Defining and Differentiating Copresence, Social Presence and Presence as Transportation

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Introduction

As media interfaces have increasingly been used for interpersonal interactions and business tasks (Chesebro & Bonsall, 1989; Rice & Love, 1987; Siegel, Dubrovsky, Kiesler, & McGuier, 1986), the ability of these systems to facilitate people's interaction goals has become increasingly important. There are a number of different types of media and interfaces one can choose for an interaction, and the question of which is best depends on a number of issues including the goals of the interaction, relationship of interactants, experience with media and access to the system, among others. The increased availability of and improvements in technology have led to a variety of changes in the choices and uses of mediated systems (Biocca & Nowak, 2001). These changes have allowed for media to be personalized and targeted for specific needs and uses, making the user's choice of medium dependent on the goals of the interaction. At the same time, designers need to increasingly tailor their systems to meet a variety of needs to ensure that their interface is bought and used.

Thus, the interface must be appropriately matched with a system to fulfill the goals of the user. "The interface is quite literally the 'face' of the telecommunication system, the only part of the weave of coper, silicon, and plastics that the user sees, hears, and touches" (Biocca & Nowak, 2001, p. 409). With this in mind, defining and creating a 'good' design seems simple: it is a system that fulfills users' goals. The goals of the user, and the extent to which a particular interface could fulfill them will vary with individual differences including previous media experience, system access. At the same time, the users goals

change from one interaction to the next. These factors have combined with others to make the ideal interface a moving target.

Whether one is designing or using systems, it is important to determine an appropriate and meaningful selection and evaluation of an interface and its ability to fulfill user goals. There are currently almost as many ways to evaluate systems as there are systems and it is important that the method used to evaluate a system addresses the uses for which the system was designed (for a discussion, see Dix, Finlay, Abowd, & Beale, 1998).

This paper examines the extent to which three of the dimensions of presence discussed in Lomabard (2000) may be appropriate for evaluating different systems and interfaces. It argues that one way to determine the ability of a medium to fulfill communication goals is to measure the extent to which users of the system experience a sense of presence in the environment, or access to or connection with another mind in communication systems. The three dimensions of presence considered here are copresence, social presence and presence as transportation. These constructs are likely to provide valuable insight that may be used to evaluate the utility of interfaces and systems.

Presence and the Awareness of Mediation

This section examines the explication of the dimensions of presence as relevant considerations in the evaluation of interfaces. Specifically, understanding what features facilitate people's ability interact in virtual environments and how they perceive one another in mediated environments is an important undertaking for media designers and researchers. In working to

conceptualize and measure these constructs, Lombard (2000, July) presented

his explication of the levels and dimensions of presence. Here, he argued that

presence does not occur when a user is aware that the experience is mediated.

There are a number of dimensions of presence (Biocca, 1997; Biocca & Nowak,

1999; Lombard, 2000, July; Lombard & Ditton, 1997; Steuer, 1992, 1994), and

awareness of mediation is likely to influence each of them in varying ways. This

is especially likely given that presence may be a product of all media (Biocca,

1997), but recognizing that awareness of mediation influences the sense of

presence ought not to not mean that this awareness makes presence impossible.

The notion that awareness of mediation prohibits the sense of presence

may not apply to dimensions of presence involving communication goals. This

has been supported by research indicating that media have facilitated the goals

of an interaction and allowed for satisfactory connections to and with others

(Chesebro & Bonsall, 1989; Parks & Floyd, 1996; Parks & Roberts, 1997;

Schiano, 1999). Further, people have been shown to find ways to "adapt the

essential features of interpersonal relationships to the changing features of

available media technologies" (Palmer, 1995, p. 277). People use whatever they

have access to in fulfilling their interaction needs and have adapted their

communication strategies to meet their environment and connection with others.

This does not imply that mediation will not influence the interaction. It is

very likely that the medium will have a large influence on the outcome of the

interaction, as when we use media to communicate, the media will effect the

process of communication itself, given that the media act as extensions of human

senses (McLuhan, 1964). A satisfactory level of copresence with another mind can be achieved with conscious awareness that the interaction is mediated. People have achieved a sense of another, created friendships, developed communities and conducted business interactions while being very aware that their connections were mediated (see Fisher, 1997; Parks & Floyd, 1996; Parks & Roberts, 1997; Turkle, 1995). Thus, it is likely that mediation will influence the degree of copresence with another mind, but it would not prohibit this sense.

