Available online at www.sciencedirect.com
ScienceDirect
Int. J. Human-Computer Studies 65 (2007) 689–708
International Journal of Human-Computer Studies
www.elsevier.com/locate/ijhcs

Manipulating perceived social presence through the web interface and its impact on attitude towards online shopping

Khaled Hassanein, Milena Head*

DeGroote School of Business, McMaster University, 1280 Main Street West, Hamilton, Ont., Canada, L8S 4M4

Received 18 April 2005; received in revised form 5 November 2006; accepted 27 November 2006
Communicated by P. Zhang
Available online 26 January 2007

Abstract

Electronic commerce typically lacks human warmth and sociability, since it is more impersonal, anonymous and automated than traditional face-to-face commerce. This paper explores how human warmth and sociability can be integrated through the web interface to positively impact consumer attitudes towards online shopping. An empirical study was undertaken to investigate the impact of various levels of socially rich text and picture design elements on the perception of online social presence and its subsequent effect on antecedents of attitudes towards websites. Higher levels of perceived social presence are shown to positively impact the perceived usefulness, trust and enjoyment of shopping websites, leading to more favourable consumer attitudes. Implications of these finding for practitioners and future research are outlined.

Keywords: E-commerce; Social presence; Web interface; Online trust; Tam; Enjoyment

1. Introduction

With the rise of the Internet, businesses have found a new medium through which to sell their products and services and interact with customers and trading partners. Although electronic commerce (e-Commerce) promised significant potential to revolutionize the way business is conduced, online business is still relatively insignificant. In particular, many argue that business-to-consumer e-Commerce transactions have not reached its full potential (Kim and Benbasat, 2003). A notable difference between online and offline consumer markets that is stifling the growth of e-Commerce is the decreased presence of human and social elements in the online environment.

Offline shopping experiences encompass a wide range of emotions involving various types of social interactions with humans (Tauber, 1972). In contrast, the online shopping experience may be viewed as lacking human warmth and sociability (Gefen and Straub, 2003), since it tends to be more impersonal, anonymous and automated (Riegelsberger et al., 2003; van der Heijden, 2003; Wang and Emurian, 2005). Shopping experiences that involve positive emotions have been linked to several important outcomes, such as increased time spent in the store, increased spending and increased unplanned purchasing (Babin et al., 1994; Jones, 1999). The social aspect of shopping has been shown to be a major contributor towards these positive emotions (Jones, 1999; McGrath and Otnes, 1995). Online vendors face a significant challenge in making their virtual storefronts socially rich (Kumar and Benbasat, 2002) and in making their products and services appear visually attractive to consumers (Kim, 2002; Wang and Emurian, 2005).

This study explores how human warmth and sociability can be integrated through the web interface to positively impact consumer attitudes towards online shopping. Prior research (Gefen and Straub, 1997, 2003; Karahanna and Straub, 1999; Kumar and Benbasat, 2002; Straub, 1994) has suggested that the perception of social presence can positively influence user trust and intentions in an online context (e-mail and e-Sevices). However, to date, no studies

*Corresponding author. Tel.: +1 905 525 9140x26996; fax: +1 905 528 0556.
E-mail addresses: hassank@mcmaster.ca (K. Hassanein), headm@mcmaster.ca (M. Head).

1071-5819/$ - see front matter
doi:10.1016/j.ijhcs.2006.11.018

have systematically examined how features of the web interface can be manipulated to instill a feeling of social presence. As such, this paper specifically focuses on empirically investigating the effects of manipulating website design elements to enrich perceptions of social presence and its subsequent effects on antecedents of attitude towards online shopping.

This paper is organized as follows: the first two sections provide a theoretical foundation to propose a research model for studying the impact of manipulating social presence within an online shopping environment and to examine its subsequent effect on antecedents to attitude towards the website. The third section describes the research method and the experiment conducted to validate the proposed model. Analysis of the results are then presented, followed by a discussion of the findings and their implications to practitioners and researchers. Finally, conclusions are outlined, indicating limitations for this study and proposing areas for future research.

2. Theory

Social presence has been defined as the extent to which a medium allows users to experience others as being psychologically present (Fulk et al., 1987). Social presence theory regards social presence as a quality inherent in a communication medium (Short et al., 1976). Some researchers characterize the social presence of a medium as its capacity to transmit information about facial expressions, posture, dress and non-verbal cues (Short et al., 1976). Others focus on its close relationship to information richness (Rice et al., 1989; Straub, 1994; Straub and Karahanna, 1998), which centers on the interactivity of the media (Sproull and Kiesler, 1986). Yet others stress the psychological connection, where social presence is concerned about "warmth". In this perspective, a medium is perceived to be warm if it conveys a feeling of human contact, sociability, and sensitivity (Rice and Case, 1983; Steinfield, 1986; Yoo and Alavi, 2001). Here we adopt the last perspective on social presence, where the medium gives the user a sense of human warmth and sociability. Adoption of this perspective allows us to explicitly compare our findings with those of other recent studies (for example, Gefen and Straub, 2003).

A notable difference between online and offline shopping environments is that the later encompasses a wide range of emotions involving various types of social interactions with humans through multiple sensory channels (Institute of Korea Science and Technology, 1996). Kumar and Benbasat (2002) stress that in this era of new retail, "shoppers have become guests, shopping has become an experience and malls have become entertainment centers with communities". The online shopping experience, on the other hand, is primarily geared towards reducing the user's cognitive burden through functional and performance-based website design heuristics (Head and Hassanein, 2002; Kumar and Benbasat, 2002; Nielsen, 2000). As such, e-Commerce may be viewed as lacking human warmth and sociability, since it is more impersonal, anonymous and automated than traditional face-to-face commerce (van der Heijden et al., 2003). In general, electronic communication media, such as the Internet, are typically viewed as low in social presence (Miranda and Saunders, 2003).

Technology adoption can be affected by the perceived social presence of the medium (Gefen and Straub, 1997). More specifically, online consumers' perceptions of social presence have been shown to positively influence trust and their subsequent intention to purchase from a commercial website (Gefen and Straub, 2003). Hence, creating a virtual shopping experience that will entice the masses must engage both the cognitive and social sides of the user (Kumar and Benbasat, 2002).

Features of the computer interface can help impact the perception of social presence. The CASA (Computers Are Social Actors) paradigm suggests that social dynamics and rules guiding human–human interaction apply equally well to human–computer interactions. For example, CASA studies have demonstrated that politeness norms (Nass et al., 1999), gender stereotypes (Nass et al., 1997), personality response (Nass et al., 1995) and flattery effects (Fogg and Nass, 1997) are similar whether interacting with another human or a computer interface. In a web context, interface features have been suggested to help impact the perception of social presence (Cyr et al., 2007; Riegelsberger, 2003; Steinbrück et al., 2002), however, to the best of our knowledge, no empirical studies have been conducted to manipulate social presence through the web interface.

Instilling a sense of human warmth and sociability can be accomplished by providing means for actual interaction with other humans or by stimulating the imagination of interacting with other humans. In a web context, *actual interaction* with other humans may be incorporated through website features such as e-mail after-sales support (Gefen and Straub, 2003), virtual communities (Kumar and Benbasat, 2002), chats (Kumar and Benbasat, 2002), message boards (Cyr et al., 2007), and human web assistants (Åberg and Shahmehri, 2001; Hostler et al., 2005). These interface elements may involve either synchronous or asynchronous communication, but the response must be generated by another human. In contrast, the response in *imaginary interactions* is generated automatically by the computer. Website features that may instil a sense of social presence through imaginary interactions include socially- rich picture content (Gefen and Straub, 2003; Cyr et al., 2007), socially- rich text content (Gefen and Straub 2003), personalized greetings (Gefen and Straub, 2003; Kumar and Benbasat, 2002), human audio (Lombard and Ditton, 1997), human video (Kumar and Benbasat, 2002), talking-face displays (Sproull et al., 1996), and intelligent agents (Papadopoulou et al., 2001). Generally, the impacts of such features on online consumers' perceptions of social presence have not been empirically validated. This paper focuses on these

imaginary interactions as a means of instilling social presence.

Most online stores tend to display their products with little or no social appeal (Gefen and Straub, 2003). They are usually accompanied by descriptions that are functional, attribute-based, and at the very least, unemotional. It is important to note that web designers who develop such pages are following the advice of usability experts, such as Nielsen (2000), whose heuristics are well regarded in the industry. This is not to suggest that Neilsen's guidelines are inaccurate, however, they tend to only address functional and performance aspects of websites. This paper examines infusing online social presence through imaginary interactions, and specifically investigates the impact of picture and text content. These website features are common across most commercial websites. As such, the implications of our findings may present the most immediate and attainable goals for practitioners. Additionally, pictures and text do not impose heavy bandwidth requirements as some other design elements, such as video and audio.

Pictures and text content can convey a personal presence in the same way as personal photographs and letters can (Gefen and Straub, 2003; Riegelsberger et al., 2003). Choice of language can help create a sense of psychological closeness and warmth (Weiner and Mehrabian, 1968). Even subtle cues, such as "gendered" text (Nass et al., 1997), can evoke reactions similar to those produced by humans, including social desirability effects. The use of natural and informal language can impact perceived social presence (Nass and Steuer, 1993). Advertising research suggests that text that stimulates the imagination may evoke elaborate, pleasurable fantasies involving the use of the product (Fiore and Yu, 2001), which in turn can enhance liking and purchasing intentions toward the product (Oliver et al., 1993). McCabe (2001) found that customers were more willing to purchase material products online when emotive descriptions of touch properties were provided, compared to a basic attribute listing. For example, a towel that was described as: "its soft-looped design feels smooth and comfortable against your skin", was more appealing to customers than the same towel described as: "100% Egyptian cotton, white, $30'' \times 54''$.

The effect of pictures may be even more pronounced. According to Short et al. (1976), our visual senses dominate our perception and visual media have more social presence than written media. Fogg (2002) found that photos accompanying online articles can increase their credibility, and Olson et al. (2002) found that photos of players increased cooperation in social dilemma games. Advertising has long relied on imagery of "friendly faces" to build a positive attitude towards products (Riegelsberger, 2003). Dormann (2001) suggests that paying attention to picture effectiveness, via emotional or social display, can be a key factor to the success of electronic commerce.

3. Research model and hypotheses development

To investigate the impact of various levels of socially-rich website design elements (socially- rich text and pictures) on the perception of social presence within an online shopping environment and to examine its subsequent effect on antecedents of website attitude, we propose the research model depicted in Fig. 1. This model is based on earlier work by Gefen and Straub (2003), who examined the effect of social presence on purchase intentions in an e-services context. Apart from the domain differences, the model proposed in Fig. 1 expands the Gefen and Straub (2003) model by adding an enjoyment construct, and focusing on attitude rather than purchase intentions. More notably, our methodology explicitly introduces variability in the perceived social presence construct by manipulating imaginary interaction elements of the web interface. The Gefen and Straub (2003) model did not introduce this variability (only one website was utilized in their study), nor did they examine design elements that could manipulate online consumer perceptions of social presence.

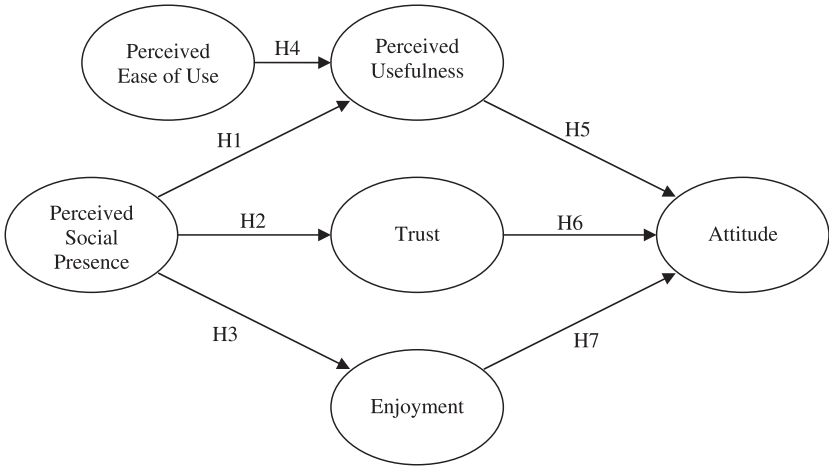

Fig. 1. Research model.

Support for our constructs and the hypotheses shown in the model (Fig. 1) are developed below.

