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**Abstract**

*This paper discusses the applications of presence in online shopping and illustrates how online stores can improve their experiential appeal and utilitarian value by enhancing shoppers' feelings of presence with the help of web-based interactive multimedia technologies. Specifically, four types of presence are discussed: presence of products, presence of a sales representative, presence of an intelligent agent, and presence of Co-shoppers and other customers. Guidelines of presence design are also suggested.*

**Keywords**: online shopping, social presence, telepresence, interface design

Online shopping has expanded strongly and steadily in the past few years. According to a recent report released by the US Department of Commerce, retail e-commerce sales in the US amounted to 2.4% of total retail sales in the forth quarter of 2005, with an exciting 23.0% year-to-year increase in e-tailing. In contrast, total retail sales increased by only 6.0% (Bureau 2006). Notwithstanding these encouraging statistics, researchers still doubt the effectiveness of electronic shopping because they are concerned that consumers cannot find as useful and enjoyable experiences online as they can derive from shopping in physical stores. In particular, consumers cannot feel, touch, and try products online, they are not able to interact with salespersons face-to-face, and they cannot share the enjoyment and sociability of hanging out with friends while shopping after work or during holidays. Hence, the compatibility of online shopping experiences with consumers' established shopping habits and product evaluation styles in physical stores is a key factor determining the adoption of e-commerce, as well as a pressing question faced by most online retailers.

In the present article, we use *presence*, a concept employed primarily in studies of telecommunication, teleoperators, and virtual environments, to illustrate how online stores can improve their experiential appeal and utilitarian value through enhancing shoppers' feelings of presence with the help of low-cost interactive multimedia technologies.

The concept of presence is very broad and has a variety of meanings. A widely accepted definition of presence has identified it as "*a perceptual illusion of nonmediation*" that occurs "*when a person fails to perceive or acknowledge the existence of a medium in his/her communication environment and responds as he/she would if the medium were not there.*" (Lombard et al. 1997) This article focuses on two prominent types of presence: *telepresence* and *social presence*. *Telepresence* has been defined as the

sensation of "being there," or as the experience of presence in an environment by means of a communication medium (Heeter 1992; Steuer 1992). *Social presence*, on the other hand, refers to the feeling of "being with another" (Biocca et al. 2003; Short et al. 1976), and is primarily used to measure the extent to which users sense the existence of other people or intelligent minds in distant locations.

Past studies on presence have been conducted predominantly in the fields of virtual reality and telecommunication. For example, researchers have used the concept of telepresence to measure user feelings of immersion or involvement within virtual or mediated environments (Kim and Biocca 1997; Steur 1992). In contrast, the concept of social presence has generally been used to explore the richness of various communication media and the appropriateness of these media to perform specific types of tasks (Biocca et al. 2003). In the present paper, we extend the concepts of both telepresence and social presence into the field of online shopping. Potential applications where the experience of presence is particularly desirable and useful are identified, as well as principles for designing these applications successfully.

## 1. Applications of Presence in Online Shopping

A few pilot trials have indicated that a lifelike replication of every aspect of physical shopping environments and experiences may not be an optimal choice for e-tailers primarily due to the inconvenience of spatial navigation (Jeandrain 2001). Instead, focusing on and developing presence around key interactions could help preserve the advantages of both online and offline settings. We propose four categories of interactions that are relevant to presence design: 1) interaction with products, 2) interaction with service representatives, 3) interaction with intelligent agents, and 4) interaction with other shoppers. These interactions can be enhanced with non-immersive presence technologies that do not impose special computer hardware or software requirements for their utilization by online shoppers.

### *1.1 Presence of Products*

One of the most frequently-mentioned constraints of Internet shopping is that consumers cannot feel, touch, and try products online as they do in brick-and-mortar stores. The lack of direct experience makes customers less confident about their evaluations of products and less willing to purchase the products. These concerns can be alleviated by enhancing consumers' feelings of telepresence, i.e. the feelings of "being with the product".

The generation of a virtual experience with products, using web-based virtual reality (VR) technologies, can effectively enhance consumers' feelings of telepresence, thereby facilitating consumers' understanding of products and engaging them in their shopping processes (Jiang and Benbasat 2005). Recently introduced web applications that apply development tools such as Macromedia Flash, Apple QuickTime, and Java 3-D APIs enable web consumers to interact with and to "try" products virtually. For example, Olympus allows customers to rotate a camera's image three-dimensionally on its website, by using computer mice and keyboards, thus enabling them to inspect the camera from different angles. Consumers can also enlarge or reduce the product image so as to evaluate it from different distances. Likewise, in Timex's online showroom, consumers can operate various features of a sports watch, such as its alarm and time settings, by

"pressing" its functional buttons. The website of Land's End even enables a customer to put clothes on customized virtual models to see whether or not the clothes fit "the body" that simulates the customer's own physique.

