"The Impact of Infusing Social Presence in the Web Interface:

An Investigation Across Different Products"

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ABSTRACT: Many online stores tend to exhibit little emotional or social appeal, and may be viewed as lacking human-warmth. A recent study conducted by the authors showed that in an online apparel domain, increased levels of social presence through socially-rich descriptions and pictures positively impacts attitudinal antecedents. However, the appropriateness and need for human warmth and sociability may differ across the types of products or services being sought. In this paper, an empirical investigation was undertaken to compare our earlier findings in the apparel domain (a product for which consumers seek fun and entertaining shopping experiences) to a different type of product (headphones: a product for which consumers primarily seek detailed product information). It was found that Websites selling headphones do not exhibit a similar positive effect on attitudinal antecedents from higher levels of social presence. Implications of these finding and future research are outlined.

KEY WORDS AND PHRASES: Social presence, product type, electronic commerce, Web interface, online shopper attitude.

Introduction

The Internet has provided businesses of all sizes with opportunities to expand their market base, improve operational efficiency, create new links with trading partners, and provide better customer service, among other benefits. However electronic commerce (e-Commerce) has, in many cases, failed to live up to its potential. In particular, business-to-consumer e-Commerce forecasts have been overly optimistic, where transactions have not reached a point of critical mass [46, 50, 59, 65].

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 [14, 72, 96]. Kumar and Benbasat [56] 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". On the other hand, most online stores tend to exhibit little emotional or social appeal [35]. The online shopping experience is primarily geared towards reducing the user's cognitive burden through functional and performance based Website design heuristics [56, 69]. As such, e-Commerce may be viewed as lacking human warmth, since it is more impersonal, anonymous and automated than traditional person-to-person commerce [42]. However, it has been suggested that creating a virtual shopping experience that will entice the masses must engage both the cognitive and social sides of the user [56, 58, 72].

Recently, researchers have begun to explore this lack of human warmth on the Internet [35, 41] by drawing on social presence theory [86]. Social presence is the extent to which a medium allows users to experience others as being psychologically present [30]. It can also refer to the richness of the media [78, 92, 93] or the interactivity afforded by the media [19, 88]. Others stress the psychological connection, where social presence is concerned with "warmth". A medium is perceived to be warm if it conveys a feeling of human contact, sociability, and sensitivity [35, 79, 83, 89, 107]. Here we adopt

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the last perspective on social presence, where the medium gives the user a sense of human warmth and sociability.

In a Web environment, instilling a sense of human warmth and sociability can be accomplished by providing means for actual interaction with other humans (via virtual communities, message boards, chats, etc.) or by stimulating the imagination of interacting with other humans (via socially-rich text and picture content, personalized greetings, human audio and video, intelligent agents, etc.). While many have discussed the potential of various Website features to infuse a feeling of human warmth [1, 35, 56, 63, 71], the impacts of such features on perceived social presence have generally not been empirically validated.

In a recent study [41], we examined the impact of manipulating online social presence through imaginary interactions, specifically focusing on the impact of picture and text content. These Website features were chosen as they are common across most commercial Websites, thus presenting immediate and attainable recommendations for practitioners. In an apparel domain, we showed that social presence can be infused into Websites through socially-rich descriptions and pictures, which in turn positively impacts attitudinal antecedents (perceived usefulness, trust and enjoyment). While the results of this initial work are encouraging, they can not be blindly generalized across various domains. The appropriateness and need for human warmth and sociability may differ across the types of products or services being sought. In this paper, we empirically explore this issue by comparing the potential impact of infusing social presence via the interface across commercial Websites selling different types of products.

This paper is organized as follows: the next section outlines various classification schemes for categorizing online products, where an appropriate scheme is selected for the cross-product research outlined in this paper. Next, the research model used in this study and corresponding hypotheses are

described, followed by an outline of the research method and the experiment conducted to investigate the hypotheses. Analysis results are then presented, followed by a discussion of the findings. Conclusions are outlined, indicating limitations for this study and proposing areas for future research.

