Agent's Role on Presence and Advertising Effectiveness

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Presenting agent on the Web site

Agents are computer-generated, graphically displayed entities that represent either imaginary characters or real humans controlled by artificial intelligence. Agents are given properties such as shape, color, sound, and motion (Biocca & Delaney, 1995). Specifically, an agent that is incarnated with human form is referred to as "anthropomorphic agent." These properties are important for the design of social virtual environments because they facilitate the real time transmission of some of the body's communication cues (Biocca, 1997).

Subtle, nonverbal behaviors (e.g., nodding, eye gaze) are the channels by which a large share of affectively changed relational information is conveyed (Palmer, 1995). Thus, individuals gain a sense of directly encountering others and their relational "minds" in face-to-face encounters through an affective, emotional, and involving relational transactions. Conventional media may become intrusive and distract individuals from the smooth and transparent processing of relational information due to restrictions in delivering verbal and nonverbal communications interactively. Unlike conventional media, an agent in a virtual environment can realistically simulate the elements of face-to-face interactions by providing sensual stimuli (e.g., voice, facial

displays) that are virtually equivalent to those in verbal and nonverbal channels. The virtual reality environment has the potential to provide these multiple communication channels in real time and in an interactive mode.

Considering the multimedia capacity of the World Wide Web (e.g., delivering both static and dynamic contents with hypertext links) and the advent of virtual reality technologies, numerous marketing applications will be possible by using agents on the Web. Currently there is no known study that has empirically tested the effect of agents on consumers' response to the Web site. Therefore, the researcher will investigate the effect of an agent's presence on advertising effectiveness in the Web site. This study is expected to contribute to the theory regarding agents, Web site design, presence, and persuasion.

The concept of Presence

Regarding the agent's application on the Web, "presence" is one theory that can predict agent's effects to the consumers' perception to the commercial Web site. Presence refers to the perceptual illusion in which the user of a medium experiences sensations of being present in an environment, and perceives objects found there as equally present (Biocca & Delaney, 1995). In other words, presence is the perception that a mediated experience is real rather than mediated (Lombard & Ditton, 1997).

Therefore, when perception is mediated by a communication technology, one is forced to perceive two separate environments simultaneously: the physical environment in which one is actually present, and the environment presented via the medium (Steuer, 1992).

Presence as transportation is telepresence. In telepresence, the immediate environment and the source of sensation are transported, using technology, to a location that differs from that of the physical body (Biocca, 1997). That is, telepresence is the extent to which one feels present in the mediated environment, rather than in one's immediate physical environment (Steuer, 1992). It is a sense of "being there" or the experience of presence in an environment by means of a communication medium (Reeves, 1991; Steuer 1992). Therefore, telepresence can be generalized as a sense of transportation to any "space" created by media.

Another type of presence is social presence. Social presence is defined as the feeling that communication exchanges are sociable, warm, personal, sensitive, and active or the degree to which a medium is perceived as conveying the presence of the communicating participants (Short et al., 1976). Biocca (1997) defined perception of social presence as the degree to which a user feels access to the intelligence, intentions, and sensory impressions of another. According to his definition, the minimum level

of social presence occurs when users feel that a form, behavior, or sensory experience indicates the presence of another intelligence. The perception of the other is the empathetic simulation of internal states of another "if we were there in the space" over there (Biocca, 1997). The simulation is run in the body and mind of the perceiver, and models the internal experience of some other moving, expressive body. Therefore, the perception of the other is based on bodily motions and cues.

Social presence is influenced by channel attributes. That is, channels that convey nonverbal information, such as facial expressions, gazes, and postures, are usually rated higher in social presence (Acker & Levitt, 1987; Short et al., 1976). Social presence theory states that communication media differ in their capacity to transmit information about facial expressions, gazes, postures, dress and nonverbal vocal cues. Accordingly, communication media that can convey nonverbal cues and social-context cues (e.g., face-to-face and video conferencing) rate high in social presence. In contrast, media that lack nonverbal elements and feedback cues (e.g., computer-based communication technologies and written documents) are considered to rate low in social presence (King and Xia, 1997).

Source of Presence: Vividness and Interactivity

Generally, presence can be influenced by the structure of the mediated

presentation, content in the medium, and media user characteristics. Vividness and interactivity are the main components of presence in the communication system. Vividness means the representational richness of a mediated environment and interactivity is a characteristic of a medium in which user can influence the form and/or content of the mediated presentation or experience (Lombard & Ditton, 1997; Steuer, 1992). Vividness is composed of sensory breadth and sensory depth. According to the theory, it is expected that the higher the number of sensory outputs, the greater the chance that the medium will produce a higher sense of presence. Actually, Short et al. (1976) proved this assumption by showing that media that provide both audio and visual stimuli produce greater social presence than audio-only. Regarding sensory depth, visual display characteristics can play an important role for presence. For example, high resolution quality and large image size can elicit more reality and a higher perception of presence (e.g., Reeves, Detenber, & Steuer, 1993; Bocker & Muhlbach, 1993; Lombard, 1995). Therefore, it is likely that the higher the number of sensory channels (or breadth) or the higher the quality of sensory fidelity (or depth), the higher the degree to which the senses are engaged, and the higher the level of presence.