Emergent technologies promise additional sensory stimuli, such as audio, olfactory, and even haptic information. In the near future, these technological advancements may provide online consumers even higher levels of presence, bringing virtual products from the tips of shoppers' fingers to the tips of their noses.

---- Insert Figure 1 here. ----

### *1.2 Presence of a Service Representative*

Although online shopping is basically a self-service activity, there are many occasions when shoppers want to interact with online vendors to obtain answers to their questions either before or after purchasing, similarly to talking with a salesperson in a physical store. However, for most consumers, clicking on hyperlinks, filling in forms, or sending email notes are not as natural processes to obtain answers as having a conversation with a service representative. To address this concern, companies have started to deploy a feature called "Live Help" or "Live Support" to assist online shoppers. By using "Live Help," customers can use a browser-based instant messaging tool to chat with a serviceperson on questions related to products or services in real time, thus enhancing the consumers' feelings of social presence, i.e. the perception of "being together" with the serviceperson.

Current "Live Help" implementations generally employ textual chat which, with single modality and no embodied representation, remains restricted in its ability to convey non-verbal cues, in comparison with face-to-face communication. Researchers have found that when two people meet for the first time and exchange a series of questions in order to find out about one another, those who communicate by text messaging evaluate each other less favorably than people who communicate face-to-face (Kiesler et al. 1985). On the other hand, research has also demonstrated that the use of images, audio, or video can significantly increase the richness of a medium, and it can improve the quality of person-to-person communication (Daft et al. 1986). For instance, the use of an image to identify another individual is familiar and analogous to the experience of using one's unmediated body in the natural world. The perceived closeness would make the consumers feel that their requests are taken care of responsively and considerately, therefore enhancing their levels of satisfaction.

Several methods can be employed to enhance the presence perceptions of "Live Help"(Qiu and Benbasat 2005). First, voice can be integrated with text-based communication so that customers will feel social affinity and closeness to servicepersons while enjoying the readability of text. Second, servicepersons can be embodied by VRML or Flash-based avatars, which can significantly boost users' feelings of presence.

### *1.3 Presence of an Intelligent Agent*

With the commercialization of sophisticated artificial intelligence technologies, software programs are taking over more and more services previously provided by human servicepersons. A virtual host or hostess can be designed on the homepage of an online store to welcome visitors and to provide information ranging from the company's

background to its best-selling products; furthermore, a recommendation agent can help consumers efficiently screen the set of alternatives available and find the product that best fits their requirements and preferences.

Prior research has shown that people automatically offer various social responses to embodied agents even when they are fully aware that the other party is a piece of software (Nass et al. 2000), indicating that anthropomorphic interfaces can be used to enhance social presence for virtual communication between shoppers and software agents. As an example, virtual hosts designed with Oddcast Sitepal, a FLASH-based anthropomorphic agent integrated with either a real human voice or computer-generated speech, can transform an interactive service, such as an inquiry for the status of an order, into a question-and-answer session with a human touch. It can also make some complicated tasks, such as product advising and demonstration, more sociable and credible. If shoppers can converse with an embodied agent in a multimodal dialogue-like style to request and acquire explanations for agents' actions, their perceptions of social presence might be boosted more significantly. Promisingly, these embodied agents, empowered with advanced artificial intelligence and extensive knowledge bases, could eventually engage in "meaningful" social chatting with human users.

---- Insert Figure 2 here ----

### *1.4 Presence of Co-Shoppers and Other Customers*

For many people, shopping in brick-and-mortar stores is not a solitary action but a shared and sociable experience. Being together, consumers can obtain advice from others; or just use the activity as an opportunity for social interaction. Comparatively, when shopping online, it is hard for consumers at different locations to communicate with each other, resulting in most online shopping activities remaining individual-focused. To increase social interactions among customers, online firms employ textual or Voice over Internet Protocol (VoIP) chat to facilitate communication and collaboration. However, there are still limitations: 1) neither textual nor VoIP can provide satisfactorily rich communication cues, such as people's facial expressions and body gestures; 2) when people shop together for a certain product, it is hard to ensure that they are looking at the same products on their own web browsers. The absence of nonverbal communications and shared contexts significantly reduces customers' feelings of social presence and telepresence in online collaborative shopping.

