

**Operationalizing Mediated Presence:
Initial Steps toward a Measure of the Construct**

**A paper presented at the Presence 2001 Conference, Temple University,
Philadelphia, PA, May 2001**

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Abstract

Operationalizing mediated presence: Initial steps toward a measure of the construct

This paper reports on an exploratory project to investigate mediated presence, a construct defined as the extent to which participants in a virtual environment perceive other participants in that environment as real, immediate or salient.

Development and initial testing of a prompt designed to consistently differentiate between high and low perceived presence are reported. A manipulation check on the prompt and open-ended explorations of the construct are discussed. Other factors that subjects apparently integrate with presence or confound with the construct are identified, and directions for future research are elaborated.

Communication scholars have studied the effect of immediacy or salience on face-to-face communication for decades and have concluded that the degree to which communicators perceive others with whom they are communicating as immediate or engaged with them in the communication influences their perceptions of the other and their satisfaction with the communication. Scholars have used scales such as verbal immediacy (Gorham, 1988), general immediacy (Anderson, 1979), and interaction involvement (Cegala, 1984) to explore how communication behaviors influence perceptions of face-to-face immediacy or presence.

The proportion of communication mediated by technology clearly is increasing and thus it is appropriate to examine the communication behaviors used in mediated communication – email, groupware, the World Wide Web and other online contexts – and address how these behaviors influence communication interaction, satisfaction, and outcomes.

Scholars have argued that mediated communication (frequently referred to as computer-mediated communication or CMC) presents a radically different context for communication. Especially referring to asynchronous text-based interaction, they emphasize the absence of social cues on which communicators rely heavily in face-to-face interaction: vocalics, proxemics, facial expression and gestures, and contextual cues (Sproull & Kiesler, 1991; Garton & Wellman, 1995; Walther, 1992). According to this argument, without such cues, a communicator's ability to convey herself as immediate or real or to perceive others as involved in the interaction is reduced by having fewer available channels and therefore less data. These outcomes have been attributed to “relatively amorphous impressions” online that communicators are posited to have in

mediated communication (Walther, 1993, p. 383). As a result of the absence of social cues, it has been argued, communication is likely to focus on task at the expense of the socioemotional component that face-to-face communication integrates. Lacking elements conveying social and emotional information, mediated communication increases the psychological distance between participants and thus may reduce interpersonal attraction and group cohesiveness (DeSanctis & Gallupe, 1987). In contrast to this position, it also has been argued that mediated communication can support development of robust relationships (Baym, 1995; Walther, 1993, 1994). Walther (1993), for example, argues that impressions of others online are developed in the same way as in face-to-face contexts but more slowly, since the time required for asynchronous interaction is greater. Online participants also have been shown to seek one another out for a wide range of social and emotional exchanges, including information and social support (Walther, 1997) and for entertainment and recreation (Baym, 1995).

The degree to which communicators perceive others as immediate, salient, or present in an interaction plays a key role in establishing a context in which individuals attend to one another and feel comfortable sharing ideas, raising questions, collaborating, and developing trust. The higher the perceived presence of others, whether face-to-face or online, the more communicators are likely to pay attention to them, and the more they may be influenced by them. For example, perceptions of presence are particularly important in online education. Students who do not feel connected to others in the learning environment – whether students or teachers – because these others do not seem immediate, salient, or real, report lower satisfaction with the course. Dissatisfied students tend not to engage the material and frequently also fail to complete online classes. Since

the attrition rate on online education is lower than in face-to-face educational environments (Carr, 2000) and since the dropout rate in organizational training is extraordinarily high, connection with the class and resulting satisfaction is a pertinent area of study. Perceptions of presence in virtual teams and groups, in organizations and educational environments, may influence the effectiveness of decisions by helping those interacting online to determine whose ideas to acknowledge or discount.

Outcomes related to such processes are critical in contexts where members of a distributed group must interact to solve problems, share and integrate information, generate new ideas, and collaborate to reach decisions or take action. The increasing use of mediated communication to execute these functions, whether in virtual organizations, distributed teams and groups, or online education, reinforces the importance of better understanding how communicators perceive and establish immediacy or presence in mediated contexts.