This section argued that the sense of presence, and especially those dimensions dealing with a connection with another mind, is not dependent upon the lack of awareness that the experience is mediated even though presence is likely to be influenced by the media interface. The next section explores the importance of people's perception that they have access to or a connection with another mind for media designers and users and critically evaluates the theoretical definitions and measurement of copresence and social presence as potential indicators of this sense.

'IS ANYONE THERE?' THE IMPORTANCE OF A PERCEIVED CONNECTION

If a person perceives that they have connected with another mind, they may also feel as if they were able to fulfill their communication goals. A medium that does not leave people with this sense of connection with or access to another mind may be less able to fulfill communication goals. It is also likely that media that provide this sense of access will be utilized more frequently than media that are not perceived to provide this connection. This section explores what it means to feel that one has been able to engage another through media.

Communication research has revealed that when individuals form relationships, "their primary concern is one of uncertainty reduction or increasing predictability about the behavior of both themselves and others in the interaction" (Berger & Calabrese, 1975, p. 100). This can be done by engaging another in an interaction, to experience another with the 'naked senses,' finding the other 'within range' (Goffman, 1963). Creating and utilizing media that can provide people with this sense of another person is an important undertaking.

Essentially, the goal of interfaces ought to be to provide interactants with a sense that they have shared an experience, had access to another mind, or experienced a face engagement. This is essential to the forming and maintenance of interpersonal relationships in that it allows people to have a focused connection, which is necessary for meaningful interactions. As Goffman (1963) describes "Face engagements comprise all those instances of two or more participants in a situation joining each other openly in maintaining a single focus of cognitive and visual attention-what is sensed as a single mutual activity, entailing preferential communication rights" (p. 89). Media that are unable to provide this sense may have limited utility in fulfilling interaction goals and are less likely to be selected, or purchased.

This section outlined the utility of using the sense of access to another mind or face engagement to evaluate media interfaces. The next section discusses theoretical and methodological approaches to measuring this sense of access to another mind.

Connecting with other Minds: Differentiating Copresence and Social Presence

Given the varying potential influences and levels of connecting with another, it is essential to have a variety of approaches to the questions raised. This section explores two ways of understanding the notion of connection with another mind, copresence and social presence. The importance of understanding what part of the construct an indicator is actually measuring is important, especially given the price of some systems for consumers. Thus, evaluating how people perceive the ability of a medium and the actual ability of the medium are both addressed in the following pages.

SOCIAL PRESENCE

Social Presence is the most common theoretical model used to attain information about the connection of people via telecommunication systems (Caldwell, Uang, & Taha, 1995; Fulk, Steinfield, Schmitz, & Power, 1987; Haythornthwaite, Wellman, & Mantei, 1995; Palmer, 1995; Rice, 1993; Rice & Tyler, 1995; Short, Williams, & Christie, 1976; Trevino, Lengel, & Daft, 1987; Walther, 1992; Walther & Burgoon, 1992; Walther, 1996). It has frequently been used in research that involves two or more individuals interacting, and has been used as a theoretical basis for comparing face to face interactions to mediated interactions and comparing mediated interactions to one another (Short et al., 1976; Walther, 1996). Short, Williams and Christie (1976) are credited with giving broad theoretical currency to the concept of social presence. They explain social presence as "the degree of salience of the other person in the interaction and the

consequent salience of the interpersonal relationships" (p. 65). Bull (1983) extended this concept to include the sense that occurs "when one person feels another person is 'there" (Bull 1983, p. 162). The question of how people create and maintain mental models of the other is complex and multi-faceted; adding the question of influence of mediation is important, but it has further complicated the processes involved in person perception.

The measures of Short, Williams and Christie (1976) ask individuals questions about the medium itself (see table I). For example, the scale includes questions about how real people at the other end seem, whether or not the medium provides a sense of realism, and whether or not one could get to know others if they were only encountered via this system (see p. 74). Thus, this research relies upon people's ability to introspect what is necessary for a connection with another person and to guess whether or not the MEDIUM could allow another to feel connected, or the evaluator's perception of the medium's ability to provide this sense.