Online Product Types

It is well established that in the pre-purchase phase consumers will go through a process of evaluating the merits of a given product. It is the outcome of this process that will determine whether a purchase decision will be made or not. The exact nature of this evaluation process will depend in part on the attributes of the product in question [23, 87, 106]. Several classification schemes for categorizing online products have been proposed, some of which are outlined below:

- Search versus Experience products: Several researchers [38, 52, 68, 106] propose classifying products based on their search and experience attributes. Search attributes refer to product features that lend themselves to indirect assessment by the consumer (e.g. size; price) [85], where full information for dominant product attributes can be known prior to purchase [13]. Experience attributes, on the other hand, refer to features that require a consumer to actually come into direct contact with the product (e.g. taste, fit; etc.) [13, 85]. The quality of such goods is difficult to assess prior to purchase and usage [4]. It is important to note that many products possess both types of attributes. For example, the color and style of apparel would be considered search attributes, whereas the fit of apparel would be considered an experience attribute [4]. The boundary between search and experience products is fluid, where product exhibition and sampling may enable consumers to turn experience attributes into search attributes [38].

Additionally, experience products in the physical channels can be transformed into search products in electronic channels [52].

- Digital versus Non-digital products: Lal and Sarvary [57] propose a similar classification to the one above, but with different terminology. They argue that consumers need to gather information on two kinds of product attributes: digital attributes which can be experienced online at relatively low cost and non-digital attributes which entail physical inspection by the customer. Digital products help to overcome two major barriers to online shopping: fulfillment and absence of immediate gratification [62].

- Geometric, Material or Mechanical products: This classification [51] (and more recently [64]) is based on the sensory dimensions used by customers in evaluating different products. According to this classification, geometric products refer to products that consumers mostly evaluate on a visual basis (e.g. picture frames, utensils, computer peripherals, etc.), whereas material products are typically evaluated with the sense of touch (e.g. linens, clothing, towels; etc.). McCabe [64] suggest that, as a consequence of being evaluated on a visual basis, geometric products are better suited to an online environment compared to material products. Li et al. [60] extended this classification by proposing a third product category called mechanical products. This new category refers to products that consumers are inclined to interact with in the pre-purchase phase (e.g. cell phones, personal digital assistants, toys, etc.).

- Infrequently purchased durables, frequently purchased nondurables or entertainment/apparel products: Burke [9] performed a detailed discriminant analysis of product differences in the

importance of various shopping attributes (such as fun of shopping, privacy, convenience, service, etc.), resulting in three major categories: (i) infrequently purchased durable goods (e.g. appliances, consumer electronics, furniture) where consumers want retailers to provide detailed product information and excellent service; (ii) frequently purchased nondurable goods (e.g. groceries, health items, office supplies) where consumers want to have fast and convenient shopping experiences; and (iii) entertainment (e.g. books, toys, games) and apparel goods where consumers want to have fun and entertaining shopping experiences. This classification was rigorously derived from an analysis involving over 2,100 online consumers and their assessment of the importance of various aspects of the shopping experience (online and offline) for various products. Based on his findings, he suggests that online stores should be tailored to meet the desired user experiences for the sought after product category.

Product characterization schemes have also focused on dimensions such as the cost and frequency of purchase [76], the degree of differentiation [22, 76, 81] and functionality/innovativeness [95]. For example, low-priced and easily described products are well suited for electronic markets [90], whereas expensive, high-risk products are less likely to be purchased online [38].

The purpose of this paper is to compare the potential impact of infusing social presence via the interface across commercial Websites selling different types of products. Lombard and Ditton [63] suggest that a prominent psychological impact of social presence is enjoyment or fun. Therefore, we seek a product classification scheme that distinguishes products along the fun attribute. Burke's study [9] classifies products according to various shopping attributes, including "fun of shopping". His infrequently purchased durable goods and frequently purchased nondurable goods categories rate low on the fun dimension, while his entertainment/apparel product category rates high on this dimension.

In a previous study [41], we showed that social presence positively impacts attitudinal antecedents for a commercial Website selling apparel (a product that rates high on the fun dimension according to Burke's study). In this study, we seek to compare these results with those obtained for a commercial Website selling headphones (a consumers' electronics product which rates low on Burke's fun dimension). Both apparel and headphones are common products that all consumers would be familiar with, making them suitable candidates for this study.

Research Model and Hypotheses

Gefen and Straub [35] examined the effect of social presence on purchase intentions in an e-services context. In their model, they investigated the impact of social presence on trust and perceived usefulness constructs, as antecedents to purchase intentions. Based on this model, Hassanein and Head [41] explored the impact of social presence on online product purchasing. Apart from the domain differences, the Hassanein and Head [41] model, shown in Figure 1, expanded the Gefen and Straub [35] model by adding an enjoyment construct, as enjoyment has been shown to be a psychological consequence of social presence [63] and an antecedent to consumer attitudes towards Websites [25, 43, 100]. This expanded model was used to study 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. Detailed theoretical support for the model shown in Figure 1 is provided in [41]. The study revealed that social presence can be infused into Websites through socially-rich descriptions and pictures. This in turn, was shown to positively impact the perceived usefulness, trust and enjoyment of a commercial Website, which resulted in more favourable attitudes towards that online store. The context of this

study was Websites selling apparel, a product for which consumers seek fun and entertaining shopping experiences [9].

