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INVESTIGATING THE ROLE OF PRESENCE IN COLLABORATIVE ONLINE SHOPPING[1]

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ABSTRACT

A large number of studies investigating business-to-consumer e-commerce have focused exclusively on online shopping by individuals, although consumers often desire to conduct their shopping activities with others. This study has therefore attempted to study collaborative online shopping by looking at two types of presence that are of particular relevance to this context, namely, telepresence and social presence. Telepresence is one's mental state in which a shopper feels physically present within a virtual shopping store, while social presence refers to the degree to which a medium allows a shopper to establish personal connection with his/her shopping buddies. A model is developed to explain how telepresence and social presence jointly affect consumers' continuance intention to use collaborative shopping, through the mediating effects of perceived usefulness and shopping enjoyment. The model was tested in a survey and was supported by the empirical results.

Keywords

Collaborative online shopping, collaboration, telepresence, social presence, continuance intention

INTRODUCTION

This study investigates the roles of two types of presence, namely social presence and telepresence, in influencing website stickiness in collaborative online shopping.

In-store shopping is usually a social process, in which consumers are accompanied by friends or families (Evans, et al., 1996). Consumers desire to communicate with their companions who have similar interests for sharing ideas about particular

products, seeking their feedback, and enjoying leisure time (Tauber, 1972). Sommer et al. (1992) have suggested that the presence of other people in social shopping often leads to more pleasant shopping experiences than shopping alone, e.g. consumers spend more time and purchase more in stores.

Likewise, the need for social shopping support in online environments is evident from prior studies (e.g. Tractinsky and Rao, 2001). 90 percent of online customers prefer some sort of human contact when conducting online transactions (Gutzman, 2000).[2] Rayport and Jaworski (2001) suggests that the capacity for online consumers to communicate with each other is indispensable to the success of web stores. Wolfinbarger and Gilly (2001) have also found that those consumers who shop online for entertainment and fun desire some sort of social contact.

Despite such evidences of the need for collaborative online shopping, prior e-commerce related consumer behavior studies are predominantly individual-based. There are however technological solutions that allow people to shop together with whomever they like on the Internet. For example, consumers can communicate with each other by instant text chat or voice chat or they can synchronize their browsing behavior by using a collaborative browsing engine (Farnham, et al., 2001). We use the term collaborative online shopping to describe the experience where a consumer shops at an online store together with one or more remotely located shopping buddies at the same time.

If as noted above the presence of others is important in in-store shopping, to what extent is it important to establish such presence in online shopping and what types of presence should HCI designers attempt to establish? To answer this question, this study examines the roles of two types of presence that are presumed to be central to collaborative online shopping, namely, telepresence and social presence, by proposing and testing a model depicting them as the main drivers of consumers' cognitive beliefs of collaborative online shopping support tools and affective responses toward their shopping experience, which further determine consumers' behavioral intentions.

The paper is organized as follows. Section 2 defines and describes telepresence and social presence. It also reviews previous literature on IT-based collaboration and discuss the importance of telepresence and social presence for collaborative online shopping. Section 3 develops a research model and proposes several hypotheses. The research method is elaborated in Section 4 and data analysis is reported in Section 5. The final section concludes with the contributions and limitations of the study.

LITERATURE REVIEW

Presence: Telepresence and Social Presence

Lombard and Ditton (1997) have defined presence as "the perceptual illusion of nonmediation". The term "perceptual" refers to people's continuous (real time) sensory, cognitive, and affective responses to objects and entities in a person's environment; and "illusion of nonmediation" indicates that a person fails to perceive or acknowledge the existence of a medium in his/her communication environment and responds as if the medium would not exist.

Two types of presence are proposed by prior studies (Biocca, 1997; Heeter, 1992): telepresence and social presence. Most researchers use telepresence to refer to "being there", which characterizes the mental state in which a user feels physically present within a virtual environment (Biocca, 1997). The perception of telepresence is especially important to online contexts, e.g., Novak et al. (2000) have found that telepresence significantly affects online customers' flow experience and their exploratory behavior, both of which positively contribute to consumers' perception of shopping experience. Steur (1992) notes that telepresence is determined by interactivity and vividness of a medium; the more a user is able to participate in modifying the form or content of a mediated environment in real time, and the richer the environment represents information, the more the user can experience telepresence. Since the web interface can present rich information and allow users to interact with it, it is likely that telepresence plays an important role in online human behavior.

