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Exploring Social Communication in Computer Conferencing

by

Liam Rourke

A thesis submitted to the Faculty of Graduate Studies and Research in partial fulfillment of the requirements for the degree of Master of Education

in

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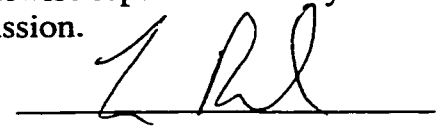

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Abstract

The influence of social communication and context on students' perceptions of the social climate of a text-based computer conference were assessed using a 32-item questionnaire. Seventy-four students, including 31 graduate, 27 undergraduate, and 16 certificate course students from four faculties responded to the survey. Results indicate that a majority of students found the environment *trusting*, *warm*, *friendly*, *disinhibiting*, and *personal*. Less than half of the students found the environment *close*. ANOVA supported the hypothesis that an increase in the perceived frequency of seven social expressions corresponded to more positive ratings of the social climate. The seven social expressions were *addressing others by name, complimenting, expressing appreciation, using the reply feature to post messages, expressing emotions, using humor,* and *salutations*. The hypothesis was not supported for the social expressions *expressing agreement, referring explicitly to the content of others' messages, using software features to quote from others' messages, asking questions of other students, using informal register, use of personal examples, chitchat, and self-disclosure.* No significant relationship was found between three categories of contextual variables (instructional design, prior relationship among participants, technological setting of participants) and the students' ratings of the social climate or the perceived frequency of the social expressions. Student comments indicated that they value social expression that is embedded in discussions of content, but that purely social messages should be delegated to alternative forums. Moderators and instructional designers are encouraged to model this pattern of communication and to keep students engaged in challenging and productive discussion.

University of Alberta

Faculty of Graduate Studies and Research

The undersigned certify that they have read, and recommended to the Faculty of Graduate Studies and Research for acceptance, a thesis entitled "Exploring Social Communication in Computer Conferencing" submitted by Liam Abraham Rourke in partial fulfillment of the requirements for the degree of Master of Education in Educational Psychology (Instructional Technology).

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Dr. T. Anderson

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Chapter 1

Exploring Social Interaction in Computer Conferencing

Background

During the last two decades, educational theorists have begun to reconsider the term 'distance' education, in part, due to the success of communications technologies at making physical distance irrelevant to many of the objectives and activities of education. Technologies such as computer mediated communication (CMC) enable students to register for classes, complete and submit assignments, and interact with instructors and peers from locations far from the campus. However, with the physical distance overcome, another perhaps more crucial distance has revealed itself--the social and psychological distance that separates students from each other and from instructors (Moore and Kearsley, 1996). This distance transcends particular modes of education, prevalent in large lecture halls and small seminar classes; however, it may be particularly salient in mediated environments.

Social interaction among students has an important role in education. From all perspectives it is regarded as an important determinant of student satisfaction, commitment, and retention (Anderson and Garrison, 1995; Burge and Howard, 1990; Fabro and Garrison, 1998; Tinto, 1987). Moreover, in current perspectives of teaching and learning such as social cognition (Resnick, 1991), constructivism, (Bruner, Goodnow, and Austin, 1956; Jonassen, 1996), and in transactional models of distance education (Garrison and Archer, 2000; Moore and Kearsley, 1996) the importance of social interaction is paramount. As Newman, Griffin, and Cole (1989) argue, "when people with different goals, roles, and resources interact, the differences in interpretation provide occasions for the construction of new knowledge" (p. 46). These are the

premises of social cognitive theory, which provides the theoretical framework for this research. Therefore, it is important to examine the viability of facilitating social interaction in mediated environments. Asynchronous, text-based computer conferencing is one form of CMC that is experiencing widespread adoption throughout many forms of education and training. There are many reasons for this, both pragmatic and pedagogical. Conferences can be put together relatively quickly by instructors, and the time/place independence appeals to many students. The pedagogical advantage of computer conferencing is that is facilitates a particularly valuable form of peer and peer-instructor interaction. Communication is asynchronous (i.e., not at the same time); therefore, students have time to reflect on each other's ideas and to carefully prepare their responses (Ahern, Peck, and Laycock, 1992; Kearsley, 2000; Laurillard, 1993; Moore and Kearsley, 1996). Second, interaction is text-based, which encourages students to articulate their ideas in a precise, logical, and coherent manner.

Nonetheless, some communication theorists impugn the capacity of asynchronous, text-based modes of communication to support interpersonal and group interaction (Galegher, Sproull, Kiesler, 1998; Daft and Lengel, 1986; Short, Williams, and Christie, 1976). Their theories predict that when channels of expression are restricted, communication is bound to be terse, task-based and somewhat autistic. These theories have received qualified support with some applications of some media in some settings. (Siegel and McGuire, 1984; Lea and Spears, 1991; Rice 1990).

Field observations based on educational applications of CMC undermine the predictive validity of these theories. Beals (1991) for instance, offers the following

description of communication on the Beginning Teachers Communication Network (BTCN):

> Communication was not impersonal. Although the communication was purely textual, members found ways to convey paralinguistic emphasis and emotion. In an informal survey of the 1988/89 cohort, several members emphasized that 'personalities were strikingly present' and 'a lot of emotion is communicated through this network'" (p.76).

A cautious consolidation of these views is that social interaction is possible in computer-mediated environments, but not automatic. Gunawardena and Zittle (1997) offer a reasonable conclusion with practical implications for instructional designers:

> In spite of the characteristics of the medium, student perception of the social and human qualities of CMC will depend on the social presence created by the instructors/moderators and the online community. Characteristics often associated with CMC--interactivity, collaboration, and reflectivity--are not inherent within the medium but can result based on design, moderator roles, participation patterns, and involvement. It is these skills and techniques, rather than the medium that will ultimately impact student perception of interaction and social presence. (p. 23-24).

As decades of educational research have shown, it is not technology alone that determines learning outcomes, but rather the methods and instructional interventions associated with them.

Purpose of Study

This study examines social interaction in educational applications of asynchronous, text-based, computer conferences. The aim is to determine the types of social communication that are positively related to the climate of a computer conference. The study addresses four questions:

1. What are students' perceptions of the social climate of conference environments?
2. What types of communication do students use to accomplish climate-setting tasks in a text-based, asynchronous, educational setting?
3. What is the relationship between instructional design, technological characteristics of participants, and prior relationships among participants with a) the types of social communication that students exchange; and b) students' perceptions of the social environment of a computer conference?
4. What is the relationship between context, specific types of social communication, and perceptions of the social dimension of a computer conference?

Significance of the Study

Computer conferencing is becoming a popular component in the delivery of both distributed and on-campus courses. This circumstance has been driven, in its most defensible moments, by a growing interest in models of teaching and learning that focus on peer and peer-instructor interaction as an important strategy for facilitating higher-order learning objectives. Although interpersonal and group interaction are the heart of these models, the special nature of interaction in computer conferencing is not well understood. Several authors advise instructional designers not to neglect the social environment of the conference, but few define exactly what this entails. Fewer still offer research--based suggestions about how to develop an environment that is conducive to

social interaction and learning. The results from this study will further the understanding of this important component of computer mediated discourse.

