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**MANIPULATING SOCIAL PRESENCE THROUGH THE WEB  
INTERFACE AND ITS IMPACT ON CONSUMER ATTITUDE  
TOWARDS ONLINE SHOPPING**

By

**Khaled Hassanein and Milena M. Head**

**hassank@mcmaster.ca  
headm@mcmaster.ca**

**McMaster eBusiness Research Centre (MeRC)  
DeGroot School of Business**

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©McMaster eBusiness Research Centre (MeRC)  
DeGroot School of Business  
McMaster University  
Hamilton, Ontario, L8S 4M4  
Canada  
[hassank@mcmaster.ca](mailto:hassank@mcmaster.ca)  
[headm@mcmaster.ca](mailto:headm@mcmaster.ca)

## **ABSTRACT**

The online shopping experience is primarily geared towards reducing the user's cognitive burden through functional and performance based Website design heuristics. As such, e-Commerce typically lacks human warmth and sociability, since it is more impersonal, anonymous and automated than traditional person-to-person commerce. Prior research has shown that the perception of social presence can affect online consumers' trust and their subsequent intention to purchase from a commercial Website. This paper reports the results of an empirical study 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 Website attitude. Higher levels of social presence are shown to positively impact the perceived usefulness, trust and enjoyment of shopping Websites, which can result in more favourable consumer attitudes. Implications of these findings for practitioners and future research are outlined.

## **KEYWORDS**

e-Commerce, social presence, Web interface, online trust, TAM, enjoyment

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## 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 conducted, online business is still relatively insignificant. In particular, business-to-consumer e-Commerce transactions have not reached a point of critical mass (Fenech et al. 2001; Kim et al. 2003; Lee et al. 2003a; McKnight et al. 2002). A key difference between online and offline consumer markets that is stifling the growth of e-Commerce is the absence of the human and social element.

The offline shopping experience encompasses 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 et al. 2003b), since it is more impersonal, anonymous and automated (Head et al. 2001). 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; Donovan et al. 1994; Jones 1999; Sherman et al. 1997). The social aspect of shopping has been shown to be a major contributor towards these positive emotions (Jones 1999; McGrath et al. 1995). Online vendors face a significant challenge in making their virtual storefront socially rich (Kumar et al. 2002) and in making their products and services appear visually attractive to consumers (Kim 2002).

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 et al. 1997; Gefen et al. 2003b; Karahanna et al. 1999; Kumar et al. 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-Services). However, to date, no studies 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 social presence through the Web interface on antecedents to online shopping attitude.

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 Website attitude. The next section describes the research method and the experiment conducted to validate the proposed model. Analysis results are then presented, followed by a discussion of the findings and their implications to practitioners and researchers. 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 (SPT) 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 et al. 1998), which centers on the interactivity of the media (Daft et al. 1984; Sproull et al. 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 et al. 1983; Sherblom 1988; Steinfield 1986; Yoo et al. 2001). Here we adopt the last perspective on social presence, where the medium gives the user a sense of human warmth and sociability.

A significant 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 (Brinck et al. 2000; Head et al. 2002; Kumar et al. 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 person-to-person commerce (Head et al. 2001).

Electronic communication media, such as the Internet, are typically viewed as low in social presence (Miranda et al. 2003). Technology adoption can be affected by the perceived social presence of the medium (Gefen et al. 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 et al. 2003b). Hence, creating a virtual shopping experience that will entice the masses must engage both the cognitive and social sides of the user (Kumar et al. 2002; Laurel 1986).

How can features of the computer interface 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 et al. 1997) are similar whether interacting with another human or a computer interface. In a World Wide Web context, interface features have been suggested to help impact the perception of social presence, however

few 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 et al. 2003b), virtual communities (Kumar et al. 2002), chats (Kumar et al. 2002), message boards (Gefen et al. 2003b; Kumar et al. 2002), and human Web assistants (Åberg et al. 2001). 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 social presence through imaginary interactions include socially-rich picture content (Gefen et al. 2003b), socially-rich text content (Gefen et al. 2003b), personalized greetings (Gefen et al. 2003b; Kumar et al. 2002), human audio (Lombard et al. 1997), human video (Kumar et al. 2002), talking-face displays (Sproull et al. 1996; Walker et al. 1994), and intelligent agents (Coughlin 1996; Papadopoulou et al. 2001). Generally, the impacts of such features on online consumers' perception of social presence have not been empirically validated.

Most online stores tend to display their products with little or no social appeal (Gefen et al. 2003b). 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 Jacob Nielsen, whose heuristics are well regarded in the industry. This is not to suggest that Nielsen'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.

Gefen and Straub (2003b) suggest that pictures and text content can convey a personal presence in the same way as personal photographs and letters can. Choice of language can help create a sense of psychological closeness and warmth (Weiner et al. 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 et al. 1993). Advertising research suggests that text that stimulates the imagination may evoke elaborate, pleasurable fantasies involving the use of the product (Fiore et al. 2001; MacInnis et al. 1987), which in turn can enhance liking and purchase intention 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” x 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 (Giddens 1990; Riegelsberger 2003). Dormann (2000; 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 to Website attitude, we propose the research model depicted in Figure 1. This model incorporates several constructs that have been shown to impact users’ attitudes towards Websites. Support for these constructs and the hypotheses shown in the model are developed below.