<Insert Figure 1 about here>

There is evidence to suggest that goods possessing various evaluation characteristics can influence online consumers' experiences and preferences differently [26, 77, 104]. Burke [9] argues that consumers seeking a product such as apparel would value a fun and entertaining shopping experience, whereas consumers seeking electronic products such as headphones would prefer detailed product descriptions and excellent service. Social presence conveys human warmth and is geared towards hedonic, rather than utilitarian, shopping motives. In other words, the infusion of social presence via the Web interface should stimulate a pleasurable shopping experience rather than an efficient one [41]. The goals of online consumers seeking apparel more closely matches the outcomes associated with higher levels of social presence than the goals of online consumers seeking headphones. Hence, it is reasonable to expect that attitudinal antecedents for online shopping will be more positively affected by higher levels of social presence for Websites selling apparel than Websites selling headphones. Therefore, we hypothesize that:

H1: The relationship between social presence and perceived usefulness is stronger for Websites selling apparel than for Websites selling headphones.

H2: The relationship between social presence and trust is stronger for Websites selling apparel than for Websites selling headphones.

H3: The relationship between social presence and enjoyment is stronger for Websites selling apparel than for Websites selling headphones.

Actual usage or purchase intention is difficult to measure in a laboratory study. This is particularly true when the object of the study is a fictitious online store. In such situations, user attitude may be a more appropriate variable to study. User attitude has been shown to be an important and useful outcome variable [31, 32]. Jeong and Lambert [47] show that customers' attitudes towards using a Website is a strong indicator for predicting their purchasing behaviour. This is in line with the Theory or Reasoned Action (TRA), which proposes that behaviour is determined by an individual's intention to perform the behaviour, and intention is influenced by attitude [3]. In this study we define "attitude" as the user's feelings towards online purchasing, following Jarvenpaa et al. [45] and van der Heijden et al. [102].

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: According to TAM, user attitude is directly affected by beliefs about the system, which consists of perceived usefulness (PU) and perceived ease of use (PEOU) [20]. More recently, TAM has been studied within the Web environment to explore acceptance of Internet related technologies or predict consumer intention to use, revisit or purchase from a Website [14, 33, 55, 66, 74, 84]. The Gefen and Staub [35] model links PEOU directly to PU but does not have a direct connection between PEOU and their outcome variable. Our initial exploration with this model verified that no significant link existed between PEOU and attitude [41].

(ii)   Trust: 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 behaviors of the e-vendor [50]. Customer trust in a company's Website has been shown to positively influence customers' attitudes towards the company and customers' willingness to buy [33, 45, 61].

(iii)   Enjoyment: Davis et al. [21] 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 is an important experiential aspect in offline shopping [7, 27, 67], and is emerging as an influential factor in online shopping with significant impacts on consumer attitudes [14, 25, 43, 100].

While perceived ease of use has been primarily linked to perceived usefulness (for example [20, 35, 84, 102]), perceived usefulness, trust and enjoyment have been shown to positively impact attitude across various product types (for example [24, 45, 54, 74, 102, 105]). Therefore, we hypothesize:

H4:   Perceived ease of use positively influences perceived usefulness for Websites selling apparel and Websites selling headphones.

H5:   Perceived usefulness positively influences attitude for Websites selling apparel and Websites selling headphones.

H6:   Trust positively influences attitude for Websites selling apparel and Websites selling headphones.

H7: Enjoyment positively influences attitude for Websites selling apparel and Websites selling headphones.

Methodology

In a previous study we explored the impact of manipulating social presence through the interface of a Website on consumer attitudes towards an online vendor selling apparel [41]. Methodology details for the apparel study (such as validity and reliability of the measures, sample characteristics, etc.) are provided in [41]. Here we duplicate the design of the apparel study, for a Website selling headphones. Each study was designed as a one-factorial experiment manipulating three levels of Website social presence with three independent groups of subjects. Subjects were given the task of purchasing a gift for a friend from one of the three Websites. To increase the realism of the task, subjects were told they had a chance of winning the product they selected from the Website, in a random draw conducted at the end of each study.

For each 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 experiments were 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 asked to complete a consent form, fill in a demographic questionnaire, perform the experimental task (selecting a gift for a friend), and complete a questionnaire about their experiences on the 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.