If the goal of a research project were to evaluate media systems for a corporation, then measures of perceived ability to get to know the other would be an important measure. Their confidence in the medium's ability may influence their impression of the outcome of the interaction. Further, "It could be argued that in many situations it is the *feeling* of having got to know someone that is more important than actually having got to know them. Perceived effectiveness might well be more important than objective effectiveness" (Short, Williams and Christie, 1976, p. 164). Finally, people's perception of the medium will greatly

affect their likelihood of utilizing it, so this may well be an important measure for interface designers in evaluating their systems.

However, researchers using these indicators should be aware that the measures might confound media choice and person perception. Further, researchers wishing to ascertain whether people actually felt connected to another mind (as opposed to whether or not one thinks they would be able to) should consider other measures. Instead, directly asking individuals whether or not they felt they made a connection with another person during a particular interaction, or whether they felt engaged in the conversation may be a better way to get at the construct.

This section introduced the theoretical construct of social presence and how it has been used and measured. It pointed out a potential limitation of this construct is that its measurement may confound person perception with media use. It is important to develop a measure that truly evaluates the extent to which people feel a sense of the other mind. This is the goal of a development of the measure of copresence as defined in the following section.

COPRESENCE

This section defines the theoretical construct of Copresence, which is another way of evaluating the sense of connection with another mind. The term copresence originated in the work of Goffman (1963), who explained that copresence exists when people sensed that they were able to perceive others and that others were able to actively perceive them. Further, he explained that in its true meaning, "copresence renders persons uniquely accessible, available,

and subject to one another" (Goffman, 1963, p. 22). Goffman (1963) explained that the "full conditions of copresence," have been achieved when persons "sense that they are close enough to be perceived in whatever they are doing, including their experiencing of others, and close enough to be perceived in this sensing of being perceived" (p. 17). Ciolec (1982) emphasized the importance of attention or responsiveness to others in this sense of copresence.

The sense of copresence shares some concepts with interpersonal constructs of intimacy, involvement and immediacy and this section considers how copresence is similar to and distinct from these constructs. Conversational involvement has been defined as "the degree to which participants are enmeshed in the topic, interpersonal relationship, and situation" (Coker & Burgoon, 1987, p. 463). Although copresence could be seen to conceptually share some issues with involvement, there are important distinctions (see Nowak, 2000b).

Given the dual nature of copresence, its measure requires separate scales, one asking about the participant's perception of their partner's involvement in the interaction (perceived copresence) and the other asking the participant about their own involvement in the interaction (self-reported copresence) (Goffman, 1963; Nowak, 2000a, 2000b).

The scale evaluated here measuring the perceived copresence included 15 indicators taken from three of the dimensions of immediacy (see Table II). This included immediacy/affection, similarity/depth and receptivity/trust. This scale was derived from a combination of the indicators for intimacy, involvement

and immediacy from Burgoon and Hale (1987). This included whether the other was perceived to be involved, interested or emotional about the conversation. It also included whether or not the interaction partner made the conversation seem superficial or created a sense of distance between the interaction partners. These were likert-type items with a five-point metric.

The second scale included 11 indicators similar to those above, but they were revised to ask about self reported copresence, or how involved the participant was in the interaction (see Table III). These items measured the extent to which the participant self-reported being copresent in the interaction and included questions about whether they were interested in a deeper relationship or more intimate conversation with their interaction partner. These were also likert-type items with a five-point metric.

Presence as Transportation

Virtual reality has been defined in terms of the experience of the user of the system, instead of in terms of the features of the medium. A group of input and output devices would be considered virtual reality if they responded to the input of the user (interactive) and provided a sense of presence, or a sense of "being in" the mediated environment (see Biocca, 1997; Steuer, 1994). The ability to understand which features of the interface influence both the perception of the medium and the other person is an important undertaking when considering interface selection and design.

There are a number of dimensions to presence (see Lombard, 2000), presence as transportation is most concerned with the extent to which people

feel transported to and located within a virtual environment. Presence as transportation is a measure of the feeling a person has that they are "inside" a virtual environment, a sense of "being there." This measure comes from a development of a measure for presence with the subheading of presence as immersion (Lombard & Ditton, 1999). Eight likert-type items with a 7-point metric were used to form a scale (see Table IV). This scale included indicators such as how intense the experience in the environment was and the extent to which the experience was involving and immersive.