Social presence refers to "being with another body" or the degree to which a medium allows a user to establish personal connection with other users (Short, et al., 1976). It represents the capability of a medium to allow a user to experience others as being psychologically present (Fulk, et al., 1987). In general, the theory of social presence suggests that the media differ in the amount of social presence they afford. It assumes that face-to-face interaction is ideal because it conveys not only verbal information, but also non-verbal information, such as facial expression, tone, and gesture, which are, at times, important and even indispensable to revealing a communication stance. Social presence has also been studied in the internet shopping environment; e.g., Gefen and Straub (2003) have found that social presence affects consumer trust, which in turn influences

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[2] Qiu and Benbasat (forthcoming) have investigated the contact between customer and service representatives in online shopping. In this study, we focus on consumer-to-consumer shopping collaboration.

consumers' purchase intention. They thus conclude that websites that excel in enhancing high degrees of social presence may prosper more than those that do not.

IT-Based Collaboration

Collaborative technologies refer to a variety of electronic tools — including email, group support systems and computer-conferencing — used by members of groups or organizations to communicate with each other and coordinate activities, in order to execute tasks (Carte and Chidambaram, 2004). Collaborative technologies have been studied in various contexts, such as distributed learning (Alavi, et al., 2002), virtual community (Bieber, et al., 2002), and system/product development (Scott, 2000), and, in general, proved to be useful in enhancing the effectiveness for team collaboration (Goodman and Darr, 1998).

Prior studies have also revealed that telepresence and social presence can be relevant to the effect of collaborative technologies. For example, Majchrzak et al. (2005) suggest that one way to overcome the drawback of dispersed collaboration is to communicate the contextual information of each collaboration participant's milieu or environment. They argue that the sharing of context can lead to more effective thinking because it helps to prioritize information and interpret cues, share and frame issues and decisions, and engage in sense making about alternative views on cause-effect links. An immediate result of communicating contextual information is the enhancement of the perception of telepresence of collaboration participants, i.e., the more clearly and comprehensively contextual information is communicated, the stronger the feeling of being in a shared communication context is generated. Burke (2001) argues that social presence is an important aspect of distant collaboration because the lack of social cues may lead to feelings that the environment is cold and unfriendly. He compared a distant group decision support system to a face-to-face collaboration on social presence and collaborators' participation level and found that the former leads to higher social presence, which, in turn, leads to more active participation than the face-to-face condition.

Collaborative Online Shopping and Presence

Collaborative technologies should allow collaborators to communicate as well as coordinate their behavior (Carte and Chidambaram, 2004). Hence, a collaborative online shopping technology should first allow remotely-located shoppers to engage in a synchronous conversation so that they can discuss products and services with each other, to share and exchange opinions. Second, collaborative online shopping should facilitate the coordination of the shoppers' examination of products and the pace of this process by exposing them to the same context. E.g., the pace of coordination can be enforced through software which synchronizes remote browsers automatically: either one of two remotely-located shoppers can control what appears in both browsers, including the web page content and navigation.

Telepresence and social presence are particularly relevant to the context of collaborative online shopping. The perception of telepresence can be enhanced when the two collaborative shoppers are aware of each other's context through the pace coordination and perusing the same web page. Perception of social presence can be enhanced by engaging both parties in communicating and exchanging opinions toward products. Hence, collaborative online shopping is different from other regular online shopping contexts, where the feeling of being present in an online store is relevant, but the feeling of others' presence may not be. It is also different from a typical collaborative working environment, where the perception of colleagues' presence is critical, while it may not matter whether or not one is situated in another's context.

RESEARCH MODEL AND HYPOTHESES DEVELOPMENT

The research model (see Figure 1) shows how consumers' perception of telepresence and social presence in collaborative online shopping affect their intentions to continue collaborative online shopping through the mediating effects of perceived usefulness, perceived ease of use, and shopping enjoyment. Consumers' continuance intention is important inasmuch as it characterizes the degree to which a website is sticky and can hold online consumers' interests and attention.