Interactivity, as another presence factor, is complex and multidimensional concept and there is little agreement on a specific set of conceptual and operational

definitions related to it (Lombard & Snyder-Duch, 2001). There are two perspectives in a large sense. One is mechanical view and the other is interpersonal perspective. From a mechanical point of view, interactivity has been defined as the extent to which users can participate in modifying the form and content of a mediated environment in real time and that depends on speed, range, and mapping (Steuer, 1992). From an interpersonal communication perspective, many communication researchers (e.g., Rafaeli & Sudweeks, 1997) use face-to-face communication as the standard of interactivity and evaluate the interactivity of mediated communication by how closely it simulates face-to-face communication (Walther & Burgoon, 1992). If presence is influenced by interactivity, the level of presence may depend on the number of choices available in modifying the form and content of a medium or how closely the medium simulates face-to-face communication.

Other influencing variables include ease of interaction and social factors. Weghorst and Bellinghurst (1993) reported that designs that eased the interaction were most predictive of the sense of presence in the virtual environment. Numerous researchers suggest that sense of presence may increase with the existence of other individuals or virtual agents (Heeter, 1992; Steuer, 1992; Welch et al., 1996).

Social Factors: Intimacy and Immediacy

Media users often respond to social cues presented by persons they encounter within a medium even though it is illogical and even inappropriate to do so (Lombard, 1995). The mediated nature of the interaction is ignored, and the media personality is incorrectly perceived as a social actor. The same thing can happen on the computer. For example, virtual agents with human gestures, facial movements, and voice can lead users to interact with them, making the interaction more like interacting with another human. In a telecommunication application, a greater sense of "being there" (telepresence) might be achieved if virtual reality systems could display representations of facial expressions (Biocca & Delaney, 1995).

In generating the sense of "being with others," social presence is related to two important concepts originally applied to non-mediated interpersonal communication: intimacy and immediacy (Lombard & Ditton, 1997). Intimacy refers to the process of reciprocal self-confirmation and the affective tone of the relationship. In large part, the experience of intimacy is closely tied to the expression of nonverbal involvement. The immediacy dimension indicates a sense of psychological closeness (Mehrabian, 1981). Immediacy cues (e.g., physical proximity, body orientation, eye contact, nodding, or facial pleasantness) are approach behaviors that signal availability, increase

sensory stimulation, and decrease both the physical and psychological distance between the interactors (Andersen, 1985; Burgoon, Buller, & Woodall, 1989; Patterson, 1983). Positive affect cues, such as smiling and vocal pleasantness, are also important because they signal availability and communication warmth and intimacy (Andersen, 1985; Burgoon, 1994). A medium high rating in social presence is achieved when the interactors can adjust more of these variables and therefore more precisely adjust the overall level of intimacy (Lombard & Ditton, 1997). Therefore , it will be logical to expect that the capacity to deliver nonverbal cues may increase the sense of "being with others," and the sense of "being there" on the Web site.

When a user interacts with a human-like virtual agent, talking and moving, in a vividly simulated audio-visual environment, more sensory cues will be involved and perceived by the users. Such an interaction will lead to a higher degree of telepresence than if no agents were present. Also, it is expected that a higher degree of social presence will be conveyed as the user interacts with an agent capable of both verbal and nonverbal cues. Therefore, the following hypotheses are proposed:

H1: A Web advertisement with an agent will generate higher telepresence than an advertisement without an agent.

H2: A Web advertisement with an agent will generate higher social presence

than an advertisement without an agent.

The Effects of Presence

The focus of much of the interest in presence concerns a wide range of psychological effects. Though research concerning those effects has only just begun, it is expected that presence may enhance a Web user's enjoyment, involvement, task performance, persuasion, and memory, depending on the media content and the user's characteristics (Lombard & Ditton, 1997). Heeter (1995) found that the feeling of entering another world was strongly related to enjoyment of the virtual experience. Media experiences that evoke presence tend to be highly involving (Lombard & Ditton, 1997). For example, virtual reality experiences are active and involving, unlike television viewing (Heeter, 1995). In one study (Kubey & Larson, 1990), children reported significantly higher attention, arousal, and motivation levels while playing video games than they reported while watching television. In an analysis of BattleTech, a virtual reality game, involvement was the highest gratification factor (Heeter, 1995). Therefore, presence implies a direct and natural experience, rather than just the processing of symbolic data, and is therefore likely to be more compelling (Lombard & Ditton, 1997). There is not much research regarding the effect of presence on advertising effectiveness. In one study (Kim and Biocca, 1997), it was

found that the sense of being present in a mediated environment had a positive effect on attitude change (e.g., buying intention and confidence in product decision).