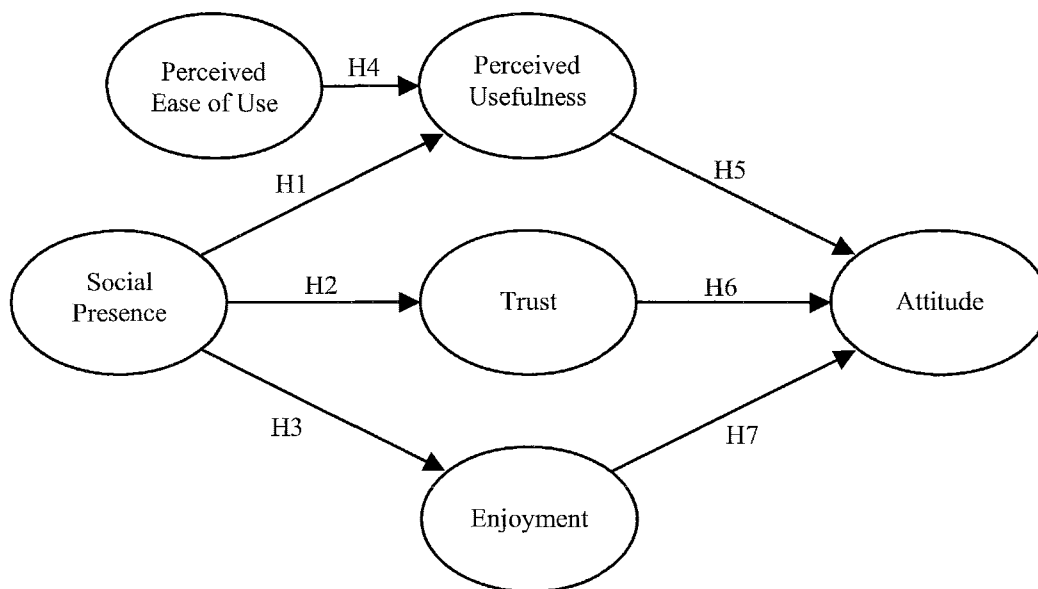


Figure 1: Research Model



### 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). From an information systems perspective, attitude is derived by the strength of a user's beliefs that adopting (or continuing to use) the system will lead to certain consequences (Ajzen et al. 1980). Prior research has shown that positive attitude towards information systems can increase the actual use of the system (DeSanctis 1983; Klobas 1995). It is expected that the same could be said for commercial Websites, as they are a type of Web-based information systems. Jeong and Lambert (2001) show that customers' attitudes towards using a Website is a strong indicator for predicting their purchasing behaviour. However, user's attitude toward commercial Websites has generally not been positive, thereby resulting in low purchase intentions (Nielsen 2001; Stevenson et al. 2000).

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) Technology Acceptance Model (TAM) constructs (perceived usefulness and perceived ease of use); (ii) Trust; and (iii) Enjoyment.

### 3.2 TAM

The theory of reasoned action (TRA) is the most prominent model explaining consumer attitudes towards an action through behavioural intention (Ajzen et al. 1980). Based on TRA, Davis (1989) proposed a Technology Acceptance Model (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, intention to use information technology is determined by the perceived usefulness (PU) and perceived ease of use (PEOU) of the technology, where PEOU also positively influences PU (Davis 1989). User attitude is directly affected by beliefs about the system, which consists of PU and PEOU.

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 a detailed list of over 40 such studies see (Gefen et al. 2000a; Lee et al. 2003b; Legris et al. 2003)]. More recently, TAM has been studied within the Web environment to study acceptance of Internet related technologies or predicting consumer intention to use, revisit or purchase from a Website (Gefen et al. 2003a; Koufaris et al. 2004; Moon et al. 2001; Pavlou 2003; Shih 2004).

### 3.3 *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 et al. 1998; Lewicki et al. 1996; Rotter 1980). 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 et al. 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 et al. 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 (Doney et al. 1997; Furnell et al. 1999; Gefen et al. 2003b; Head et al. 2001; Jarvenpaa et al. 2000; Roy et al. 2001; 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 building, 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 absence of the human 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, trust is especially important in the online environment to positively impact consumers’ attitudes and purchasing intentions (Corritore et al. 2003; Frederick 2000; Gefen et al. 2003a; Head et al. 2001; Roy et al. 2001; van der Heijden et al. 2001). 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 et al. 2000; Ambrose et al. 1998; Egger 2000; Egger 2003; Gefen et al. 2003a; Head et al. 2001; Lee et al. 2000; McKnight et al. 2002; Papadopoulou et al. 2001; Roy et al. 2001; Salam et al. 1998; Yoon 2002)]. The McKnight et al. (2002) model has quickly become one of the most widely cited online trust model in information systems literature (Li et al. 2004). This model focuses on initial trust, which is defined as trust in an unfamiliar trustee (Bigley et al. 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 antecedents have included knowledge-based trust, institution-based trust, calculative based trust, cognition-based trust and personality-based trust [examples include Gefen et al. (2003a) and McKnight et al. (2002)]. 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 Gefen et al. (2003b) and Koufaris et al. (2002a)]. The focus of this paper is to study the impact of social presence on consumer attitude towards online shopping, via various attitude determinants. Thus, we take the later approach where trust is conceptualized as a single construct that can be operationalized through existing validated scales.