Prior research suggests that a higher level of telepresence can lead to more effective task performance (Held and Durlach, 1992). Specifically, higher telepresence means that an online consumer has stronger perception of being in a shopping environment where her shopping partner is. In this case, more contextual cues are provided to both shopping buddies, who are then able to better coordinate their shopping and its pace. Therefore, the shopping buddies can better understand each other by establishing greater common ground[3] (Olson and Olson, 2000). It is thus likely that they would rate a collaborative shopping tool as more useful for their shopping task.

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[3] Common ground is defined as the knowledge held in common by the collaborators, combined with their awareness that they possess the knowledge in common (Olson and Olson, 2000).

Figure 1: Research Model
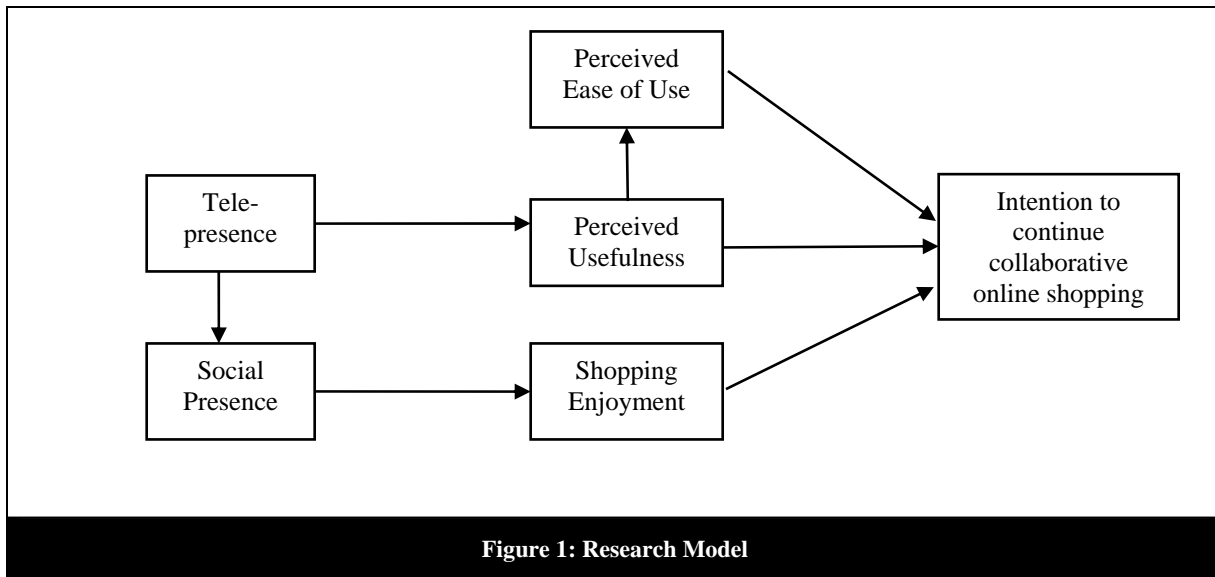
> H1: Consumers' perception of telepresence will positively affect the perceived usefulness of a collaborative online shopping support tool.

Further, if consumers feel more like they are situated in the virtual store where their friends are, they are more likely to sense the presence of each other by being aware of or observing the changes of contextual cues and consequently each others' behavior (Majchrzak, et al., 2005). It follows that the consumer may feel more empathy in the collaboration and believes that the collaboration conveys socially richer information. Therefore, we posit:

> H2: Consumers' perception of telepresence will positively affect their perception of social presence.

According to Tauber (1972) and Woodruffe-Burton et al. (2002), shopping together with friends or relatives can fulfill people's social role in social interaction, where they enjoy leisure with each other. Higher levels of social presence in collaborative shopping means that consumers feel their shopping partners are psychologically closer and the communication is warmer and friendlier, hence they will enjoy the virtual shopping collaboration more. Therefore,

> H3: Consumers' perception of social presence will positively affect their shopping enjoyment in collaborative online shopping.

Both the theory of reasoned action (Fishbein and Ajzen, 1975) and the theory of planned behavior (Ajzen, 1991) suggest that people's cognitive belief will influence their behavioral intentions. Therefore, we propose:

> H4: Consumers' perceived usefulness of a collaborative online shopping support tool will positively affect their intentions to continue collaborative shopping.