In order to isolate the impact of product type on the influence of social presence, multiple Websites were created for a fictitious clothing company (called myCloset.com) in the apparel study [41] and a fictitious electronics company (called myStereo.com) for this headphones study. Fictitious companies were chosen to avoid any potential bias from previous branding or experiences[1]. The manipulated levels of social presence were offered incrementally, as shown in Table 1. With this approach, differences between the three groups for each product type could be directly attributed to the increasing levels of social presence. This incremental design has been adopted by similar studies, such as Schaffer & Hannafin [82], Burgoon et al. [8] and Teo et al. [97]. Sample Web pages for the headphones study are shown in Figure 2 which shows the same headphones displayed with low, medium and high social presence. Corresponding sample Web pages for the apparel study can be found in [41].

<Insert Table 1 about here>

<Insert Figure 2 about here>

Subjects

The apparel study had 78 participants while the headphones study had 90 participants. All subjects were Canadian, and were a mix of MBA students and professionals working in various industries. Each subject participated in one treatment group (i.e. one social presence level for one product type study). Subjects were randomly assigned to the different social presence groups to control for confounding effects due to possible variations in individual characteristics. A summary of the participant demographics for the headphones study is shown in Table 2. The demographics for the

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[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.

apparel study are reported in [41]. The data for the two studies were collected a few months apart. ANOVA tests found no significant differences for subjects in the various treatment groups in terms of gender, age, Internet and online shopping experience. Therefore, randomization of assignment across social presence groups for both the headphone and apparel studies was successful in terms of subject characteristics.

<Insert Table 2 about here>

Content Validity

Content validity examines how representative and comprehensive the measurement items are in creating the constructs in a given model. It is assessed by examining the process by which the items were generated [91]. A construct valid in content is one that has drawn representative questions (items) from a universal pool [18, 49]. In this research, the principal constructs were developed based on, or adapted from, existing validated measures. Appendix A summarizes the construct items used in the questionnaire and provides literature sources for each construct. It is important to note that the same construct items were used in the apparel study [41].

Construct Validity

Construct validity examines the extent to which a construct measures the variable of interest. In other words, it should demonstrate relatively high correlations between items of the same construct (convergent validity) and low correlations between items of constructs that are expected to differ (discriminant validity) [10]. To assess convergent validity, Fornell and Larcker [29] propose examining: (i) the item reliability of each measure; (ii) the composite (construct) reliability of each

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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 [91]. A construct is considered to exhibit satisfactory convergent and discriminant validities when items load highly on their related factor and have low loadings on unrelated factors. Table 3 shows the results of the varimax rotation on the original 19 items (outlined in Appendix A) constrained to five factors. Hair et al. [40] suggested that an item is significant if its factor loading is greater than 0.50. From the initial 19 items, four items (PEOU1, T3, T4 and A3) were eliminated due to cross-loadings on other constructs.

Construct reliability was assessed using Cronbach α-values. As shown in Table 3, α-values for this study ranged from 0.803 to 0.936. All constructs exhibited an α-value greater than 0.7, a common reliability threshold for exploratory research [70, 80]. Similarly, Table 4 shows that the average variance extracted for each construct in our model exceeded the recommended 0.5 benchmark [29]. Thus, the proposed constructs demonstrated convergent validity on all three measures proposed by Fornell and Larcker [29].

<Insert Table 3 about here>

Discriminant validity was assessed to ensure that constructs differed from each other. As per Fornell and Larcker [29], 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 4, 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 both product models, satisfying Fornell and Larker's [29] criteria

for discriminant validity. The above results, therefore, confirm that our instrument encompassed satisfactory construct validity.

<Insert Table 4 about here>

Manipulation Validity

To check the validity of the manipulation of experimental treatments, subjects assessed the perceived social presence of the experimental Websites. This manipulation check was performed before the dependent measures were taken to prevent bias formed from responding to the dependent measures [75]. Subjects were asked to rate (on a 7-point Likert scale) the following items that were adapted from a validated construct developed by Gefen and Straub [34, 35] 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

ANOVA tests indicated that the three subject groups within were significantly different in terms of their perceived social presence (F(2,89)=23.81, p<.000). Table 5 shows the results of post-hoc Tukey tests, which confirmed significant between-group differences. Therefore, the three experimental Websites for this study effectively demonstrated three different and increasing levels of social presence.