### **3.4 *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; Deci 1971; Malone 1981). Davis et al. (1992) classified enjoyment as an intrinsic motivation for adopting technology in contrast to the TAM constructs of PU and PEOU which they classified as extrinsic motivations. 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 et al. 1994; Forman et al. 1991; Morris 1987). Likewise, enjoyment has emerged as an essential factor in online shopping with significant impact on attitude towards online shopping (Eighmey 1997; Jarvenpaa et al. 1997). Recently, several studies have integrated

enjoyment as a construct in Web adoption studies. Teo et al. (1999) validated the importance of enjoyment on Internet usage empirically validating that perceived enjoyment is positively related to the frequency of Internet usage. Koufaris et al. (2002; 2001/02) found that shopping enjoyment can positively influence new Web shoppers to return to a site. Van der Heijden (2003) found that perceived enjoyment and perceived ease of use had almost as much influence on attitude as perceived usefulness. Yi and Hwang (2003) proposed and validated a model that applied findings in intrinsic motivation and computers self-efficacy research to TAM to predict usage of Web-based information systems. Their study validated the importance of enjoyment in determining the actual use of the system through its impact on the TAM constructs of PU, PEOU and application specific self-efficacy.

### **3.5 Social presence and TAM**

There is a psychological connection between perceiving that a medium is warm and its usefulness across a range of communications tasks (Rice et al. 1983; Sherblom 1988; Steinfield 1986). Therefore, when a Website serves as a communication interface between an online vendor and a customer, it is expected that social presence will be positively related to perceived usefulness. This relationship between 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 (2003b) were not able to show a link between social presence and perceived usefulness in an e-Services context, there is enough evidence to suggest the following hypotheses:

**H1:** Increased levels of social presence will result in greater perceived usefulness in online shopping Websites

Subsequently, based on the prior TAM research, outlined above, linking TAM constructs to attitude 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

### **3.6 Social presence and trust**

Trust is created within the context of a social environment (Blau 1964; Fukuyama 1995). As such, social presence is a necessary condition for the development of trust (Gefen et al. 2003b). 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 social presence (Gefen et al. 2003b). We, therefore, hypothesize that:

**H2:** Increased levels of social presence will result in greater trust in online shopping Websites

Subsequently, based on the prior online trust research outlined above, we hypothesize that:

**H6:** Higher trust will result in a more positive attitude towards online shopping Websites

### **3.7 Social presence and enjoyment**

Perhaps the most prominent psychological impact of social presence is enjoyment (Lombard et al. 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 et al. 1997). Therefore, we hypothesize:

**H3:** Increased levels of social presence will result in greater enjoyment in online shopping Websites

Subsequently, based on the prior Website enjoyment research outlined above we hypothesize that:

**H7:** Higher enjoyment will result in a more positive attitude towards online shopping Websites

## **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. Several studies have also identified clothing among the top selling online products (HarrisInteractive 2000; King et al. 2000; Research 1999), making it a product that has the potential for mass online appeal. To increase the realism of the task, subjects were told they had a chance of winning the top they selected from the Website, in a random draw conducted at the end of the study.

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. The questionnaire included measures for a manipulation check and the dependent variables. Open-ended questions were also posed to allow for more in-depth explanations or clarifications.

## 4.2 Experimental websites

In order to isolate the impact of social presence on our model constructs, multiple 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<sup>1</sup>. The manipulated levels of social presence were offered incrementally, 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 & 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 Figures 2, 3 and 4 which show the same product page for the low, medium and high social presence Websites respectively.

**Table 1: Social Presence Manipulations of the Experimental Websites**

Site Name	Social Presence Level	Available Features
SP-1	Low	<ul style="list-style-type: none"><li>• Products are shown in a solitary format</li><li>• point form, functional descriptions</li></ul>
SP-2	Medium	<ul style="list-style-type: none"><li>• all features of SP-1</li><li>• socially-rich text: descriptions aimed at evoking positive emotions</li></ul>
SP-3	High	<ul style="list-style-type: none"><li>• all features of SP-2</li><li>• socially-rich pictures: products are shown worn by people in emotional, dynamic settings</li></ul>

<sup>1</sup> 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.