One way to increase presence is to equip consumers with video communication, i.e., to use web-based video conferencing technologies to allow shopping partners to see each other. Another way to improve presence involves the development of shared contexts via a collaborative browsing tool. Collaborative browsing is a software-enabled technique that allows consumers to interact with their shopping partners by using the partners' web browsers to demonstrate products displayed on a web page. Research (Farnham et al. 2001) has found that people prefer a shared browser to an unshared browser when shopping online together; the shared browsing can significantly enhance users' feelings of enjoyment, beyond its ease of use and functionality.

Presence can also be enhanced in online communities. Bulletin board and discussion forums are effective tools to support shopper-to-shopper interactions. When designing forums, user-customized avatars, real-time online and offline status indicators, and web-

based short message services (SMS) can be implemented to encourage potential social interactions even among strangers, just like the small-talk that takes place among fellow shoppers in physical stores.

The four potential sources of presence and the tools that can be used to enhance the perception of presence are summarized in Table 1.

------ Insert Table 1 here -------

## 2. Guidelines for Designing Presence in Online Shopping

To enhance consumer perceptions of presence, web applications should be designed with high levels of realism so that consumers have the illusion that they are interacting with real objects or real people. One key antecedent of telepresence is *vividness*, defined as the representational richness of a communication medium (Steur 1992). Social communication theories (e.g., Daft et al. 1986) have also found that the increase of media richness can reduce perceptions of social distance between two parties and improve the quality of communication.

Fidelity and multimodality of sensory stimuli are effective in boosting impressions of realism. For example, when presenting 3D product images using QuickTime or Flash, high resolution pictures should be used to ensure pictorial realism; when designing interactions between customers and service representatives (or intelligent agents), the embodied characters should be designed with anthropomorphic properties, such as a voice, facial expressions, and body movement. Thus, we propose:

*Rule 1: Presence design should ensure the realism of virtual entities.*

Another important antecedent of presence is *interactivity* (Steuer 1992). Interacting with products allows consumers to feel that they can directly exert influence on these objects. For example, virtual experiences with products can enable customers to control the way they look at and manipulate the products; meanwhile, it can also simulate the products' reactions to possible manipulations in a natural way. Furthermore, interactivity is also important for generating social presence. It has been found that an interface with higher interactivity promotes more favorable perceptions of communication partners' credibility and affinity toward other parties in an interaction (Burgoon et al. 1999). Hence we suggest:

*Rule 2: Presence design should craft consumers' virtual experiences to be highly interactive.*

The amount of perceived presence varies greatly among people with different personality traits, from moment to moment and task by task. User perceptions of presence are contextualized and dependent upon "scenarios" that are larger than the moment when users comprehend their experiences (Heeter 2003). Various cues should be embedded in website design so consumers can adjust their expectations and prepare themselves accordingly. For example, a company selling furniture online may want to enable its customers to position a sofa in a virtual living-room at their discretion; this can further enhance feelings of "being with the product." When designing human-agent interactions, if an agent can exploit historical information from a customer's chat log or personal profile to create a sense of a conversation context, the perception of social presence can be enhanced even more. Therefore, we propose:

*Rule 3: Presence design should take context into consideration.*

From a technological point of view, the crucial goal of presence design is to offer users fully immersive experiences; however, with current computing technology, it may not be effective to "immerse" a helmet-mounted and sensor-wired customer into a 3D virtual store, even though this may be more acceptable in gaming or interactive simulations. Some pioneering efforts (Jeandrain 2001) on transforming traditional 2D websites into quasi-3D first-person-shooting-game-style environments demonstrates that although such designs can enhance shoppers' feelings of telepresence, and although they are reported as engaging and entertaining by some users, these designs lack one important advantage of shopping online – the convenience of information retrieval without physical world constraints. For example, navigation processes are not reducible to spatial metaphors. It takes significantly more time for shoppers to walk around a virtual mall to find a product compared with using a search engine or clicking hierarchical navigation hyperlinks. When the navigation process itself becomes a laborious task, the perception of presence may be considered burdensome and distracting. Therefore, we argue:

*Rule 4: Presence design should not overload users with features that do not match their principle tasks.*

## 3. Conclusion

This paper discusses the importance of presence design in online shopping. Nevertheless, it should be noted that presence may only be effective for those situations where impressions of "being there" or "being together" are desired by customers and inseparable from their shopping experiences. For example, enhancing presence in consumer-product interactions may provide limited benefits for products that are identified better through verbal descriptions, such as books or computer parts. The effectiveness of presence in agent interface design may also depend upon the style and nature of consumer-agent interactions. A humanoid embodiment may not be particularly helpful if interactions between consumers and the agent are simple and straightforward, without involving the consumers' participation all the time.