The construct of interest here, *mediated presence*, refers to the perception by a communicator that another person in a mediated or online environment is “real,” immediate or present. It occurs when the communicator perceives the salience and involvement of others, and reflects the feeling that the connection made with another is active, sociable, and sensitive. This definition posits mediated presence as a result of interaction between enacted communication behaviors and a medium, rather than as a characteristic of a medium, as had been argued early on by Short, Williams, and Christie (1976), Culnan and Markus (1987), Hiltz, Johnson and Turoff (1986), and Steinfield (1986). That is, mediated presence acknowledges both the role of the behaviors communicators enact and the role of the medium in enabling and constraining

communication. The emphasis in this study is on text-based asynchronous communication, whether as email or in threaded discussions, bulletin boards, and the like. Although technological improvements and expanded bandwidth unquestionably will provide communicators with more social cues, text-based interactions will continue to play an important role in mediated communication as a result of their penetration and low cost.

Two behavior-oriented constructs that have been used to help describe and explain face-to-face interpersonal communication are immediacy (Anderson, 1979) and interaction involvement (Cegala, 1984). Immediacy refers to behaviors that reduce psychological and physical distance, while interaction involvement addresses how attentive, perceptive and responsive individuals tend to be while communicating. Both of these constructs appear to share characteristics with mediated presence.

The construct of immediacy originated in social psychology to refer to behaviors that help overcome psychological and physical distance between individuals (Mehrabian, 1967). Anderson (1979), who investigated immediacy in instructional settings, focused on nonverbal signals such as head nods, eye contact, vocal expressiveness and close proximity as behaviors that expressed liking. Gorham (1988) later argued that perceptions of immediacy are reflected not only by nonverbal behavior but also by an individual's verbal behaviors, such as addressing another by name, using personal examples, and soliciting personal views or opinions. Immediacy is related to presence in that both focus on the salience of individuals in communication.

Interaction involvement addresses "the extent to which an individual participates with another in conversation (Cegala, Savage, Brunner & Conrad, 1982, p. 229). The

work of Cegala and others identifies three components of participation: attentiveness, perceptiveness, and responsiveness. Attentiveness reflects the extent to which an individual is aware of stimuli in his immediate environment. Perceptiveness refers to the extent to which an individual knows the meanings others assign to his behavior and the meanings he ought to assign to others' behaviors. Responsiveness is "the tendency to react mentally to one's social circumstances and adapt by knowing what to say and when to say it" (Cegala et al., 1982, p. 233). Those low in interaction involvement often appear detached or inattentive and are generally viewed as less competent communicators.

Applying the literature in interpersonal, face-to-face communication to mediated environments and arguing that language and verbal communication may convey relational messages in addition to task messages, Walther and Burgoon (1992) identified a number of verbal/textual cues of relationship communication they argued are present in computer-mediated communication.

Immediacy/affection

Verbal immediacy (Wiener & Mehrabian, 1968) incorporates grammatical and lexical measures that indicate affection, inclusion and involvement. Walther and Burgoon note that research in immediacy indicates that verbal or text components not only convey immediacy but may compensate from reductions in immediacy associated with other channels (Argyle & Cook, 1976; Wiener & Mehrabian, 1968).

Similarity/depth

This variable represents the degree to which a communicator stresses similarities or the relative familiarity or superficiality of a relationship. As relationships develop, partners' communication becomes more similar and smooth (Knapp, 1984). Depth, the

degree of knowledge about personal information, also may increase, as is evidenced through self-disclosure. Therefore, self-disclosure is an example of similarity and depth in the relationship.

Composure/Relaxation-arousal

These dimensions are indicated through language intensity, intentional misspellings, use of punctuation, capitalization, or relational icons (emoticons). They represent the degree to which participants express calm and relaxation. Many relationships become more relaxed as they develop (Knapp, 1984), with uncertainty being reduced when participants gain interpersonal knowledge. Arousal may be related to a communicator's familiarity with a medium (Walther & Burgoon, 1992).