3.1. Attitude and its determinants

Attitude has been described as predispositions to respond in a particular way towards a particular object or class of objects in a consistently favourable or unfavourable way (Allport, 1935; Rosenberg, 1960). This commonly accepted definition states that attitude is not overt behaviour but a disposition which influences behaviour. The theory of reasoned action (TRA) claims that an individual's performance are determined by his or her behavioural intentions, which, in turn, is determined by the individual's attitude and subjective norms (Ajzen and Fishbein, 1980). Building upon TRA, Davis (1989) developed the technology acceptance model (TAM) to explain acceptance of information systems. Empirical studies of TAM have shown that a user's attitude towards using an information system impacts the actual usage of the system.

In the current study, attitude is chosen as the endogenous construct rather than behavioural intention. The reason is three-fold. First, this investigation utilizes a controlled experimental design with manipulated fictitious websites. Although the experimental websites were designed to provide the look and feel of a "real" and professional e-Commerce site, the hypothetical and simulated nature of the experiment was clearly evident to the participants. As such, asking participants to indicate their behavioural intentions, such as their likelihood to purchase from or return to an artificial website, may not be appropriate or realistic. In this case, it is more realistic to solicit perceptions of attitude, as a predisposition to influence behaviour.

Second, attitudinal beliefs are particularly relevant in the consumer decision-making context (Venkatesh and Brown, 2001; Brown and Venkatesh, 2005). Although some recent studies have suggested that attitude may not be as important in predicting behavioural intentions (for example, Venkatesh et al., 2003), as originally suggested by TRA and TAM, it is important to note that such studies have typically examined individuals being introduced to new technologies in their workplace. In the context of consumer website use and online shopping adoption, several researchers have indeed found positive and significant impacts of attitude on intention (Jeong and Lambert, 2001; Korzaan, 2003; van der Heijden, 2003; Shih, 2004; Lee et al., 2005; Pavlou and Fygenson, 2006). Further, favourable attitude is expected to ease online transactions and reduce barriers to the adoption of e-Commerce (Jarvenpaa et al., 1999; Pavlou and Chai, 2002).

Lastly, attitude has been shown to correlate well with behavioural intention when adoption is voluntary (Davis et al., 1989) and among experienced users (Karahanna and Straub, 1999; Yu et al., 2005). The participants in the current study were experienced web users and online purchasers, and the context was voluntary.

A number of IS studies have examined various determinants of attitude. Here we focus on three commonly cited determinants of attitude within the web context: (i) TAM constructs (perceived usefulness and perceived ease of use); (ii) Trust; and (iii) Enjoyment. These popular antecedents to attitude were also selected because literature suggests they may be influenced by higher perceptions of social presence.

3.1.1. Technology acceptance model

The TRA is the most prominent model explaining consumer attitudes towards an action through behavioural intention (Ajzen and Fishbein 1980). Based on TRA, Davis (1989) proposed a TAM for predicting information systems usage. While TRA is "designed to explain virtually any human behaviour", the goal of TAM is "to provide an explanation of the determinants of computer acceptance … across a broad range of end-user computing technologies and user populations" (Davis et al., 1989). According to TAM, user attitude towards a technology is directly affected by beliefs about the system, which consists of perceived usefulness (PU) and perceived ease of use (PEOU). In turn, user attitude impacts behavioural intention (Davis, 1989).

TAM is one of the most influential and discussed theories in explaining and predicting user behaviour and system use. It has been applied and widely established across various contexts and cultures (for detailed lists of over 40 such studies see Gefen and Straub, 2000; Lee et al., 2003; Legris et al., 2003). More recently, TAM has been studied within the web environment to understand acceptance of Internet-related technologies or predicting consumer intention to use, revisit or purchase from a website (for example Gefen et al., 2003; Koufaris and Hampton-Sosa, 2004; Moon and Kim, 2001; Pavlou, 2003; Shih, 2004).

3.1.2. Trust

Trust is a complex concept that has been widely studied. However, it remains a difficult concept to describe due to its dynamic, evolving and multi-faceted nature (Ambrose and Johnson, 1998; Lewicki and Bunker, 1996). Shapiro (1987) described it best, when calling the state of trust definitions a "confusing potpourri". Although there may be many ways to describe this concept, the most commonly cited definition of trust in various contexts (according to Rousseau et al., 1998) is the "willingness of a party to be vulnerable to the actions of another party based on the expectations that the other will perform a particular action important to the trustor", as proposed by Mayer et al. (1995). Hence, vulnerability is not just risk-taking, but the willingness to take the risk (Ambrose and Johnson, 1998). The more trusting we are, the more willing we may be to take the risk of engagement/interaction. For example, consumers will be more willing to purchase products from a vendor if they can trust that the vendor's word can be relied upon and the vendor will not take advantage of the consumer's vulnerabilities (Geyskens et al., 1996).

In an online shopping context, consumers are vulnerable and likely to expose themselves to loss if they (Kim and Benbasat, 2003): (i) provide their email address (making themselves vulnerable to receiving spam email or other annoyances); (ii) provide their shipping information (making themselves vulnerable to privacy invasion); (iii) provide their credit card numbers (making themselves vulnerable to credit card fraud); or (iv) complete online purchase transactions (making themselves vulnerable to quality and service inadequacies).

Although online and offline trust have many commonalities, they differ in some key aspects. The main differences are (Bart et al., 2005; Gefen and Straub, 2003; Jarvenpaa et al., 2000; Roy et al., 2001; Wang and Emurian, 2005; Yoon, 2002):

- The parties involved may interact across different times and locations: rules and regulations may vary across these zones.
- Less data control during and following its transfer.
- Partners may be more likely to not know each other in an online environment, compared to an offline environment.
- Lower barriers to entry and exit: online vendors may be considered ''fly-by-night'' as there are few assurances that they will stay in business for some time.
- The absence of the physical element: in offline environments, consumer trust is affected by the seller's investments in physical buildings, facilities and personnel. These factors are not as visible in the online environment. In addition, the physical evaluation of products is hindered in an online setting.
- The decreased human/social element, resulting in lower social presence: electronic transactions are more impersonal, anonymous and automated than person-to-person off-line transactions.

Due to the above factors, establishing trust is especially important in the online environment to positively impact consumers' attitudes and purchasing intentions (Bart et al., 2005; Corritore et al., 2003; Gefen et al., 2003; Roy et al., 2001; van der Heijden et al., 2001; Wang and Emurian, 2005). In particular, business-to-consumer (B2C) online trust is more difficult to establish than business-to-business (B2B) online trust. B2C relationships are inherently more transaction-focused and short-term than B2B relationships, and consumers typically expect the Internet to support a level of trust they do not observe in their everyday lives. For example, most people do not hesitate to pass credit card information to unknown waiters, store clerks, or even on the phone. However, they are very sceptical about passing this information through electronic means on the Internet even when encryption is used.

Many models for online trust have been proposed in the literature (examples include Åberg and Shahmehri, 2000; Ambrose and Johnson, 1998; Egger, 2000, 2003; Gefen et al., 2003; Koufaris and Hampton-Sosa, 2004; McKnight et al., 2002; Papadopoulou et al., 2001; Roy et al., 2001; Yoon, 2002). The McKnight et al. (2002) model has quickly become one of the most widely cited online trust models in information systems literature (Li et al., 2004). This model focuses on initial trust, which is defined as trust in an unfamiliar trustee (Bigley and Pearce, 1998). As in the McKnight et al. (2002) model, this study focuses on initial trust, which is the period during which a consumer visits and explores a vendor's website for the first time.

Researchers, who primarily focus on understanding the concept of online trust, tend to divide the trust construct into its various components. This provides a richer analysis of the impacts of various antecedents on trust components and the relationships among the trust-related constructs. In such examinations, trust has been decomposed to include knowledge-based trust, institution-based trust, calculative-based trust, cognition-based trust and personality-based trust (examples include Gefen et al. (2003) and McKnight et al. (2002)). Schlosser et al. (2006) point out that a multidimensional view of trust can help to identify what actions should be taken to build trust. However, in studies where trust is not the primary focus, but merely one component to understand a different or larger phenomenon, trust has been conceptualized as a single construct (examples include Al-Natour et al., 2005; Cyr et al., 2007; Gefen et al., 2003; Koufaris and Hampton-Sosa, 2002; Luarn and Lin, 2003). When the research goal does not entail a detailed understanding of trust signals, combining trusting beliefs into a single variable is a parsimonious approach to studying trust (Schlosser et al., 2006). The focus of this paper is to study the impact of perceived social presence on consumer attitude towards online shopping, via various attitude determinants, including trust. Thus, we take the later approach where trust is conceptualized as a single construct that can be operationalized through existing validated scales.

3.1.3. *Enjoyment*

Csikszentmihalyi (1975) introduced the concept of *flow*, defined as ''the holistic sensation that people feel when they act with total involvement''. When people are in a state of flow, they are absorbed in their activity and their focus of awareness is narrowed. More recently, flow has been studied within the context of information technologies and has been recommended as an important theory in understanding online consumer behaviour (Ghani and Deshpande, 1994; Korzaan, 2003; Novak et al., 2000; Webster et al., 1993). Koufaris (2002) argues that flow is a useful theory, but stipulates that it is too broad and ill-defined. In trying to understand online consumer behaviour, he recommends focusing on certain dimensions of flow theory, including emotional components (namely, intrinsic enjoyment).

Enjoyment has been defined as the extent to which using a system is perceived to be enjoyable in its own right, apart from any performance consequences that may be anticipated (Carroll, 1988). Davis et al. (1992) classified

enjoyment as an intrinsic motivation for adopting technology. Enjoyment was also shown to induce perceptions of ease of use with subjects, thus enhancing technology adoption (Venkatesh, 2000).

Enjoyment is an important experiential aspect in offline shopping (Blakney and Sekely, 1994; Forman and Sriram, 1991). Likewise, enjoyment has emerged as an essential factor in online shopping (Eighmey, 1997; Jarvenpaa and Todd, 1997). Recently, several studies have established the positive influence of enjoyment on attitude towards a website (for example Childers et al., 2001; Lee et al., 2005; Monsuwé et al., 2004). Van der Heijden (2003) found that perceived enjoyment and perceived ease of use had almost as much influence on attitude as perceived usefulness. Beyond attitude, enjoyment has also been shown to positively influence web shoppers to return to a site (Koufaris, 2002).

3.2. Perceived social presence and TAM

There is a psychological connection between perceiving that a medium is warm and its usefulness across a range of communication tasks (Rice and Case, 1983; Steinfield, 1986). Therefore, when a website serves as a communication interface between an online vendor and a customer, it is expected that perceived social presence will be positively related to perceived usefulness. This relationship between perceived social presence and perceived usefulness has been investigated and established by Straub (1994), Karahanna and Straub (1999) and Gefen and Straub (1997). While Gefen and Straub (2003) were not able to show a link between perceived social presence and perceived usefulness in an e-Services context, there is enough evidence to suggest the following hypothesis:

H1. Increased levels of perceived social presence will result in greater perceived usefulness in online shopping websites

The relationship between perceived social presence and perceived ease of use has not been supported in previous literature (Gefen and Straub, 2003) and, as such, is not included within our research model. The path between perceived ease of use and attitude or intention has been shown to be insignificant in a number of recent TAM studies conducted in an online shopping context (refer to Gefen and Straub, 2000 for a detailed list of such studies). However, research has consistently shown that perceived ease of use influences perceived usefulness, which in turn affects the outcome of the shopping experience (such as user attitudes or intentions) across various contexts (Gefen and Straub, 2000). Thus, we hypothesize that:

H4. Higher perceived ease of use will result in higher perceived usefulness in online shopping websites

H5. Higher perceived usefulness will result in a more positive attitude towards online shopping websites

3.3. Perceived social presence and trust

Trust is created within the context of a social environment (Blau, 1964; Fukuyama, 1995). Simon (2001) examined social presence of websites. Simon notes that "information richness and social presence are closely related concepts", and that "information-rich, consumer-oriented websites should help reduce ambiguity, increase trust/reduce risk, and encourage users to purchase with lower levels of consumer dissonance" (p. 26).