Past research has suggested that technology is not always necessary to generate impressions of presence – people can use their imaginations and creativity for any fantasy world they would like to visit (Gerrig 1993). However, presence technologies, particularly those that can be used to design and deliver enriched experiences for online shoppers through web browsers, can make presence an effective catalyst of consumer learning and social communications. At the same time, online vendors may find their investments are worthwhile for seeing not only a happier existing customer base, but the presence of previously offline-only shoppers.

**Table 1 Framework of Presence Design in Online Shopping**

| Shopping Activities | Candidate Technologies |
|---|---|

| | |
|---|---|
| ***Customer-Product Interaction*** | • Web-based 3D product presentation technologies<br>• Interactive multimedia tools for functional product simulation |
| ***Customer-Serviceperson Interaction*** | • Web-based textual chat<br>• VRML or Flash-based humanoid avatar<br>• Text-To-Speech Voice or pre-recorded real human voice<br>• Virtual reference tools such as page pushing |
| ***Customer-Agent Interaction*** | • Flash or VRML-based embodied virtual character<br>• Dialogue-style explanation scripts backed with sophisticated artificial intelligence repositories |
| ***Customer-Customer Interaction*** | • Collaborative browsing software<br>• Textual or VoIP messaging tools<br>• Presence-oriented online communities |

**Figure 1**


**Figure 1 Examples of Virtual Experience with Products (Left: Olympus Digital Camera; Right: Timex Sports Watch)**

**Figure 2**

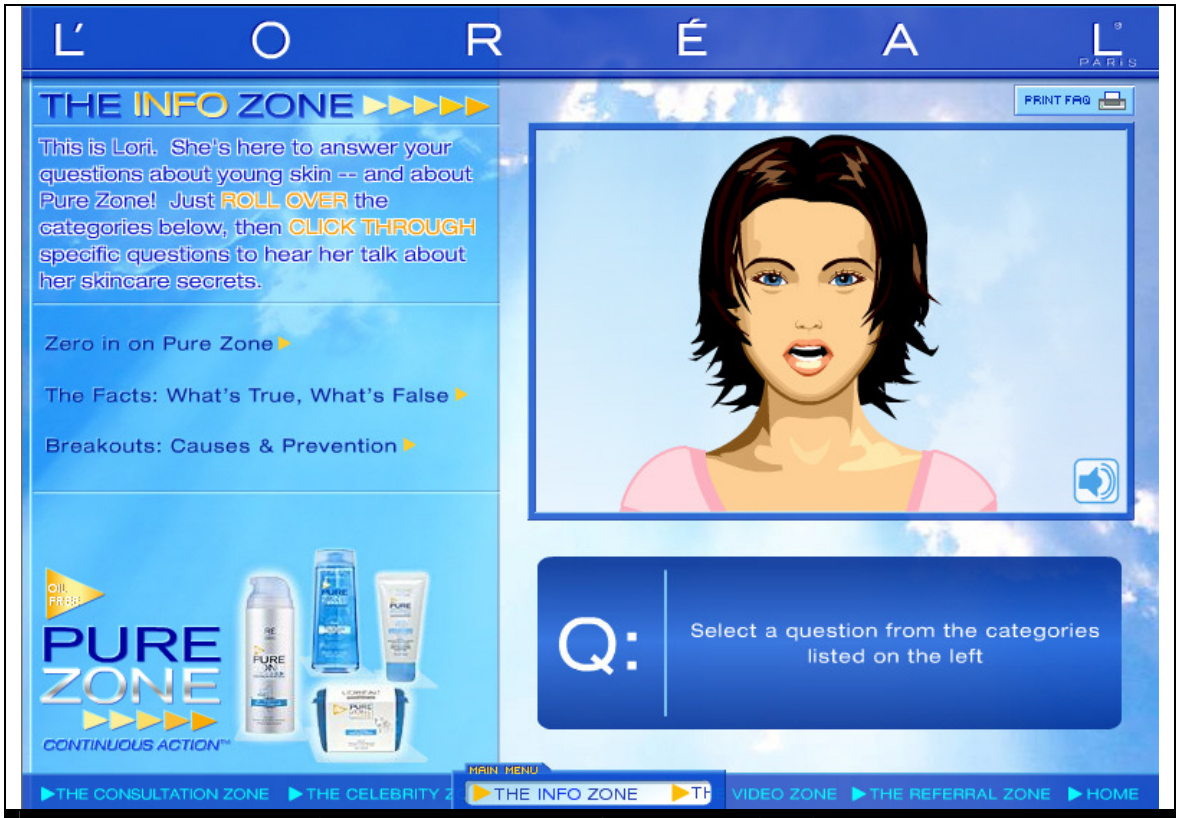


**Figure 2 Example of an Embodied Agent (A Product Recommendation Agent from L'Oréal)**

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