The next section discusses the relationship between social presence, copresence and presence as transportation.

Explicating and measuring Copresence, Social Presence and Presence as Transportation

Copresence, social presence and presence as transportation are predicted to be correlated to each other. In other words, people who felt more copresent with their interaction partner, or more social presence, are predicted to report feeling more physical presence in the environment. Also, people who feel more social presence are likely to feel more copresence as well. It may be that these are factors related to immersion, or personality variables such as computer experience and demographics. However, these dimensions of presence are predicted to be highly and positively correlated, but not unidimensional.

The prediction that social presence and copresence are not unidimensional as measured is important because the conceptual description of these concepts appears to be the same or very similar. The indicators of social

presence considered here ask about people's perceived ability of a medium to provide social presence, and do not directly measure the sense of another person, which copresence attempts to. It is predicted that social presence and presence will be more highly correlated than physical presence and copresence or social presence and copresence.

Method

DESIGN

This study used a between subjects experimental design with two factors. The first factor, agency of the intelligent other, had two levels; whether participants were told they were interacting with a human (avatar) or a bot (agent). The second factor, degree of anthropomorphism of virtual image had three levels, high and low anthropomorphism and a control with no virtual image.

PARTICIPANTS

134 undergraduates from a telecommunication department at a large midwestern university took part in this experiment for class credit. Participants were stratified by sex and randomly assigned to condition. There were a total of 94 males and 40 females. The average age of participants was 21, and ages ranged from 19 to 33.

Results

AN ALPHA LEVEL OF .05 WAS USED FOR ALL STATISTICAL TESTS.

SCALE CONSTRUCTION

Standardized item alpha is included for all scales. The dimensionality of each scale was determined in two ways. First, confirmatory factor analysis tests of internal consistency were applied to each instrument. All retained items met the criteria for internal consistency: (a) face validity and (b) a primary factor loading of 0.5. Further, items were removed when they had greater errors with other items than what would be expected by sampling error. Items were dropped from their respective scales when item correlations failed tests of internal consistency. Second, all scales were evaluated together and all items loaded highest on their primary factor. Any item that did not meet all tests was removed from the scale. Retained items are indicated in bold for the respective scales (see tables I, II, and III). As predicted, these items were not unidimensional, indicating they are not measuring the same constructs, although they may be measuring related constructs.

Hypothesis I: The items measuring social presence, self reported copresence and perceived partner copresence will not be unidimensional

This hypothesis was supported.

Tested with CFA, Factor Loading scores and Analysis of Residuals. See table I-IV.

RELATIONSHIP AND ASSOCIATION BETWEEN CONSTRUCTS

Hypothesis II: People that feel more copresence with their interaction partner will feel that a medium is capable of providing more social presence.

This hypothesis was tested with a Correlation and was supported.

Perceived "other" copresence and social presence- $r = .57$, $p < .01$. Self reported

copresence and social presence $r = .19$, $p < .05$. Both dimensions of

Copresence were positively correlated with Social presence.

Hypothesis III: People that feel more physical presence in the environment will feel that a medium is capable of providing more social presence.

This hypothesis was tested with a Correlation and was supported. See

Table IV for the items used to measure presence as transportation.

Presence and Social Presence $r = .61$, $p < .01$. Physical presence and

social presence were positively correlated.

Hypothesis IV: People that feel more physical presence in the environment will feel more copresence with their interaction partner

This hypothesis was tested with a Correlation and was supported.

Perceived "other" copresence and presence- $r = .46$, $p < .01$. Self reported

copresence and presence .54, $p < .00$. Physical presence and both dimensions

of copresence were positively correlated.

Hypothesis V: Social presence correlates to copresence to a significantly different degree than social presence correlates to presence.

Tested with t tests of the correlations. This hypothesis was partially

supported.

Self reported Copresence. The correlation of social presence to presence

is significant, $r = .61$, $p < .01$, the correlation of social presence to self reported

copresence was significant, $r = .19$, $p < .05$. Social presence correlates to self

reported copresence to a significantly different degree than social presence correlates to presence, t = 3.72, p < .01.