Formality/informality

This dimension is evident through forms of address communicators use, lexical surrogates such as "hmmmm" or "yuck," and by overall use of formal expressions. Research has tended to indicate that mediated communication is more formal in general than face-to-face communication, particularly in being largely written (Gibson & Hodgetts, 1986). However, the lack of turn-taking in virtual teams and groups may enhance informality (Siegel, 1986).

Dominance/equality

This dimension is evidenced through proportion of group participation, manipulation of group-managing cues, relational control grammatical constructions (such as imperatives), and compliance seeking. As face-to-face groups develop, members may assert dominance once they have a sense of others' potential contributions (Walther &

Burgoon, 1992). In mediated contexts, because of the lack of social context cues, there may be more dominating messages early in a relationship.

Receptivity/trust

Self-disclosure is a key expression of this dimension. Non-competitive strategies that show rapport, openness, and the need to be trusted are other indicators of this dimension.

This framework was used as a basis to identify communication behaviors associated with establishing and perceiving mediated presence in the study reported here. The next section describes this study and findings from it. The last section of the paper reflects on implications of the findings and proposes additional investigations.

METHODS

To examine the communication behaviors that underpin perceptions of others' presence in mediated environments and establishment of one's own presence, a prompt or stimulus containing a threaded text discussion was developed. Four characters or targets were developed based on actual student postings from an online class taught by the researcher in Spring 2000. Based on communication behaviors identified in the literature reviewed above and on experiences in online classes and virtual groups, two of the targets reflect behaviors posited to exemplify high mediated presence and two enacted behaviors posited to exemplify low presence. Postings also were attributed to other characters, but subjects were not asked to evaluate the amount of presence they perceived in those individuals. Table 1 identifies the characteristics posited to evoke perceptions of mediated presence and the distribution of behaviors demonstrating these characteristics in

the prompt.

Communication Behavior	Theoretical link	Brad (high)	Pam (low)	John (low)	Corrine (high)	Others
Referring to others by name	Verbal immediacy	1				
Referring to prior messages	Similarity/depth	1			1	
Including personal accounts	Self-disclosure, trust				2	
Using intensifiers or emphasis	Composure/arousal	1				
Using contractions or informality	Formality/informality	1				
Asking questions of other participants	Dominance, receptivity or verbal immediacy	1			2	
Using courtesies, such as thanks	Formality/informality	1			1	
Number of postings		3	3	3	3	4

Table 1. Presence cues incorporated into original prompt

The first step in this study was an initial manipulation check to determine if the stimulus information consistently differentiated between targets posited to enact communication behaviors reflecting high presence and low presence. Fourteen graduate students in communication studies at a large Midwestern university were given a minimalist definition of presence in order to minimize priming: “Mediated presence exists when participants in a mediated environment perceive others in that environment as “real,” “salient,” or “immediate. The construct shares characteristics with immediacy.” They then were asked to read a printed version of the series of postings and then to rate the presence they perceived in each target using a 5-point Likert-style scale. Anchored strongly agree and strongly disagree, the statement read that “(target) had high

mediated presence in this threaded discussion.” They also were asked to write several sentences to describe each of the targets. A minimalist definition of presence was provided to avoid priming the subjects.

RESULTS

Means for perceived presence of the two targets posited to demonstrate high presence were higher than the means for the two low-presence characters. To determine whether the differences in means were statistically significant, paired sample t-tests were run for each target against each other target. Evidence that the stimulus differentiated between high and low presence would require that the differences between Pam (low) and Corrine (high), as well as between Pam (low) and Brad (high) and between John (low) and Brad (high) be statistically significant, but that the differences between the other pairs not be statistically significant.

	Mean	Std. Deviation
Pam (low)	2.7857	1.1217
John (low)	3.5000	.9405
Corrine (high)	4.4286	.6462
Brad (high)	3.9286	.9169

Table 2. Means and standard deviations for ratings of mediated presence.

