paradox" (Norberg et al., 2007). Because the current study did not directly ask the participants to identify themselves, the potential inconsistency between disclosure intentions and actual disclosure behavior should be recognized as a limitation of this study. In this sense, future research should employ more realistic scenarios where actual disclosure behaviors can be measured in the domain of human-computer interaction.

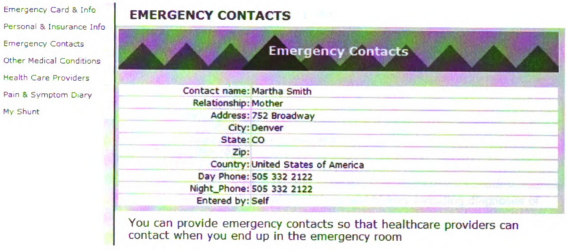


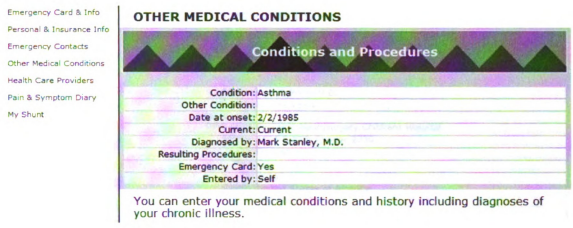
If you are in an emergency situation, this printable Emergency Information Card with photo alerts emergency personnel to your medical condition.

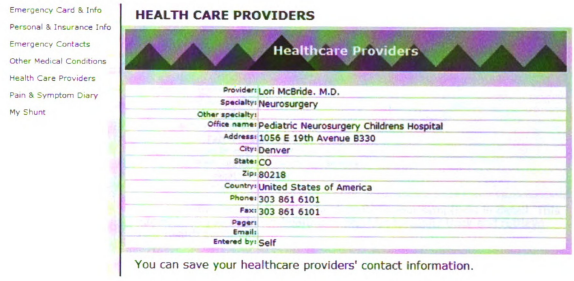
Imagine that you have a serious medical condition but travel a lot. Now you don't have to worry that an unfamiliar doctor in an emergency might kill you.

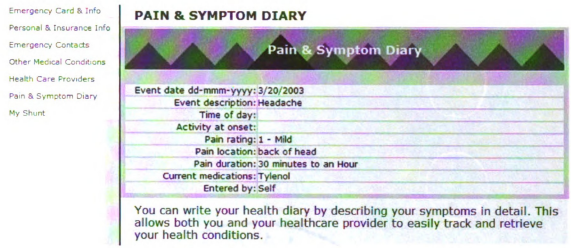

Emergency Card & Info
Personal & Insurance Info
Emergency Contacts
Other Medical Conditions
Health Care Providers
Pain & Symptom Diary
My Shunt
PERSONAL & INSURANCE INFO
guest Personal & Insurance Information
First name: Jane
Last name: Smith
Middle initial:
Relationship: Daughter
Email: jsmith@myhinrecords.org
Address: 4242 Donner Drive
Address:
City: Aspen
State: CO
Zip:
Country: United States of America
Home phone: 303 861 6101
Work phone:
Cell phone: 303 890 0732
Social security number: 555 33 2233
Driver license:
Birth Place: Los Angeles
Birthdate: 5/28/1986
Gender: f
Blood type: AB
Employer:
Employer address:
Employer phone:
Health plan: Blue Cross
Group number: X3452
Member id: 553 33 2233
You can store your personal and health insurance information that can be transferred to your healthcare provider.

APPENDIX A-3


Emergency Card & Info
Personal & Insurance Info
Emergency Contacts
Other Medical Conditions
Health Care Providers
Pain & Symptom Diary
My Shunt
EMERGENCY CONTACTS
Emergency Contacts
Contact name: Martha Smith
Relationship: Mother
Address: 752 Broadway
City: Denver
State: CO
Zip:
Country: United States of America
Day Phone: 505 332 2122
Night_Phone: 505 332 2122
Entered by: Self
You can provide emergency contacts so that healthcare providers can contact when you end up in the emergency room

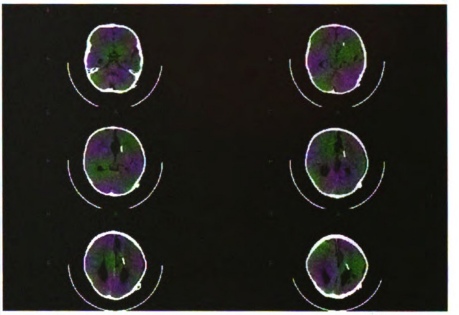

Emergency Card & Info
Personal & Insurance Info
Emergency Contacts
Other Medical Conditions
Health Care Providers
Pain & Symptom Diary
My Shunt
OTHER MEDICAL CONDITIONS
Conditions and Procedures
Condition: Asthma
Other Condition:
Date at onset: 2/2/1985
Current: Current
Diagnosed by: Mark Stanley, M.D.
Resulting Procedures:
Emergency Card: Yes
Entered by: Self
You can enter your medical conditions and history including diagnoses of your chronic illness.


Emergency Card & Info
Personal & Insurance Info
Emergency Contacts
Other Medical Conditions
Health Care Providers
Pain & Symptom Diary
My Shunt
HEALTH CARE PROVIDERS
Healthcare Providers
Provider: Lori McBride, M.D.
Specialty: Neurosurgery
Other specialty:
Office name: Pediatric Neurosurgery Childrens Hospital
Address: 1056 E 19th Avenue B330
City: Denver
State: CO
Zip: 80218
Country: United States of America
Phone: 303 861 6101
Fax: 303 861 6101
Pager:
Email:
Entered by: Self
You can save your healthcare providers' contact information.


Emergency Card & Info
Personal & Insurance Info
Emergency Contacts
Other Medical Conditions
Health Care Providers
Pain & Symptom Diary
My Shunt
PAIN & SYMPTOM DIARY
Pain & Symptom Diary
Event date dd-mmm-yyyy: 3/20/2003
Event description: Headache
Time of day:
Activity at onset:
Pain rating: 1 - Mild
Pain location: back of head
Pain duration: 30 minutes to an Hour
Current medications: Tylenol
Entered by: Self
You can write your health diary by describing your symptoms in detail. This allows both you and your healthcare provider to easily track and retrieve your health conditions.

Emergency Card & Info
Personal & Insurance Info
Emergency Contacts
Other Medical Conditions
Health Care Providers
Pain & Symptom Diary
My Shunt

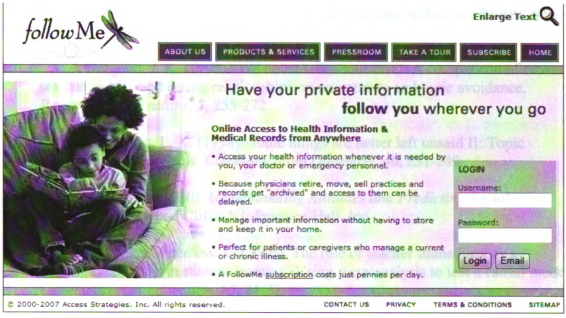
MY SHUNT



Shunt Type	Diagnosis	Date original shunt placed	Date of last revision
Ventriculoperitoneal	Arachnoid Cyst	5/20/1989	9/20/1999

You can store scans and labs, and upload your medical documents such as doctors' notes, test results, and CT images.

APPENDIX B



Powered by **FollowMe™**

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