Perceived copresence: The correlation of social presence to presence is significant, r = .61, p < .01. The correlation of social presence to perceived copresence was significant, r = .57, p < .01. Social presence does not correlate to perceived copresence to a significantly different degree than social presence correlates to presence, t = .466, p > .05.**Discussion/Conclusion**

Both dimensions of copresence and social presence were highly and significantly correlated with the concept of presence. This significant association indicated one of two things: either the connection between people influenced presence in the interface, *or* the presence in the interface influenced attention to their interaction partner. Future research should explore the direction and meaning of this influence and explore possible moderating variables. It is important to examine whether presence increases copresence or whether copresence increases presence as well as the extent to which this sense influences people's perception of or willingness to use a medium or interface.

Researchers seeking to explore how media connect minds should carefully ensure that they are measuring the construct they wish to test. The data indicate that the measures of social presence are more closely correlated with the sense of involvement in the medium (presence as transportation) than to the sense of access to another mind (self reported copresence). In other words, traditional social presence indicators are closer to indicators of physical presence than to indicators of immediacy and self reported copresence. However, the

difference between social presence (the perceived ability of a medium to provide a connection with another mind) was not significantly different from the perception of the interaction partner's copresence. It is possible that the difference has to do with one's connection with another mind and not with the extent to which one actually engaged in the interaction. Future research should continue to develop indicators to measure self reported copresence, as a number of these indicators failed tests of internal consistency and it will be an ongoing effort to clear up the relationships between these variables.

The data support indicate that there is a distinction between one's perception of an ability to connect minds and their self reported involvement or immersion in the interaction. It also shows that social presence as measured is more closely correlated to perceived copresence, or to presence than it is to the self reported copresence. This may be that social presence and perceived copresence ask about the user's perception of the medium, or perception of their interaction partner's involvement in the interaction, while self reported copresence deals directly with how involved the user felt.

Further, the data indicate that the sense of presence in the environment is related to one's perception of their interaction partner's involvement in the interaction. This underscores the importance of the sense of presence in an environment in gauging the extent to which media are perceived to connect minds and in interface evaluation and design. Future researchers should continue to work to develop and improve indicators to measure these constructs and to reveal the direction and meaning of their relationship to one another.

As researchers continue their exploration of the influence of presence on people's mental processes they should also consider the importance of the sensation on the perception of copresence with other people and objects in the environment. Designers and users of interfaces for interpersonal interactions ought to use this information to enlighten their designs. This could allow them to design or choose media that best facilitates the needs of their interaction goals, promoting the necessary levels of both presence and copresence. These measures can provide important information that should be used in designing and selecting information.

References

Berger, C., & Calabrese, R. (1975). Some Explorations in initial interaction and beyond: Toward a developmental Theory of Interpersonal communication. *Human Communication Research, 1*, 99-112.

Biocca, F. (1997). The Cyborg's Dilemma: Progressive Embodiment in Virtual Environments. *Journal of Computer Mediated Communication, 3*(2).

Biocca, F., & Nowak, K. (1999). *I feel as if I'm here, inside the computer: Toward a theory of presence in Advanced Virtual Environments.* Paper presented at the International Communication Association, San Francisco, CA.

Biocca, F., & Nowak, K. (2001). Plugging your body into the telecommunication system: Mediated Embodiment, Media Interfaces, and Social Virtual Environments. In D. Atkin & C. Lin (Eds.), *Communication Technology and Society*.

Burgoon, J., & Hale, J. (1987). Validation and Measurement of the Fundamental Themes of Relational Communication. *Communication Monographs, 54,* 19-41.

Caldwell, B., Uang, S., & Taha, L. (1995). Appropriateness of communications media use in organizations: situation requirements and media characteristics. *Behavior and Information Technology, 14(4)*, 199-207.

Chesebro, J., & Bonsall, D. (1989). *Computer-Mediated Communication; Human Relationships in a Computerized World.*: The University of Alabama Press.

Ciolek, T. (1982). Zones of Co-presence in face-to-face interaction: some observational data. *Man-environment systems, 12(6)*, 223-242.