Gefen and Straub (2003) confirm that social presence is a necessary condition for the development of trust. It is easier to hide information and engage in untrustworthy behaviour in a lean social presence environment than in a high social presence environment. Therefore, more trust can be developed in a situation that displays greater perceived social presence (Gefen and Straub, 2003; Wang and Emurian, 2005). We, therefore, hypothesize that:

H2. Increased levels of perceived social presence will result in greater trust in online shopping websites

Trust helps reduce the complexity and vulnerability a consumer feels while engaging in e-Commerce by allowing the consumer to subjectively rule out undesirable yet possible behaviours of the e-vendor (Kim and Benbasat, 2003). As such, trust helps consumers reduce their risk perceptions when dealing with online vendors (van der Heijden et al., 2003), and makes them more comfortable sharing their personal information, which is essential for e-commerce transactions (McKnight and Choudhury, 2006). Subsequently, consumer trust in a company's website has been shown to positively impact attitude towards the company and willingness to buy from the online vendor (Gefen et al., 2003; Jarvenpaa et al., 2000; McKnight and Choudhury, 2006; van der Heijden et al., 2003). Thus, we hypothesize that:

H6. Higher trust will result in a more positive attitude towards online shopping websites

3.4. Perceived social presence and enjoyment

Perhaps the most prominent psychological impact of social presence is enjoyment (Lombard and Ditton, 1997). In the context of a virtual reality entertainment system, Heeter (1995) found that users enjoyed the experience more when they felt a stronger social presence by "entering another world". However, there is remarkably little other research linking social presence to enjoyment, perhaps because this effect is taken for granted (Lombard and Ditton, 1997). Therefore, we hypothesize:

H3. Increased levels of perceived social presence will result in greater enjoyment in online shopping websites

Subsequently, prior research outlined above has indicated that perceived enjoyment can positively impact consumer attitudes of online vendors and their websites

(for example, Childers et al., 2001; Lee et al., 2005; Monsuwé et al., 2004; van der Heijden, 2003). Therefore, we hypothesize that:

H7. Higher enjoyment will result in a more positive attitude towards online shopping websites

It is important to note that a direct path between perceived social presence and attitude is not considered in our research model, as Gefen and Straub (2003) suggest that social presence is mediated through constructs that are antecedents to user intentions, which is closely related to attitude (Stevenson et al., 2000). However, this potential link is explored in our post hoc analysis (Section 5.3).

4. Research methodology

4.1. Task and procedure

An empirical study was conducted to validate the proposed research model and test our proposed hypotheses. The study was designed as a one-factorial experiment manipulating three levels of website social presence with three independent groups. There were 26 participants in each of the three groups. Subjects were given the task of purchasing a shirt/top as a gift for a female friend. Clothing was selected as the online product to sell on the websites for this study as it is a product that all consumers would be familiar with and to which social presence could be easily and naturally applied. Recent studies have also identified clothing among the top selling online products (HarrisInteractive, 2004), making it a product that has the potential for mass online appeal.

Each of the three websites displayed the same products and followed the same design. Only social presence elements were manipulated on the sites. The experiment was conducted entirely online and subjects could complete the study from any computer with an Internet connection, thus increasing the online shopping task realism. Subjects were solicited via student email lists. Similar methodologies have been employed by others, such as Pennington et al. (2004) and Chen et al. (2002). Those that wished to participate in the study first completed a consent form and a demographic questionnaire. Following the completion of the task (selecting a woman's top for a friend), subjects completed a questionnaire about their experiences on the clothing website they visited. Open-ended questions were also posed to allow for more in-depth explanations or clarifications.

Table 1
Social presence manipulations of the experimental websites

Website name	Social presence level	Available features
SP-1	Low	• products are shown in a solitary format • point form, functional descriptions
SP-2	Medium	• all features of SP-1 • socially-rich text: descriptions aimed at evoking positive emotions
SP-3	High	• all features of SP-2 • socially-rich pictures: products are shown worn by people in emotional, dynamic settings

4.2. Experimental websites

To ensure variability in the exogenous perceived social presence construct and to isolate, control and understand the impact of specific design elements on user perceptions of social presence, three websites were created for a fictitious clothing company (called myCloset.com). A fictitious company was chosen to avoid any potential bias from previous branding or experiences.[1] The manipulated levels of social presence were incremental, as shown in Table 1. With this approach, differences between the three groups could be directly attributed to the increasing levels of social presence. This incremental design has been adopted by similar studies, such as Schaffer and Hannafin (1986), Burgoon et al. (2000) and Teo et al. (2003).

As previously mentioned, this study was restricted to manipulating social presence through imaginary interaction elements of textual and graphic information. Example screen shots of the study sites are shown in Figs. 2, 3 and 4 which show the same product page for the low, medium and high social presence websites, respectively.

4.3. Subjects

A total of 78 subjects participated in this study. Subjects were largely MBA students at a major Canadian University. In a recent meta-analysis of empirical research in online trust, Grabner-Kräuter and Kaluscha (2003) revealed that the majority of studies in this field utilized undergraduate and/or MBA students as their subject pool. The use of professionals or graduate students as subjects is recommended, since they typically make better decisions than undergraduate students (Remus, 1989). In particular, MBA students tend to have varied educational backgrounds, more closely represent the population as a whole, and are more likely to be using e-Commerce in general (Gefen and Straub, 2000). Walczuch and Lundgren (2004) also advocate the use of students for e-retailing research as they have the opportunity to use the Internet for communication and commercial transactions, and are a representative and appropriate sample for such studies.

Each subject participated in only one of the three groups. Subjects were randomly assigned to the social presence

[1]While the product pictures used on the experimental websites may have come from existing websites, all references (including logos, colors and design elements) to known companies/websites were eliminated.

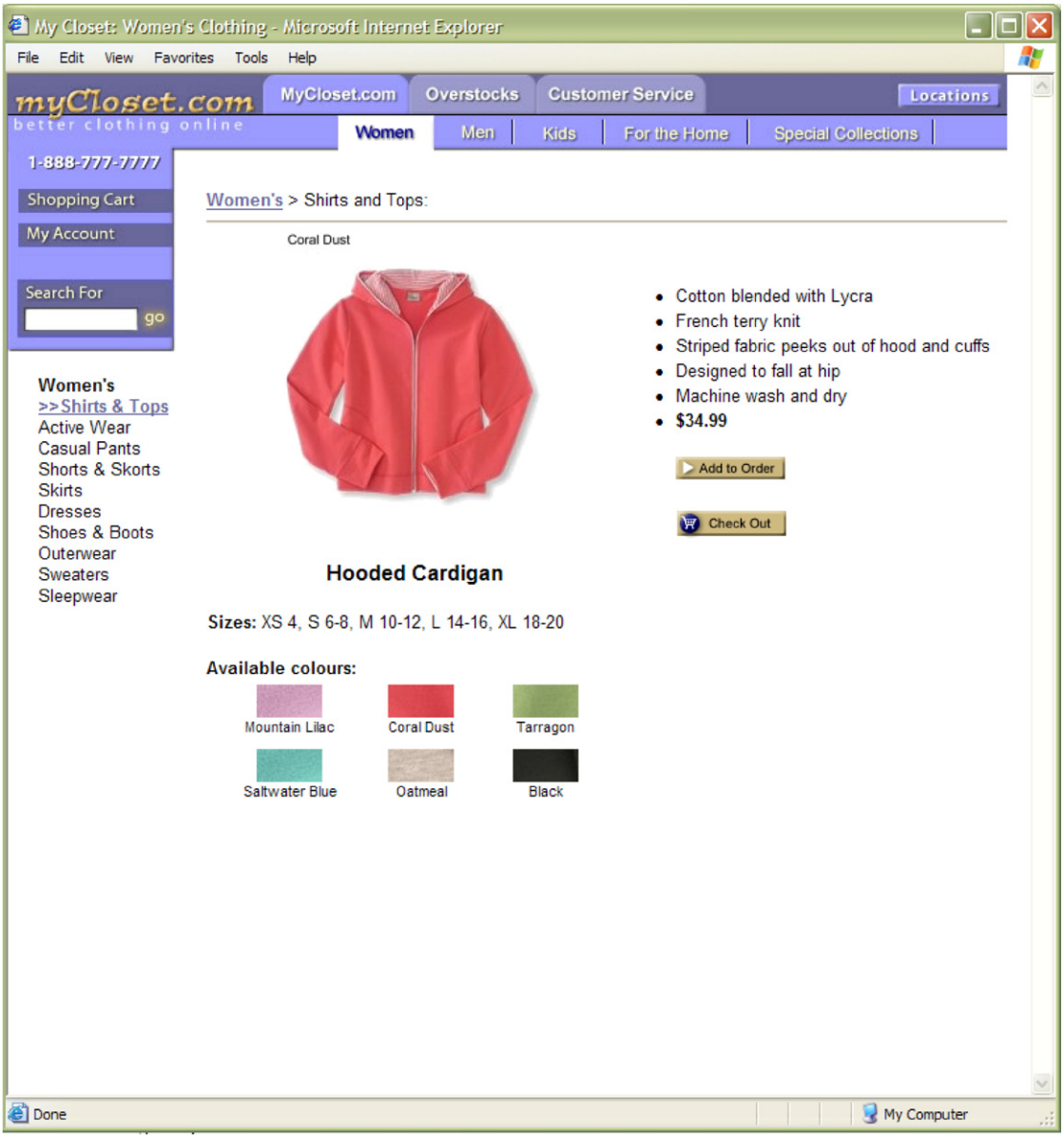

Fig. 2. SP-1 low social presence website.

groups to control for confounding effects due to possible variations in individual characteristics. To encourage realistic task behaviour, subjects were informed that they had a chance of winning the product they selected from the website.

Based on the answers to the demographics questionnaire, Table 2 summarizes the profile of the 78 subjects. As expected, this group was Internet-savvy where over 60% of the respondents spent more than 10 hours online per week. They were experienced online shoppers, where, on average, they made seven previous online purchases and the majority of respondents (87%) spent over $25 per online purchase. ANOVA tests found no significant differences for subjects in the various treatment groups in terms of Internet and online shopping experience. Similarly, there were no significant differences in the proportion of male-to-female subjects across the three groups. Therefore, randomization of assignment across groups was successful in terms of subject characteristics.

4.4. Content validity

Content validity examines how representative and comprehensive the items are in creating the constructs in a given model. It is assessed by examining the process by which the items were generated (Straub 1989). A construct valid in content is one that has drawn representative questions (items) from a universal pool (Cronbach, 1971; Kerlinger, 1964). In this research, definitions for PEOU, PU, trust, enjoyment and attitude came from existing literature, where they had been repeatedly shown to exhibit strong content validity. Table 3 summarizes the construct

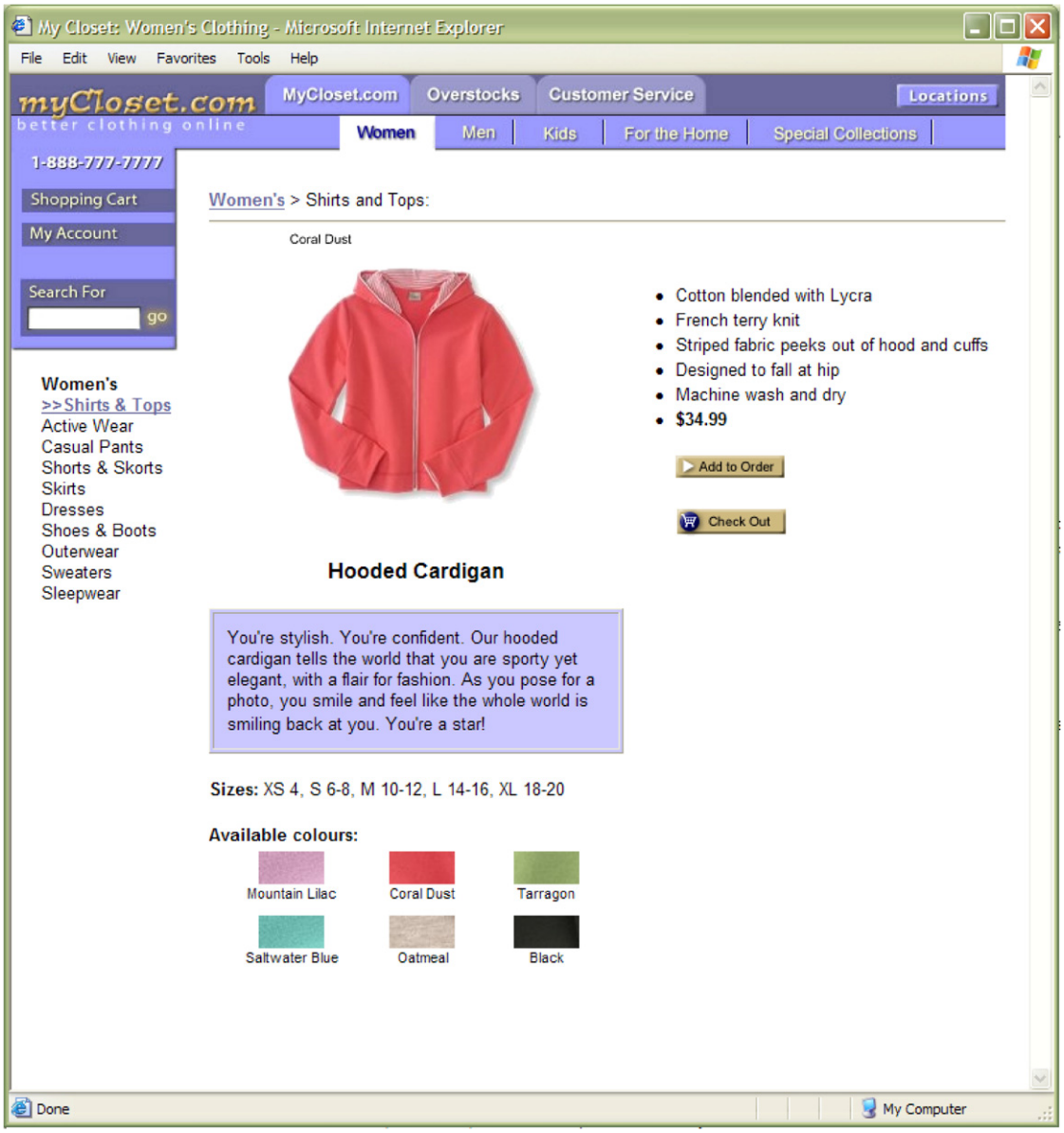

Fig. 3. SP-2 medium social presence website.