# Manipulating Social Presence Through the Web Interface and its Impact on Consumer Attitude Towards Online Shopping

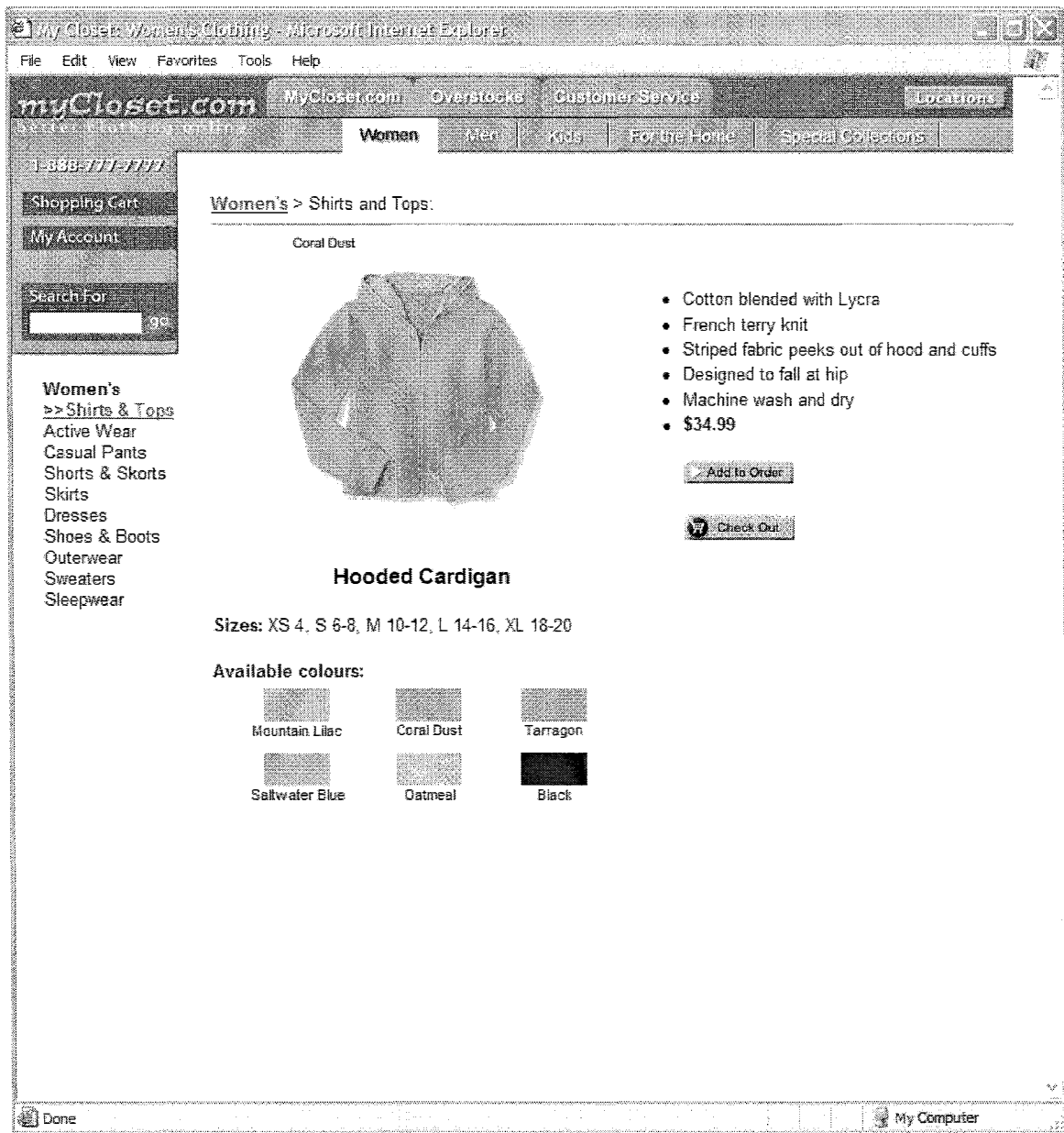


Figure 2: SP-1 Low Social Presence Website

# Manipulating Social Presence Through the Web Interface and its Impact on Consumer Attitude Towards Online Shopping

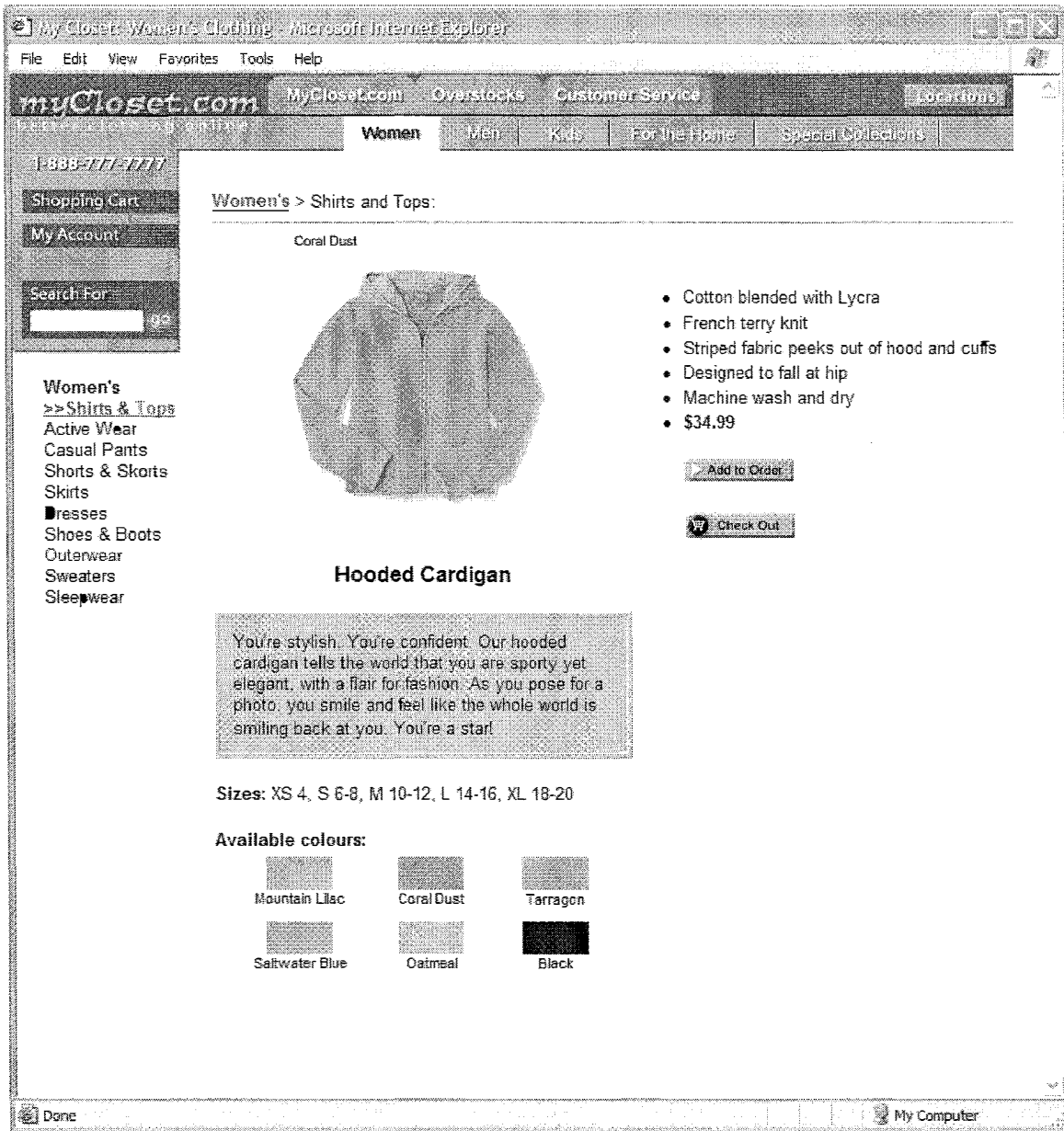


Figure 3: SP-2 Medium Social Presence Website



# Manipulating Social Presence Through the Web Interface and its Impact on Consumer Attitude Towards Online Shopping

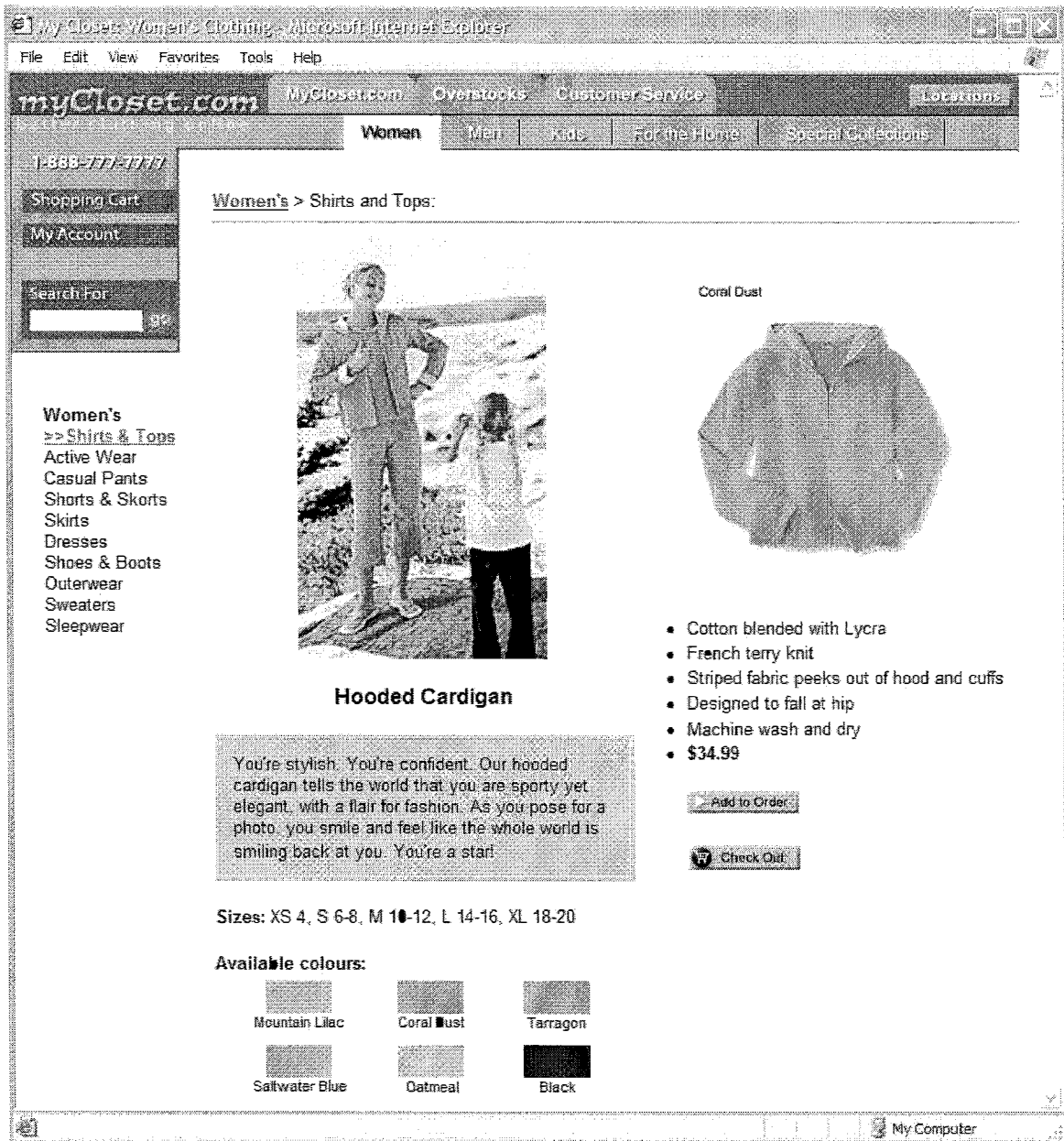


Figure 4: SP-3 High Social Presence Website

## 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. However, 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 et al. 2000a).

Each subject participated in only one of the three groups. Subjects were randomly assigned to the social presence groups to control for confounding effects due to possible variations in individual characteristics. To encourage realistic task behavior, 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. On average, they made 7 previous online purchases and the majority of the 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.

**Table 2: Subject Demographics**

<b>Characteristics</b>	<b>Statistics</b>
<b>Gender</b>	
Male	31 (39.7%)
Female	47 (60.3%)
<b>Age</b>	
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%)
<b>Hours online/week</b>	
0-5	9 (11.5%)
6-10	18 (23.1%)
11-20	27 (34.6%)
21-30	16 (20.5%)
31+	8 (10.3%)
