

# ***THE EFFECTS OF INSTRUCTOR IMMEDIACY BEHAVIORS IN ONLINE LEARNING ENVIRONMENTS***

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Previous research has indicated that instructor immediacy is associated with learning outcomes, satisfaction, and motivation. However, few researchers have examined instructor immediacy in the context of online learning. This study is the first large experiment ( $n = 433$ ) to empirically investigate the effects of instructor immediacy behaviors (high versus low) and online delivery modality (audio versus video) on participant perceptions of instructor immediacy and social presence. Results demonstrated that participants assigned to the high-immediacy sessions indicated significantly higher perception of instructor immediacy and social presence than participants assigned to the low-immediacy sessions. Findings also established a strong correlation between participants' perception of instructor immediacy behaviors and their perception of the instructor's social presence.

We live in an era in which many education and training organizations routinely employ distance education systems to substitute electronically mediated interactions for direct, physically proximate communication between instructors and students. Despite this, the literature on student-instructor interactions evidences a dearth of experimental or causal-comparative research on how instructor communicative behaviors influence student percep-

tion of important instructors' characteristics such as care, empathy, disclosure of personality, and expression of emotions. Educational researchers have associated these characteristics to social presence (Garrison, Cleveland-Innes, & Fung, 2004) and have reported that student perception of social presence can increase student satisfaction and student perception of learning (Gunawardena & Zittle, 1997; Picciano, 2002; Richardson & Swan,

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2003). Researchers investigating social presence suggest that this construct is closely related to the construct of immediacy (Gunawardena, 1995; Short, Williams, & Christie, 1976) but the literature appears to offer no empirical evidence regarding relationships between social presence and instructor immediacy behaviors in classes or in online distance education settings.

Immediacy behaviors reflect an ancient set of human communication modalities including voice, gestures, and facial expressions as well as verbal expressions of inquiry, concern, inclusiveness, encouragement, and recognition that have long been associated with humane teaching and learning. Communication researchers often describe immediacy metaphorically as a psychological distance between a communicator and the object of his communication (Wiener & Mehrabian, 1968). Research has shown that when instructors employ verbal and nonverbal immediacy behaviors, students demonstrate increased motivation, report enhanced satisfaction, and achieve higher levels of learning outcomes (Andersen, 1979; Christophel, 1990; Gorham, 1988; Gorham & Christophel, 1990; Gorham & Zakahi, 1990; Kearney, Plax, & Wendt-Wasco, 1985; Kelley & Gorham, 1988).

However, most research on immediacy behaviors has been conducted in traditional face-to-face, non-mediated settings and few studies examined instructor immediacy in the context of distance education (Freitas, Myers, & Avtgis, 1998; Guerrero & Miller, 1998; Hackman & Walker, 1990; O'Sullivan, Hunt, & Lippert, 2004). Considering the increasing number of students enrolled in courses offered online, there is a noticeable gap when it comes to investigating how students perceive instructor immediacy when formal courses employ various computer conferencing tools. Therefore, this experimental study examined the effects of instructor immediacy behaviors and online lecture environment on student perception of instructor immediacy and perception of social presence.

## ***REVIEW OF THE LITERATURE***

### ***Instructor Immediacy***

Immediacy refers to the perceived physical and/or psychological closeness between people (Mehrabian, 1967); instructors can employ verbal and nonverbal behaviors to signal immediacy and to reduce physical and psychological distance with their students (Christophel & Gorham, 1995). Verbal behaviors include the use of personal examples, asking questions or encouraging students to talk, using humor, addressing students by name and being addressed by first name by the students, using inclusive language (referring to class as "our" class or what "we" are doing), providing feedback, and praising students' work (Gorham, 1988). Nonverbal immediacy behaviors include using gestures, moving around the classroom, assuming a relaxed body position and smiling at the class, not reading notes, and looking at the class while talking (Andersen, 1979; Richmond, Gorham, & McCroskey, 1987).

Existing research on the impact of such instructor behaviors has generally been conducted in traditional face-to-face classrooms (Wise, Chang, Duffy, & Del Valle, 2004). Researchers have repeatedly associated instructors' verbal and nonverbal immediacy behaviors with increased affective and cognitive learning, motivation, and satisfaction (Andersen, 1979; Christophel, 1990; Gorham, 1988; Gorham & Christophel, 1990; Gorham & Zakahi, 1990; Kearney et al., 1985; Kelley & Gorham, 1988).