Results indicated that differences in means of the perceived presence of targets designated as having high and low presence were as expected in five of the six comparisons. Differences in means for Pam (low) and Corrine (high), for the pair of John (low) and Corrine (high) and for the pair of Pam (low) and Brad (high) were

significantly different, as expected. Also as expected, differences for Pam (low) and John (low) and for Corrine (high) and Brad (high) were not significantly different.

Pair	Mean	Std. Dev.	t	Df	Sig (2-tailed)
Pam (low): Corrine (high)	-1.6429	1.3363	-4.600	13	.000*
Pam (low): John (low)	-.7143	1.3260	-2.016	13	.065
Pam (low): Brad (high)	-1.1429	1.5619	-2.738	13	.017*
John (low): Corrine (high)	-.9286	.9927	-3.484	13	.004*
John (low): Brad (high)	-.4286	1.5046	-1.066	13	.306
Corrine (high): Brad (high)	.5000	.9405	1.989	13	.068

Table 3. T-tests of differences between means of rated mediated presence.

Interestingly, however, as Table 3 indicates, the differences in means for perceived presence for John (low) and Brad (high) were not as expected. Subjects did not rate Brad's presence behaviors and John's as statistically significantly different.

Subjects completing this manipulation check also were asked to write two or three sentences to describe each of the four target individuals. Descriptions of the targets ranged widely for each individual. For example, Pam (posited to have low mediated presence) was described in this way; "Pam doesn't seem very involved in the discussion," and "Pam keeps her comments short and to the point. She isn't overblown or 'preachy.'" In contrast, Corrine (posited to have high mediated presence) was described in these terms: "Corrine is probably the most involved person in this discussion. She's taking a leading role among the participants" and "Brings more of a broad, inquisitive view; shared resources/ideas; stimulates thought." Brad (also posited to have high mediated

presence) was described in a variety of terms: “Polite, recognizes the contributions of others,” and “Brad is very personable – he refers to specific people.”

This study was an initial step in investigating mediated presence, the perception of others in a mediated environment as real, immediate or salient. Responses to a prompt designed to differentiate between targets posited to reflect high and low presence differentiated in the expected pattern and at a statistically significant level in five of six comparisons. Open-ended descriptions of the targets indicated that respondents identified more communication behaviors in the high presence targets than in low presence targets. Importantly, descriptions of the targets also revealed that respondents evaluated not just the communication behaviors but also the content of the messages in assessing mediated presence.

This study confirms the utility of examining presence using the framework of Walther and Burgoon’s (1992) list of verbal/textual cues of relationship communication they presented as present in computer-mediated communication. These cues were integrated into the behaviors of the targets in the prompt and, it can be argued, contributed to the rating of presence given by respondents. Further, they are reflected in the descriptions of the targets provided by respondents. Descriptions of low-presence individuals were shorter in length and were dominated by negative comments that neither was connected, that they were confusing, had little useful to say, and were uninvolved in the threaded discussion. In contrast, descriptions of the high-presence individuals were more elaborated and consistently more positive.

The unexpected finding that subjects' perceptions of John (posited to reflect low mediated presence) and Brad (posited to represent high mediated presence) were not statistically different, is particularly interesting. It may be explained in part by the open-ended descriptions. Respondents said of John: "engaged," "involved," "added information," "takes a position," "serious," "brainstorms well," "solid logical thinker," and "he is involved in details." Brad (high) also was described as "engaged." Further, observers described him using these terms: "seemed to know what he was talking about," "person-oriented, polite, recognizes others," "personalizes through appreciation and questions." The notion of engagement in the online discussion occurs in both sets of descriptions, for both a high-presence and a low-presence target, suggesting that observers perceive involvement and intensity, indicators of verbal immediacy (Wiener & Mehrabian, 1968) and relational arousal (Bradac, Bowers, & Courtright, 1979) as components of mediated presence. These same constructs also appeared in Walther and Burgoon's (1992) list as relaxation/arousal and immediacy.