Coker, D., & Burgoon, J. (1987). The Nature of Conversational Involvement and Nonverbal Encoding Patterns. *Human Communication Research., 13*(4), 463-494.

Dix, A., Finlay, J., Abowd, G., & Beale, R. (1998). *Human Computer Interaction (* Second ed.). London: Prentice Hall Europe.

Fisher, J. (1997). The Postmodern Paradiso; Dante, Cyberpunk, and the Technosophy of cyberspace. In D. Porter (Ed.), *Internet Culture* (pp. 106-122). London: Routledge.

Fulk, J., Steinfield, C., Schmitz, J., & Power, J. (1987). A Social Information Processing Model of Media Use in Organizations. *Communication Research, 14*(5), 529-552.

Goffman, E. (1963). *Behavior in Public Places; Notes on the Social Organization of Gatherings*. New York: The Free Press.

Haythornthwaite, C., Wellman, B., & Mantei, M. (1995). Work Relationships and Media Use: A Social Network Analysis. *Group Decision and Negotiation, 4*, 193-211.

Lombard, M. (2000, July). *Resources for the study of presence: Presence explication*, [World Wide Web]. Available: http://nimbus.temple.edu/~mlombard/Presence/explicat.htm [2001, January 14].

Lombard, M., & Ditton, T. (1997). At the heart of it all: The concept of presence. *Journal of Computer-Mediated Communication, 3*(2), (http://www.ascusc.org/jcmc/vol3/issue2/).

Lombard, M., & Ditton, T. (1999). *Presence Measures* (Unpublished Manuscript): Temple University.

McLuhan, M. (1964). *Understanding Media*.: McGraw Hill.

Nowak, K. (2000a, May). *Creating a Mental Model of Others; Implications for Social Virtual Environments.* Paper presented at the International Communication Association, Acapulco, Mexico.

Nowak, K. (2000b). *The Influence of Anthropomorphism on Mental Models of Agents and Avatars in Social Virtual Environments.* Unpublished Dissertation, Michigan State University, East Lansing, MI.

Palmer, M. (1995). Interpersonal Communication and Virtual Reality: Mediating Interpersonal Relationships. In F. Biocca & M. Levy (Eds.), *Communication in the Age of Virtual Reality* (pp. 277-299). Hillsdale, New Jersey: Lawrence Erlbaum Associates.

Parks, M., & Floyd, K. (1996). Making Friends in Cyberspace. *Journal of Communication, 46*(1), 80-97.

Parks, M., & Roberts, L. (1997). *Making MOOsic: the Development of personal relationships on-line and a comparison to their off-line counterparts.* Paper presented at the Presented at the Western Speech Communication Association . February 1997., Monterrey, California.

Rice, R. (1993). Media Appropriateness; Using social presence theory to compare traditional and new organizational media. *Human Communication Research, 19*(4), 451-484.

Rice, R., & Love, G. (1987). Electronic Emotion; Socioemotional Content in a Computer-Mediated Communication Network. *Communication Research, 14*(1), 85-108.

Rice, R., & Tyler, J. (1995). Individual and organizational Influences on Voice Mail use and Evaluation. *Behavior and Information Technology, 14*(6), 329-341.

Schiano, D. J. (1999). Lessons from LambdaMOO: A social, text-based virtual environment. *Presence: teleoperators and virtual environments, 8*(2), 127-139.

Short, J., Williams, E., & Christie, B. (1976). *The social psychology of telecommunications*. London.: John Wiley & Sons, Ltd.

Siegel, J., Dubrovsky, V., Kiesler, S., & McGuier, T. (1986). Group Processes in Computer-Mediated Communication. *Organizational Behavior and Human Decision Processes, 37*, 157-187.

Steuer, J. (1992). Defining virtual reality: Dimensions determining telepresence. *Journal of Communication, 42*(4), 73-93.

Steuer, J. (1994). Defining Virtual Reality: Dimensions Determining Telepresence. In F. Biocca & M. Levy (Eds.), *Communication in the Age of Virtual Reality*. Hillsdale, NJ: Lawrence Erlbaum.

Trevino, L., Lengel, R., & Daft, R. (1987). Media Symbolism, Media Richness, and Media Choice in Organizations; A Symbolic Interactionist Perspective. *Communication Research, 14*(5), 553-574.