The impact of verbal and nonverbal behaviors may be influenced by class size. Gorham (1988) found that the effect of some behaviors (e.g. teacher self-disclosure, asking questions or encouraging students to talk, referring to class as "our class" or "we" are doing, gesturing, smiling at individual students, employing relaxed body position, and movement around the classroom) on measures of affect and learning increased as the number of students in a classroom increased. Gorham suggests that it

is possible that the physical proximity of students to the instructor in small classes enhances perceptions of instructor immediacy whereas larger class size increases the psychological distance. In view of the previously cited findings on the importance of immediacy on student learning, Gorham's findings might be the basis of arguments that teachers in larger classes should use specific verbal and nonverbal behaviors to reduce psychological distance with their students. The same argument might apply to distance education classes in which students are physically separated from instructors and instructors are faced with the challenge of reducing the psychological distance with the students.

Many researchers (e.g. Andersen, 1979, Gorham, 1988; Richmond et al., 1987) have emphasized the importance of immediacy behaviors in relation to teaching effectiveness, so it seems reasonable to expect that the absence of a full range of nonverbal behaviors in typical distance education venues might contribute to increased psychological distance between students and their instructors. Audio- and video-enabled computer conferencing tools allow—but do not require—distance education instructors to employ many of the verbal immediacy behaviors that previously cited research has found to be positively correlated with cognitive and affective learning outcomes.

Instructors can enhance satisfaction of distant students by providing individual attention and by using vocal variety (Hackman & Walker, 1990). Skilled distance education instructors who are animated, fluent, composed, and warm seem likely to convey immediacy despite the geographical distance separating them from their students (Guerrero & Miller, 1998). For example, Guerrero and Miller found that instructor behaviors projecting instructor involvement and conversational skill (e.g., general involvement, expressiveness or warmth, composure or fluency, eye contact, and articulation or clarity) correlated with students' positive responses to the instructor and the course content.

### ***Social Presence***

Several studies in the distance education literature have examined social presence, a concept closely related to the concept of immediacy (Gunawardena, 1995; Short et al., 1976). In their theory of social presence Short et al. define this construct as the degree of salience of the other person in the interaction and the consequent salience of the interpersonal relationships. Short et al. theorize that social presence is partly a quality of the medium through which immediacy behaviors are represented so, in their view, media vary in the degree of social presence they can convey. In addition, their theory attempted to take into account such factors as the communicators and their perception of the medium, and their presence in a series of interactions. Consistent with these arguments, Tu and McIsaac (2002) assert that social presence can be enhanced by considering the characteristics of the learners, by selecting appropriate communication media, and by applying appropriate instructional elements to course design. However, it is important to note that most educational researchers have studied social presence primarily in asynchronous text-based learning environments. Collectively, the findings suggest that social presence impacts learning, interaction, interpersonal relationships, and user satisfaction (Gunawardena & Zittle, 1997; Picciano, 2002; Richardson & Swan, 2003; Stacey, 2002; Tu, 2001; Tu & McIsaac.). Furthermore, perception of social presence can be cultivated in conference participants (Gunawardena & Zittle) and improved social presence can increase interaction between students and instructors.

While recent studies examining social presence in distance education did not address the potential impact of the media used in the courses under study, communication media differ in the extent to which they can overcome constraints of time, location, permanence, distribution, and distance (Rice, 1993). Media also differ in the extent to which they can represent and transmit the many social, symbolic, and nonverbal cues

important to human communication (Rice). For example, media vary in their capacity for communicating immediate feedback, the number of the cues and senses involved, personalization, and language variety (Daft & Lengel, 1986). This implies that the communication medium is a factor in representing discrete immediacy behaviors (Gunawardena, 1995). Earlier studies reported by Short et al. (1976) and Rice appear to be in agreement as to the ranking of media in their likely ability to convey social presence (face-to-face was ranked highest, followed by video, audio, and text). However, we could find no recent study that examined social presence in the newer computer-based conferencing tools. Finally, while many authors have theorized that attributes of the media systems influence perceived social presence, student perception of social presence will largely depend on the ways in which media are employed to represent the immediacy behaviors of instructors and the online community (Gunawardena; Gunawardena & Zittle, 1997). Therefore the immediacy behaviors of the instructor can be expected to play a key role in determining the communication process, interaction, and student perception of social presence.