Effects of Presence on the Web site: Vividness and Communication Modality

Information is vivid to the extent that it attracts or holds attention and excites the imagination and vividly presented information has more impact on judgment than does pallid and abstract information (Nisbett & Ross, 1980). Communication modality is one of the major sources of vividness effects (Kisielius & Sternthal, 1986). Even though the effects of vividness on persuasion seems controversial, several researches show that communication modality has an effect on attitude change (e.g., Andreoli & Worchel, 1978; Chaiken & Eagly , 1983).

The availability-valence hypothesis posits that attitudes depend on the favorableness of the information that is available in memory (Nisbett & Ross, 1980). According to this view, vividness of message can affect attitudes by influencing the extent to which people will engage in cognitive elaboration. To the extent that information is rich in modality, messages using these devices are likely to enhance the number of message-relevant associations in memory. Whether vivid information evokes cognitive elaboration that may either enhance, undermine, or have no effect on the persuasiveness of a message depends on the relative favorableness of the

information in response to vivid or pallid presentations. Mousavi et al. (1995) suggest that dual-presentation modalities may increase working memory resources by activating both auditory and the visual working memory rather than just one or the other. Chaiken and Eagly (1983) found that a video presentation presented by a likable source was more effective than the same message presented in audio or written format. Conversely, for an unlikable source, audio and written messages were more persuasive than video message presentations. Similarly, it is expected that the advertising Web site presenting an anthropomorphic agent will induce greater cognitive elaboration than the Web without an agent because of the agent's audio-visual message presentation. Simultaneously, an agent's nonverbal cues may have some effects on the valence of relevant information.

Effects of Nonverbal Communication Cues

The literature linking nonverbal behaviors to persuasion is focused on Kinesic and vocal cues because vocal, facial, and gestural animations indicate a high degree of expressiveness (Burgoon & Newton, 1991). Coker and Burgoon (1987) suggested that kinesic, proximic, and vocal patterns combine to create perceptions of alertness, attention, focus, and interest. For example, persuasive speakers use more eye contact, more affirmative head nods, more gestures, and moderately relaxed (Mehrabian &

Williams, 1969). Research regarding vocal cues found that persuasiveness can be enhanced by increased vocal intensity in the form of louder amplitude, greater intonation, greater fluency, and faster tempo (Edinger & Patterson, 1983; Erickson et al., 1978; Mehrabian & William, 1969). With high physical expressiveness accompanied by positive affect cues (e.g., nodding, smiling, warm voice), intimacy (psychological and/or physical closeness) and affiliation are likely conveyed (Burgoon, 1994). Similarly, it is expected that an agent with positive nonverbal cues can develop intimacy and affiliation with users during the simulated interaction. For example, an agent with nodding and warm voice may indicate its intention to greet users visiting the Web site.

Agent's Effects on Web site Advertisement

Web sites can be broadly defined as a form of advertising delivering commercial content (e.g., video clip, print, or audio) available on the Internet (Berthon, Pitt, & Watson, 1996; Ducoffe, 1996; Raman, 1996; Schlosser et al., 1999). When advertising content is exposed to consumers in a specific manner, the first "communication effect" likely to result from advertising processing responses is the consumer's overall evaluation of the advertising itself, their attitude toward the ad (Rossiter & Bellman, 1999). Research shows that the attitude toward the ad is affected by ad credibility and ad perceptions, ad cognitions, and ad-induced feelings, etc.

The related variables include with range of factors such as humorous appeals (Belch & Belch, 1984; Madden, Allen, & Twible, 1988), the use of celebrities and endorsers (Atkin & Block, 1983; Kamins, 1990; Lutz, MacKenzie, & Belch, 1983), the visual/verbal nature of the ad (Mitchell, 1986), and ads evoking a pleasant feelings (Villarreal, 1985). The agent's effect on the Web advertisement can be explored in this sphere. In a mediated virtual environment, users may have to direct their attention and their gaze toward the agent when they are faced with an agent capable of multi-modal interaction with speech and gestures. The agent's audio-visual message presentation will facilitate the cognitive elaboration, thereby making information more accessible from the memory. Simultaneously, an agent's favorable nonverbal cues may influence the valence of relevant information to enhance the persuasiveness of advertising messages on the Web site. This process will evoke something, an ad-induced feelings, to have direct effects on the attitude toward the Web advertisement. Thus, the following hypothesis is proposed:

H3a: People who are exposed to the Web advertisement with an agent will have more favorable attitudes toward the advertisement (Aad) than people who are exposed to the advertisement without an agent.