<b>Number of Online Purchases</b>	
Mean=7	
<b>Average Spent/Online Purchase</b>	
\$1-25	8 (12.9%)

Manipulating Social Presence Through the Web Interface and its Impact on Consumer Attitude Towards Online Shopping

\$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%)

**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 items used in the questionnaire and provides literature sources for each question.

**Table 3: Sources for Construct Items**

Item	Wording	Source
<b>Perceived Ease of Use (PEOU)</b>		
PEOU1*	This Website easy to use for clothing assessment	(Agarwal et al. 2000; Choi et al. 2003; Davis 1989; Gefen et al. 2003a; Hackbarth et al. 2003; Heijden et al. 2001; Heijden et al. 2003)
PEOU2	I can quickly find the information I need on this Website	(Pavlou 2001b; 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	(Chen et al. 2002; Davis 1989; Gefen et al. 2003a; Hackbarth et al. 2003; Heijden et al. 2001; Heijden et al. 2003; Koufaris 2002; Koufaris et al. 2002b; Moon et al. 2001; Pavlou 2001b)
<b>Perceived Usefulness (PU)</b>		
PU1	This Website provides good quality information	(Moon et al. 2001)
PU2	This Website improves my performance in assessing clothing	(Agarwal et al. 2000; Chen et al. 2002; Choi et al. 2003; Davis 1989; Gefen et al. 2003a; Koufaris

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	online	2002; Koufaris et al. 2002b; Moon et al. 2001; Teo 2001)