Definition of Terms

Immediacy

Mehrabian (1969) defined *immediacy* as "those communication behaviors that enhance closeness to and nonverbal interaction with another (p. 203). This concept guided much of the subsequent study of interpersonal communication by communication theorists and educational researchers.

Media Capacity Theories

Media capacity theories begin with the observation that interpersonal communication relies on many types and modes of symbolic communication. The effectiveness of a medium at supporting interpersonal communication, therefore, depends on its ability to support multimodal communication. In this perspective, face-to-face communication is supremely effective, video-mediated communication less so, and presumably, asynchronous, text-based communication would be the least effective medium for interpersonal communication (see for example Short et al, 1976; Daft and Lengel, 1986; Sproull and Kiesler, 1986). These theories have received most of their support when studying the use of traditional media in organization settings. They have received less support when studying new media in educational settings (Carlson and Zmud, 1999).

Community Inquiry

Garrison, Anderson, and Archer's (2000) model of community inquiry is a conceptual tool designed to assist instructors and researchers in understanding the role of

computer conferencing in higher education. The model consists of three core elements—*cognitive presence, teacher presence*, and *social presence. Cognitive presence* is defined as "the extent to which the participants in any particular configuration of a community of inquiry are able to construct meaning through sustained communication" (p. 19). *Teaching presence* encompasses the design, facilitation and direction of cognitive and social processes for the purpose of realizing personally meaningful and educational worthwhile learning outcomes (Anderson, Rourke, Garrison, and Archer, 2000). The final element--*social presence*--is the focus of this paper. Short et al., (1976) introduced the term *social presence* to refer to "the salience of the other in a [mediated] interaction, and the consequent salience of their interpersonal interactions" (p. 65). Although Short et al. conceptualized social presence primarily as an inherent quality of a medium, subsequent research has identified other factors such as context to be equally important (Carlson and Zmud, 1999). In Garrison et al.'s community inquiry model, social presence is defined as "the ability of learners to project themselves socially and emotionally as 'real' people into a community of learners" (p. 19). In the context of this study, social presence has been operationally defined to include the following dimensions: warm, friendly, trusting, personal, disinhibiting, and close.

Social Expressions

The term *social expressions* is used in the context of this study to refer to the localized elements of students' messages that serve social rather than informative functions. For conceptual convenience, social expressions have been provisionally subdivided into three categories—*affective expressions, interactive expressions,* and *reinforcing expressions. Affective expressions* are the subset of social expressions that

communicate emotion, mood, or feeling. They include the following six expressions: *expressions of emotion, use of humor, salutations, self-disclosure, use of informal register* (i.e., a variety of language used in a specific social setting, includes elliptical language, slang, etc...), and *chitchat* (small talk, e.g., formalized inquiries about the weather, about one's health, etc.). *Interactive expressions* are the subset of social expressions that communicate mutual attention and awareness among conference participants. They include the following five expressions: , *referring explicitly to the contents of others' messages, addressing others' by name, asking questions of other students, posting messages using the reply feature,* and *using software features to quote from the transcript. Reinforcing expressions* are the subset of social expressions that offer social reinforcement for the active participation of others in the conference discussion. They include the following three expressions: *complimenting, expressing appreciation,* and *expressing agreement.*

Teacher Immediacy

Andersen (1979) defined *teacher immediacy* as "those nonverbal behaviors that reduce physical and/or psychological distance between teachers and students" (p. 544). Subsequent research by authors such as Gorham (1988) extended the concept to include verbal behaviors. Studies of teacher immediacy have documented several teacher behaviors that influence student perceptions of teacher immediacy, such as addressing students by name, smiling, and complimenting students work.

Summary

This chapter has introduced the idea that social interaction is an important aspect of teaching and learning. It has also presented two competing views about the capacity of

computer conferencing to support this type of activity. It was concluded that ultimately, instructors, moderators, and the online community will determine the social character of a computer conference. Therefore, more knowledge is required concerning the nature of social interaction in asynchronous, text-based environments.

The next chapter expands on the ideas presented in the introduction. A review of the literature explores the feasibility of using computer conferencing to support learning through discussion as described by social cognitive theory. It is argued that the novel and restrictive character of communication in this medium may inhibit social interaction, which many students and theorists feel is the basis of productive discussion. Text-based socio-emotional expression and instructional context are regarded as two factors that have the potential to mediate these inhibitory effects.

Chapter three presents a research methodology for exploring the relationship between social communication, instructional context, and students' perceptions of the climate of computer conferences. It includes a description of a questionnaire used to collect data and operational and constitutive definitions of the variables social presence, social expressions, and instructional context.

Chapters four and five present the results from the data collection and analysis procedures, and a discussion of the results. Conclusions about the theoretical and practical implications of the results are offered.

Chapter 2

Literature Review

Introduction

Like all educational technologies, computer conferencing was introduced amidst a wave of hyperbole concerning its effectiveness as an educational technology. As Mason and Romiskowski (1996) note: "CMC scholarship tends to proudly acclaim the educational merits of this technology for a variety of reasons--access, collaboration, interactivity, self-direction, and experiential learning, to name a few" (p. 444). However, the authors add the following caution: "few of these are grounded in systematic, rigorous inquiry" (p. 444). Perhaps for this reason, practical outcomes have been inconsistent. This chapter begins with the suggestion that CMC should not be regarded as a solution for all educational objectives. Instead, one objective and one instructional method are proposed for which computer conferencing may be particularly well suited. These are, respectively, critical thinking facilitated by instructor-guided peer discussion. Social cognitive theory (Piaget, 1968) is introduced to provide an account of the mechanisms of learning through discussion. This theory provides a framework for a review of studies that offer descriptive evidence of the strengths and weaknesses of computer conferencing. It is then suggested that the asynchronous, text-based form of communication may impede the social processes that are important in social cognitive descriptions of learning. The final sections of this chapter present a review of education and communication research to determine whether the social work that is conventionally performed through visual, auditory, or paralinguistic means, can be achieved in an asynchronous, text-based medium.

Learning through Discussion

Much of the rhetoric concerning the pedagogical effectiveness of computer conferencing is phrased in technological deterministic vocabulary with authors speaking of the "inherent" benefits of the system. These positions overlook an important distinction between communications technologies, such as computer-mediated communication, and educational technologies, such as instructional design. The former is designed to facilitate communication, the latter learning. Thus, any benefits "inherent" in computer conferencing will be related to communication. Based on these premises, it becomes apparent that any assertion about the pedagogical effectiveness of computer conferencing will need to make a case for communication in learning. Several authors have made this argument.