> H5: Consumers' perceived ease of use of a collaborative online shopping support tool will positively affect their intentions to continue collaborative shopping.

In addition, Technology Acceptance Model (Davis, 1989) suggests that perceived usefulness partly mediates the effects of perceived ease of use on behavioral intentions.

> H6: Consumers' perceived usefulness of a collaborative online shopping support tool will partly mediate the effect of perceived ease of use of the tool on consumers' intentions to continue collaborative shopping.

In general, shopping enjoyment is considered an important aspect of online shopping experiences (Wolfinbarger and Gilly, 2001). This is particularly true for collaborative online shopping, where people shop with friends both for utilitarian purposes, notably to share ideas, and for hedonic purposes, such as to enjoy leisure time. For example, Anderson et al. (1999) have suggested that virtual shopping with others is expected to be fun, and preferable to shopping alone. Therefore,

H7: Consumers' shopping enjoyment of collaborative online shopping will positively affect their intentions to continue collaborative shopping.

RESEARCH METHOD

The research model was tested in a study with 128 volunteer (64 pairs) student subjects. Prior to their participation, each participant was asked to invite a friend, whom they would like to shop with, to complete the study together with them. To increase the realism and applicability of the present research, study settings were manipulated to achieve considerable variances of telepresence and social presence. Each pair of participants was randomly assigned to one of the two conditions, either shopping with collaborative browsing engine (enabled by MSN 8.0) or without the tool. For all pairs, a text-based conversation tool and a voice-based conversation were provided such that they were able to communicate with each other as well as coordinate their collaborative browsing behavior.

Each pair of participants was told to shop and consider puchasing a product from a website. They were then asked to perform two shopping tasks, purchasing a school bag and a watch. One task was performed with text-based conversation, the other was with voice-based conversation. The order of the two conversation supports was balanced across different pairs. Similarly, the product order was also balanced across different conditions such that half of the participants shopped for watches first and school bags second; and vice versa for the other half.

The two particular products – school bags and watches – were selected for this study for several reasons: 1) both products are social products, inasmuch as they are used in public settings and therefore serve to exhibit their owners' tastes and values; 2) both are products with a variety of attributes (e.g., functionality, color and size) that can provoke discussion between two shopping partners; and 3) both products are gender-neutral products. Amazon.com was chosen as the survey website because it provides a rich collection of both products.

Since very few subjects had prior experience with online collaborative shopping, they reported, in a pilot test, that it was difficult for them to answer questions, e.g., to judge the usefulness and ease of use of an interface on a Likert scale. This is also consistent with Helson's Adaptation-Level Theory (Helson, 1964), which suggests that people's judgments are based on a mental reference framework. Hufnagel and Conca (Hufnagel and Conca, 1994) also noted the importance of contextual clarity in collecting user response data. They have argued that "the likelihood of context-related errors and biases can be significantly reduced" by "specifying the population to which comparisons should be made" (p. 56). Accordingly, in the main experiment, before subjects were exposed to their formal tasks, they were asked to perform a task under a base condition, using text chat support but without enforced collaborative browsing. The questionnaire was designed to ask the subjects about their perceptions of the treatment condition relative to the base condition (see the same design in Jiang and Benbasat (2005)).

Participants were asked to answer questions regarding all constructs after they performed each task and were paid $15 each upon their completion of the survey. The instruments used are reported in Appendix 1.

DATA ANALYSIS

Among the 128 participants, 60 are females and 68 are males. The ages of the participants range from 17 to 33. The participants come from very diverse academic backgrounds, such as science, arts, engineering and business.

Since the basic collaboration units in our context are pairs, the data collected from both participants in each pair were averaged and used in the following analysis to represent human behavior on a group level.

Measurement Model

The research model was tested using Partial Least Squares (PLS). Barclay et al. (1995) have suggested that the assessment of a measurement model should examine: 1) individual item reliability, 2) internal consistency, and 3) discriminant validity.

The measurement items in the model generally load heavily on their respective constructs (Table 1), with loadings above 0.7, thus demonstrating adequate individual item reliability. Since composite reliability and Cronbach's (Table 2) are all above 0.7 (Nunnally, 1978), internal consistency criteria are met.