### ***PURPOSE OF THE STUDY***

The purpose of this study was to investigate participants' perception of instructor immediacy and social presence, and the relationships between immediacy and social presence in online learning environments. For the purpose of this study, online learning was defined as a computer-mediated learning experience that occurs through the Internet and students access content on the World Wide Web (Web). The study employed two widely-used combinations of computer conferencing tools that allow synchronous computer communication through the Internet: (a) video and audio tools for the instructor with student-supplied text comments and questions ("text chat"), and (b) audio tools for the instructor with text chat

for the students. Within the context of these two learning environments, we examined the following hypotheses:

**Hypothesis 1i:** Participants who view the high-immediacy sessions will indicate higher perception of instructor immediacy than the participants who view the low-immediacy sessions.

**Hypothesis H1ii:** Participants who view the high-immediacy, video and audio with text chat session will indicate the highest perception of instructor immediacy.

**Hypothesis H2i:** Participants who view the high-immediacy sessions will indicate higher perception of instructor social presence than the participants who view the low-immediacy sessions.

**Hypothesis H2ii:** Participants who view the high-immediacy video and audio with text chat session will indicate the highest perception of instructor social presence.

**Hypothesis H3:** There is a positive relationship between perceived instructor immediacy and perceived instructor social presence.

## ***METHOD***

### ***Materials***

To examine the hypotheses experimentally, we manipulated the level of immediacy behaviors (high versus low) projected by the instructor, using two simulated synchronous computer conferencing environments: (a) video and audio tools for the instructor with text chat for comments supplied by the students, and (b) audio only tools for the instructor with text chat for comments supplied by the students. The audio with text chat groups were presented with a static picture of the instructor in the place of the video window.

To reliably manipulate the level of immediacy projected by the instructor, we scripted two versions of a lesson on current psychological perspectives, which was part of a regular introductory psychology course content. The two versions of the lesson were created

by first writing the basic script, then systematically increasing and decreasing specific verbal and nonverbal immediacy cues to create the high- and low-immediacy conditions. The instructor was asked to project high- and low-immediacy behaviors in accordance with established verbal (Gorham, 1988) and nonverbal (Richmond et al., 1987) immediacy behaviors. The instructor performed each of these two scripts in the two learning environments and each session was recorded, resulting in the four experimental conditions presented in Table 1. The lesson included a presentation from an instructor (using video and audio or audio only) accompanied by illustrative slides and intermittent exchanges between the instructor and simulated student “participants.” These simulated students appeared to submit text comments or questions in a chat box and the instructor responded using audio in various ways consistent with either the high or the low immediacy conditions.

The manipulation of the immediacy behaviors resulted in minor difference in the script as it was performed (the low immediacy videos were approximately 23 minutes long and the high immediacy videos were approximately 25 minutes long). A summary of the overall instructor behaviors in the high and low conditions is presented in Table 2.

### ***Participants and Procedures***

The participants for this study were drawn from two sections of Psychology 101, an introductory course for undergraduate students at a large public university in Southern California. Combined, the two sections provided a sample of 989 subjects who were then randomly assigned to one of the four treatment groups (see Table 3).

Participants were told by their course instructor that they could complete an online assignment featuring a presentation by a guest instructor and complete a few questionnaires as a way to prepare for an upcoming midterm exam. Participants were offered extra credit for this assignment. The instructor informed the participants that after completing the assignment and receiving their credit, they would have the option to give their consent to the researchers to use their responses for research purposes. Based on which group they were randomly assigned to, the instructor of the course e-mailed a URL to each enrolled student directing them to one of four Web sites designed for standard Web browsers. Each site contained identical directions on how to access and view the simulated session and complete the questionnaires at any time of their choice, on any computer available to them. Participants were given one week to complete this assignment. Of the