Turkle, S. (1995). *Life on the screen: Identity in the age of the Internet*. New York: Simon & Schuster.

Walther, J. (1992). Interpersonal Effects in Computer-Mediated Interaction; A relational Perspective. *Communication Research, "Vol 19 No. 1, "*, 52-90.

Walther, J., & Burgoon, J. (1992). Relational Communication in Computer-Mediated Interaction. *Human Communication Research, 19*(1), 50-88.

Walther, J. B. (1996). Computer-mediated communication: Impersonal, interpersonal, and hyperpersonal interaction. *Communication Research, 23*, 3-43.

Table I

Social Presence-partner/interaction assessment. Measured on a sliding scale. All items remained after Scale analysis (Standardized Alpha .82).

Item	Final Factor Loading
To what extent was this like a face-to-face meeting?,1 A lot like face to face,2 not like face to face at all	**.57**
To what extent was this like you were in the same room with your partner?,1 A lot like being in the same room,2 not like being in the same room at all.	**.84**
To what extent did your partner seem "real"?,1 very real,2 not real at all	**.70**
How likely is it that you would choose to use this system of interaction for a meeting in which you wanted to persuade others of something?,1 very likely,2 not likely at all	**.63**
To what extent did you feel you could get to know someone that you met only through this system?,1 very well,2 not at all	**.53**

Table II

Perceived Copresence. These indicators were measured on a 5-point metric. 1 strongly agree to 5 strongly disagree. Bold items remained after Scale analysis (Standardized alpha .9).

Item	Initial Factor Loading	Final Factor Loading
My interaction partner was willing to listen to me	**.57**	**.54**
My interaction partner was intensely involved in our interaction	**.65**	**.63**
My interaction partner did not want a deeper relationship	.53	Removed
My interaction partner was not attracted to me	.40	Removed
My interaction partner seemed to find our interaction stimulating	**.63**	**.58**
My interaction partner communicated coldness rather than warmth	**.71**	**.73**
My interaction partner created a sense of distance between us	**.74**	**.73**
My interaction partner seemed detached during our interaction	**.66**	**.63**
My interaction partner was unwilling to share personal information/feelings with me	**.60**	**.53**
My interaction partner made our conversation seem intimate	**.64**	**.61**
My interaction partner created a sense of distance between us	**.81**	**.79**
My interaction partner created a sense of closeness between us	**.64**	**.68**
My interaction partner acted bored by our conversation	**.67**	**.64**
My interaction partner was interested in talking to me	**.76**	**.78**
My interaction partner showed enthusiasm while talking to me	**.58**	**.53**

Table III

Self-reported copresence scale. These indicators were measured on a 5-point metric. 1 strongly agree to 5 strongly disagree. Bold items remained after Scale analysis (Standardized alpha .78).

Item	Initial factor loading	Final factor loading
I was willing to listen to my interaction partner	.37	Removed
I was detached during the conversation	.44	Removed
I was intensely involved in this interaction	.55	Removed
I did not want a deeper relationship with my interaction partner	.71	**.74**
I found the interaction stimulating	**.51**	
I wanted to maintain a sense of distance between us	.66	**.62**
I was unwilling to share personal information/feelings with my interaction partner	**.52**	**.49**
I wanted to make the conversation more intimate	**.61**	**.68**
I wanted to make the interaction seem casual	**.14**	
I tried to create a sense of closeness between us.	.61	**.65**
I was interested in talking to my interaction partner	**.65**	**.51**

Table IV

Five Items retained in Presence scale. These indicators were measured on a 7-point metric. 1 Not at All to 7 Very Much. Bold items remained after Scale analysis (Standardized Alpha .88)

Item	Final factor loading
How involving was the experience?	**.72**
How intense was the experience?	**.73**
To what extent did you feel like you were inside the environment you saw/heard?	**.84**
To what extent did you feel immersed in the environment you saw/heard?	**.86**
To what extent did you feel surrounded by the environment you saw/heard?	**.84**
How often did you want to touch something you saw/heard?	**.48**
How often did you try to touch something you saw/heard?	
How often did you want to smell something you saw/heard?	