Off-diagonal elements in Table 2 represent correlations of all latent variables, while the diagonal elements are the square roots of the Average Variances Extracted (AVE) of the latent variables. For adequate discriminant validity, the AVE of any latent variable should be greater than the variance shared between the latent variable and other latent variables (Barclay, et al., 1995). Data presented in Table 2 satisfy this requirement.

Another criterion for adequate discriminant validity requires that loadings of indicators on their respective latent variables are higher than loadings of other indicators on these latent variables and the loadings of these indicators on other latent variables. The loadings and cross-loadings presented in Table 1 largely demonstrate discriminant validity.

	TELL	SOC	PU	PEOU	ENJOY	INTENS
TELE1	**0.94**	0.63	0.35	0.43	0.64	0.49
TELE2	**0.82**	0.43	0.17	0.28	0.46	0.30
TELE3	**0.72**	0.37	0.12	0.20	0.35	0.26
TELE4	**0.85**	0.52	0.23	0.36	0.56	0.40
TELE5	**0.85**	0.53	0.34	0.50	0.64	0.46
TELE6	**0.90**	0.61	0.28	0.44	0.63	0.46
SOC1	0.50	**0.85**	0.48	0.53	0.60	0.56
SOC2	0.64	**0.92**	0.56	0.67	0.79	0.63
SOC3	0.56	**0.92**	0.52	0.65	0.71	0.55
SOC4	0.58	**0.91**	0.52	0.60	0.68	0.58
SOC5	0.54	**0.85**	0.45	0.54	0.68	0.51
SOC6	0.46	**0.85**	0.43	0.47	0.56	0.43
SOC7	0.52	**0.88**	0.54	0.55	0.62	0.50
PU1	0.30	0.52	**0.83**	0.73	0.62	0.62
PU2	0.29	0.54	**0.89**	0.67	0.57	0.63
PU3	0.26	0.47	**0.86**	0.53	0.47	0.54
PU4	0.22	0.45	**0.91**	0.63	0.51	0.66
PEOU1	0.46	0.64	0.65	**0.95**	0.73	0.71
PEOU2	0.37	0.56	0.69	**0.93**	0.67	0.72
PEOU3	0.46	0.59	0.68	**0.96**	0.70	0.72
PEOU4	0.42	0.67	0.78	**0.92**	0.72	0.71
ENJOY1	0.65	0.71	0.43	0.64	**0.88**	0.60
ENJOY2	0.52	0.67	0.69	0.75	**0.92**	0.70
ENJOY3	0.69	0.68	0.55	0.66	**0.91**	0.66
ENJOY4	0.56	0.70	0.61	0.69	**0.93**	0.69
INTEN1	0.45	0.59	0.68	0.70	0.70	**0.92**
INTEN2	0.46	0.52	0.55	0.63	0.58	**0.86**
INTEN3	0.36	0.51	0.63	0.67	0.63	**0.85**

Table 1. Loadings and Cross-Loadings of Measures

	Tele-presence	Social Presence	PU	PEOU	Enjoy	Intention	Composite Reliability	Cronbach's Alpha
Telepresence	**0.85**						0.94	0.92
Social Presence	0.62	**0.88**					0.96	0.95
PU	0.31	0.57	**0.87**				0.96	0.89
PEOU	0.45	0.65	0.74	**0.94**			0.92	0.96
Enjoy	0.66	0.76	0.63	0.75	**0.91**		0.95	0.93
Intention	0.48	0.62	0.71	0.76	0.73	**0.88**	0.91	0.84

Table 2 Correlations and Internal Consistency of Constructs

Structural Model

Bootstrap resampling was performed on the structural model to examine path significance levels (Figure 2). Telepresence significantly affects perceived usefulness and social presence which, in turn, influences shopping enjoyment. Perceived usefulness, perceived ease of use, and shopping enjoyment all significantly affect intentions to continue collaborative online shopping and jointly explain 67% variance of the intentions. In addition, perceived ease of use is partly mediated by perceived usefulness. Therefore, all proposed hypotheses are supported.