PU3	This Website increases my effectiveness for clothing assessment online	(Agarwal et al. 2000; Chen et al. 2002; Choi et al. 2003; Davis 1989; Gefen et al. 2003a; Koufaris 2002; Koufaris et al. 2002b; Teo 2001)
PU4	This Website useful for assessing clothing online	(Agarwal et al. 2000; Chen et al. 2002; Choi et al. 2003; Davis 1989; Gefen et al. 2003a; Heijden et al. 2001; Heijden et al. 2003; Koufaris 2002; Koufaris et al. 2002b; Pavlou 2001a; Pavlou 2001b; van der Heijden 2003)
<b>Enjoyment (E)</b>		
E1	I found my visit to this Website interesting	(Ghani et al. 1994; Koufaris 2002)
E2	I found my visit to this Website entertaining	(Heijden 2003)
E3	I found my visit to this Website enjoyable	(Agarwal et al. 2000; Ghani et al. 1994; Moon et al. 2001)
E4	I found my visit to this Website pleasant	(Hwang et al. 2002; Teo et al. 1999)
<b>Trust</b>		
T1	I feel that this online vendor is honest	(Ba et al. 2002; Gefen et al. 2003a; Walter et al. 2000)
T2	I feel that this online vendor is trustworthy	(Gefen 2002; Gefen et al. 2003a; Heijden et al. 2001; Heijden et al. 2003; Jarvenpaa et al. 2000; Koufaris et al. 2002b; Pavlou 2001a; Pavlou 2001b)
T3*	I feel that this online vendor cares about customers	(Gefen et al. 2003a)
T4	I feel that this online vendor would provide me with good service	(Gefen et al. 2003a)
<b>Attitude (A)</b>		
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	(Jarvenpaa et al. 1999; van der Heijden et al. 2001)
A3	It would be a good idea to buy a product from this Website	(Jarvenpaa et al. 1999; van der Heijden et al. 2001; Venkatesh et al. 2003)