Investigations of the effect of Aad mostly focused on brand attitude supporting

the notion that individuals' Aad has a direct effect on brand attitudes (e.g., Lutz, MacKenzie, & Belch, 1983; Laczniak & Carlson, 1989; Laczniak & Muehling, 1990; Park & Young, 1986; Miniard, Bhatla, & Rose, 1990). Other research regards the effects of Aad on behavioral intentions. So far, most research supports the mediated effects of Aad on intentions. For example, MacKenzie et al. (1986) found strong support for the dual mediation (indirect effect) model. Further, Brown and Stayman (1992) meta-analyzed 43 articles in advertising and marketing research journals and found support for the dual mediation model, which posits that brand attitude mediates the impact of Aad on purchase intentions and there is no direct Aad-intention link. This model has been previously supported by a number of studies (e.g., Homer, 1990; Miniard et al., 1990), and thus, appears fairly robust. Thus, the following hypotheses are proposed:

H3b: People who are exposed to the Web advertisement with an agent will have more favorable attitudes toward the brand (Ab) than people who are exposed to the advertisement without an agent.

H3c: People who are exposed to the Web advertisement with an agent will have a higher intention to purchase the brand (PI) than people who are exposed to the advertisement without an agent.

H3d: Aad will mediate ad-related responses to Ab and, in turn, Ab will influence purchase intention.

In traditional media (e.g., magazines), communication is a one-way passive process that requires on extra voluntary action (e.g., visiting Web sites, clicking banner ads) other than purchase. Comparatively, voluntary action is a precondition for consumers' active information processing. If the Web site is not visited, the information in the site will be totally ignored. However, consumers with a specific interest in the Web site can bookmark advertising sites for future reference or voluntary repeated exposure (Cho, 1999). Attracting visitors to Web sites is important as a positive behavioral consequence for commercial Web providers (Novak, Hoffman, & Young, 1999). Therefore, "intention to revisit (VI)" the Web site has been added to the list of dependent variables. Consequently, the following hypothesis is also proposed:

H3e: People who are exposed to the Web advertisement with an agent will have a higher intention to revisit the Web site (VI) than people who are exposed to the advertisement without an agent.

Relationships between Presence and Advertising Effectiveness

Even though there is a dearth of advertising literature addressing the

relationship with presence, nonverbal communication researches and vividness theory imply a positive relationship between presence and advertising effectiveness. In the presence theory, the sense of presence is affected both by the communication modality as a sensory breadth and by nonverbal cues as content variables (e.g., Lombard & Ditton, 1997). The modality of message presentation will influence the vividness of the message and an agent's nonverbal cues will influence the users' perceived interactivity in the mediated environment. Such an interaction will lead to higher degree of telepresence and social presence. According to availability-valiance hypothesis, such presence factors (e.g., modality, interactivity from agent's nonverbal cues) will shape users' attitudes toward the Web site to be more favorable. This means that, in the Web environment, the more the consumer feels that he or she is really present and interacting with an agent, who looks and sounds favorable, the more favorable will be the consumer's attitudes or behavioral intentions. Thus, the following hypotheses are proposed:

H4: The effect of an agent will be mediated by telepresence to influence attitude toward the advertisement.

H5: The effect of an agent will be mediated by social presence to influence attitude toward the advertisement.

Method

This study used one factor experimental design. The independent variable was media content: one with an agent and the other without an agent. The dependent variables were attitude toward the Web advertisement (Aad), brand attitude (Ab), purchase intention (PI), and intention to revisit the Web site (VI). Telepresence and social presence were suggested as mediators between the independent variable and dependent variables.

Subjects

A total of 210 undergraduate students were drawn as a sample to be assigned in each treatment condition. The subjects were recruited from introductory advertising classes at a large midwestern university in the United States. Subjects were randomly assigned to each treatment condition, and the number of males and females were arranged to be similar across treatment conditions.

Stimulus materials

The advertising Web site was developed for t-shirts and socks to be relevant to college student subjects. To control the effects of prior attitudes toward a brand, a fictitious brand name was used for the product. The Web site for both conditions included a welcoming message for customers, information search options, purchase

instructions, and a farewell message in a 3-dimensional background setting. The Web site with an agent presented messages using the agent that had a voice and some of nonverbal cues (e.g., head nodding, waving hands, and moving arms). Exactly same messages were provided in a textual format in the Web site without an agent condition. The user interface and the agent were developed at MSU MIND Lab using 3 D Studio Max, Character Studio, and Macromedia Director 7.

Procedure

Each subject was guided into the lab and was asked to navigate the Web site. After subjects looked over the site, their responses were collected on a questionnaire at the separate room. After subjects completed the questionnaire, they were debriefed, thanked, and dismissed.

Measurement

Presence measure

Social presence (SP) was measured by 7-point semantic differential scales previously developed and used by Short et al. (1976) and Lombard (1999). The scales included the following anchor points: impersonal/personal, unsociable/sociable, insensitive/sensitive, cold/warm, dead/lively, dull/vivid, unresponsive/responsive, informal/formal, unfriendly/friendly, unemotional/emotional, inaccessible/accessible,

and remote/immediate. Telepresence (TP) was measured by multi-item semantic differential scales. Ten items were adopted from Lombard (1999)'s scale.