An additional test was also conducted to check whether telepresence and social presence have direct effects on the intentions over and above the indirect effects that are mediated by perceived usefulness and shopping enjoyment. Thus, we added two links directly from telepresence and social presence to intention to continue shopping collaboratively. Results showed that the two paths are not statistically significantly, while other paths significance levels remain the same indicating that the effects of telepresence and social presence are fully mediated by usefulness and enjoyment.
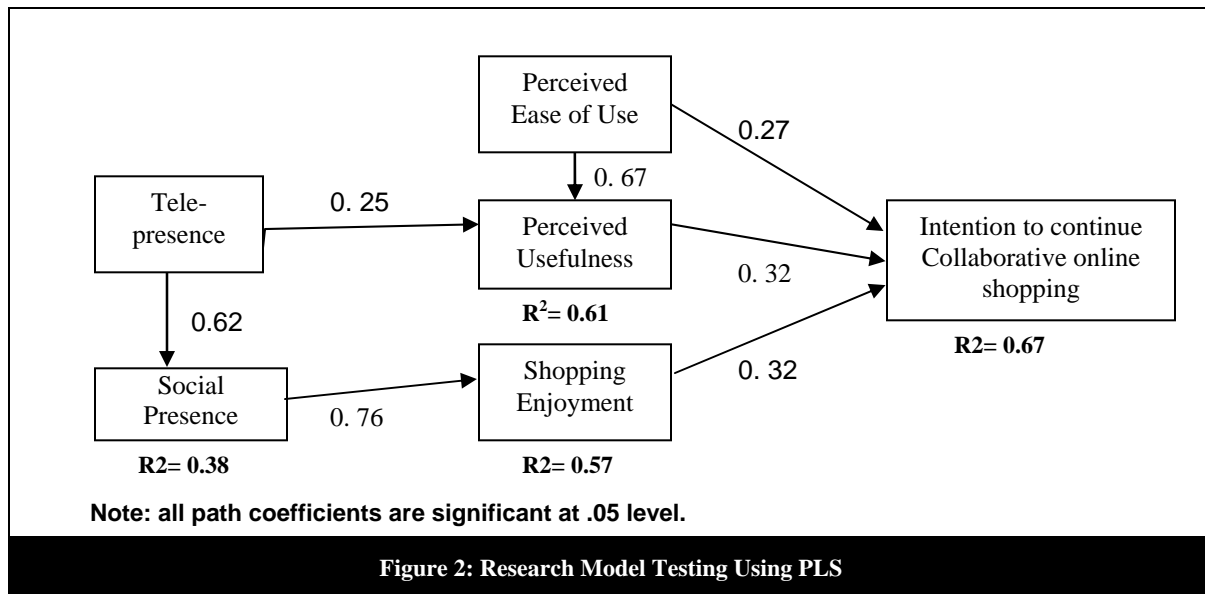

Figure 2: Research Model Testing Using PLS

CONCLUDING REMARKS

Discussion and Contributions

Most prior studies on internet shopping have focused on individual experiences. In general, they found that shopping online individually provides online consumers with a lot of fun and convenience (Wolfinbarger and Gilly, 2001). Yet, at times consumers desire to shop with friends or relatives for friendly consultation and advice as well as for socializing (Tauber, 1972). Given the lack of relevant research in this area, the present study contributes to IS literature by exploring how consumers behave when shopping online collaboratively.

In this study, we have combined telepresence and social presence together to explain how collaborative online shopping influences consumers' continuance intentions. This approach is particularly effective to this context because collaborative online shopping involves two parallel processes: communication and coordination. Shopping buddies' feelings of psychological distances with each other vary with different communication methods used (Yoo and Alavi, 2001), e.g. voice or text; while their feelings of virtual presence in a store depends on the interactivity and naturalness of the coordination, i.e. whether they can influence their shopping buddies' web browsing directly through co-browsing, or indirectly through verbal coordination. Therefore, this study has made theoretical contribution to IS research by identifying the roles of telepresence and social presence in collaborative online shopping.

Previous research, such as Kourfaris (2002), has found that perceived usefulness and shopping enjoyment are two significant predictors of online consumers' shopping behaviour. This study makes its contribution by showing that telepresence is a strong predictor of perceived usefulness of a collaborative online shopping tool and that social presence is a strong antecedent of shopping enjoyment. In other words, the more a collaborative shopping tool can increase consumers' perception of being in a virtual store, the more useful consumers would perceive the tool as being; the more a collaborative shopping tool facilitates rich and warm interaction between shopping buddies, the more enjoyment consumers will feel. In addition, telepresence has a significant impact on social presence, i.e., consumers will feel more like they are interacting with their shopping buddy personally if they feel, more strongly, that they are situated in the same virtual space. Therefore, how to increase telepresence becomes a key to a satisfactory collaborative online shopping experience.