A wide variety of instructional methods have been developed to meet the broad range of learning objectives of formal education. The diversity is based on the knowledge that some strategies are better than others at supporting particular objectives. Several authors have argued that critical thinking as an educational objective is best supported through discussion. In reference to discussion as an instructional method, Kemp, Morrison, and Ross (1998) state that "as learners think about a subject under discussion and present their views, learning can take place on higher intellectual levels (specifically analysis, synthesis, and evaluation) than is possible solely with the recall of information" (p. 154). Sternberg and Martin (1988) present a similar argument. They compare discussion to didactic lecturing and fact-based questioning approaches of delivering instruction and declare: "Discussion is by far the most useful style for stimulating higher-order thinking" (p. 562). Jonassen (2000) agrees, arguing that "as

groups of individuals provide different perspectives and interpretations, debate, argue, and compromise on the meaning of ideas, they are deeply engaged in knowledge construction" (p.166).

Computer conferencing may be well suited to support this method of learning. In a review of several educational technologies, Jonassen (2000) states: "No tool better facilitates reflective thinking and knowledge construction than CMC, because it supports reflection on what one knows and, through communication of that with others, may lead to conceptual change" (p. 166). Mason and Romiskowski (1996) note that "CMC, through the provision of real opportunities for conversation, is an appropriate medium for the development of those types of learning objectives where a conversational approach is of particular importance, i.e., higher-order learning objectives associated with problem-solving and critical-thinking skills" (p. 439). They refer to Wells (1992) who suggests that CMC is best suited to subject matter that involves discussion, brainstorming, problem solving, collaboration, and reflection. Henri and Rigault (1989) observe that "this technology greatly facilitates, in particular, the examination of concepts through disputation, which are key elements in some forms of learning. The possibility to disagree, ask questions and solve problems in a group are the main factors that enrich this technology" (p. 51).

Social Cognitive Theory

A strong theoretical basis for learning through discussion is developed in social cognitive theory, articulated originally by Piaget (1981). The underlying assumption of this theoretical perspective is that knowledge is motivated, organized, and communicated in the context of social interaction. As Clements and Nastassi (1988) explain: "Cognitive

development requires that individuals face others who contradict their own intuitively derived concepts and points of view (*decentration*), and thereby create cognitive conflicts (*disequilibration*) whose resolutions result in the construction of higher forms of reasoning. The following experience of an in-service teacher engaging in a discussion with her peers exemplifies how the processes of disequilibration and decentration can lead to reflective thinking:

> One teacher reported that her group asked her what was going through her mind as she planned a particular lesson. 'Same thing that's always in my head,' she recalled saying, 'How do we have fun with this? But then, I thought, maybe that's not the best way to teach. The group really pulls me up short and makes me think.' (Dunne and Honts, 1998, p. 21).

Based on this theory, the pedagogical value of computer conferencing to support higher-order educational objectives will depend on its ability to facilitate open communication and reflective discourse. The next section examines this capability.

Educational Outcomes of Computer Conferencing

The literature indicates that computer conferencing can improve performance in four important educational processes including participation, interaction, discourse, and critical thinking. However, the results are not universal.

Participation

One benefit that has surfaced in the computer conferencing literature is the increased level and distribution of student participation. Active participation in instructional activities is an important part of learning through discussion. However, as Flanders (1970) and Sinclair and Coulthard (1975) revealed in their analysis of classroom

discourse, teachers produce two-thirds, or more, of the discussion in a typical classroom (see also Ahern, Peck, and Laycock, 1992; Hillman, 1999; Laurillard, 1993). As Boyd (1996) says, "in face to face discussions, it is difficult to arrange for each person to have a full and equal chance to contribute and to digest the contributions of others" (p. 181). However, in computer conferencing, these proportions are often reversed. Several researchers have listed this as the reason for turning to conferencing as a delivery technology. Newman, Webb, and Cochrane (1996) for instance, provide the following rationale: "We were faced with increasing class sizes, leading to seminar groups of up to 30 students, only a few of whom took part in each discussion. The hope was that computer conferencing could be used to support discussions among more students without increasing the lecturer's time" (p. 60). Hillman (1999) found support for this rationale. In a comparison of face-to-face and CMC courses, he found that face-to-face teachers "uttered 73% of the sentences; comparatively, the teachers in the CMC courses wrote only 49% of the sentences" (p. 37). Zhu's (1996) experiences are supportive: "Everyone is participating, even the most shy students whose perspectives and voices are usually absent in face-to-face discussion" (p. 841). Comments from Fabro and Garrison's (1998) students support this observation: "In face-to-face I don't feel an obligation to say anything. In the computer conferencing system you still have to say 'I agree'...It's pulled me out a little more" (p. 47). Other students added that "there's a few people in our class that are quite reserved and didn't speak much during the three weeks of [face-to-face] and what I found was that when they get in this medium they are quite articulate " (Fabro and Garrison, p. 48). It is important to note that each of these results comes from conferences in which participation was not extrinsically rewarded. Marks for

participation and other instructional design strategies can be employed to manipulate participation rates and ratios.

However, the value of this type of instrumental participation is not clear. Several of the students that Bullen (1998) interviewed reported that they "participated solely for the marks and that when they had made the minimum required contribution they stopped" (p. 22). These comments contradict the notion that something inherent in CMC bolsters participation. Bullen notes that deadlines for participation caused some students to wait until the last moment to contribute. In Mason's (1991) conference, in which participation was not rewarded, "only one-third of students contributed actively to the discussion" (p. 171).

Interaction

Moving beyond simple participation, other authors have found evidence of increased interaction among students. "The value of sharing ideas, networking, and discovering what others are doing in the field" were some of the benefits that Kanuka and Anderson's (1998) students reported concerning the conference discussions (p. 71). Zhu (1996) adds, "across the weekly discussion, there were participants who raised questions and asked for answers and others who actively shared, exchanged, and constructed new ideas and concepts" (p. 838). Hara, Bonk, and Angeli (2000) used computer conferencing to support classroom discussion, and they offer a positive analysis of the technology's ability to support collaboration:

> From a learning environment or community standpoint, students have greater opportunities with [computer conferencing] tools to solicit and share knowledge while developing common ground or intersubjectivity with their peers and

> teachers. In this conference, such shared knowledge was immediately apparent in the regular classroom wherein students commented on each other's ideas before many of the classes began. (p. 26).

Yet, of the 207 conference messages that Bullen (1998) analyzed, only 48 (23%) contained references to existing messages either through replying to, or elaborating on previous messages. Henri's (1991) content analysis yielded similar results. Categorizing messages as either independent statements or interactive comments, she found that the great majority of students' inputs were independent statements, and it was the course instructors and tutors who sent most of the interactive messages.