Advertising effectiveness measure.

Attitude toward the advertisement (Aad) was measured by 7-point semantic differential scales: good/bad, like/dislike, favorable/unfavorable, enjoyable/unenjoyable, pleasant/unpleasant, appealing/unappealing, interesting/uninteresting, and nice/awful (Kirmani, 1990; Lutz, MacKenzie, & Belch, 1983; Stout & Burda, 1989; Machleit & Kent, 1989; Machleit & Wilson, 1988; Madden, Allen, & Twible, 1988; Shimp & Yokum, 1981). Attitude toward the brand (Ab) was measured by 7-point semantic differential scales: positive/negative, satisfactory/unsatisfactory, favorable/unfavorable, good/bad, and likable/dislikable (Lutz & Belch, 1983; Messmer, 1979; Mitchell & Olson, 1981; Osgood, Suci, & Tanneunbaum, 1957). The intention to purchase the brand (PI) and the intention to revisit the Web site (VI) were measured by 7-point semantic differential scales: likely/unlikely, probable/improbable, and possible/impossible (Bearden, Lichtenstein, & Teel, 1984).

Results

A total of 207 usable questionnaires were used for data analysis. All scales used in the research were tested and optimized for face validity, internal consistency,

and parallelism using confirmatory factor analysis and tested for reliability using coefficient alpha. A confirmatory factor analysis performed on nineteen items to measure the subjects' attitude toward the ad (Aad), brand attitude (Ab), intention to purchase (PI), and intention to revisit the Web site (VI) revealed that the data were consistent with the posited four-factor model. The items with large error sizes were deleted form each of the four scales.

Presence measures underwent two procedures. First, principal component analysis with VARIMAX rotation was conducted to extract social presence (SP) and telepresence (TP) components (see Appendix 1). The scales were found to be composed of seven factors. Based on the literature (e.g., Reeves, 1991; Steuer, 1992; Biocca, 1977; Short et al., 1976), the first and the second factor were defined to be telepresence and social presence measures. These two factors explained 41% of the total variance. Second, a confirmatory factor analysis was conducted using the nineteen items indicating social presence and telepresence to test internal consistency and parallelism. The results of the analysis revealed that the data were consistent with the posited two-factor model. Items with large errors were deleted and retained ones were used for data analysis. Coefficient alpha showed that most of measures were highly reliable. Table 1 displays descriptive statistics and Table 2 shows the result of

the validity and the reliability check after optimizing the scales.

Table 1. Descriptive Statistics for Scales Used in the Experiment

Variables	M	SD	Number of items included in the final analysis	Coefficient alpha
Social presence	4.60	1.14	6	.86
Telepresence	3.43	1.43	10	.95
Aad	5.07	1.24	6	.95
Ab	4.59	1.29	4	.95
PI	3.28	1.75	2	.97
VI	4.13	1.91	3	.96

Table 2. Summary of Measures used for Data Analysis

Variables	Selected Items
Social presence (SP)	Cold/Warm Unsociable/Sociable Impersonal/Personal Unfriendly/Friendly Unemotional/Emotional Unresponsive/Responsive
Telepresence (TP)	To what extent ddi you feel like you were inside Tees & Toes Web site you saw/heard? To what extent did you feel surrounded by the environment you saw/heard in Tees & Toes Web site? To what extent did you feel immersed in Tees & Toes Web site you saw/heard? To what extent did you experience a sense of being “really there” inside Tees & Toes Web site you saw/heard?

	How often did Tees & Toes Web site you saw/heard seem more like 'somewhere that you visited' rather than 'something that you saw/heard? How often did you feel "My body was in this room, but my mind was inside Tees & Toes Web site I saw/heard"? How often did it feel as if you visited another place? How often did you feel you were inside Tees & Toes Web site you saw/heard? How much did it feel as if you were inside Tees & Toes Web site you saw/heard observing the products? How addictive was the experience?
Aad	Bad/Good Dislike/Like Unfavorable/Favorable Unenjoyable/Enjoyable Unpleasant/Pleasant Awful/Nice
Ab	Negative/Positive Unsatisfactory/Satisfactory Bad/Good Dislikable/Likable
PI	Unlikely/Likely Improbable/Probable
VI	Unlikely/Likely Improbable/Probable Impossible/Possible

The effects of an agent on presence

Hypotheses 1 and 2 posited that a Web advertisement with an agent will generate higher telepresence and social presence than the advertisement without an agent. A t-test performed on these data produced a statistically significant mean difference between agent and non-agent conditions (see Table 2). Both social presence (SP) and telepresence (TP) were higher in the Web site with agent (SP: M= 4.80, TP: M= 3.59) than without agent (SP: M=4.18, TP: M= 3.10). Therefore, hypotheses 1 and 2 were supported.