Our results show that perceived ease of use significantly affects consumers' continuance intention, which is contradictory to Koufaris (Koufaris, 2002), who found that perceived ease of use did not affect consumers' behaviour intentions. This inconsistence is presumably because our study context has involved some features that are not typical to regular online shopping, e.g. text/voice-based conversation, and collaborative browsing, which may be initially challenging to use. In this case, the perceived ease of use of a technology plays an important role in influencing consumer's intention to continue use of the website.

Limitations

The generalizability of this study may be limited by inviting selected subjects to participate in the survey in pairs. Before the survey, we were aware that collaborative shopping is suitable for those online consumers with experiential motives (Wolfinbarger and Gilly, 2001); while other consumers who are goal-oriented would rather shop alone for efficiency. Thus when we recruited survey participants, we purposely asked whether a volunteer would like to shop with others on a 1-7 Likert scale (1 – strongly dislike; 7 – strongly like). Only those whose answers were above 5 were selected for survey participants. This means that our findings are best generalized to those consumers who prefer collaborative shopping. Also, since the survey was conducted in pairs, we asked each volunteer to participate with a friend that he would like to shop with. Therefore, if a volunteer participated only for monetary incentives, he would probably invite a friend for convenience, rather than truly desired shopping buddies. In that case, our results cannot accurately reflect the real collaborative shopping patterns.

Future Research

The present research has found that telepresence and social presence are two important antecedents of perceived usefulness and shopping enjoyment in collaborative online shopping. The next important question would be how to appropriately identify and design IT mechanisms so as to enhance telepresence and social presence (Benbasat and Zmud, 2003). For example, we are aware there are two types of screen design for collaborative shopping. One design, that has been adopted in this study, is to allow shopping buddies to access one common browser in a screen. An alternative way is to provide each individual a divided screen that involves both a browser that can only be accessed by the particular user and a share browser that can accessed by both. Future research can examine which screen design can lead to a higher level of telepresence and usefulness. Also, since our study has measured subjects' perceptions toward collaborative online shopping, future research can also examine whether collaborative online shopping brings actual performance gains for consumers and optimize their product choices.

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Appendix 1: Measurement

Perceived usefulness: adapted from Venkatesh and Davis (1996).

Using this collaborative online shopping support tool can

- Improve my collaborative online shopping performance.
- Increase my collaborative online shopping productivity.
- Increase my collaborative online shopping effectiveness.
- I find using this collaborative online shopping support tool useful.

Perceived ease of use: adapted from Venkatesh and Davis (1996).

- Learning to use this collaborative online shopping support tool would be easy for me.
- My interaction with this collaborative online shopping support tool is clear and understandable.
- It would be easy for me to become skillful at using this collaborative online shopping support tool.
- I find this online collaborative tool easy to use.

Perceived telepresence: used by Kim and Biocca (1997).

During my last collaborative online shopping activity with my shopping partner,

- I forgot about my immediate surroundings when I use this tool to shop with a friend online.
- Using this tool often made me forget where I am.
- After using this tool, I felt like I came back to the "real world" after a journey.
- Using this tool created a new world for me, and this world suddenly disappeared when I stop using it.
- When I used the tool, I felt I was in a world created by the websites I visited.
- When I used the tool, my body was in the room, but my mind was inside the world created by the websites I visited.

Social Presence: adapted from Short et al. (1976)

During my last collaborative online shopping activity with my shopping partner, the interaction with my shopping partner was

- personal
- warm
- close
- humanizing

- expressive
- emotional
- was sensitive

Shopping enjoyment: adapted from Ghani et al. (1991).

During my last collaborative online shopping activity with my shopping partner, I found this experience

- interesting.
- enjoyable.
- exciting.
- fun.

Intention to continue collaborative shopping: adapted from the scale used by Bhattacherjee (2001):

- I want to continue shopping collaboratively online rather than discontinuing the activity.
- My intentions are to continue my collaborative online shopping rather than using any alternative means.
- If I could, I would like to discontinue my collaborative online shopping.