Discourse

Another benefit linked to computer conferencing is improvements in the level of peer and peer-instructor discourse. Newman et al. (1995,1996) conducted two studies in which they compared discourse in face-to-faces setting with discourse in computer conferencing. They noted that the asynchronicity of computer conferences enabled students to support their statements by bringing in outside references. In their experience "a statement of opinion in a face-to-face discussion becomes an evidentially justified point in a computer conference message" (p. 72). The students that Beals (1991) studied reported that "the time to read and reread allowed members to formulate coherent responses" (p. 76). Additionally, Beals' students reported "knowing that interlocutors were not waiting for an immediate response allowed time to reflect on the topic and craft a clear response" (p. 76). Zhu (1996) registered similar praise for asynchronous communication from her students:

> I recall times in class when there was something I wanted to discuss but for one reason or another the point was forgotten. Using electronic classrooms as the primary means for discussion allowed us to explore ideas in depth and several ideas at the same time. Students who have a difficult time following the class discussion have a chance to catch up. The electronic classroom gives them a tool for reflection and clarification about class discussion. Students may not feel as apprehensive about discussing. That is a tool that benefited all of us. (p. 842).

Fabro and Garrison's (1998) students responded with similar approval of asynchronous discussion: "I kind of like that its not in real time because then I'm able to reflect a bit more which I think deepens the learning. It's not just an immediate response that would happen in a face-to-face. That has added to the learning process" (p. 47).

Along with the asynchronicity, improvements in discourse are also attributed to the text-based nature of communication. Henri and Rigault (1996) provide a concise summary of this advantage: "Writing, more than any other form of expression, compels the user to rigorously organize his thoughts, translate same into a coherent message and communicate it in a simplified, authentic and sober manner for easy understanding by all" (p. 52). Hillman (1999) found empirical support for this, noting that overall, CMC participants' messages were better organized and structured than those of an equivalent face-to-face group. Zhu (1996) echoes these sentiments: "Some students enjoy using [text-based conferencing] as a tool to engage in the discussion because they believe the action of writing down their ideas makes them think and reason more deeply and clearly' (p. 841). The students that Fabro and Garrison surveyed offered comments such as "you have to think about your responses when using written communication. You can't take a

rest. You have to think about it relatively deeply. It's pretty permanent, and it makes a difference in how you think about what you do" (p. 46).

Unfortunately, this type of reflective discourse is not characteristic of all computer conferences. Mason (1991) laments that only a small percentage of students:

> actively engaged in the giving and receiving of feedback. There was little evidence that students were learning to synthesize ideas or course issues through the medium of conferencing discussions. At best, the interactions are broadening, but so far they do not encourage students either to pursue themes in depth or to synthesize ideas. (p. 171).

The instructors and students that Bullen (1998) interviewed were also disappointed with the level of discourse, and commented that that there was "a lack of dissonance or disagreement that could spark a sustained and interactive discussion" (p. 22).

Critical Thinking

Perhaps the most important benefit of asynchronous text-based computer conferencing is its ability to promote critical thinking. Newman et al. (1996) used Garrison's (1991) concept of critical thinking to examine computer conferences in comparison to face-to-face seminars, and they declared unequivocally: "Critical thinking is deeper in computer conferences" (p. 61). Expanding on this assertion, they explain:

> It appears that the [face-to-face] students enumerated a lot of new ideas in their discussions of [course content] and kept the discussion wide, but were less able to link these ideas together, resolve ambiguities, bring in relevant outside material, or to keep discussion centered on important non-trivial issues. It is with such subjects that computer conferencing could be of most benefit since it shows signs

> of supporting those aspects of critical thinking that were most lacking in this face-to-face discussion. (p. 65).

Martunnen (1997) offered theoretical support for Newman et al.'s observations, reporting that, "CMC can be regarded to include such characteristics that are beneficial in practicing argumentation and critical thinking skills whose promotion is, along with self-direction, a central goal of higher education (p. 346). However, when she used CMC to teach argumentation skills to students, she found that "the small portion of argumentative messages indicated that disputes and debates between the students were quite uncommon even if the students were encouraged to exchange opinions and critique each other's texts" (p. 359). Garrison et al. (2000) analyzed the transcripts from two graduate-level conferences, seeking evidence of critical thinking. They categorized the bulk of student messages as "exploration," which they characterized as information exchanges and descriptions of personal experiences. Few messages contained evidence of higher-order thinking such as integration and resolution. Using a methodology similar to Garrison et al. (2000), Kanuka and Anderson (1998) used quantitative content analysis along with qualitative techniques and report:

> Evidence from the surveys, telephone interviews, and transcript analysis indicated that most of the discussion was of a sharing and comparing nature. Dissonance and inconsistency were not actively explored, little testing of evidence against experience or the literature was expressed, and rarely did participants state the relevance or application of new knowledge that was created. (p. 71).

The foregoing studies provide qualified support for some of the early postulations concerning computer conferencing. Asynchronous, text-based communication has the

potential to enhance the social and cognitive processes described in social cognitive theories of learning. However, the descriptions and conclusions are far from unanimous. Equally often, instructors and researchers find that extrinsic rewards are required to encourage participation, the participation is not always characterized by interaction or critical discourse, and that when these processes are not occurring, the evidence of critical thinking and learning is sparse.

In order to account for the inconsistency in these results, the discussion returns to social cognitive theory. This theory, as its name suggests, regards learning in terms of two equally important complimentary processes--individual cognition and social interaction. Communication theorists have suggested that asynchronous, text-based media hinder social interaction. Bullen (1998), for instance, offered the following analysis at the conclusion of his study:

> For some students, the lack of facial expressions and voice intonation made computer conferencing a less human form of communication. For these students there was no 'virtual community'. The online activity was not an interactive discussion, but just a series of messages posted to an electronic board. They felt no connection with their fellow students and thus felt no compulsion to go beyond the minimum requirements. (Bullen, 1998, p. 11)

This issue has received attention in communication research. One body of research in particular, referred to as media capacity theory, is reviewed in the next section.

Media Capacity Theories

Face-to-face communication employs a rich mixture of verbal and nonverbal signals. The bare theses of communicative tasks are embroidered with vocal inflections,

facial expressions, postural affectations, and other qualifying information. Some media theorists consider this observation paramount in the study of media that restrict our channels of expression.

Immediacy

In 1969, Mehrabian introduced a concept that was to guide much of the subsequent research on interpersonal interaction in mediated environments. He defined *immediacy* as "those communication behaviors that enhance closeness to and nonverbal interaction with another" (p. 203). His research suggested that nonverbal cues such as facial expressions, body movements, and eye contact, increase the sensory stimulation of interlocutors. This, in turn, leads to more intense, more affective, more immediate interactions.

Social Presence

Mehrabian's (1969) concept was adopted by Short et al. (1976) who introduced the term *social presence* to refer to the "the degree of salience of the other person in a mediated interaction and the consequent salience of their interpersonal interactions (p. 65). Short et al. postulated that the inability of media to transmit nonverbal cues would, as Mehrabian had shown, have a negative effect on interpersonal communication. Their exhaustive review of the media comparison studies culminated in the following conclusion:

> In most cases, the function of non-verbal cues has been in some way related to forming, building, or maintaining the relationship between interactants. The absence of the visual channel reduces the possibilities for expression of socio-emotional material and decreases the information available about the other's self-

> image, attitudes, moods, and reactions. So, regarding the medium as an information transmission system, the removal of the visual channel is likely to produce a serious disturbance of the affective interaction; one would expect the transmission of cognitive information to be relatively unaffected. (p. 59-60).