<Insert Table 5 about here>

Results

Data analysis was performed using a structural equation modeling (SEM) approach, 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 allows a more complete modeling of theoretical relations, and it can simultaneously test the structural and measurement models [6, 36]. 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 [36]; (ii) PLS is appropriate for testing theories in the early stages of development [28] as it supports both exploratory and confirmatory research [36]; and (iii) PLS can be applied to relatively small sample sizes [28, 36]. Chin [15] and Gefen et al. [36] 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 four items and the largest number of independent variables estimated for a dependent variable is only three. Thus, sample sizes for our studies (78 and 90) are more than adequate for PLS estimation procedures.

As recommended by Chin [15], bootstrapping (with 500 sub-samples) was performed to test the statistical significance of each path coefficient using *t*-tests. Figure 3 provides a comparison of the results of the PLS analysis of our model from the apparel study [41] and from this study involving headphones. The results show that increased levels of social presence have a positive and significant impact on perceived usefulness, trust and enjoyment for Websites selling apparel. However, no significant relationships were found between increased levels of social presence and usefulness, trust or

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enjoyment for Websites selling headphones. Therefore, social presence (manipulated through textual and pictorial design elements) has a stronger and more positive impact on attitudinal antecedents for Websites selling apparel than for Websites selling headphones. Thus, hypotheses H1, H2 and H3 are supported.   Additionally, the results show that both apparel and headphones had positive and significant beta coefficients between: (i) perceived ease of use and perceived usefulness (H4); (ii) perceived usefulness and attitude (H5); (iii) trust and attitude (H6); and (iv) enjoyment and attitude (H7). Approximately 46% and 55% of the variance in the attitude towards Websites was accounted for by the variables in the apparel and headphones product models, respectively. The R^2 for the trust and enjoyment endogenous constructs in both models were rather low, ranging from 0.012 to 0.138. However, this is reasonable as trust and enjoyment are affected by a large number of factors other than social presence (especially for headphones, where no causal relationships were supported). Further, an R^2 value of less than 0.1 is not uncommon in behavioural science studies, as well as in research employing structural equation modeling [16]. Many TAM-based investigations report low R^2 (for example [11, 20, 66]. Cohen [16] also suggests that the amount of actual association between constructs may, in fact, be greater than the proportion of variance accounted for by measuring R^2.

<Insert Figure 3 about here>

Discussion

Gefen and Straub [35] showed that the perception of social presence has an effect on online consumers' trust and their subsequent intention to purchase from a commercial Website. Hassanein and Head [41] showed that social presence level can be manipulated through Web design elements (namely, text and picture presentations) and that increased levels of social presence have a positive significant effect on

perceived usefulness (b=.349), trust (b=.372) and enjoyment (b=.342) for Websites selling apparel. The results presented in this paper show that this effect differs according to the type of product that is being sold by the online vendor. Perceived usefulness, trust and enjoyment of Websites selling headphones were not influenced by increased levels of social presence. However, regardless of the product being sold, these three constructs are significantly positive antecedents to online consumers' attitudes towards a shopping Wesite.

Further analysis of the open-ended questions revealed some interesting insights into our findings. For the low social presence Website selling apparel, some subjects commented that it was "straight forward" and provided products in a "clear" form that was "easy to view". However, many noted that the Website was "too plain", "dull and boring", and generally "unappealing". A few subjects commented that they were "not able to judge what the piece of clothing looks like when it's being worn" and felt it generally "lacked a personal touch". In contrast, for the low social presence Website selling headphones, while some subjects noted that it had a "cold feeling" and "was not memorable", most stressed the "simplicity" and "uncluttered design" where the "essential information was easy to find and compare". Most subjects preferred the headphones low social presence Website to "cut to the chase without extra fluff". One online shopper stated that he liked the fact that this Website "was not overly complicated" and it allowed him to "view what you need and buy what you want".

For the medium social presence Website selling apparel products, subjects commented that while the socialized descriptions were "interesting", "fun and imaginative", they did not necessarily "help in making a decision". In contrast, few subjects had positive remarks about the socialized descriptions on the Website selling headphones. Some did comment that it gave the Website a "warm feeling" and "a touch of personality". As with the apparel Website, it was "entertaining to read the

captions but they would not prompt [them] to buy the product". However, most subjects disliked the socialized descriptions for the headphones, expressing that it was "irritating", "fake", "distracting", "too personal and almost unprofessional". Some of the reasons given for this dislike included: "it was trying to sway me into purchasing a product for a certain occasion rather than the objective practical use of it"; "stories did not add anything to the shopping experience"; "I mistrust someone who tells stories to distract you from the actual benefits of the product"; "It seemed like it was mocking my intelligence"; "I felt that they were trying too hard to convince me by using my own feelings"; "It doesn't show the quality of the product, it's too subjective" and it would be "better if the info was more factual than just entertaining".