items used in the questionnaire and provides literature sources for each question. It is important to note that while some constructs drew their items from one validated source, others have been drawn from more than one validated source, to best measure the appropriate dimensions of the constructs being studied. A larger pool of construct items was tested in a pilot study, where 10 subjects were explicitly asked to provide their feedback on the appropriateness of the survey items, given the context of the study. This feedback was taken into consideration when determining the final construct items.

4.5. Construct validity

Construct validity examines the extent to which a construct measures the variable of interest. If constructs are valid in this sense, they should demonstrate relatively high correlations between measures of the same construct (convergent validity) and low correlations between measures of constructs that are expected to differ (discriminant validity) (Campbell and Fiske, 1959; Straub, 1989).

To assess the convergent validity of the measurements, Fornell and Larcker (1981) propose examining three metrics: (i) the item reliability of each measure; (ii) the composite (construct) reliability of each construct; and (iii) the average variance extracted for each construct. The item reliability of each measure was assessed by performing a principle components factor analysis (PCA), as recommended by Straub (1989). A construct is considered to exhibit satisfactory convergent and discriminant validity when items load highly on their related factor and have low

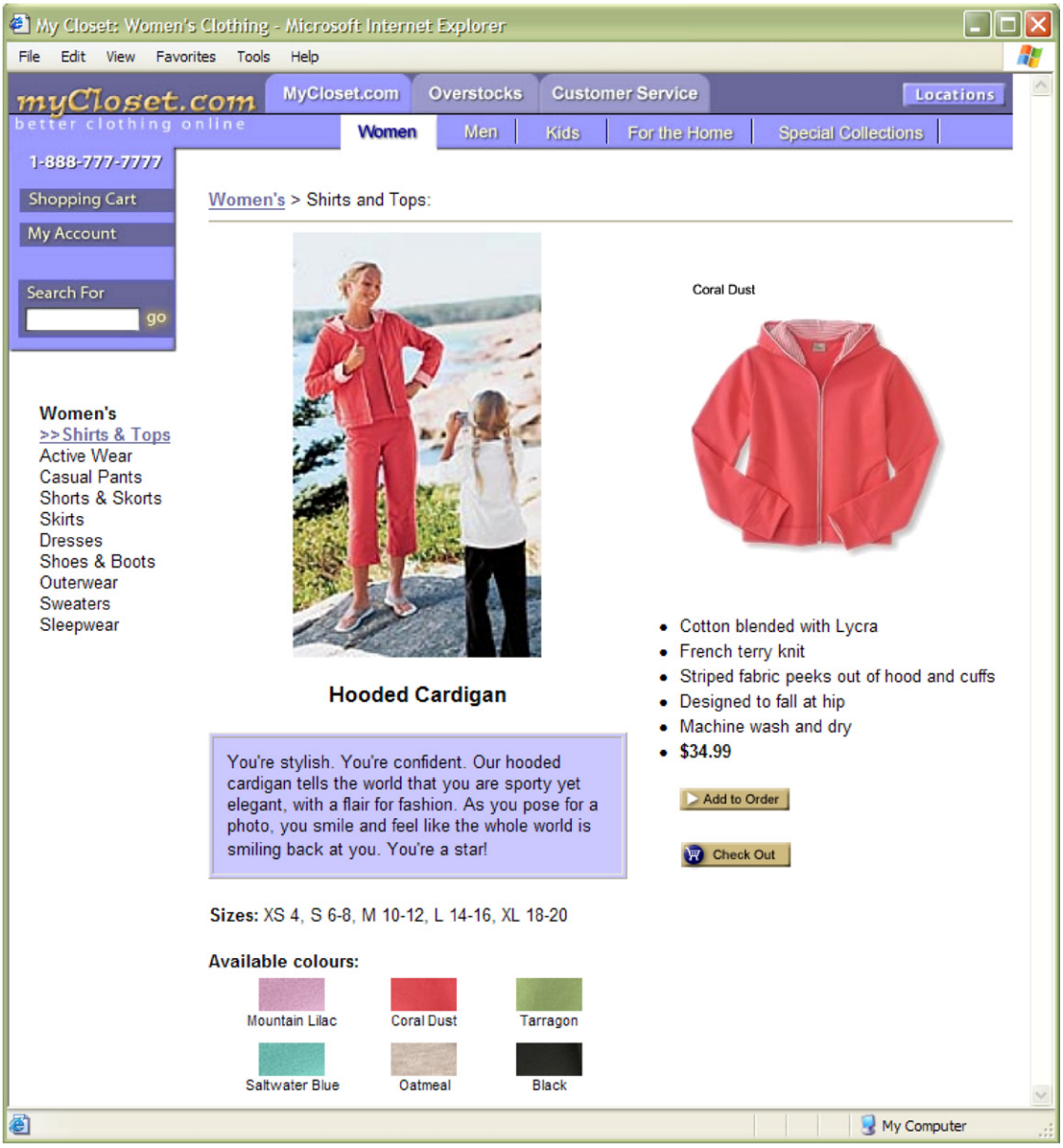

Fig. 4. SP-3 high social presence website.

loadings on unrelated factors. Table 4 includes the results of the varimax rotation on the original 22 items (outlined in Table 3). Hair et al. (1995) suggested that an item is significant if its factor loading is greater than 0.50. From the original 22 items, two were eliminated (PEOU1 and T3) due to high cross-loadings on other constructs (cross-loadings close to 0.5 in both cases).

Construct reliability was assessed using Cronbach's α-values. As shown in Table 4, α-values ranged from 0.821 (for trust) to 0.935 (for perceived social presence). Rivard and Huff (1988) suggest that this measure for reliability should be higher than 0.5 and ideally higher than 0.7. Nunnally (1978) also recommends that the Cronbach α of a scale should be greater than 0.7 for items to be used together as a construct. Therefore, all our constructs passed the test of construct reliability.

Fornell and Larcker (1981) suggested that the average variance extracted from a construct should exceed 0.5. As shown in Table 4, all constructs exceed this criterion. Thus, the proposed constructs demonstrated convergent validity on all three metrics proposed by Fornell and Larcker (1981).

A further test of convergent validity was conducted using PLS,[2] following Gefen and Straub (2005). According to this technique, convergent validity is satisfied when the t-values of the Outer PLS Model Loadings are above 1.96. As shown in Table 5, this criterion is met for all construct items in our model.

[2]Partial least squares (PLS) is the structural equation modeling (SEM) technique used in this study, described in Section 5.

Table 2
Subject demographics

Characteristics	Statistics (%)
Gender	
Male	31 (39.7)
Female	47 (60.3)
Age	
18–24	53 (67.9)
25–29	13 (16.7)
30–34	3 (3.8)
35–39	3 (3.8)
40–44	4 (5.1)
45+	2 (2.6)
Hours online/week	
0–5	9 (11.5)
6–10	18 (23.1)
11–20	27 (34.6)
21–30	16 (20.5)
31+	8 (10.3)
Number of online purchases	
Mean = 7; Std. Dev. = 9	
Average spent/online purchase	
$1–25	8 (12.9)
$26–50	21 (33.9)
$51–75	11 (17.7)
$76–100	10 (16.1)
$101+	12 (19.4)
Reasons for shopping online	
Convenience	49 (79)
Product/Service not available offline	32 (51.6)
Better Price	30 (48.4)
Curiosity	10 (16.1)
Other	4 (19.4)
Reasons for not shopping online	
Lack of trust	8 (50)
Privacy concerns	9 (56.3)
Security concerns	13 (81.3)
No credit card	3 (18.8)
Prefer shopping offline	11 (68.8)
Difficult to evaluate products online	10 (62.5)

Discriminant validity was assessed to ensure that constructs differed from each other. As per Fornell and Larcker (1981), the correlations between items in any two constructs should be lower than the square root of the average variance shared by items within a construct. As shown in Table 6, the square root of the variance shared between a construct and its items was greater than the correlations between the construct and any other construct in the model, satisfying Fornell and Larker's (1981) criteria for discriminant validity. The above results, therefore, confirm that our instrument encompassed satisfactory construct validity.

A second method of examining discriminant validity was performed using PLS, as per Gefen and Straub (2005). Table 7 shows the item to construct correlations for our PLS model. For discriminant validity, the loadings of the measurement items on their assigned latent variables should be higher than the correlation of that item with any other construct. Gefen and Straub (2005) indicate there is no exact threshold to be applied, but they provide the following illustrative example: "if one of the measurement items loads with a .70 coefficient on its latent construct, then the loadings of all the measurement items on any latent construct but their own should be below .60". As shown in Table 7, the above criteria are satisfied.

4.6. Manipulation validity

In this study, three experimental websites were designed to represent three levels of social presence. The perceived social presence scale, developed by Gefen and Straub (1997, 2003), was used to check the validity of the manipulation of experimental treatments.[3] An ANOVA test indicated that the three subject groups were significantly different in terms of their perceived social presence ($F(2,75) = 70.75$, $p < .000$). Table 8 shows the results of a post hoc Tukey test, which confirmed significant differences between groups. Therefore, the three experimental websites effectively demonstrated three different and increasing levels of perceived social presence.

5. Results

A SEM approach was adopted in our data analysis, as it possesses many advantages over traditional methods, such as multiple regression (see Bagozzi and Yi, 1989; Gefen et al., 2000 for details). The variance-based PLS method was chosen over covariance-based methods, such as LISREL, for the following reasons: (i) PLS is relatively robust to deviations from a multivariate distribution (Gefen et al., 2000); (ii) PLS is prediction-oriented and thus gives optimal prediction accuracy (Fornell and Cha, 1994); (iii) PLS can be applied to relatively small sample sizes (Fornell and Bookstein, 1982; Gefen et al., 2000); and (iv) PLS is appropriate for testing theories in the early stages of development (Fornell and Bookstein, 1982), as it supports both exploratory and confirmatory research (Gefen et al., 2000). Examining the impact of varying levels of social presence on website attitudinal constructs is a new research topic. Therefore PLS is a more appropriate choice over LISREL. With regards to sample size, Chin (1998) and Gefen et al. (2000) advise that the minimum sample size for a PLS analysis should be the larger of (i) 10 times the number of items for the most complex construct; or (ii) 10 times the largest number of independent variables impacting a dependant variable. In our model, the most complex construct has 4 items and the largest number of independent variables estimated for a dependant variable is

[3]While the Gefen and Straub scale for perceived social presence had five items, only three were used in this study, as the 'personalness' and 'human sensitivity' items were deemed to be confusing by subjects in our pilot study.