Table 2. Test of the Effects of an Agent on Presence

Variable	Web advertisement without agent		Web advertisement with an agent	
	M	SD	M	SD
Social presence	4.18**	1.10	4.80**	1.10
Telepresence	3.10*	1.34	3.59*	1.45

*p < .05. **p < .01.

The effects of an agent on advertising effectiveness

Hypothesis 3 (a, b, c, and e) stated that people who are exposed to the Web advertisement with an agent will have more favorable attitudes toward the advertisement (Aad) and attitude toward the brand (Ab), and will have a higher intention to purchase the brand (PI) and intention to revisit the Web site (VI). A t-test performed on these data produced a significant mean difference on Aad and VI but not on Ab and PI (see Table 3). Subjects' attitudes toward the Web advertisement were more favorable with an agent (M= 5.24) than without an agent (M= 4.73). Subjects' intentions to revisit the Web site were greater with an agent (M= 4.37) than without an agent (M= 3.65). Therefore, hypothesis 3 was partially supported (only H3a and H3e).

Table 3. Test of the Effects of an Agent on Advertising Effectiveness

Variable	Web advertisement without agent		Web advertisement with an agent	
	M	SD	M	SD
Aad	4.73**	1.34	5.24**	1.15
Ab	4.50	1.33	4.64	1.28
PI	3.36	1.77	3.24	1.75
VI	3.65*	1.88	4.37*	1.88

*p < .05. **p < .01.

The relationship among presence and advertising effectiveness measures

It was found that the presence of an agent can generate higher social presence and telepresence and ultimately more favorable attitude (Aad) and behavioral intention (VI). To investigate the patterns of relationships between constructs underlying the effects of an agent and the effects of presence, a structural equation model was tested based on theory and inspection of the data. The hypothesis 4 and 5 suggested that the effect of an agent will be mediated by social presence and telepresence to have a positive effect on attitude toward the advertisement and this effect will be delivered to Ab, PI, and VI (H3d). To explore the nature of this process, the correlation matrix among seven variables were used as input data as shown in Table 4.

Table 4. Correlations between the exogenous and endogenous variables. The lower triangle includes the correlations uncorrected, the top triangle includes the correlations corrected for attenuation due to error of measurement.

	Mcont	SP	TP	Aad	Ab	PI	VI
Mcont	**1.00**	.28	.16	.19	.05	-.03	.18
SP	.26**	**1.00**	.66	.78	.64	.52	.62
TP	.16*	.59**	**1.00**	.59	.52	.54	.54
Aad	.19**	.70**	.55**	**1.00**	.73	.56	.65
Ab	.05	.58**	.49**	.69**	**1.00**	.59	.58
PI	-.03	.47**	.52**	.54**	.56**	**1.00**	.69
VI	.18**	.56**	.51**	.62**	.55**	.66**	**1.00**

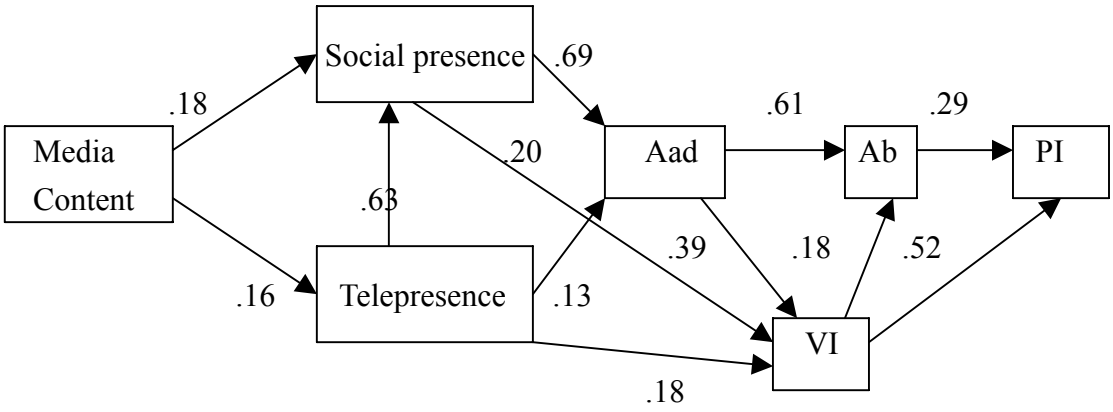
*p < .05. **p < .01.

Mcont: the Media Content; Web advertisement without agent (0) vs. with an agent (1)
SP: Social presence
TP: Telepresence
Aad: Attitude toward the advertisement
Ab: Attitude toward the brand
PI: Intention to purchase the brand
VI: Intention to revisit the Web site

Formal path analysis was conducted using seven variables based on the model specified in Figure 1. The content of the Web site was entered as an exogenous variable with dichotomous values ("0" for without agent vs. "1" for with agent condition). Social presence and telepresence were entered as first-rank endogenous variables. Finally, four sets of advertising effectiveness measures were entered as dependent variables in the order of Aad, Ab, PI, and VI. Therefore, the path model was tested as in Figure 1 based on proposed hypotheses and individual link analysis.