Finally, for the high social presence version for the apparel Website, 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". For the headphones study, some subjects also commented that the high-social presence version "provided a warm and fuzzy feeling", that they "liked the personal aspect" and "the fact that it showed the relative size of each product". One subject commented: "I liked the picture of the product while being used as it kind of helped me to pick one for a friend ... sporty friend, laid back friend … that kind of thing". However, the majority would have "preferred to see only product pictures" rather than "cheesy" and "phony" socially-rich content that "tried too hard to make the product seem interesting, cool or fun". Subjects stated that the infusion of social presence "distracted from the product", "obscured the product" and was "pointless as we know how to use headphones". One subject questioned "do you really need to be in the presence of someone else to enjoy listening to music via a headset?"

Conclusions

This paper investigates the impact of infusing social presence via the interface across commercial Websites selling various product types. We found that perceived usefulness, trust and enjoyment are important antecedents to online shoppers' attitudes regardless of the type of product being sought by consumers. However, higher levels of social presence have varying effects on these attitudinal antecedents according to the product being sold online. Websites selling apparel (a product for which consumers seek fun and entertaining shopping experiences) benefit from higher levels of social presence. On the other hand, Websites selling headphones (a product for which consumers primarily seek detailed product information) do not exhibit a positive effect from higher levels of social presence.

These results confirmed our proposed hypotheses that infusing social presence through interface design affects Websites for different product types to different degrees. From the open-ended comments provided by the subjects, it was clear that apparel was better suited for socially-rich online presentations, as the product itself evoked emotion and the socially rich design induced positive feelings in addition to providing additional information (visualizing the product and obtaining ideas for situations in which to use the product). In contrast, the comments on the headphones Website stressed that the socially-rich presentations did not match the information requirements (detailed product specifications) for a more technical product, and thus seemed forced and inappropriate.

From a theoretical perspective, this study extends social presence research in the e-Commerce domain. Previous studies have explored the impact of social presence for email [34, 48, 92], online stores selling apparel [41] and online digital products (i.e. airline tickets) [35]. However, this is the first study to suggest that the potential impact of social presence varies according to the product/service being sold on a commercial Website.

From a practitioner perspective, results from this study can have direct and immediate implications for designers of commercial Websites. Online vendors selling apparel are encouraged to consider infusing social presence in their Website design, as its potential impact is positive for this category of products. Descriptions aimed at evoking positive emotions and pictures that depict products with people in emotional and dynamic settings were shown to significantly impact online shoppers' perception of social presence [41]. While some online vendors (such as L.L. Bean and LandsEnd) currently incorporate a few social presence elements in their Web pages (e.g. socially-rich pictures, human Web assistants, personalized avatars, "shop with a friend" feature), currently most online offerings are functional with little or no social appeal [35]. We have shown that inducing a sense of social presence on a commercial Website can be an immediate and attainable goal, potentially resulting in an improved online customer experience for apparel products. On the other hand, vendors selling other types of products should be cautious about adopting such an approach as it may not match the experiential requirements for online customers seeking such products (e.g. headphones).

As with any research study, there are some limitations that should be noted. First, this study was conducted in a laboratory setting where the measurement of actual/natural consumer behaviour is difficult. 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 taken the task more seriously and employed their natural purchasing behaviour. Second, generalizability is an issue that applies to most studies in information systems, and this research is no exception. Future studies should determine the extent to which the findings presented here can be expanded to include other persons, settings and times [17]. Only one product classification scheme was used and only one representative product from each category of this classification scheme was studied. There are many product dimensions/attributes that can be used to differentiate between product groups. As such,

further investigation could explore the particular product attributes that best lend themselves to socially rich presentation. Similarly, the representative products used in this study may have led to a bias in the results due to the prevailing attitudes of consumer towards those products. Third, since only one research method was employed (survey analysis following an experimental task), there is a potential for bias due to common method variance [94]. Various evaluation methods could be employed (such as formal usability tests, focus groups, eye tracking and log analysis) to avoid this potential bias and obtain a richer understanding of the impacts of social presence across online vendors selling various products and services.