Table 3
Sources for construct items

Item	Wording	Source
Perceived Social Presence (PSP)		
PSP1	There is a sense of human contact on this website	Gefen and Straub (2003)
PSP2	There is a sense of sociability on this website	Gefen and Straub (2003)
PSP3	There is a sense of human warmth on this website	Gefen and Straub (2003)
Perceived Ease of Use (PEOU)		
PEOU1[a]	This website easy to use for clothing assessment	van der Heijden et al. (2003)
PEOU2	I can quickly find the information I need on this website	van der Heijden (2003)
PEOU3	This is a user-friendly website	van der Heijden (2003)
PEOU4	My interaction with this website is clear and understandable	van der Heijden et al. (2003)
Perceived Usefulness (PU)		
PU1	This website provides good quality information	Moon and Kim (2001)
PU2	This website improves my performance in assessing clothing online	Chen et al. (2002); Moon and Kim (2001)
PU3	This website increases my effectiveness for clothing assessment online	Chen et al. (2002)
PU4	This website is useful for assessing clothing online	Chen et al. (2002)
Enjoyment (E)		
E1	I found my visit to this website interesting	Ghani and Deshpande (1994)
E2	I found my visit to this website entertaining	van der Heijden (2003)
E3	I found my visit to this website enjoyable	Ghani and Deshpande (1994)
E4	I found my visit to this website pleasant	Hwang and Yi (2002)
Trust (T)		
T1	I feel that this online vendor is honest	Gefen et al. (2003)
T2	I feel that this online vendor is trustworthy	Gefen et al. (2003)
T3[a]	I feel that this online vendor cares about customers	Gefen et al. (2003)
T4	I feel that this online vendor would provide me with good service	Gefen et al. (2003)
Attitude (A)		
A1	I would have positive feelings towards buying a product from this site	van der Heijden (2003)
A2	The thought of buying a product from this website is appealing to me	van der Heijden et al. (2001)
A3	It would be a good idea to buy a product from this website	van der Heijden et al. (2001)

[a]Indicates dropped item to increase construct reliability.

only 3. Thus, our sample size of 78 is more than adequate for PLS estimation procedures.

The results of the PLS analysis of the research model shown in Fig. 1, are presented in Fig. 5. Since PLS does not generate an overall goodness-of-fit index (as with LISREL), model validity is primarily assessed by examining the structural paths and R^2 values (Chwelos et al., 2001). As recommended by Chin (1998), bootstrapping (with 500 subsamples) was performed to test the statistical significance of each path coefficient using t-tests. All path coefficients of the causal links in our hypothesized model are significant. These findings support all our hypotheses at a minimum $p<0.05$ level. Table 9 provides the t-values for all path coefficients. Approximately 46% of the variance in the attitude towards websites was accounted for by the variables in the model ($R^2=0.465$). All the R^2 of the endogenous constructs in the model exceed the 10% benchmark recommended by Falk and Miller (1992).

5.1. Analysis of mediating effects

The model proposed and validated in this study hypothesized that the constructs of perceived usefulness, trust and enjoyment would mediate the relationship between perceived social presence and attitude. Here we further test for mediation following the approach outlined by Baron and Kenny (1986). First, we tested a simple model with a direct path between perceived social presence and attitude (eliminating perceived usefulness, trust and enjoyment) in PLS. The path coefficient between perceived social presence and attitude was significant ($b=0.459$**). When the mediating variables of perceived usefulness, trust and enjoyment were added to the simple model, the path coefficient between perceived social presence and attitude became insignificant ($b=0.086$). Moreover, the variance explained in the study's endogenous variable (attitude) was much higher ($R^2=0.470$) compared to the simple model ($R^2=0.211$). These finding clearly suggest that perceived usefulness, trust and enjoyment are indeed *full* mediators, as hypothesized in the proposed model.

5.2. Effect size

The effect size of independent variables on a dependant variable can be determined by comparing the R^2 of the dependant variable with and without the presence of each

independent variable (Chin, 1998). The calculation for effect size (f^2) is as follows:

$$f^2 = \frac{R^2_{\text{included}} - R^2_{\text{excluded}}}{1 - R^2_{\text{included}}}.$$

Table 4
Convergent validity tests

	Component					
	1	2	3	4	5	6
PSP1	.216	**.844**	.196	.132	.212	.161
PSP2	.161	**.869**	.295	.093	.104	.069
PSP3	.239	**.852**	.194	.048	.144	.095
PU1	.120	.252	**.610**	.304	.015	.259
PU2	.157	.177	**.806**	.093	.309	−.027
PU3	.220	.236	**.778**	.064	.321	.123
PU4	.407	.204	**.622**	.265	.135	.208
PEOU1	.235	.228	.573	.490	−.035	.239
PEOU2	.198	−.073	.290	**.736**	.084	.172
PEOU3	.097	.110	.119	**.847**	.165	.064
PEOU4	−.005	.131	.072	**.887**	.036	−.047
E1	**.804**	.242	.195	.025	.185	.005
E2	**.847**	.166	.097	.103	.175	.056
E3	**.872**	.109	.217	.120	.008	.145
E4	**.775**	.101	.143	.072	.185	.161
T1	.139	.087	.142	−.073	.160	**.860**
T2	.160	.028	.147	.158	.251	**.820**
T3	.139	.379	.052	.074	.514	.490
T4	−.030	.353	.117	.365	.343	**.605**
A1	.273	.220	.141	.183	**.739**	.286
A2	.244	.109	.257	.114	**.800**	.068
A3	.069	.099	.155	.031	**.780**	.310
α	.900	.935	.856	.828	.855	.821
AVE	.681	.731	.504	.682	.598	.593

Extraction Method: Principal Component Analysis.

The effect size of perceived usefulness, trust and enjoyment on attitude were $f^2 = 0.064$, $f^2 = 0.236$ and $f^2 = 0.051$, respectively. Cohen (1988) provides the following criteria for interpreting effect size: (i) for small effect size, $0.02 < f^2 \leqslant 0.15$; (ii) for medium effect size, $0.15 < f^2 \leqslant 0.35$; and (iii) for large effect size, $f^2 > 0.35$. Therefore, both perceived usefulness and enjoyment were shown to have a small effect size on attitude, while trust can be classified as having a medium effect size on attitude.

5.3. Post hoc analysis

Having shown the validity of our proposed model, we further conducted a post hoc analysis to explore whether adding various other relationships would impact our findings (using the same data). As indicated in Section 5.1 above, adding a direct path between perceived social presence and attitude to the proposed model was not

Table 6
Discriminant validity test

	PSP	PEOU	PU	Trust	Enjoy	Attitude
PSP	**.855**					
PEOU	.259	**.826**				
PU	.564	.451	**.710**			
TRUST	.413	.351	.472	**.770**		
ENJOY	.456	.274	.539	.315	**.825**	
ATTITUDE	.451	.318	.544	.589	.457	**.773**

The diagonal elements in bold (the square root of the average variance extracted) should exceed the inter-construct correlations below and across them for adequate discriminant validity.

Table 5
Outer PLS model loadings

Construct	Item	Entire sample estimate	Mean of subsamples	Standard error	*t*-statistic
PSP	PSP1	.9502	.9502	.0120	78.8723
	PSP2	.9454	.9452	.0152	62.2801
	PSP3	.9280	.9271	.0189	49.2131
PEOU	PEOU2	.8720	.8843	.0405	21.5182
	PEOU3	.8874	.8676	.0662	13.4145
	PEOU4	.8273	.8184	.0767	10.7887
PU	PU1	.7469	.7360	.0925	8.0734
	PU2	.8547	.8517	.0425	20.1167
	PU3	.8976	.8954	.0263	34.1442
	PU4	.8402	.8381	.0412	20.3825
Trust	T1	.8205	.8155	.0523	15.6815
	T2	.9027	.8983	.0259	34.8043
	T4	.8445	.8441	.0461	18.3117
Enjoy	E1	.8864	.8847	.0288	30.7396
	E2	.8963	.8912	.0252	35.5712
	E3	.8959	.8921	.0304	29.4464
	E4	.8286	.8212	.0437	18.9737
Attitude	A1	.9048	.9036	.0252	35.8722
	A2	.8772	.8699	.0378	23.2320
	A3	.8593	.8457	.0608	14.1394

significant and did not improve the variance explained by the dependant variable (attitude) in our proposed model. Our post hoc analysis also explored the direct path between social presence and PEOU. As expected, this path was not significant and did not impact the significance of any other relationships in our model. This supports findings from Gefen and Straub (2003).

Next, we explored adding various paths between PEOU, PU, Trust and Enjoyment as suggested by various previous studies (for example, Venkatesh, 2000; Gefen et al., 2003). Sun and Zhang (2005) point out that enjoyment has been theorized and empirically validated as either an antecedent or a consequence of ease of use. Our post hoc analysis confirmed this apparent duality. The additional path from PEOU to enjoyment was significant ($b = 0.174$*) as was the path from enjoyment to PEOU ($b = 0.280$**). However, neither of these additions impacted the overall R^2 value for attitude in our model, nor did they impact the significance of any other relationships in the model. A saturated model was also run, where all additional links were found to be insignificant. Therefore, our post hoc analysis further confirms the validity of our proposed model and findings.

Finally, a MANOVA analysis was conducted to examine differences between group means for the three dependant variables of social presence (i.e. perceived usefulness, trust and enjoyment). Groups were defined by the three levels of manipulated social presence (SP-1, SP-2, and SP-3).

Table 7
PLS model item-to-construct correlations

Items	Constructs					
	PSP	PEOU	PU	Trust	Enjoy	Attitude
PSP1	**.950182**	.274494	.531957	.451662	.446809	.496001
PSP2	**.945377**	.244395	.560407	.362627	.397246	.368066
PSP3	**.927967**	.207701	.499271	.344866	.440817	.399503
PU1	.443066	.442353	**.746918**	.413577	.350164	.346561
PU2	.459162	.33572	**.854648**	.309829	.402744	.479034
PU3	.515597	.322702	**.897637**	.416458	.459209	.533301
PU4	.466223	.421017	**.840195**	.441512	.583441	.449206
PEOU2	.191735	**.871955**	.451745	.362287	.315934	.314157
PEOU3	.264563	**.887398**	.391124	.308234	.238003	.309472
PEOU4	.21845	**.82728**	.29787	.211049	.116129	.170543
E1	.461814	.206213	.497586	.239189	**.886365**	.420594
E2	.381955	.260457	.456964	.261822	**.896321**	.396371
E3	.386065	.294762	.491964	.289099	**.895965**	.323309
E4	.357681	.208907	.442989	.318951	**.828561**	.449766
T1	.286974	.119488	.333849	**.82047**	.274321	.437734
T2	.275146	.304061	.385043	**.902711**	.312465	.521655
T4	.466292	.432172	.472403	**.844498**	.231305	.539972
A1	.465523	.340232	.510968	.589192	.474304	**.904741**
A2	.39136	.295843	.510839	.420571	.43051	**.877221**
A3	.317206	.19154	.410514	.536007	.288326	**.859275**

Table 8
Mean differences between social presence groups

Social Presence Group	SP-1 (Low)	SP-2 (Medium)	SP-3 (High)
SP-1 (Low)	—	2.385***	3.167***
SP-2 (Medium)	—	—	.782**
SP-3 (High)	—	—	—

** denotes significance at the .01 level; *** denotes significance at the .001 level.

Table 9
Results of hypotheses testing

Hypothesis	Causal path	Path coefficient	*t*-Values	Supported
H1	PSP → PU	.479	5.482**	Yes
H2	PSP → Trust	.412	4.608**	Yes
H3	PSP → Enjoyment	.455	4.752**	Yes
H4	PEOU → PU	.328	3.258**	Yes
H5	PU → Attitude	.244	2.033*	Yes
H6	Trust → Attitude	.413	4.161**	Yes
H7	Enjoyment → Attitude	.196	2.243*	Yes

* denotes significance at the .05 level; ** denotes significance at the .01 level.

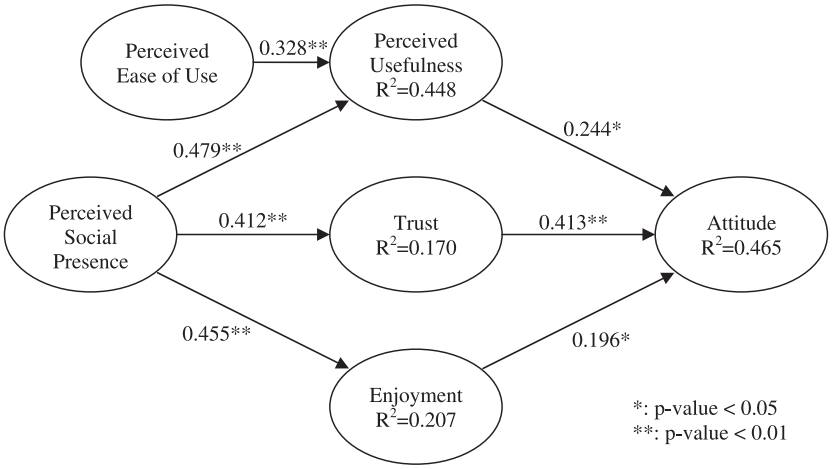

Fig. 5. PLS structural model.