Reduction of Social Cues

Sproull and Keisler (1986) perceived the implications of reduced cues on interpersonal communication from a different perspective. The critical difference between face-to-face communication and CMC, they suggested, was the absence of *social context cues*, defined by Collins (1992) as "the various geographic, organizational, and situation variables that influence the content of conversation among persons (p. 1).

. Their research indicated that the lack of cues that define the nature of a social situation would lead to uninhibited communication such as hostile and intense language, greater self-absorption versus other-orientation, and a resistance to defer speaking turns to higher-status participants.

Media Richness

Daft and Lengel (1986) presented an articulated version of Sproull and Keisler's (1986) and Short et al.'s (1976) theories. They conceded that the lack of paralinguistic information in some communications media results in terse, pragmatic interchanges. However, they argued that, in some situations, this could be beneficial:

> When messages are very simple or unequivocal, a lean medium such as CMC is sufficient for effective communication. Moreover, a lean medium is more efficient, because shadow functions and coordinated interaction efforts are unnecessary. However, for receivers to understand equivocal information,

information that is ambiguous, emphatic, or emotional, a richer medium should be used. (p. 57)

Previously, it was stressed that the efficacy of computer-mediated communication as an educational delivery technology would ultimately be based on its ability to facilitate open communication among students and instructors. In light of this, media capacity theory poses some important questions. The next section of this chapter seeks to determine the extent to which the projections of this theory are apparent in educational applications of computer conferencing.

Consequences of Reduced Cues

Attention and Awareness

Four consequences of the reduced repertoire of communication cues are discernable in the computer conferencing literature. The first, predicted accurately by Short et al. (1976), is the lack of mutual attention and awareness. Short et al. argued that effective interaction relies on continual evidence that others are receiving and attending to one's message. A comment from one of Fisher, Phelps, and Ellis' (2000) students reveals this deficiency and its consequences: "Immediate feedback was not possible, as each student was unable to 'see' if they had the attention of other students. Hence in this online course, communication was hampered as individuals were restricted to communicating by written words only" (p. 489). Bullen (1998) summarizes his students feeling in this regard: "The asynchronous communication left them feeling remote, detached, and isolated, and this discouraged them from participating" (p. 10).

Feedback

A second problem, also identified by Short et al. (1976) is the lack of feedback, which answers questions such as, How is the other reacting? Surprised? Annoyed? Comprehending? Feenberg (1989) observes that communicating online involves a personal risk, and "a response, any response is generally interpreted as a success while silence means failure" (p. 25). One of Fisher et al.'s (2000) students remarked: "It is difficult to introduce myself to the group. I do not have all the signals we use in communication, such as body language or vocal intonation. I am relying completely on words but I do not know if my words are getting through" (p. 489). Feedback operates in both directions. Receivers of these lean messages often complain that it is easy to misconstrue others' messages. One of Fabro and Garrison's (1998) students explained that the rich information provided in a face-to-face setting "is critical to provide the context for interpreting comments, to getting to know the people, their style (p. 45).

Communication apprehension

The lack of cues in this novel medium can also exacerbate *communication apprehension*. Defined as the fear of real or anticipated communication with people, Elias (1999) notes that both oral and written forms of communication apprehension have been documented. Grint (1989) noticed that students found it difficult to carry out conversations in asynchronous time because "they were inhibited by their impression of a large, lurking, anonymous audience, who would be reading their contributions (191). Jonassen (2000) notes that although communication apprehension is not localized to computer conferencing, conferencing may amplify existing insecurities and can prevent

individuals from participating openly and fully. One of Fisher et al.'s (2000) students describes the disquieting feeling of posting to the message board:

> I believe I have been feeling uncomfortable because I am not receiving all the extra messages that I normally receive when having a verbal conversation with someone. The extras I am thinking about are the unconscious messages we both emit and receive. The intonation of the voice, whether it is soft or sharp. We get so much meaning from the speech. We receive even more messages from face to face interaction by reading the body language. (p. 489).

Douglass (1997) presents three reasons why more conference participants are, in his vocabulary, "Read Only Members (ROM's)" rather than Radical Active Members (RAM's):" 1) a reluctance to speak to strangers; 2) fear of being evaluated by others; and 3) fear of receiving criticism from others" (p. 12).

Group Cohesion

A third problem that is apparent in the literature is the difficulty in establishing a sense of group cohesion. Bullen identified this theme in his students' comments: "Some students said that social activities would allow them to get to know each other before they began the discussions. Students felt they needed this form of communication in order to develop a social bond and that some sort of social cohesion was a prerequisite to meaningful discussion of course content (p. 13). Fabro and Garrison (1998) arranged a face-to-face meeting at the onset of their course, and the students benefited from this experience:

> Once you get to know the other students as friends you allow them more space because you have a relationship with them. The sense of community provides a

> way to dialogue back and forth. It is a part of getting to know each other and making friends as opposed to contributing to the learning environment as an anonymous individual. The sense of belonging to a group and a community and the connection with others is essential to learning and interaction within the computer conferencing environment. (p. 46).

Wegerif (1998) reiterates this point: "Forming a sense of community, where people feel they will be treated sympathetically by their fellows, seems to be a necessary first step for collaborative learning. Without a feeling of community people are on their own, likely to be anxious, defensive and unwilling to take the risks involved in learning (p. 48).

Each of these factors can interfere with the ability of computer conferencing to support open and critical, yet respectful discourse. Chen (1994), for instance, observed that students who felt uncomfortable in an educational communication environment avoided social interaction, were less argumentative, less willing to advocate their position on controversial issues or challenge others' positions, and generally more constrained in their interactions with other students. These types of interaction are the very mechanism of learning in social cognitive theory.

Channel Expansion

Yet, some conference groups overcome these issues and have highly interactive and educationally worthwhile experiences. Recent reviews of media capacity research question the extent to which its conclusions are generalizable to all media and all applications ({Carlson and Zmud 1999 #1200} McCormick and McCormick, 1992; Turkle, 1995; Walther, 1994). In an important challenge to media capacity theories, Walther characterizes CMC as, in some cases, '*hyper*personal' rather than the predicted

impersonal (p. 9). The author cites several studies in which "experienced CMC users rated text-based media, including email and computer conferencing, as 'as rich or richer' than telephone conversations and face-to-face conversations" (p. 18). In another study, McCormick and McCormick (1992) found that electronic mail served primarily a social function, with less than half of undergraduate e-mail addressing pragmatic concerns.