TABLE 1  
Experimental Conditions

<i>Recorded Session</i>	<i>Conditions</i>
Session 1 (Hi-VAT)	High Immediacy script (Hi) – Video, Audio, & Text (VAT) The instructor used video and audio while the simulated students supplied text comments and questions.
Session 2 (Hi-AT)	High Immediacy script (Hi) – Audio & Text (AT) The instructor used audio while the simulated students supplied text comments and questions.
Session 3 (Lo-VAT)	Low Immediacy script (Lo) – Video, Audio, & Text (VAT) The instructor used video and audio while the simulated students supplied text comments and questions.
Session 4 (Lo-AT)	Low Immediacy script (Lo) – Audio & Text (AT) The instructor used audio while the simulated students supplied text comments and questions.

TABLE 2  
Instructor Immediacy Behaviors in Four Sessions

<i>Hi - VAT</i>	<i>Hi - AT</i>	<i>Lo-VAT</i>	<i>Lo-AT</i>
Video—upper body relaxed posture	Static image of instructor	Video – upper body	Static image of instructor
Moved upper body and head while teaching (animated)	NA	Did not move upper body or head while teaching (not animated)	NA
Inclusive language (“our” “we”)	Inclusive language (“our” “we”)	No inclusive language—used “your” “you”	No inclusive language – used “your” “you”
Smiled in response to individual students’ comments and to class	NA	Did not smile	NA
Used gestures	NA	No gestures	NA
Used humor	Used humor	No humor	No Humor
Asked students to address him by his first name	Asked students to address him by his first name	Introduced himself to the students as Dr. <Last Name>	Introduced himself to the students as Dr. <Last Name>
Enthusiastic voice while talking to class-varied vocal expressions	Enthusiastic voice while talking to class-varied vocal expressions	Monotone-dull voice	Monotone-dull voice
Used personal examples and talked about experiences he has had outside of class	Used personal examples and talked about experiences he has had outside of class	No personal examples	No personal examples
Addressed students by first name	Addressed students by first name	Did not address students by name	Did not address students by name
Asked how students felt about topic	Asked how students felt about topic	Did not ask how students felt about topic	Did not ask how students felt about topic
Asked questions and encouraged students to talk	Asked questions and encouraged students to talk	Did not ask questions or encourage students to talk	Did not ask questions or encourage students to talk
Solicited viewpoints or opinions	Solicited viewpoints or opinions	Did not solicit viewpoints or opinions	Did not solicit viewpoints or opinions
Praised students’ comments	Praised students’ comments	Did not praise students	Did not praise students
Did not appear to read notes	Did not appear to read notes	Appeared to read notes	Appeared to read notes
Showed emotion	Showed emotion	Showed no emotion	Showed no emotion
Got into discussions based on student questions which were not part of his plan	Got into discussions based on student questions which were not part of his plan	Did not get into discussions about questions that were not part of his lecture plan	Did not get into discussions about questions that were not part of his lecture plan

989 students who were assigned to the four groups, 632 students completed the assignment and 433 students consented to use of their data for analysis. Table 4 displays the distribution of consenting participants across

the four groups. Consenting participants were primarily female (73.2%) and 53.3% were self-identified as White. The mean age of the consenting participants was 19; 79% were 18 or 19 years old.

TABLE 3  
Subject Groupings

<i>Random Assignment</i>	
<i>Group</i>	<i>Treatments</i>
Group 1 (Hi-VAT)	Assigned to watch Hi-VAT session: High Immediacy (Hi) – Video, Audio, & Text (VAT)
Group 2 (Hi-AT)	Assigned to watch Hi-AT session: High Immediacy (Hi) – Audio & Text (AT)
Group 3 (Lo-VAT)	Assigned to watch Lo-VAT session: Low Immediacy (Lo) – Video, Audio, & Text (VAT)
Group 4 (Lo-AT)	Assigned to watch Lo-AT session: Low Immediacy (Lo) – Audio & Text (AT)

TABLE 4  
Distribution of Consenting Students Across Experimental Groups (*n* = 433)

<i>Group</i>	<i>Group 1 Hi-VAT</i>	<i>Group 2 Hi-AT</i>	<i>Group 3 Lo-VAT</i>	<i>Group 4 Lo-AT</i>
<i>n</i>	110	100	113	110

**Instrumentation**

*Survey.* The study employed a short self-report questionnaire to gather demographic information, such as age, gender, and ethnicity.