MANOVA test statistics included Pillari's Trace, Wilks' Lambda, Hotelling's Trace, and Roy's Largest Root. The p-values of these statistics were found to be significant ($p<0.01$) across all three groups of respondents. Table 10 summarizes the MANOVA results, where social presence level is the independent variable, and perceived usefulness, trust and enjoyment are the three dependant variables.

As shown in Table 10, the F-statistic was significant for all three dependant variables. This indicates that at least one of the social presence levels is different from the others. Contrast results, shown in Table 11, indicate where these differences are. It is interesting to note that there were no perceived differences for usefulness, trust and enjoyment between SP-1 and SP-2. Hence, the addition of emotive text to website design did significantly impact the perception of social presence (as per our manipulation check shown in Table 8), but did not influence the attitudinal antecedents investigated in this study. However, there were significant differences between SP-1 and SP-3 and between SP-2 and SP-3 in terms of perceived usefulness, trust and enjoyment. This indicates that the addition of socially rich pictures to website design had a more influential impact on user perceptions than the addition of emotive text. This is in line with extant literature that suggests the effects of pictures may be more pronounced than the effects of text alone (Short et al., 1976; Fogg, 2002; Olson et al., 2002; Riegelsberger, 2003).

Table 10
A summary of the result of the multivariate analysis of variance

Dependent variable	Sum of squares	d*f*	Mean square	*F*	Sig.
Perceived Usefulness	16.199	2	8.099	7.360	.001
Trust	12.599	2	6.300	8.503	.000
Enjoyment	13.684	2	6.842	6.101	.004

Note: Level of social presence is the independent variable.

Table 11
MANOVA contrast results

Contrast	Dependent variable		
	Per. Usefulness	Trust	Enjoyment
SP-1 vs. SP-2			
Contrast Estimate	.519	−.013	.096
Std. Error	.291	.239	.294
Sig.	.078	.955	.744
SP-1 vs. SP-3			
Contrast Estimate	−1.115	−.846	−.933
Std. Error	.291	.239	.294
Sig.	.000	.001	.002
SP-2 vs. SP-3			
Contrast Estimate	−.596	−.859	−.837
Std. Error	.291	.239	.294
Sig.	.044	.001	.006

6. Discussion

Gefen and Straub (2003) showed that the perception of social presence has an effect on online consumers' trust and their subsequent intention to purchase from a commercial eServices website. This paper sought to investigate interface features that impact the perception of social presence and to examine its effect on additional attitudinal antecedents (enjoyment) within an online shopping environment. Results from our PLS model show that the perceived social presence level of a commercial website appears to have a positive significant effect on perceived usefulness ($b = .479$), trust ($b = .412$) and enjoyment ($b = .455$). The effect on trust supports earlier work by Gefen et al. (2003) in an e-Services context. While the effect on perceived usefulness disagrees with earlier research by Gefen et al. (2003), it supports earlier work by Straub (1994), Gefen and Straub (1997), Karahanna and Straub (1999) in an e-mail context. This disagreement with earlier findings by Gefen et al. could be attributed to the different nature of the product being studied (e.g. airline tickets vs. clothing). Further, our results provide empirical support for Lombard and Ditton's (1997) proposition that social presence has a prominent psychological impact on enjoyment. Perceived social presence levels appear to have equally important impacts on PU, trust and enjoyment, as the path coefficients are comparable. However, the three outcomes of perceived social presence have varying path coefficients toward attitude. In analysing effect size, trust was found to be the largest contributing factor in forming consumers' attitudes towards online shopping.

Further analysis of the open-ended questions confirm the positive impacts of social presence on attitudes towards shopping websites. For the low social presence website, some subjects commented that it was "straight forward" and provided products in a "clear" form that was "easy to view". One subject commented that this version "was to the point, providing the information you need to make a purchase without extra fluff". However, many noted that the low social presence website was "too plain", "dull and boring", and generally "unappealing". While the product was "displayed without any ambiguity", users were "not able to judge what the piece of clothing looks like when it's being worn". Some remarked that the website "lacked a personal touch", "lacked the human aspect of displaying the merchandise" and that they would prefer to see the products "in a functional setting".

For the medium social presence website, subjects commented that while the socialized descriptions were "interesting", "fun and imaginative", they were generally "not helpful in assessing what the (product) looks like" and, thus, "did not help in making a decision". Finally, for the high social presence version, subjects tended to agree that they "enjoyed seeing people wearing the clothing and the activities they were taking part in". While some remarked that "it was difficult to see the design and cut of the shirt when it was on someone else" or that the

"clothing was masked by all the actions in the pictures", most agreed that "having a sense of human contact made it more appealing and helped better visualize the product". One subject commented: "I liked seeing the people presented on the website and being able to see how the clothes look on them. I liked the fact that they are doing many activities and thus coordinating the clothes with other pieces. This gives me ideas on how to dress and in which situations I should wear the clothes."

7. Conclusions

In this section, we start by outlining the theoretical contributions of this work. Next we explain the practical implications of our findings. We then point out some limitations for this study. Finally, we outline potential areas for future research in this area.

This paper shows that social presence can be infused into websites through socially rich descriptions and pictures. This in turn, can positively impact the perceived usefulness, trust and enjoyment of a commercial website, which can result in more favourable attitudes towards that online store.

From a theoretical point of view, this study extends social presence research in the e-Commerce domain. Previous studies have explored the impact of social presence for online digital products (i.e. airline and concert tickets) (Gefen and Straub, 2003; Cyr et al., 2007) and email (Gefen and Straub, 1997; Karahanna and Straub, 1999; Straub, 1994). Findings from this study suggest that social presence is also important in forming positive consumer attitudes towards websites selling physical products (i.e. clothing). Additionally, our research model is an extension of previous models used to study the impact of social presence in the online environment, as it incorporated the enjoyment construct. Our analysis showed that enjoyment, in addition to perceived usefulness and trust, is an important consequence of perceived social presence. Our findings also confirm earlier work linking TAM constructs, trust and enjoyment to online consumer attitudes (for example: Gefen et al., 2003; Gefen and Straub, 2003; Koufaris and Hampton-Sosa, 2002, 2004; McKnight et al., 2002; Moon and Kim, 2001; Pavlou, 2003; Shih, 2004; van der Heijden et al., 2003).

Most notably, this work examined specific interface features that impact the perception of social presence. Previous work has suggested that perceived social presence could play an important role in the online environment, but did not investigate *how* social presence can be manipulated through the interface. In particular, we have empirically demonstrated the positive impact of specific design elements (i.e. socially rich text and pictures) on the perception of social presence and subsequently on various constructs leading to online consumer attitude.

From a practitioners' point of view, results from this study can have direct implications for designers of online shopping websites. We have shown that a perception of social presence can be infused through these elements by including descriptions aimed at evoking positive emotions and pictures that depict products with people in emotional and dynamic settings. Text and pictures are standard elements in webpages, not requiring advanced technologies from the designers' or users' points of view. Therefore, inducing a sense of social presence through these elements on a commercial website can be an immediate and attainable goal for e-vendors.

While there are some obvious and significant differences between offline and online shopping settings, shoppers in these environments share a common need for social interaction. An important element of traditional shopping is the "experience", where "malls have become entertainment centers with communities" (Kumar and Benbasat, 2002). Sherry (1990) suggests that a consumer's quest for a pleasurable experience is often even more important than the acquisition of the product itself. Others have confirmed the importance of hedonic shopping value (Babin et al., 1994; Roy, 1994), which is directly influenced by social interactions with other humans (Jones, 1999; McGrath and Otnes, 1995). Similarly, this and other recent studies (Gefen and Straub, 2003; Jarvenpaa and Todd, 1997; Kim, 2002) confirm that online shoppers also crave socially rich experiences. While a few online vendors (such as L.L. Bean and LandsEnd) currently incorporate some social elements in their webpages, most e-vendor offerings are functional with little or no social appeal (Gefen and Straub, 2003). While it seems clear that e-vendors may benefit from adding social elements to their online stores, different product types and consumer segments may determine the extent of this benefit. Hence, e-vendors should assess the impact of incorporating such elements through controlled experiments with representative customer groups.

There are a few limitations to this research that should be noted. First, generalizability is an issue that applies to most studies in information systems. This research is no exception. Future research needs to determine the extent to which the findings presented in this paper can be expanded to include other persons, settings, products and times (Cook and Campbell, 1979).

Second, construct measures were collected at one point in time and via one method. Therefore the potential for common method variance exists (Straub et al., 1995). Various methods (such as customer focus groups, usability evaluations via think-aloud protocols and direct observation, and analysis of actual behaviour via log files) could be employed to provide a richer understanding of website social presence and to overcome potential bias from common method variance. The outcomes of perceived social presence (i.e. impacts on attitude and its determinants) may vary as an online consumer becomes more familiar with a website. First time versus repeat customers may exhibit different preferences for website social presence in general, and, more specifically, the design elements that can induce feelings of social presence.

Therefore, future research should employ a longitudinal design in order to determine if the findings of this study can be replicated.

Third, this was a controlled study. Subjects were given a fictitious task and were asked to browse a fictitious website that strictly manipulated design features in order to control potential bias from extraneous design, company, or product elements. Given the artificial setting, one might expect that the decision-making processes employed by the subjects during the experiment may differ if they were actually going to purchase an online gift for a friend. However, to help increase the realism of the task, subjects were told they had a chance of winning the product they selected. In the hopes of winning the selected product, subjects may have utilized their more typical purchasing/decision making methods. Also, it is important to note that our research model examined perceived website attitude rather than actual behaviour (whether it be initial use, purchase or continued use behaviour). However, there is evidence to suggest that customers' attitudes towards using a website is a strong indicator for predicting their purchasing behaviour (Jeong and Lambert, 2001; Korzaan, 2003; van der Heijden, 2003; Shih, 2004; Lee et al., 2005; Pavlou and Fygenson, 2006).

Fourth, results of this study were obtained using MBA student subjects. These results may be somewhat different from results obtained using more typical online shoppers. However, the majority of e-Commerce research utilizes undergraduate and/or MBA students as their subject pool (Grabner-Kräuter and Kaluscha, 2003). From the student groups, MBA subjects are preferred in this context as they typically make better decisions (Remus, 1989), have more varied backgrounds, and are more likely to be shopping online (Gefen and Straub, 2000). Although the sample size used in this study was well within the recommended thresholds for PLS analysis, researchers are encouraged to replicate this study with other and larger samples.

Other areas for future research include: (i) *Examining other product types*: Clothing is a tangible product that benefits from tactile evaluation. Other product types that can be assessed visually, without the need for tactile evaluation (such as picture frames, computers and peripherals) may have different emotional or social requirements. Hence, this study should be replicated for various websites selling different types of products. (ii) *Examining other socially rich design elements*: Our study only examined the impacts of socially rich text and pictures on perceived social presence (vendor-to-customer communication modes). The impacts of actual interactions with other humans (via website features such as e-mail after-sales support, virtual communities, chats, message boards, and human web assistants) and imaginary interaction (via website features such as personalized greetings, human audio, human video, and intelligent agents) on perceived social presence should also be explored. (iii) *Examining other constructs of interest*: Our study focused on attitude and its antecedents pertinent to social presence. Future research could examine the potential impact of social presence on other endogenous constructs, such as intentional behaviour and actual usage within real websites. Similarly, constructs such as trust can be expanded to fully understand the impact of social presence on its relevant facets (such as trusting beliefs, disposition to trust, and trusting intentions). It is interesting to note that the benevolence trusting belief item in our unidimensional trust scale dropped out of our analysis due to issues of construct validity. Future research should seek to explore such relationships further. (iv) *Examining other cultures*: Preferences for information display vary across cultures and websites may be perceived differently by customers in different parts of the world (Sears et al., 2000). Therefore, it would be of value to investigate the effectiveness of website social presence across different cultures. (v) *Examining B2B and C2C applications*: Our study focused on B2C e-Commerce applications. Future research could investigate the appropriateness and effectiveness of website social presence within the business-to-business and consumer-to-consumer markets. (vi) *Examining m-Commerce applications*: Our study focused on the impact of website social presence. Mobile commerce (m-Commerce) is a natural extension of e-Commerce that allows users to interact with other users or businesses in a wireless mode, anytime/anywhere. Although the usability issues are quite different in the m-Commerce environment where display size is very limited, socially rich design should also be explored in this context.