These results are supported by studies that focus on educational uses of CMC. Hara et al. (2000) conducted a content analysis of a course delivered entirely through CMC. They found that 27% of the total message content consisted of expressions of feeling, self-introductions, jokes, compliments, greetings, and closures. McDonald (1998) studied the development of group dynamics in educational computer conference settings and found that openness and solidarity were significant elements, rising from 18% and 40%, respectively, when the conference commenced, to 36% and 54% at its conclusion. Weiss and Morrison (1998) were skeptical about the capacity of computer conferencing to support a graduate seminar. One of the potential weaknesses, they ventured, was that "it would result in dry dialogue devoid of emotion" (p. 446). However, their analysis revealed 54 instances of humor and additional episodes of hurt feelings. Kanuka and Anderson (1998) analyzed a professional development conference from a constructivist perspective. After a preliminary analysis, the authors added an additional category to their coding instrument to capture the overwhelming amount of social interchange that was occurring, an amount that was significantly higher than any of the other content they were seeking. Gunawardena (1994) assessed students' subjective evaluations of a computer conference. On a five-point scale in which '1' indicated a positive rating, the average rating for 'sociable' was 2.23.

Results such as these mitigate the predictive validity of media capacity theories, which imply that social presence is a quality of a medium. On the contrary, it appears that Gunawardena and Zittle's (1997) hypothesis is more tenable, that is, students' perceptions of the social and human qualities of CMC will depend on the social presence created by the moderators and the online community, instructional design, and communication patterns among participants. Many strategies for influencing the socio-emotional climate of the learning environment have been studied at length in the context of face-to-face settings (see for example Johnson and Johnson, 1994, Slavin, 1994). It is conceivable that practical suggestions can be translated from one medium to another with moderate effort. However, one issue, communication patterns among students, requires more substantial study. The process of building and sustaining relationships, and cultivating a social environment that supports open communication in asynchronous, text-based environments has received insufficient study in communication research, and even less in the field of education. The next section reviews research in both of these areas to explore how the social work normally accomplished through visual, auditory, and paralinguistic means can be achieved in text.

Categories of Text-based Social Expression

This section reviews research that identifies specific types of textual expressions that have a positive relationship with social presence. These expressions have been provisionally divided into three broad categories: 1) Interactive expressions, which include *referring explicitly to the content of others' messages, , addressing other students by name, using the reply feature to post messages, asking questions of other students,* and *quoting from the transcript*; 2) Reinforcing expressions, which include *complimenting,*

expressing appreciation for others' contributions; and 3) Affective expressions, which include *expressing emotions, using humor, chat, salutations, self-disclosing, using personal examples to illustrate points, and use of informal register* (see Table 1).

Table 1

Taxonomy of Social Expressions

	Interactive	Reinforcing	Affective
Definition	• Expressions that communicate mutual attention and awareness	▪ Expressions that communicate social reinforcement	• Expressions that communicate emotion, feeling mood
Social Function	• Build and sustain relationships • Provide evidence that others are attending	• Encourage participation • Strengthen posting behavior • Attenuate evaluation apprehension	• Present participants as multidimensional, "real" human beings • Develop trust, reduces inhibition • Facilitate impression management
Constitutive Expressions	• Posting using the reply feature • Referring explicitly to the contents of others messages • Using software features to quote from the transcript • Asking other students questions	• Complimenting • Expressing appreciation	• expressing emotion • self-disclosing • using humor • using informal register • chitchat

Social Expressions

The term *social expressions* is used in the context of this study to refer to the localized elements of students' messages that serve social rather than informative functions. The use of the adjective *social* reflects a traditional division in discourse analysis, which regards communication as having two broad functions. These functions are variously denoted as "transactional" versus "interactional" (Brown and Yule, 1996), "representative" versus "expressive" (Buhler, 1934), "referential" versus "emotive" (Jokobson, 1960), "ideational" versus "interpersonal" (Halliday, 1970), "descriptive" versus "social-expressive" (Lyons, 1977), "task" versus "socio-emotional" (Bales, 1970), or in Short et al.'s terms "informational" versus "integrational." Brown and Yule note that despite the difference in terminology, the functional division is consistent. One type of communication serves in the expression of content, the other serves to build and sustain social relations and convey personal attitudes.

Computer conferencing researchers have maintained this division. Henri's (1991) analysis, for example, includes the category *social* which she defines as "statement or part of statement not related to course content" (p. 213). This division is also present in Garrison et al.'s (2000) community of inquiry model in which cognitive presence is distinguished from social presence.

The second part of the term—*expressions*—is used to identify the units of communication that are examined in this study. Although several units have been developed in the field of linguistic analysis (e.g. sentence, utterance, conversational move, communicative act), none of these units accurately reflects the style of communication that is unique to computer conferencing. The style of communication

that students use in computer conferencing is a hybrid that melds the scholarly voice used in formal submissions, the telegraphic style of email, and the informal register (i.e., a variety of language used in social settings) used in casual conversation.

Interactive expressions

Interactive expressions include the subset of communications that communicate mutual attention and awareness. The function of interactive expressions is to provide evidence that others are attending, to build and sustain relationships, and to show recognition of communicants. Interactive expressions include *using the reply feature to post messages, quoting directly from the conference transcript, addressing others by name),* and *referring explicitly to the content of others' messages.*

Short et al. (1976) characterized these functions as critical in the promotion of interpersonal communication. Feenberg (1989) suggests that evidence that the other is attending is especially important in CMC because: "It is disturbing to do without nods of the head, smiles, glances, tacit signs which in everyday conversation often take the place of words. (p. 24). Eggins and Slade (1997) suggest that responses and rejoinders serve several beneficial purposes in conversation. They build and sustain relationships, express a willingness to maintain and prolong contact, and tacitly indicate interpersonal support and acceptance of the initiator.

Teacher immediacy, defined by Andersen (1979) as " those nonverbal and verbal behaviors that reduce physical and/or psychological distance between teachers and students" (p. 544), has developed an empirical connection between interactive expressions such as *addressing others by name* and students' ratings of teacher immediacy (Christenson and Menzel, 1998; Gorham and Christophel, 1990; Gorham,

1988; Gorham and Zakahi, 1990; Sanders and Wiseman, 1990). Eggins and Slade (1997) note that addressing others by name would tend to indicate an attempt by the addresser to establish a closer relationship with the addressee" (p. 145).

Reinforcing expressions

Reinforcing expressions include the subset of social expressions that communicate social reinforcement. Their function is to strengthen, solidify, or support active participation in the discussion. *Complimenting, expressing appreciation, and expressing agreement* are textual means of communicating social reinforcement.

Christensen and Menzel (1998) Christophel (1990), Gorham (1988), Gorham and Zakahi (1990) each found that reinforcing communicative behavior such as praising students' work, actions, or comments contributed to teacher immediacy. In the context of computer conferencing, Hara et al. (2000) offer the following advice: "Praise is one strategy to foster electronic interaction" (p. 28). Sanders and Wiseman (1990) studied immediacy indices individually and found a significant correlation ($r = 0.55$) between 'praises students work' and the teacher immediacy.

The importance of reinforcement to collaboration is supported by sociological theory. Social interaction theorists such as Mead and Cooley contend that the human needs for affiliation and self-esteem are on par with basic physiological needs (Stark, 1996). They point out that these needs can only be obtained through interaction with others. In this perspective, reinforcement is the object that fuels the development and maintenance of exchange relationships, or interaction.