*Instructor Immediacy.* Instructor immediacy was measured using a questionnaire based on the Verbal Immediacy Behavior Scale (VIBS) developed by Gorham (1988) and the Nonverbal Immediacy Behavior Scale (NIBS) developed by Richmond et al. (1987). The scales use a five-point Likert-type scale, ranging from 0 (*never*) to 4 (*often*). Combined, the scores on the verbal and nonverbal scales provide an overall immediacy score ranging from 0 to 136 (Moore, Masterson, Christophel, & Shea, 1996). Previous research (Freitas et al., 1998) demonstrated Cronbach’s alpha coefficients ranging from .77 to .94 for the VIBS and from .76 to .82 for the NIBS. The wordings of a few items were revised and some were omitted to reflect the computer conferencing capabilities simulated in the treatments employed in this study.

*Social Presence.* Social presence was measured using an instrument developed by Garrison et al. (2004) for assessing student role

adjustment in online communities of inquiry. The social presence scale consists of 10 items with a reported alpha coefficients ranging from .9211 to .9237 (Garrison et al.). The original scale, ranging from “Much Better” to “Much Worse,” was modified to “Strongly Disagree” to “Strongly Agree” to meet the needs of the current study.

*Open-ended Items.* A few open-ended items asked participants to provide additional comments on their perception of the instructor.

**RESULTS**

First, we calculated Cronbach’s alpha for the internal consistency of the items in the combined (VIB + NIB) scales ( $\alpha = .904$ ) and the 10-item modified social presence scale ( $\alpha = .937$ ), indicating high levels of reliability.

To determine the utility as a covariate of self-report data regarding prior experience with courses using online conferencing tools, we performed a series of dependent *t* tests comparing participants with “no” and “some” prior experience in each of the treatment groups. In particular, we compared student responses to the instructor immediacy and

social presence items. With alpha set at .05, these failed to detect any significant difference on the dependent variables. Therefore, we decided not to use online conferencing experience as a covariate in the data analysis.

### ***Hypothesis One***

We hypothesized that participants who viewed the high-immediacy sessions (Hi-VAT and Hi-AT) would indicate higher perception of instructor immediacy than the participants who viewed the low-immediacy sessions (Lo-VAT and Lo-AT), with participants in the Hi-VAT group indicating the highest perception of instructor immediacy.

A one-way ANOVA demonstrated an overall significant effect [ $F(3, 433) = 97.972, p = .000$ ]. As shown in Figure 1, participants who viewed the high-immediacy sessions (Hi-VAT and Hi-AT) indicated higher levels of perceived instructor immediacy than participants who viewed the low-immediacy sessions (Lo-VAT and Lo-AT). Planned contrasts between groups revealed significant differences

( $p < .000$ ) in perception of instructor immediacy between the Hi-VAT group and the two low-immediacy groups (Lo-VAT and Lo-AT); between the Hi-AT group and the two low-immediacy groups (Lo-VAT and Lo-AT); and between the two high-immediacy groups (Hi-VAT and Hi-AT). Finally, Tamhane's T2 post-hoc test for multiple comparisons showed that perception of instructor immediacy in the Lo-VAT group did not significantly differ ( $p = .870$ ) than perception in the Lo-AT group (mean difference = 2.283).

### ***Hypothesis Two***

We hypothesized that participants who viewed the high immediacy behaviors sessions (Hi-VAT and Hi-AT) would indicate higher perception of instructor social presence than participants who viewed the low immediacy behaviors sessions (Lo-VAT and Lo-AT), with participants in the Hi-VAT group indicating the highest perception of instructor social presence.