Descriptions of the high-presence targets contained more comments about the manner in which the targets behaved than were present in descriptions of the low-presence targets. One respondent wrote about Brad, "Brad would always respond directly to the other emails. He personalized his messages through appreciation and questions." Another wrote, "Brad is very person oriented and tends to involve others in his comments." About Corrine, the other high-presence target, one respondent wrote, "Corrine seems to make the messages her own and personalizes the issue through references to her family. She responds personally to the other emails." She also was

described as “genuinely interested in prompting the response of others” and “She seems to be friendly and talking to people she knows.”

Open-ended comments about all the targets also indicated that subjects incorporated their assessment of the content of the message as much as or more than the manner in which targets presented the content. Corrine was described as “informed and involved with the subject matter” and “smart and aware of current issues.” Pam (low mediated presence) was described in this way: “Pam doesn’t seem to have enough information to develop her argument further. She seems to have a basic idea but clearly her argument is weak.” About Brad, one respondent wrote, “Stands by what he believes and can relate to the subject matter well. Seems to know what he is talking about.” And John was described as “participating based on limited knowledge.” These comments suggest that respondents are inferring characteristics of the targets based at least as much on what was posted as on how the targets are communicating. Such an approach reinforces the argument that presence is relational, perceived, and dependent on both the content and delivery of the communication.

This study demonstrated that respondents evaluate targets’ mediated presence at least in part in terms of interpersonal communication behaviors. This suggests the appropriateness of exploring the nature and range of mediated presence by examining responses of subjects to targets based on existing scales of interpersonal communication.

Limitations of this study and directions for future research

Among the challenges of operationalizing a construct is establishing a working definition that will enable investigation without foreclosing responses or failing to capture unanticipated connections. This exploratory study used an extremely simple

definition of mediated presence because elaborated definitions of this unfamiliar construct tend to limit responses. Similarly, priming respondents is an issue. If they are provided with a detailed definition, results are threatened by obvious answers, social desirability bias or social undesirability bias.

The most significant limitation in this study is the number of subjects. While results from this investigation suggest that the prompt may serve as a starting point for further investigations of mediated presence, additional work to confirm this is in order.

In showing links between interpretations and perceptions of mediated presence and textual/verbal characteristics of mediated communication, this exploratory study suggests that additional investigations into the nature and range of mediated presence will be fruitful. Grounded theory investigations of how individuals describe or frame the communication behaviors that signal mediated presence would identify specific characteristics that can be further examined. Qualitative investigations to help determine the range of perceived presence also are needed. A key component of subsequent investigations will be an improved working definition to narrow the range of responses.

Based on the connections between textual/verbal interpersonal relationship communication and responses to those behaviors as exemplified in the prompt, further investigation of the extent to which mediated and face-to-face interpersonal communication share characteristics is in order. Additional investigations should examine the extent to which items from interpersonal interaction scales from the communication studies discipline are consistent with subjects' evaluations of presence. Specific investigations should include the congruence between both whole scales and individual items from Gorham's (1988) verbal immediacy, Anderson's (1979) general

immediacy, Cegala's (1981) interaction involvement, and Burgoon and Hale's (1987) relational communication scales.

Responses to this initial study also suggest evaluation of whether a subject's agreement with the positions taken by a target influences his or her rating of the target's mediated presence. Along the same line, researchers should investigate what confounding, mediating, or moderating factors influence reported perceptions of mediated presence. The open-ended comments in this study suggest that respondents evaluated presence by looking at the content of target's messages as much as or more than by looking at their communication behaviors. Efforts to create materials that prompt respondents to differentiate between high and low presence without being influenced by the content of the messages will be an important component of future research.

Another potentially useful line of research would investigate how experience with mediated interaction influences perceptions of presence. This is particularly salient given the increasing use of Instant Messenger. Many young people are becoming socialized to sets of behaviors used in different electronic communication contexts, and investigate the behaviors that individuals using mediated communication for business or educational applications report using.

In conclusion, this study confirms that additional research into the nature and range of mediated presence is in order. To the extent that, as in face-to-face contexts, the sense of others as immediate, salient, or worth attending to plays an important role in mediated interactions and influences satisfaction and outcomes of interaction, understanding how individuals perceive and establish mediated presence is a significant topic for research.

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