\* indicates dropped item to increase construct reliability

#### 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 et al. 1959; Straub 1989).

To assess the convergent validity of the measurements, Fornell and Larcker (1981) propose examining three measures: (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

(Straub 1989). A construct is considered to exhibit satisfactory convergent and discriminant validity when items load highly on their related factor and have low loadings on unrelated factors. Table 3 includes the results of the varimax rotation on the original 19 items (outlined in Table 1) constrained to five factors. Hair et al. (1995) suggested that an item is significant if its factor loading is greater than 0.50. From the original 19 items, two were eliminated (PEOU1 and T3) due to high cross-loadings on other constructs.

Construct reliability was assessed using Cronbach's  $\alpha$ -value. As shown in Table 3,  $\alpha$ -values ranged from 0.821 (for trust) to 0.900 (for enjoyment). 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  $\alpha$  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 measures proposed by Fornell and Larcker (1981).

**Table 4: Convergent Validity Tests**

Construct Items	Item Loadings	Construct Reliability	Average Variance Extracted
PU1	.664	0.856	0.689
PU2	.827		
PU3	.813		
PU4	.623		
PEOU2	.737	0.828	0.543
PEOU3	.853		
PEOU4	.892		
E1	.822		
E2	.858	0.900	0.699
E3	.881		
E4	.781		
T1	.873		
T2	.833	0.821	0.613
T4	.621		
A1	.754		
A2	.813		
A3	.786	0.855	0.616

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 5, 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 Larcker's (1981) criteria for discriminant validity. The above results, therefore, confirm that our instrument encompassed satisfactory construct validity.

**Table 5: Discriminant Validity Test**

	PEOU	PU	TRUST	ENJOY	ATTITUDE
PEOU	<b>0.737</b>				
PU	0.452	<b>0.830</b>			
TRUST	0.345	0.470	<b>0.783</b>		
ENJOY	0.274	0.543	0.319	<b>0.836</b>	
ATTITUDE	0.318	0.544	0.587	0.457	<b>0.785</b>

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.

#### 4.6 Manipulation validity

To check the validity of the manipulation of experimental treatments, subjects assessed the social presence of the fictitious Websites. This manipulation check was performed before the dependent measures were taken to prevent bias formed from responding to the dependent measures (Perdue et al. 1986). On a seven-point Lickert scale, subjects were asked to rate the following items that were adapted from a validated construct developed by Gefen and Straub (1997; 2003b) for Perceived Social Presence:

- There is a sense of human contact on this Website
- There is a sense of sociability on this Website
- There is a sense of human warmth on this Website

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 6 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 social presence.

**Table 6: 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)	--	--	0.782**
SP-3 (High)	--	--	--

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

## 5. RESULTS

A structural equation modeling (SEM) approach was adopted in our data analysis, as it possesses many advantages over traditional methods, such as multiple regression.

Namely, SEM does not involve assumptions of homogeneity in variances and covariances of the dependent variables across groups; it corrects for measurement error in the variable measurements; it allows a more complete modeling of theoretical relations; and it can simultaneously test the structural and measurement models (Bagozzi et al. 1989; Gefen et al. 2000b). Hence, this approach provides a more complete analysis for the inter-relationships in a model (Fornell 1982).

The variance-based Partial Least Square (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. 2000b); (ii) PLS is prediction-oriented and thus gives optimal prediction accuracy (Fornell et al. 1994); (iii) PLS can be applied to relatively small sample sizes (Bontis 1998; Fornell et al. 1982; Gefen et al. 2000b); and (iv) PLS is appropriate for testing theories in the early stages of development (Fornell et al. 1982), as it supports both exploratory and confirmatory research (Gefen et al. 2000b). 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. (2000b) 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 dependent variable. In our model, the most complex construct has 4 items and the largest number of independent variables estimated for a dependent variable is only two. 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 Figure 1, are presented in Figure 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 (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 7 also provides the  $t$ -values for all path coefficients. Approximately 46% of the variance in the attitude towards Web sites was accounted for by the variables in the model ( $R^2 = 0.463$ ). All the  $R^2$  of the endogenous constructs in the model exceed the 10% benchmark recommended by Falk and Miller (1992).