The overall chi-square goodness of fit test yielded a non-significant chi-square value for the modified model (chi-square = 7.33, df = 9, p = .602), which suggested the fit of the model to the data. Additionally, individual link analysis showed that none of the errors due to the missing links was statistically significant. These results indicate that the error generated by the path model was not substantial.

Figure 1. Test of model: the relationship between presence and advertising effectiveness



Content variable: Web site without agent vs. with an agent
The analysis for the model as a whole:
The overall chisquare = 7.33
the degree of freedom = 9
p= .602

The final result of the path analysis shows that presence and advertising effectiveness measures are positive related. Especially, effects of social presence on Aad (r= .69) was much stronger than those of telepresence (.13). A strong and positive causal link between telepresence and social presence (r= .63) implies that some effects of telepresence on Aad will be indirectly mediated by social presence while some of them are directly influencing Aad. Therefore, H4 (the effects of an agent will be mediated by telepresence to influence Aad) and H5 (the effects of an agent will be mediated by social presence to influence Aad) were supported.

Telepresence (r= .18) and social presence (r= .20) also directly influenced VI to the positive direction. Aad was the major variable that directly mediates the effects of presence to Ab (r=.61) and to VI (r= .39). VI was found to be another important variable that mediates the effects of presence to Ab (r= .18) and PI (r= .52). Aad mediated ad-related responses to Ab, and, in turn, Ab influenced PI with no direct link between Aad and PI. Therefore, H3d was supported.

Overall, both social presence and telepresence were important variables to

influence advertising effectiveness and social presence seems to have more direct impact than telepresence on Aad.

Discussion

Theoretical implications

This study found that an agent on Web site can contribute to a sense of telepresence and social presence in viewers. Vividness and interactivity were implied to be primary presence boosters. Communication modality (e.g., agent's voice) was a major vividness factor in a communication interface. The interactivity (e.g., agent's gestures), from simulated face-to-face communication, also can be an important component for presence.

Presence played a vital role in generating more favorable attitudes toward the advertisement (Aad) in the Web site and stronger intention to revisit the Web site. Especially, the relationship between social presence and Aad indicates that as consumers perceive their experience in the Web site to be more personal, warm, sociable, and responsive, they are more likely to build a favorable advertising attitude in the Web site.

Previous advertising research (e.g., Batra & Ray,1986; Holbrook & Batra, 1987; Leigh, Rethans, & Whitney, 1987; MacInnis & Park, 1991; Miniard, Bhatla, & Rose, 1990; Muehling, Stoltman, & Mishra, 1989) has determinded that the attitude

toward the advertisement will be influenced by the individual affective, emotional, and non-ad-related responses evoked at the time of ad exposure. Burke and Edell (1989) found that ad-induced feelings (e.g., upbeat feelings and negative feelings) had a significant direct effect on Aad. Stayman and Aaker (1988) also found feelings (e.g., informed, warm, irritated, amused, and bored) directly influenced Aad. Therefore, social presence, that is consumers' perception of their Web experience to be personal, warm, sociable, friendly, can be regarded as a parallel to ad-induced feelings, and these feelings may have evoked affective responses to influence Aad.

In addition to the effect of affective components on Aad, other researchers (e.g., Chattopadhyay & Basu, 1990; Hastak & Olson, 1989; Homer, 1990; Muehling & Laczniak, 1992; Muehling, Laczniak, & Stoltman, 1991; Rethans, Swasy, & Marks, 1986) have established that cognitive responses toward particular aspects of an advertisement may directly influence Aad. According to the availability-valence hypothesis, consumers' attitudes depend on the favorableness of the information that is available in memory. Vivid information will increase the number of associative pathways in memory. This effect is termed cognitive elaboration (Nisbett & Ross, 1980). To the extent that advertising messages are rich in modality, messages using this device are likely to enhance cognitive elaboration. That in turn will influence

consumers' attitudes toward the advertisement. In this regard, the telepresence, instigated by multi-modal presentation of messages from the agent, may have enhanced cognitive elaboration of information so that it is more accessible from memory in the Web advertisement with an agent condition. This means that as consumers feel that they are really transported into the mediated environment rather than remaining in their own physical environment, the information in the Web site will be more easily accessible from the consumers' memory. Therefore, telepresence seems more likely to influence cognitive responses to influence Aad.

Another important finding is the strong positive relationship between telepresence and social presence (r= .63). According to Loomis (1992), people's perception of a space is more fundamental for human cognition than th eperception of a specific object in that space. Therefore, it is expected that the telepresence generated by the vividness and interactivity of an environment will precede the social presence caused by the agent's nonverbal cues abiding in the virtual environment. This relationship indicates that the higher the sense of "being there" in the Web site, the higher the degree of salience of the communication participant in the mediated environment. However, social presence is not a sufficient factor for telepresence because many other elements (e.g., ease of interaction, pictorial realism, length of

exposure, etc.) can shape the sense of being there.