Another function of reinforcing expressions is to attenuate the effects of evaluation apprehension. Geen (1976) showed that when a task is performed in the presence of an audience, the anticipation of being evaluated induces arousal and the threat of failure. However, Geen found that when the nature of audience evaluation is helpful and supportive, these effects are diminished.

Affective expressions

Affective expressions are the subset of social expressions that serve to communicate emotion, feeling, or mood. The function of affective expressions is to present interlocutors as 'real,' multidimensional human beings, promote trust, and reduce communication apprehension. Affect is expressed in computer conferencing in a number of ways, including *expressing emotion, using humor, self-disclosing, using informal register,* and *chitchat.*

Burge and Howard (1990) found this type of communication important in audioconferencing: "The need to create a friendly 'ambiance' and a recognition that 'humor helps' was frequently expressed in suggestions for some informal contact time and some lighthearted banter" (p. 5). Teacher immediacy literature has identified the use of humor as a contributive factor to immediacy (Christensen and Menzel, 1998; Christophel, 1990; Gorham, 1988; Gorham and Zakahi, 1990; Sanders and Wiseman, 1990). Gorham and Christophel (1990) note that humor is like an invitation to start a conversation, it aims at decreasing social distance, and it conveys goodwill. Research by Eggins and Slade (1997) reinforces the importance of humor as an indicator of social presence. They found humor to be "a pervasive characteristic of casual conversation in contrast to its infrequent occurrence in formal, pragmatic interactions" (p. 155). They also postulate a

connection between humor and critical discourse: "The construction of group cohesion frequently involves using conversational strategies such as humorous banter, teasing, and joking. These strategies allow differences between group members to be presented not as serious challenges to the consensus and similarity of the group" (p. 180).

The psychological explanation of social attraction and bonding between individuals includes self-disclosure in its five-factor model. Cutler (1995) explains that "the more one discloses personal information, the more others will reciprocate, and the more individuals know about each other the more likely they are to establish trust, seek support, and thus find satisfaction" (p. 17). Shamp (1991) successfully applied these notions to computer mediated communication. Reversing Turkle's (1995) observation that people have a tendency to view computers as human (*anthropomorphism*), Shamp suggests that people communicating via CMC also have an obverse tendency to view humans as computers (*mechanomorphism*). Based on his experiments, Shamp concludes that encouraging the exchange of personal information can reduce feelings of social isolation and contribute to the formation of individualized impressions of interlocutors. Fabro and Garrison's (1998) study of critical thinking in audio-teleconference settings revealed the importance of self-disclosure: "The work and real life examples shared during the teleconferences were often mentioned by students, in the interview, as major benefits of attendance at the teleconferences. Critical thinking is associated with integration of new concepts and ideas with previous knowledge and experience. This integration is facilitated by peer examples and illustrations of new knowledge application" (p. 45). Teacher immediacy literature has provided an empirical justification for extending these conclusions to computer conferencing. Christensen and

Menzel (1998), Christophel (1990), Gorham (1988), Gorham and Christophel (1990), Gorham and Zakahi (1990) and Sanders and Wiseman (1990) found positive correlations between use of personal examples, personal ancedotes, and self-disclosure, and students' perceptions of teacher immediacy.

A novel manner of expressing emotions in CMC is the use of emoticons (a short sequence of keyboard letters and symbols, usually emulating a facial expression, expressing a feeling that supplements the message). Kuhn (1996) and Walther (1996) note that communicants will adopt new strategies and make the medium do what they want. Beals' (1991) analysis of a listserve supported this: "Members used textual means to communicate emphasis and emotion. These included all capital letters...overuse of punctuation, and use of expressives. Many of these techniques would be considered inappropriate in more formal, written communication, but the often-emotional content of many messages required explicit textual display of what would have been non-verbal cues in face-to-face conversation" (p. 76). Gunawardena and Zittle (1997) also found that conference participants "enhanced their socioemotional experience by using emoticons to express missing nonverbal cues in written form" (p. 8).

Contextual Issues

The main focus of this study is the social environment of the conference and the specific communicative expressions that are contributive. However, Rice (1984) and Hiltz and Johnson (1990) have found empirical support for an additional set of variables that can influence social interaction in mediated environments. What they call the *human relations perspective* focuses on factors such as the nature of existing ties among group members as a determinant of the sociability of a communications technology.

Hiltz and Johnson (1990) studied *expressiveness* in computer conferencing, which they describe as "the users' ability to express themselves in this medium of communication, to express views and feelings, form impressions of others, and feel socially stimulated (p, 753). They tested the following variables: incentive to use the system, education level of users, prior relationship among group members, previous communications among the group, communication frequency, limitations on use of the system, task, and typing skill. The authors report that typing skill, cost of using the system, and affinity toward members of the group were significant factors. Interestingly, these variables did not have the same or even a significant effect on the task-related dimensions of their study; their effects were confined to expressiveness.

This type of analysis is congruent with the work of conversation analysts Eggins and Slade (1997) who focus on the role structure of a group, which they describe as "the cluster of socially meaningful participant relationships operating in a situation" (p. 54). They classify role relations into five dimensions: 1) status relations: inequality/equality; 2) affective involvement: nil (distant, unattached)/some (school friends, work colleagues)/ high (lovers, close friends, family); 3) contact: frequent/intermittent and voluntary/involuntary; 4) orientation: pragmatic or casual; and 5) personal orientation to affiliate. Evidence from Beals (1991) provides support for at least one of these factors in an educational environment: "Beginning users often report feeling initially uncomfortable with a network's technology and communication style. However, that initial discomfort can be quickly overcome by the presence of pre-existing relationships between members of the network" (p. 76). Further, Beal notes that:

> Even though group members did not share a physical context, they did have some aspects of a social context in common. All received their pre-service teacher education from a one-year program at Harvard University, many attending classes together and graduating the same year. This gave the group some common experience and pre-established relationships. This commonality provided enough initial social context to facilitate communication. (p. 76)

These variables could explain many of the contrasting results in the literature. Henri and Rigault (1996) observed that "Mason (1991) and Henri (1992) came up with different results. The former found little interaction, while the later found a lot more. The difference can be explained by the fact that these analyses do not take into consideration the specific nature of the task, the structure of the learning process, the particular virtual environment and the types of learners. These irrevocably influence their participation in the conference" (p. 57).

Summary

Learning through discussion is widely recognized as a valuable strategy for promoting critical thinking. However, as Boyd (1996) has argued, the traditional face-to-face classroom permits behaviors that lead to less than ideal conversational situations. Asynchronous, text-based conferencing systems resolve some of the problems, but at the same time, these systems introduce new problems. The lack of visual, auditory, and paralinguistic information can leave participants feeling isolated, anonymous, and apprehensive about contributing to the discussion. Often, this results in peer interaction that is devoid of the processes that are elemental to social cognitive descriptions of learning. One characteristic of groups that overcome these problems is the rich socio-

emotional content of their messages. In the next section, a methodology is presented to explore the relationship between social expressions, instructional context, and students' perceptions of the climate of a computer conference.