Acknowledgments

This research was partially funded by research grants from the National Engineering and Research Council (NSERC) of Canada. The authors wish to thank the Associate Editor and anonymous reviewers for their valuable comments and feedback, which helped to significantly improve this manuscript.

References

Åberg, J., Shahmehri, N., 2000. The Role of Human Web Assistants in E-Commerce: An Analysis and a Usability Study. Internet Research: Electronic Networking Applications and Policy (10:2), 114–125.

Åberg, J., Shahmehri, N., 2001. An Empirical Study of Human Web Assistants: Implications for User Support in Web Information Systems. CHI, 2001, pp. 404–411.

Ajzen, I., Fishbein, M., 1980. Understanding Attitudes and Predicting Social Behavior. Prentice-Hall Inc., Englewood Cliffs, NJ.

Allport, G., 1935. Attitudes. In: Murchinson, C.A. (Ed.), A Handbook of Social Psychology. Clark University Press, Worcester.

Al-Natour, S., Benbasat, I., Cenfetelli, R.T., 2005. The Role of Similarity in e-Commerce Interactions: The Case of Online Shopping Assistants. In: Proceeding of the Fourth Annual Workshop on HCI Research in MIS, Las Vegas, December.

Ambrose, P.J., Johnson, G.J., 1998. A Trust Based Model of Buying Behaviour in Electronic Retailing. In: Proceedings of the Fourth Conference of the Association for Information Systems), August 1998, pp. 263–265.

Babin, B.J., Darden, W.R., Griffin, M., 1994. Work and/or fun: measuring hedonic and utilitarian shopping value. Journal of Consumer Research (20), 644–656.

Bagozzi, R.P., Yi, Y., 1989. On the use of structural equation models in experimental designs. Journal of Marketing Research (26), 271–284.

Baron, R.M., Kenny, D.A., 1986. The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. Journal of Personality and Social Psychology (51), 1173–1182.

Bart, Y., Shandar, V., Sultan, F., Urban, G.L., 2005. Are the drivers and role of online trust the same for all web sites and consumers? A large-scale exploratory empirical study. Journal of Marketing (69), 133–152.

Bigley, G.A., Pearce, J.L., 1998. Straining for shared meaning in organization science: problems of trust and distrust. Academy Management Review 23 (3), 405–421.

Blakney, V.L., Sekely, W., 1994. Retail attributes: influence on shopping mode choice behavior. Journal of Managerial Issues 6 (1), 101–118.

Blau, P., 1964. Exchange and Power in Social Life. Wiley, New York.

Brown, S.A., Venkatesh, V., 2005. Model of adoption of technology in households: a baseline model test and extension incorporating household life cycle. MIS Quarterly 29 (3), 399–426.

Burgoon, J.K., Bonito, J.A., Bengtsson, B., Cederberg, C., Lundeberg, M., Allspach, L., 2000. Interactivity in human–computer interaction: a study of credibility, understanding, and influence. Computers in Human Behavior (16), 533–574.

Campbell, D.T., Fiske, D.W., 1959. Convergent and discriminant validation by the mulitrait-multimethod matrix. Psychological Bulletin (56), 81–105.

Carroll, J.M., 1988. Fun. SIGCHI Bulletin (19), 21–24.

Chen, L., Gillenson, M.L., Sherrell, D.L., 2002. Enticing online consumers: an extended technology acceptance perspective. Information & Management (39), 705–719.

Childers, T.L., Carr, C.L., Peck, J., Carson, S., 2001. Hedonic and utilitarian motives for online retail shopping behavior. Journal of Retailing (77), 511–535.

Chin, W.W., 1998. The partial least squares approach to structural equation modeling. In: Marcoulides, G.A. (Ed.), Modern Methods for Business Research. Lawrence Erlbaum Associates, Mahwah, NJ, pp. 295–336.

Chwelos, P., Benbasat, I., Dexter, A.S., 2001. Research report: empirical test of an EDI adoption model. Information Systems Research (12), 304–321.

Cohen, J., 1988. Statistical Power Analysis for the Behavioral Sciences, second ed. Academic Press, New York.

Cook, T.D., Campbell, D.T., 1979. Quasi Experimentation: Design and Analytical Issues for Field Settings. Rand McNally, Chicago.

Corritore, C.L., Kracher, B., Wiedenbeck, S., 2003. On-line trust: concepts, evolving themes, a model. International Journal of Human-Computer Studies (58), 737–758.

Cronbach, L.J., 1971. Test Validation. American Council on Education, Washington, DC., pp. 443–507.

Csikszentmihalyi, M., 1975. Play and intrinsic rewards. Humanistic Psychology (15), 41–63.

Cyr, D., Hassanein, K., Head, M., Ivanov, A., 2007. The role of social presence in establishing loyalty in e-service environments. Interacting with computers, to appear.

Davis, F.D., 1989. Perceived usefulness, perceived ease of use, and user acceptance of information technology. MIS Quarterly (13), 319–339.

Davis, F.D., Bagozzi, R.P., Warshaw, P.R., 1989. User acceptance of computer technology: a comparison of two theoretical models. Management Science 35 (8), 982–1003.

Davis, F.D., Bagozzi, R.P., Warshaw, P.R., 1992. Extrinsic and intrinsic motivation to use computers in the workplace. Journal of Applied Social Psychology (22), 1111–1132.

Dormann, C., 2001. Seducing consumers, evaluating emotions. IHM-CHI, pp. 10–14.

Egger, F.N., 2000. 'Trust Me, I'm an Online Vendor': Towards a Model of Trust for E-Commerce System Design. In: Proceeding of the CHI2000 Extended Abstracts: Conference on Human Factors in Computing Systems, pp. 101–102.

Egger, F.N., 2003. From interactions to transactions: designing the trust experience for business-to-consumer electronic commerce. In: J.F. Schouten School for User-System Interaction Research, Eindhoven University of Technoloogy, Eindhoven, The Netherlands, p. 156.

Eighmey, J., 1997. Profiling user responses to commercial web sites. Journal of Advertising Research 37 (3), 59–66.

Falk, R.F., Miller, N.B., 1992. A Primer for Soft Modeling, First ed. The University of Akron Press, Akron, Ohio.

Fiore, A.M., Yu, H., 2001. Effects of imagery copy and product samples on responses toward the product. Journal of Interactive Marketing 15 (2), 36–46.

Fogg, B.J., 2002. Persuasive Technology: Using Computers to Change What We Think and Do. Morgan Kaufman, San Francisco.

Fogg, B.J., Nass, C., 1997. Silicon sycophants: effects of computers that flatter. International Journal of Human-Computer Studies 46 (5), 551–561.

Forman, A.M., Sriram, V., 1991. The depersonalization of retailing: Its impact on the "lonely" consumer. Journal of Retailing 67 (2), 226–243.

Fornell, C., Bookstein, F.L., 1982. Two structural equation models: LISREL and PLS applied to consumer exit-voice theory. Journal of Marketing Research (19), 440–452.

Fornell, C., Cha, J., 1994. Partial least squares. In: Bagozzi, R.P. (Ed.), Advanced Methods of Marketing Research. Blackwell Publishers, Oxford.

Fornell, C., Larcker, D.F., 1981. Evaluating structural equation models with unobserved variables and measurement error. Journal of Marketing Research (18), 39–50.

Fukuyama, H.I., 1995. Trust: The Social Virtues and the Creation of Prosperity. The Free Press, New York, NY.

Fulk, J., Schmitz, J., Power, G.J., 1987. A social information processing model of media use in organizations. Communication Research 14 (5), 520–552.

Gefen, D., Straub, D.W., 1997. Gender differences in perception and adoption of e-mail: an extension to the technology acceptance model. MIS Quarterly 21 (4), 389–400.

Gefen, D., Straub, D.W., 2000. The relative importance of perceived ease-of-use in IS adoption: a study of e-commerce adoption. JAIS 1 (8), 1–30.

Gefen, D., Straub, D.W., 2003. Managing user trust in B2C e-Services. e-Service Journal 2 (2), 7–24.

Gefen, D., Straub, D.W., 2005. A practical guide to factorial validity using PLS-Graph: tutorial and annotated example. Communications of the AIS 16 (25), 91–109.

Gefen, D., Straub, D.W., Boudreau, M.-C., 2000. Structural equation modeling and regression: guidelines for research practice. Communications of the Association for Information Systems 4 (7), 2–77.

Gefen, D., Karahanna, E., Straub, D.W., 2003. Trust and TAM in online shopping: an integrated model. MIS Quarterly 27 (1), 51–90.

Geyskens, I., Steenkamp, J., Scheer, L.K., Kumar, N., 1996. The effects of trust and interdependence on relationship commitment: a transatlantic study. International Journal of Research in Marketing (13), 303–317.

Ghani, J.A., Deshpande, S.P., 1994. Task characteristics and the experience of optimal flow in human–computer interaction. The Journal of Psychology 128 (4), 381–391.

Grabner-Kräuter, S., Kaluscha, E.A., 2003. Empirical research in on-line trust: a review and critical assessment. International Journal of Human-Computer Studies (58), 783–812.

Hair, J.F., Anderson, R.E., Tatham, R.L., Black, W.C., 1995. Multivariate Data Analysis with Readings, fourth ed. Prentice-Hall, Englewook Cliffs, NJ.

HarrisInteractive. 2004. Online Consumers Spend $18.5 Billion During 2003 Holiday Season, According to the Goldman Sachs, Harrish Interactive and Nielsen/Netratings Holiday eSpending Report, 〈http://www.harrisinteractive.com/news/allnewsbydate.asp?NewsID=738〉 (accessed August 2004)).

Head, M.M., Hassanein, K., 2002. Web Site Usability for eBusiness Success: Dimensions, Guidelines and Evaluation Methods. Hawaii International Conference on Business.

Heeter, C., 1995. Communication research on consumer VR. In: Biocca, F., Levy, M.R. (Eds.), Communication in the Age of Virtual Reality. Lawrence Erlbaum Associates, Hillsdale, NJ, pp. 191–218.

Hostler, R.E., Yoon, V.Y., Guimaraes, T., 2005. Assessing the impact of internet agent on end users' performance. Decision Support Systems (41), 313–323.

Hwang, Y., Yi, M.Y., 2002. Predicting the use of Web-based information systems: Intrinsic motivation and self-efficacy. Eighth Americas Conference on Information Systems.

Institute of Korea Science and Technology, 1996. Electronic commerce laboratory, the components of electronic commerce. Internet Monthly 5, 216–219.

Jarvenpaa, S.L., Todd, P., 1997. Consumer reactions to electronic shopping on the World Wide Web. International Journal of Electronic Commerce 1 (2), 59–88.

Jarvenpaa, S.L., Tractinsky, N., Saarinen, L., 1999. Consumer trust in an internet store: a cross-cultural validation. Journal of Computer Mediated Communication 5 (2), 1–37.

Jarvenpaa, S.L., Tractinsky, N., Vitale, M., 2000. Consumer trust in an internet store. Information Technology and Management 1 (1–2), 45–71.

Jeong, M., Lambert, C.U., 2001. Adaptation of an information quality framework to measure customers' behavioural intentions to use lodging Web sites. International Journal of Hospitality Management (20), 129–146.

Jones, M.A., 1999. Entertaining shopping experiences: an exploratory investigation. Journal of Retailing and Consumer Services (6), 129–139.

Karahanna, E., Straub, D.W., 1999. The psychological origins of perceived usefulness and perceived ease-of-use. Information & Management (35), 237–250.

Kerlinger, F.N., 1964. Foundations in Behavioral Research. Holt, Rinehart, and Winston, New York, NY.

Kim, Y.K., 2002. Consumer value: an application to mall and Internet shopping. International Journal of Retail & Distribution Management 30 (12), 595–602.

Kim, D., Benbasat, I., 2003. Trust-related arguments in internet stores: a framework for evaluation. Journal of Electronic Commerce Research 4 (2), 49–64.

Korzaan, M.L., 2003. Going with the flow: prediciting online purchase intentions. Journal of Computer Information Systems (Summer), 25–31.

Koufaris, M., 2002. Applying the technology acceptance model and flow theory to online consumer behaviour. Information Systems Research 13 (2), 205–223.