In addition to the above suggestions to overcome our study's limitations, future research can include: (i) investigation of additional socially-rich design elements across product types, as only text and pictures were investigated in this study; (ii) investigation of preferences for social presence across consumer groups (divisions may be based on gender, age, culture). For example, our initial investigations suggests that the impact of social presence on Website attitude and its antecedents may differ across cultures; (iii) investigation of preferences for social presence across consumer goals (browsing vs. searching); and (iv) investigation of preferences for social richness in a business-to-business and consumer-to-consumer environments.

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Appendix A: Construct Items and their Sources

All items were measured on a seven-point Likert strongly disagree/strongly agree scale.

Perceived Ease of Use (PEOU)
    Sources: [20, 33, 39, 73, 100]

1. PEOU1[§]   This Website is easy to use for clothing / headphone assessment
2. PEOU2   I can quickly find the information I need on this Website
3. PEOU3   This is a user-friendly Website
4. PEOU4   My interaction with this Website is clear and understandable

Perceived Usefulness (PU)
    Sources: [2, 12, 20, 33, 53, 66, 98]

1. PU1   This Website provides good quality information
2. PU2   This Website improves my performance in assessing clothing / headphones online
3. PU3   This Website increases my effectiveness for clothing / headphone assessment online
4. PU4   This Website is useful for assessing clothing / headphones online

Enjoyment (E)
    Sources: [2, 37, 53, 66, 99, 100]

1. E1   I found my visit to this Website interesting
2. E2   I found my visit to this Website entertaining
3. E3   I found my visit to this Website enjoyable
4. E3   I found my visit to this Website pleasant

Trust (T)
    Sources: [5, 33, 45, 73, 102]

1. T1   I feel that this online vendor is honest
2. T2   I feel that this online vendor is trustworthy
3. T3[§]   I feel that this online vendor cares about customers
4. T4[§]   I feel that this online vendor would provide me with good service

Attitude (A)
    Sources: [44, 100, 101, 103]

1. A1   I would have positive feelings towards buying a product from this Website
2. A2   The thought of buying a product from this Website is appealing to me
3. A3[§]   It would be a good idea to buy a product from this Website

---

[§] indicates dropped item to increase construct reliability in the headphones study

Site 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 being used with people in emotional, dynamic settings

Table 1. Social Presence Manipulations of the Experimental Websites

Characteristics	
Gender	
Male	46%
Female	54%
Dominant age group	18-29
Average number of online purchases	7.6
Reasons for Shopping Online	
Convenience	80%
Product/Service not available offline	54%
Better Price	54%
Curiosity	10%
Reasons for not Shopping Online	
Lack of trust	50%
Privacy concerns	50%
Security concerns	55%
No credit card	40%
Prefer shopping offline	45%
Difficult to evaluate products online	50%

Table 2. Subject Demographics (n = 90)

Construct Items	Item Loadings	Construct Reliability (α)	Average Variance Extracted
PU1	.707	0.893	0.563
PU2	.791		
PU3	.760		
PU4	.741		
PEOU2	.614	0.876	0.608
PEOU3	.852		
PEOU4	.850		
E1	.750	0.936	0.662
E2	.866		
E3	.848		
E4	.784		
T1	.861	0.921	0.707
T2	.820		
A1	.735	0.803	0.565
A2	.768		

Table 3. Convergent Validity Tests

	PEOU	PU	TRUST	ENJOY	ATTITUDE
PEOU	**0.780**				
PU	0.677	**0.750**			
TRUST	0.451	0.464	**0.841**		
ENJOY	0.559	0.607	0.463	**0.813**	
ATTITUDE	0.534	0.601	0.639	0.562	**0.752**

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 4. Discriminant Validity Tests

Social Presence Group	SP-1 (Low)	SP-2 (Medium)	SP-3 (High)
SP-1 (Low)	--	0.967*	2.300***
SP-2 (Medium)	--	--	1.333***
SP-3 (High)	--	--	--

* denotes significance at the .05 level; ** denotes significance at the .01 level; *** denotes significance at the .001 level