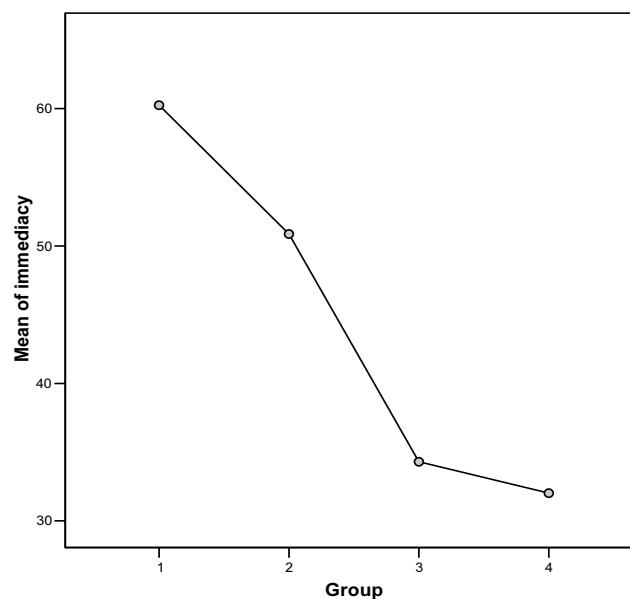


FIGURE 1  
Means Plot for Instructor Immediacy



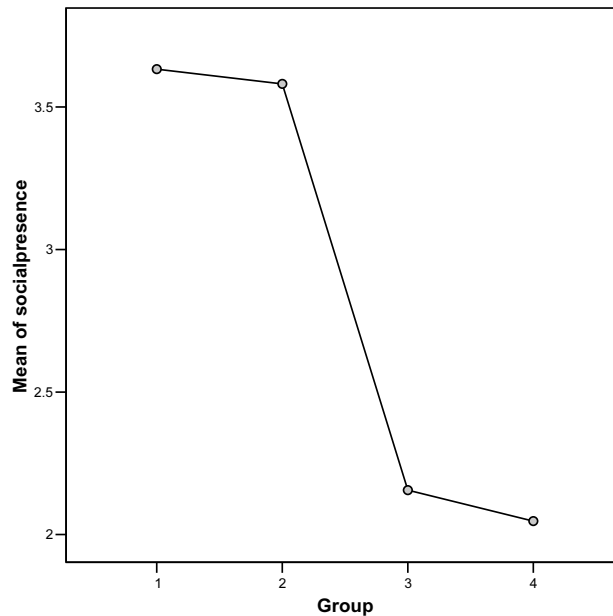


FIGURE 2  
Means Plot for Instructor Social Presence

The magnitude and direction of differences between mean scores were consistent with the research hypotheses: Participants in the Hi-VAT group indicated the highest perception of instructor social presence ( $M = 36.33$ ,  $SD = 6.01$ ), followed by the Hi-AT group ( $M = 35.81$ ,  $SD = 7.01$ ), the Lo-VAT group ( $M = 21.56$ ,  $SD = 7.95$ ), and the Lo-AT group ( $M = 20.47$ ,  $SD = 7.97$ ) (see Figure 2).

A one-way ANOVA demonstrated an overall significant effect [ $F(3, 433) = 154.337, p = .000$ ]. Contrast tests supported the first research hypothesis, but not the second research hypothesis. There was no significant difference ( $p = .569$ ) in perception of instructor social presence between the Hi-VAT and the Hi-AT group. However, there was significant difference ( $p = .000$ ) in perception of instructor social presence between the Hi-VAT group, and the two low-immediacy groups (Lo-VAT and Lo-AT). Similarly, there was a significant difference ( $p = .000$ ) in perception of instructor social presence between the Hi-AT group and the two low-immediacy groups

(Lo-VAT and Lo-AT). Finally, posthoc analysis using Tamhane's T2 posthoc demonstrated no significance difference (mean difference = 1.09,  $p = .892$ ) between the Hi-AT and Lo-VAT groups on the measure of perceived social presence.

### Hypothesis Three

We hypothesized that there is a positive relationship between perceived instructor immediacy and perceived instructor social presence. Using a Pearson Correlation we found a significant correlation ( $r(433) = .844$ ,  $p = .000$ ) between participant ratings of the level of instructor immediacy and participant ratings of the social presence of the instructor (See Figure 3 for scatterplot). Regression analysis based on this data ( $F(1, 433) = 1067.567$ ,  $R^2 = .712$ ,  $p = .000$ ) demonstrated that over 71% of the variance in ratings for social presence could be explained by ratings for immediacy behaviors (perception that the instructor was emitting immediacy behaviors).