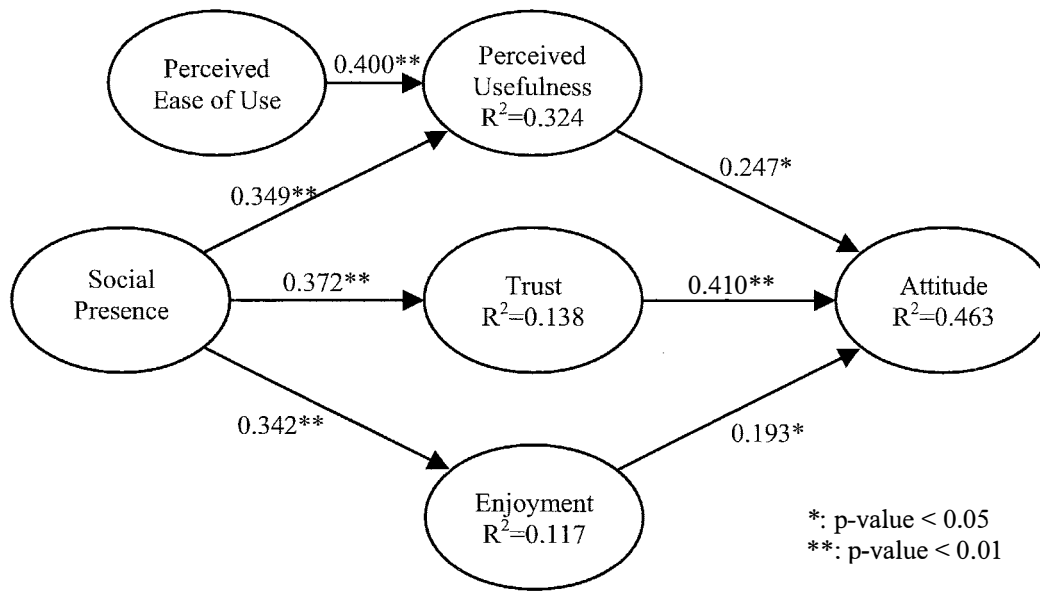


Figure 5: PLS Structural Model

Table 7: Results of Hypotheses Testing

Hypothesis	Causal path	Path coefficient	t-Values	Supported
H1	SP → PU	0.349	4.214**	Yes
H2	SP → Trust	0.372	3.842**	Yes
H3	SP → Enjoyment	0.342	3.718**	Yes
H4	PEOU → PU	0.400	3.451**	Yes
H5	PU → Attitude	0.247	1.974*	Yes
H6	Trust → Attitude	0.410	3.937**	Yes
H7	Enjoyment → Attitude	0.193	2.160*	Yes

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

## 6. DISCUSSION

Gefen and Straub (2003b) showed that the perception of social presence has an effect on online consumers' trust and their subsequent intention to purchase from a commercial Website. This paper sought to investigate interface features that impact the perception of social presence and to examine its effect on additional attitudinal antecedents within an online shopping environment. Results from our PLS model show that social presence level of a commercial Website appears to have a positive significant effect on perceived usefulness ( $b=.349$ ), trust ( $b=.372$ ) and enjoyment ( $b=.342$ ). The effect on trust supports earlier work by Gefen et al. (2003b) in an e-Services context. While the effect on perceived usefulness disagrees with earlier research by Gefen et al. (2003b), 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 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 et al.'s (1997) proposition that social presence has a prominent psychological impact on enjoyment. Social presence level appears to have equally important impacts on PU, trust and enjoyment, as the path coefficients are comparable. However, the three outcomes of social presence have varying path coefficients toward attitude. The path coefficient of trust to attitude is the highest ( $b=.410$ ), suggesting that trust may 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 commercial 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 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 tickets) (Gefen et al. 2003b) and email (Gefen et al. 1997; Karahanna et al. 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 social presence. Our findings also confirm earlier work linking TAM constructs, trust and enjoyment to online consumer attitudes [for example: (Gefen et al. 2003a; Gefen et al. 2003b; Koufaris et al. 2002a; Koufaris et al. 2002b; Koufaris et al. 2004; Koufaris et al. 2001/02; McKnight et al. 2002; Moon et al. 2001; Pavlou 2003; Shih 2004; van der Heijden et al. 2003; Yi 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 online environment, but did not provide empirically investigate how social presence can be manipulated through the interface. In particular, we have demonstrated the positive impact of socially-rich design elements (i.e. socially-rich text and pictures) on various constructs leading to online consumer attitude.

From a practitioner point of view, results from this study can have direct implications for designers of online shopping Websites. We have shown that a 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 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 et al. 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; Bellenger et al. 1976; Bloch et al. 1994; Roy 1994), which is directly influenced by social interactions with other humans (Jones 1999; McGrath et al. 1995). Similarly, this and other recent studies (Gefen et al. 2003b; Jarvenpaa et al. 1997; Kim 2002; Korgaonkar et al. 1999; Parsons 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 et al. 2003b). 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 et al. 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 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 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 et al. 2001).

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 et al. 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 et al. 2000a).

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 interaction 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 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; (iv) 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; (v) 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.

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McMaster eBusiness Research Centre

**McMaster eBusiness Research Centre (MeRC)**

DeGroot School of Business

McMaster University

1280 Main St. W. MGD A201

Hamilton, ON

L8S 4M4

Tel: 905-525-9140 ext. 27027

Fax: 905-528-0556

Email: [ebusiness@mcmaster.ca](mailto:ebusiness@mcmaster.ca)

Web: <http://merc.mcmaster.ca>