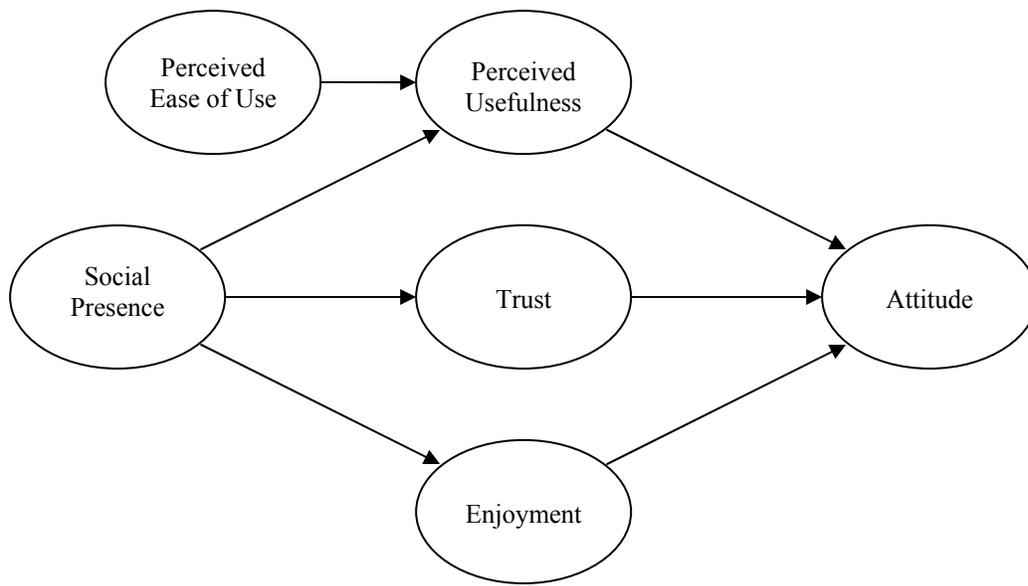**Table 5. Mean Differences Between Social Presence Groups**

Figure 1. Research Model after [41]
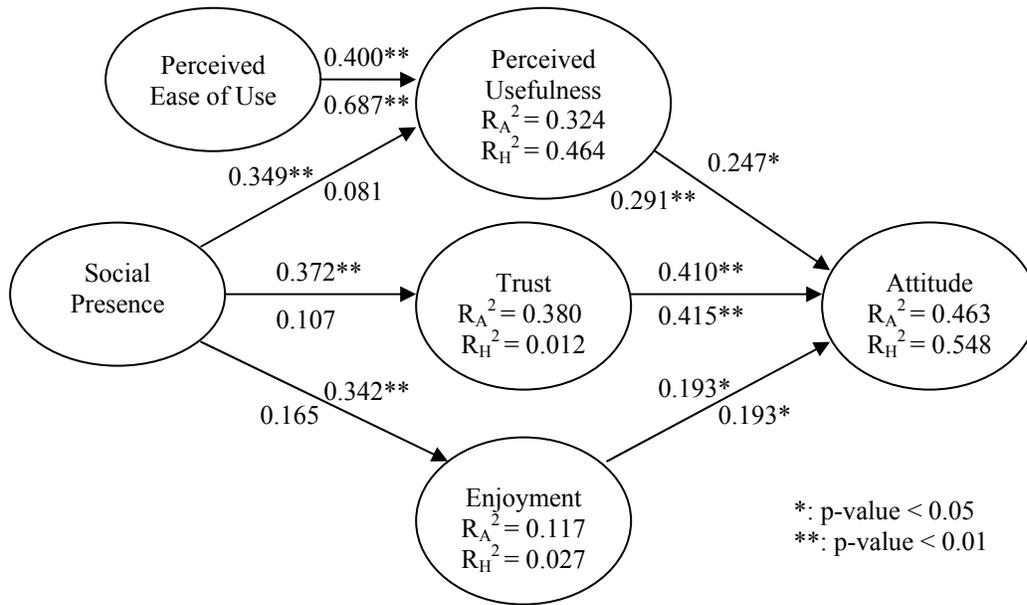
2a. SP-1 Low Social Presence Website

2b. SP-2 Medium Social Presence Website

2b. SP-3 High Social Presence Website

Figure 2. Experimental Websites with Various levels of SP

Perceived Ease of Use

0.400**
0.687**

Perceived Usefulness
$R_A^2 = 0.324$
$R_H^2 = 0.464$

0.247*

0.349**
0.081

0.291**

Social Presence

0.372**
0.107

Trust
$R_A^2 = 0.380$
$R_H^2 = 0.012$

0.410**
0.415**

Attitude
$R_A^2 = 0.463$
$R_H^2 = 0.548$

0.342**
0.165

0.193*
0.193*

Enjoyment
$R_A^2 = 0.117$
$R_H^2 = 0.027$

*: p-value < 0.05
**: p-value < 0.01

- Values above the arrows refer to path coefficients from the apparel study model.
- Values below the arrows refer to path coefficients from the headphones study model.
- R_A^2 refers to R^2 values from the apparel study model.
- R_H^2 refers to R^2 values from the headphones study model.

Figure 3. PLS Structural Models for Apparel and Headphones Studies