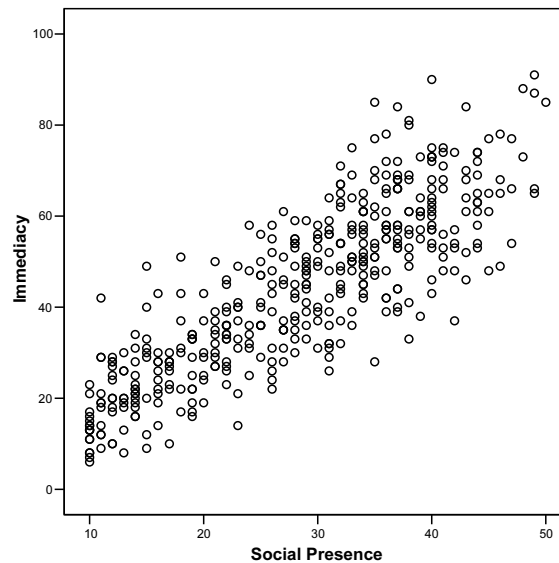


FIGURE 3  
Correlation of Social Presence and Immediacy

## DISCUSSION

The purpose of this study was to determine the effects of instructor immediacy behaviors (communicated through recorded online lessons using video-enabled and audio-enabled online learning environments) on participants' perception of the instructor's immediacy and social presence.

We hypothesized that participants who viewed the high-immediacy sessions (Hi-VAT and Hi-AT) would indicate higher perception of instructor immediacy than participants who viewed the low-immediacy sessions (Lo-VAT and Lo-AT), with participants in the Hi-VAT group indicating the highest perception of instructor immediacy. The ANOVA comparing the four groups demonstrated significance ( $F(3, 433) = 97.972, p = .000$ ) and supported the research hypotheses. These findings suggest that video-enabled computer conferencing enables (but does not ensure) communication of immediacy behaviors. However, the findings also remind us that the use of audio also enables projection of immediacy behaviors. Participants' perceptions of instructor immedi-

acy in the Hi-VAT group were significantly higher than perceptions in the other groups. This suggests that the use of video allowed the instructor to project more immediacy behaviors (e.g., gesturing, body position, smiling, etc.) and had an impact on how participants perceived the instructor. However, the ability to see the instructor in the Lo-VAT group did not contribute significantly to student perceptions of immediacy. From a practical perspective, this finding suggests that the use of video may reduce the psychological distance between the instructor and the online learners if the instructor is proficient in the use of immediacy behaviors. However, if an instructor fails to employ immediacy behaviors, students are more likely to perceive him/her as nonimmediate regardless of whether the communication environment is (a) video- and audio-enabled or (b) only audio-enabled. These results also suggest that when an instructor is trained to project relevant immediacy behaviors, students will be more likely to perceive him/her as highly immediate even if the communication environment is only audio-enabled. These findings are consistent with

earlier research. For example, Gorham and Zakahi (1990) found that instructors' perceptions of their immediacy and their perceptions of learning are congruent with their students' perceptions. Based on the findings of their study, Gorham and Zakahi suggested that instructors can monitor their behaviors based on the immediacy literature. Similarly, the findings of the present study have prescriptive value for training faculty to utilize the information identified in the immediacy literature for teaching students at a distance.

We can derive similar conclusions from the results of testing related to the second hypothesis. The findings supported this hypothesis: participants who viewed the high-immediacy sessions indicated significantly higher perception of instructor social presence than the participants who viewed the low-immediacy sessions ( $p = .000$ ). Ranking groups by mean ratings for perceived social presence was consistent with our predictions: participants in the Hi-VAT group indicated the highest perception of instructor social presence, followed by the Hi-AT group, the Lo-VAT group, and Lo-AT group. These findings are also consistent with responses to an open-ended question that asked participants whether they perceived the instructor as a real person. Real person was defined as a person who is caring, empathetic, disclosing personality, and expressing emotions, in accordance with the social presence scale used in this study. A very substantial majority of comments from participants in the Hi-VAT group (92%) indicated their perception of the instructor's social presence, followed by the Hi-AT group (66%), the Lo-VAT group (56%), and the Lo-AT group (50%). However, contrast tests showed no significant difference in perception of instructor social presence between participants in the two high-immediacy groups or between participants in the two low-immediacy groups. These findings suggest that the level of immediacy projected by the instructor influenced participants' perceptions of instructor social presence but the use of video did not significantly affect student perception of the instructor