Practical implications

The World Wide Web has grown at a spectacular rate as a medium for promoting and marketing products and services. At the same time, commercial sites must compete intensely for even a small share of consumer visits because consumer Web traffic is fragmented across millions of Web sites (Meeker, 1997). Considering that the initial goal of Web site advertising was to attract consumers to the advertiser's Web site, the main task of commercial Web providers will be to figure out how to attract and retain customers.

The research findings suggest a clue for online marketers who are challenged to attract and retain online consumers to their Web sites. First, it was found that social presence and telepresence are able to positively influence consumers' attitudes and their behavioral intentions. This result offers a potentially powerful insight for marketers and advertisers. It implies that the Web site needs to be developed to help consumers feel a higher sense of presence while they explore the site. The research has shown that the employment of agents can increase both social presence and telepresence. The concept of presence should be actively applied to increase traffic to a Web site by creating a more intimate relationship with customers, and ultimately to draw more

favorable responses from consumers. Advertising practitioners should begin to think about various types of structural variables (e.g., communication modality, speed, range, mapping) and content variables (e.g., virtual agent's gestures, voice, or facial expressiveness) in promoting products on the Web site to make consumers' experiences more compelling and to make the message more persuasive. Creating a sense of presence will be one of the important strategies in online marketing to attract consumers and to establish more favorable relationships with visitors.

This study had several limitations. It was a single laboratory experiment, and replications are needed so that advertisers can base their strategies on a solid foundation of empirical evidence. To achieve more generalizable findings, the sample should include more diverse group of people, not just college students. This study used only one product, t-shirts, and more various product types (e.g., products with different level of involvement) should be used in the stimuli for the same purpose.

Another drawback is about measurement issue. This study was focused on the effects of social presence and telepresence. However, these two constructs explained only 41% of the total variance of presence measures. More research is needed to better define the various dimensions of presence. This study simply compared the site with an agent and one without it. However, different agents may be perceived differently

from the site visitors. Therefore, future study need to investigate the interrelationship between different design characteristics of agents, presence, and advertising effectiveness.

Appendix 1. Measure of Social presence & Telepresence

Rotated Component Matrix

	Component						
	1	**2**	3	4	5	6	7
TP15	**.845**						
TP17	**.805**						
TP16	**.797**						
TP8	**.786**						
TP4	**.780**						
TP5	**.767**						
TP9	**.752**						
TP3	**.716**						
TP10	**.683**						
TP14	**.540**						
TP13	**.525**						
SP3		**.816**					
SP4		**.811**					
SP2		**.750**					
SP1		**.649**					
SP9		**.642**					
SP6		**.642**					
SP10		**.619**					
SP7		**.612**					
TP11			.597				
SP11			.534				
SP12			.529				
TP12			.424				
TP6				.785			
TP7				.530			
SP5				.423			
TP1					.825		
TP2					.735		
TP19						.864	
TP18						.629	
SP8							-.875

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

Total Variance Explained

Component	Rotated Sum of Squared Loadings		
	Total	% of Variance	Cumulative %
1	**7.396**	**23.857**	**23.857**
2	**5.299**	**17.093**	**40.950**
3	1.956	6.310	47.260
4	1.888	6.090	53.350
5	1.647	5.312	58.662
6	1.568	5.057	63.719
7	1.343	4.331	68.050

Selected Items: component 1 & 2.

Telepresence measure (Component 1)

TP15: To what extent did you feel like you were inside Tees & Toes Web site you saw/heard?

TP17: To what extent did you feel surrounded by the environment you saw/heard in Tees & Toes Web site?

TP16: To what extent did you feel immersed in Tees & Toes Web site you saw/heard?

TP8: To what extent did you experience a sense of being 'really there' inside Tees & Toes Web site you saw/heard?

TP4: How often did Tees & Toes Web site you saw/heard seem more like 'somewhere that you visited' rather than 'something that you saw/heard'?

TP5: How often did you feel "My body was in this room, but my mind was inside Tees & Toes Web site I saw/heard"?

TP9: How often did it feel as if you visited another place?

TP3: How often did you feel you were inside Tees & Toes Web site you saw/heard?

TP10: How much did it feel as if you were inside Tees & Toes Web site you saw/heard observing the products?

TP14: How addictive was the experience?

TP13: How intense was the experience?**

**indicates that these items were not retained for the final analysis due to large error of measurement.

Social presence measure (Component 2)

SP3: Insensitive/Sensitive**
SP4: Cold/Warm
SP2:Unsociable/Sociable
SP1: Impersonal/Personal
SP9: Unfriendly/Friendly
SP6: Dull/Vivid**
SP10: Unemotional/Emotional
SP7: Unresponsive/Responsive

**indicates that these items were not retained for the final analysis due to large error of measurement.

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