Koufaris, M., Hampton-Sosa, W., 2002. Customer trust online: examining the role of the experience with the Web-site. CIS Working Paper Series, Zicklin School of Business, Baruch College, New York, NY.

Koufaris, M., Hampton-Sosa, W., 2004. The development of initial trust in an online company by new customers. Information & Management (41), 377–397.

Kumar, N., Benbasat, I., 2002. Para-social presence and communication capabilities of a Web site: a theoretical perspective. e-Service Journal. 1(3).

Lee, Y., Kozar, K., Larsen, K., 2003. The technology acceptance model: past, present, and future. Communications of the Association for Information Systems 12 (50), 752–780.

Lee, M.K.O., Cheung, C.M.K., Chen, Z., 2005. Acceptance of internet-based learning medium: the role of extrinsic and intrinsic motivation. Information & Management 42 (8), 1095–1104.

Legris, P., Ingham, J., Collerett, P., 2003. Why do people use information technology? A critical review of the technology acceptance model. Information & Management (40), 191–204.

Lewicki, R.J., Bunker, B.B., 1996. Developing and maintaining trust in work relationships. In: Kramer, R.M., Tyler, T.R. (Eds.), Trust in Organizations: Frontiers of Theory and Research. Sage, Thousand Oaks, CA.

Li, X., Valacich, J.S., Hess, T.J., 2004. Predicting user trust in information systems: A comparison of competing trust models,'' 37th Hawaii International Conference on System Sciences, IEEE, Hawaii.

Lombard, M., Ditton, T., 1997. At the heart of it all: the concept of presence. Journal of Computer Mediated Communication 9(3:2).

Luarn, P., Lin, H., 2003. A customer loyalty model for e-serve context. Journal of Electronic Commerce Research 4 (4), 156–167.

Mayer, R.C., Davis, J.H., Schoorman, F.D., 1995. An integrative model of organizational trust. The Academy of Management Review 20 (3), 709–734.

McCabe, D.B., 2001. Online and offline decisions: The effect of product category and order of information, Ph.D. Thesis, Arizona State University.

McGrath, M.A., Otnes, C., 1995. Unacquainted influencers: when strangers interact in the retail setting. Journal of Business Research 9 (32), 261–272.

McKnight, D.H., Choudhury, V., 2006. Distrust and Trust in B2C E-Commerce: Do They Differ? Proceedings of the International Conference on Electronic Commerce (ICEC'06), Fredericton, Canada.

McKnight, D.H., Choudhury, V., Kacmar, C., 2002. Developing and validating trust measures for e-Commerce: an integrative typology. Information Systems Research 13 (3), 334–359.

Miranda, S.M., Saunders, C.S., 2003. The social construction of meaning: an alternative perspective on information sharing. Information Systems Research 14 (1), 87–106.

Monsuwé, T.P., Dellaert, B.G.C., Ruyter, K., 2004. What drives consumers to shop online? a literature review. International Journal of Service Industry Management 15 (1), 102–121.

Moon, J.W., Kim, Y.G., 2001. Extending the TAM for a World-Wide-Web context. Information & Management 38 (4), 217–230.

Nass, C., Steuer, J., 1993. Voices, boxes, and sources of messages: computers and social actors. Human Communication Research 19 (4), 504–527.

Nass, C., Moon, Y., Fogg, B.J., Reeves, B., Dryer, D.C., 1995. Can computer personalities be human personalities? International Journal of Human-Computer Studies 4 (3), 223–239.

Nass, C., Moon, Y., Green, N., 1997. Are computers gender-neutral? Gender stereotypic responses to computers. Journal of Applied Social Psychology 27 (10), 864–876.

Nass, C., Moon, Y., Carney, P., 1999. Are respondents polite to computers? Social desirability and direct responses to computers. Journal of Applied Social Psychology 29 (5), 1093–1110.

Nielsen, J., 2000. Designing Web Usability: The Practice of Simplicity. New Riders Publishing, Indianapolis, Indiana.

Novak, T.P., Hoffman, D.L., Yung, Y., 2000. Measuring the customer experience in online environments: a structural modeling approach. Marketing Science 19 (1), 22–42.

Nunnally, J.C., 1978. Psychometric Theory, second ed. McGraw Hill, New York.

Oliver, R.L., Robertson, T.S., Mitchell, D.J., 1993. Imaging and analyzing in response to new product advertising. Journal of Advertising (12), 35–49.

Olson, J.S., Zheng, J., Bos, N., Olson, G.M., Veinott, E., 2002. Trust without touch: Jumpstarting long-distance trust with initial social activities. CHI2002, Minneapolis, MN, US, pp. 141–146.

Papadopoulou, P., Andreou, A., Kanellis, P., Martakos, D., 2001. Building customer trust within e-commerce environments: the role of agents and virtual reality. Internet Research: Electronic Networking Applications and Policy 11 (4), 322–332.

Pavlou, P.A., 2003. Consumer acceptance of electronic commerce: integrating trust and risk with the technology acceptance model. International Journal of Electronic Commerce 7 (3), 69–103.

Pavlou, P.A., Chai, L., 2002. What drives electronic commerce across cultures? A cross-cultural empirical investigation of the theory of planned behaviour. Journal of Electronic Commerce Research 3 (4), 240–253.

Pavlou, P.A., Fygenson, M., 2006. Understanding and predicting electronic commerce adoption: an extension of the theory of planned behvior. MIS Quarterly 30 (1), 115–143.

Pennington, R., Wilcox, D., Grover, V., 2004. The role of system trust in business-to-consumer transactions. Journal of Management Information Systems 20 (3), 197–226.

Remus, W., 1989. Using students as subjects in experiments on decision support systems. Twenty-Second Hawaii International Conference on System Sciences, Hawaii, pp. 176–180.

Rice, R.E., Case, D., 1983. Electronic message systems in the university: a description of use and utility. Journal of Communications 33 (1), 131–152.

Rice, R., Hughes, G., Love, G., 1989. Usage and outcomes of electronic messaging at an R and D organization: Situational constraints, job level, and media awareness. Office, Technology and People 5 (2), 141–161.

Riegelsberger, J., 2003. Interpersonal Cues and Consumer Trust in E-commerce. CHI2003, Ft. Lauderdale, FL, USA.

Riegelsberger, J., Sasse, M.A., McCarthy, J.D., 2003. Shiny Happy People Building Trust? Photos on e-Commerce websites and Consumer Trust. CHI2003, Ft. Lauderdale, FL, USA.

Rivard, S., Huff, S., 1988. Factors of success for end user computing. Communications of the ACM 31 (5), 552–561.

Rosenberg, M.J., 1960. An analysis of affective-congitive consistency. In: Hovland, C.I., Rosenberg, M.J. (Eds.), Attitude Organization and Change. Yale University Press Inc., CT, pp. 15–64.

Rousseau, D.M., Sitkin, S.B., Burt, R.S., C.C., 1998. Not so different after all: a cross-discipline view of trust. The Academy of Management Review 23(3), 393–404.

Roy, A., 1994. Correlates of mall visit frequency. Journal of Retailing (70), 139–162.

Roy, M.C., Dewit, O., Aubert, B.A., 2001. The impact of interface usability on trust in web retailers. Internet Research: Electronic Networking Applications and Policy 11 (5), 388–398.

Schaffer, L.C., Hannafin, M.J., 1986. The effects of progressive interactivity on learning from interactive video. Educational Communication and Technology (34), 89–96.

Schlosser, A.E., White, T.B., Lloyd, S.M., 2006. Converting Web site visitors into buyers: how web site investment increases consumer trusting beliefs and online purchase intentions. Journal of Marketing 9(70), 133–148.

Sears, A., Jacko, J.A., Dubach, E.M., 2000. International aspects of World Wide Web usability and the role of high-end graphical enhancements. International Journal of Human-Computer Interaction 12 (2), 241–261.

Shapiro, S.P., 1987. The social control of impersonal trust. American Journal of Sociology 93 (3), 623–658.

Sherry, J.F., 1990. A sociocultural analysis of a Midwestern American flea market. Journal of Consumer Research (17), 13–30.

Shih, H.P., 2004. An empirical study on predicting user acceptance of e-shopping on the Web. Information & Management (41), 351–368.

Short, J., Williams, E., Christie, B., 1976. The Social Psychology of Telecommunications. Wiley, London.

Simon, S.J., 2001. The impact of culture and gender on web sites: An empirical study. Data Base for Advances in Information Systems 32 (1), 18–37.

Sproull, L., Kiesler, S., 1986. Reducing social context cues: the case of electronic mail. Management Science (32), 1492–1512.

Sproull, L., Subramani, R., Kiesler, S., Walker, J., 1996. When the interface is a face. Human-Computer Interaction (11), 97–124.

Steinbrück, U., Schaumburg, H., Duda, S., Krüger, T., 2002. A Picture Says More than a Thousand Words—Photographs as Trust Builders in E-Commerce websites. CHI2002, Minneapolis, MN, USA.

Steinfield, C.W., 1986. Computer-mediated communications in an organizational setting: Explaining task-related and socio-emotional uses. Newbury Park, CA, pp. 777–804.

Stevenson, J.S., Bruner, G.C., Kumar, A., 2000. Webpage background and viewer attitudes. Journal of Advertising Research (40), 29–34.

Straub, D.W., 1989. Validating instrument in MIS research. MIS Quarterly 12 (2), 147–170.

Straub, D.W., 1994. The effect of culture on IT diffusion: e-mail and FAX in Japan and the US. Information Systems Research 5 (1), 23–47.

Straub, D.W., Karahanna, E., 1998. Knowledge worker communications and recipient availability: toward a task closure explanation of media choice. Organization Science 9 (2), 160–175.

Straub, D.W., Limayen, M., Karahanna-Evaristo, E., 1995. Measuring system usage: implications for IS theory and testing. Management Science 41 (8), 1328–1342.

Sun, H., Zhang, P., 2005. An empirical study on causal relationships between perceived enjoyment and perceived ease of use, Proceedings of the Pre-ICIS HCI Research in MIS Workshop, Las Vegas, December.

Tauber, E.M., 1972. Why do people shop? Journal of Marketing (36), 46–59.

Teo, H., Oh, L., Liu, C., Wei, K., 2003. An empirical study of the effects of interactivity on web user attitude. International Journal of Human-Computer Studies (58), 281–305.

van der Heijden, H., 2003. Factors influencing the usage of websites: the case of a generic portal in The Netherlands. Information & Management 40 (6), 541–549.

van der Heijden, H., Verhagen, T., Creemers, M., 2001. Predicting online purchase behavior: replications and tests of competing models, 34th Hawaii International Conference on System Sciences, IEEE, Hawaii.

van der Heijden, H., Verhagen, T., Creemers, M., 2003. Understanding online purchase intentions: contributions from technology and trust perspectives. European Journal of Information Systems (12), 41–48.

Venkatesh, V., 2000. Determinants of perceived ease of use: integrating control, intrinsic motivation, and emotion into the technology acceptance model. Information Systems Research 11 (4), 342–365.

Venkatesh, V., Brown, S.A., 2001. A longitudinal investigation of personal computers in homes: adoption determinants and emerging challenges. MIS Quarterly 25 (1), 71–102.

Venkatesh, V., Morris, M.G., Davis, G.B., Davis, F.D., 2003. User acceptance of information technology: toward a unified view. MIS Quarterly 27 (3), 425–478.

Walczuch, R., Lundgren, H., 2004. Psychological antecedents of institution-based consumer trust in e-retailing. Information & Management (42), 159–177.

Wang, Y.D., Emurian, H.H., 2005. An overview of online trust: concepts, elements, and implications. Computers in Human Behavior (21), 105–125.

Webster, J., Trevino, L.K., Ryan, L., 1993. The dimensionality and correlates of flow in human–computer interaction. Comput. Human Behavior 9 (4), 411–426.

Weiner, M., Mehrabian, A., 1968. Language within language: Immediacy, a channel in verbal communication. Appleton-Centry-Crofts, New York, NY.

Yoo, Y., Alavi, M., 2001. Media and group cohesion: relative influences on social presence, task participation, and group consensus. MIS Quarterly 25 (3), 371–390.

Yoon, S., 2002. The antecedents and consequences of trust in online-purchase decision. Journal of Interactive Marketing 16 (2), 47–63.

Yu, J., Ha, I., Choi, M., Rho, J., 2005. Extending the TAM for a t-commerce. Information & Management (42), 965–976.