as a "real person." While no recent studies have compared the social presence of different online conferencing learning environments, earlier experiments conducted by Short et al. (1976) and Rice (1993) ranked the social presence of video higher than audio. The findings of this study are consistent with the claims of researchers who argue that even though the characteristics of the media affect the levels of social presence, student perception of social presence will depend on the social presence created by the instructor (Gunawardena, 1995; Gunawardena & Zittle, 1997). These findings emphasize the prescriptive value of the present research as the instructor holds a central role in determining student perceptions in the online classroom. The availability of video-enabled tools could enhance student perception of instructor immediacy, which according to the current study will also increase perception of social presence. However, in the absence of video, instructors can still project several immediacy behaviors and increase perception of social presence. For example, some participants who reported that the instructor seemed like a real person, indicated that factors influencing their perception of the instructor included the fact that the instructor, among other reasons, encouraged students to talk, used gestures, answered questions, and they could also see him and hear his voice. Specifically, participants reported that "he expressed emotions, and asked questions to get the students involved," "he made a lot of gestures and called out individuals by name," "he cared about what the students understood or didn't understand," and "he was actively engaging with the class, he was asking questions and giving a chance for students to voice their opinions and questions."

Research has shown that social presence is a strong predictor of satisfaction in computer conferencing settings (Gunawardena & Zittle, 1997). Findings in this current study suggest that regardless of the computer conferencing learning environment, training instructors to use the use high-immediacy behaviors, could impact students' perceptions of the instructor

and their satisfaction with the online course. The relationship between instructor immediacy and social presence was further tested with the third hypothesis. We hypothesized that there is a positive association between perceived instructor immediacy and perceived instructor social presence. Indeed, the correlation analysis and regression analysis indicated a strong, positive relationship between perceived instructor immediacy and perceived instructor social presence ( $r(433) = .844, p = .000; R^2 = .712$ ). These results are consistent with early research that suggested, but did not empirically confirm, that immediacy is related to social presence (Gunawardena, 1995; Short et al., 1976). These findings suggest that instructors who are able to monitor and project high-immediacy behaviors can reduce psychological distance in distance education settings and by doing so they can also increase social presence and students' perceptions of the instructors as caring, empathetic, emotionally expressive, and disclosing personality. The results of the current study are particularly important in light of recent work by Richardson and Swan (2003) who demonstrated a relationship between perceived social presence, perceived learning, and satisfaction with instructors and interaction. Similarly, Picciano (2002) found a relationship among student perceptions of interaction, social presence, and learning.

We must note that this study is limited in its nature because it was conducted as a "one shot" experiment. The study addresses only the perceptions of the particular undergraduate level participating students and does not necessarily represent perceptions and responses of all the students who are engaging in online learning. Furthermore, participating students only observed a simulated lesson; their perceptions of the instructor might have been different if had they been able to interact directly with the instructor.

Nevertheless, this study's experimental design (random assignment of participants to treatment groups), the significant differences between groups, and the variance in perception

of social presence accounted by use of immediacy behaviors (71.2%) allow us to infer with considerable confidence that coordinated use of immediacy behaviors can strongly influence the social presence of instructors as perceived by students in both video- and audio-enabled computer conferencing systems. The findings of these previous studies considered together with those of the current study suggest that regardless of the conferencing tool, increasing instructor immediacy in online learning environments increases the perceived social presence of the instructor. The combination of increased instructor immediacy and perceived social presence can positively influence students' perceptions of course-related interpersonal interactions and learning outcomes as well as student motivation for participating and their satisfaction with their course-related experiences.

Growing interest in technologies for improving instructional logistics and convenience will not automatically ensure that distance education venues will be instructionally effective or educationally satisfying. Nor will such technologies necessarily preserve or enhance the human attributes and interactions that help make learning experiences humane and meaningful. What seems particularly relevant in an age of new media machines, is to better understand the role of ancient forms of human expression that communicate interest, enthusiasm, empathy, concern, and recognition—the forms of expression that help real students and real teachers to project their personal presence through electronic pathways.

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