Chapter 3: Methods

Introduction

Social cognitive theory supports the idea that discussion can be an important instructional strategy for facilitating reflective thinking, cognitive growth, and learning. Computer conferencing, which offers a text-based, asynchronous form of communication may enhance some of the processes described in theoretical accounts of learning through discussion. Other fundamental processes, however, such as socio-emotional communication, may be impaired. In order to understand this impairment, four questions are asked:

1. What are students' perceptions of the social environment of the conference.
2. What types of social communication do students exchange in this environment.
3. Which types of social communication have are positively related to the students' perceptions of the social environment of the conference.
4. Does the instructional, technological, and relational context in which the conference operates influence this relationship.

This chapter presents a methodology for seeking answers to these questions.

Measures

The preceding questions center around three variables--*social presence*, *social expressions*, and *context*. Operational and constitutive definitions of these terms are provided in the following section along with the procedures that will be used to measure these variables.

Social Presence

The term *social presence* was introduced by Short et al. (1976) to refer to "the salience of the other in a mediated interaction and the consequent salience of their interpersonal interactions" (p. 65). Although Short et al. conceptualized social presence primarily as an inherent quality of a medium, subsequent research has found other factors such as context to be equally important. In Garrison et al.'s (2000) community of inquiry model, social presence is stipulatively defined in a mediated educational context as "the ability of learners to project themselves socially and emotionally as 'real' people into a community of learners" (p. 17). In the context of this study, social presence has been operationally defined to include the following dimensions: warmth, friendliness, trust, personalness, disinhibitiveness, and closeness.

The literature presents two general approaches to measuring social presence--subjective and objective. Subjective measures of presence require study participants to produce a conscious, introspective judgement regarding their experience in a medium. This judgement is typically reported via a self-report questionnaire following the experience (Lombard and Ditton, 2000). Objective measures of presence record participants' physiological and/or behavioral responses (e.g., skin conductance, blood pressure, heart rate, muscle tension, respiration, ocular responses, etc...) that are logically correlated with their relevant psychological responses. Objective measurement of presence is more typical of virtual reality or simulation research in which *presence* is interpreted as the "perceptual illusion of nonmediation (Lombard and Ditton, 1997).

Studies in which presence is conceived in terms of social richness use subjective questionnaire items in their studies (Andersen, 1979; Gunawardena and Zittle, 1997;

Short et al., 1976). This is due in part because subjective measures have construct validity, they are easy to use, and they are inexpensive (Perse, Button, Kovner, Lears, and Sen, 1992). Evidence indicates that subjective measures are valid and reliable (Perse et al.); however, they have two important limitations. First, the items on questionnaires may be difficult for participants to understand, particularly if the items explicitly refer to the presence concept. Second, few researchers use the same set or sets of measurement items, making comparisons across studies difficult.

In an effort to avoid these limitations, use of the term "presence" or other jargon was omitted from the survey. Other ambiguous or subjective terms such as *warm* and *cold* were piloted successfully before inclusion in the final questionnaire. To facilitate generalization across studies, appropriate items from existing social presence measurement instruments were selected (Gunawardena and Zittle, 1997; Short et al, 2000). These authors used adjective pairs such as impersonal/personal, unsociable/sociable, cold/warm, and impersonal/personal. Subsequent research in related areas such as teacher immediacy continued to use modified versions of Short et al.'s scale. Andersen (1979), who performed the seminal work on teacher immediacy, asked students to rate their instructor as immediate/not immediate, cold/warm, unfriendly/friendly, and close/distant. More recently, the technique was used by Gunawardena and Zittle (1997) to assess the social environment of an educational computer conference. Their scale allowed students to rate the environment on adjective pairs such as interactive/not interactive, interesting/not interesting, and sociable/unsociable. To measure social presence in the current project, adjective pairs were selected from this catalogue.

Students' responses to the social presence section of the questionnaire were presented using a special type of attitude scale called the semantic differential. A semantic differential scale "asks individuals to rate an attitude object on a series of bipoloar adjectives" (Borg and Gall, 1989, p. 769). It has been used consistently for assessing social presence since Short et al. introduced the term in 1976. This is because, as Fraenkel and Wallen (1996) suggest, the scale is especially useful for measuring subjects' attitudes toward particular concepts. Subjects are presented with a continuum of several pairs of adjectives (e.g., "warm-cold," "friendly-unfriendly," etc...) and asked to place a checkmark between each pair to indicate their attitudes. The length of these continuums or the number of response options between these pairs of words has varied among studies. Short et al. (1976) used seven-point scales, while Gunawardena and Zittle (1996) and Andersen (1979) used five-point scales. In this exploratory study, a four-point scale was designed in an effort to improve the interpretability of the responses. Results from the pilot testing of a five-point semantic differential scale revealed that students often selected the middle or undecided option. Although the four-point scale restricts the range of responses, it forces to students to commit to one attitude or its opposite, while still providing them with a range of intensity of their attitude, albeit a limited range.

Social expressions

The term social expressions is used in the context of this study to refer to the localized elements of students' messages that serve social rather than informative functions. For conceptual convenience, social expressions have been provisionally subdivided into three categories—affective expressions, interactive expressions, and

reinforcing expressions. Affective expressions include the subset of social expressions that communicate emotion, mood, or feeling. They include the following six expressions: *expressions of emotion, use of humor, salutations, self-disclosure, use of informal register,* and *chat* (speech used to share feelings or to establish a mood of sociability rather than to communicate information or ideas). Interactive expressions are the subset of social expressions that communicate mutual attention and awareness among conference participants. They include the following five expressions: *posting messages using the reply feature, using software features to quote from the transcript, referring explicitly to the contents of others' messages, addressing others' by name,* and *asking questions of other students.* Reinforcing expressions are the subset of social expressions that offer social reinforcement for the active participation of others in the conference discussion. They include the following three expressions: *complimenting, expressing appreciation,* and *expressing agreement.*

The frequency of social expressions are measured in this study using a four-point scale, anchored at one end by the option "almost always" and at the opposite end by the option "never." The two middle options are "frequently" and "rarely." The decision to use a four-point scale was also based on data from a pilot test of a five-point scale that contained the additional option "sometimes." An analysis of that data indicated that students were frequently selecting this additional option, which made interpretation difficult.

Context

Three contextual factors have been selected for investigation in this study. Information is gathered on four characteristics of the instructional context:

1) course level: graduate/undergraduate/certificate course
2) conference moderator: instructor/teaching assistant/other students/guest lecturer/other
3) percentage of mark dedicated to conference activities
4) instructional activities: responded to question from moderator/responded to questions from other students/small group problem solving/debates/other

Information is also requested on three characteristics of the students' technological context:

1) location from which conference board was accessed: home/school/work/other
2) limitation of access: strictly limited/somewhat limited/unlimited
3) amount of time spent participating in conference: open-ended

Finally, information was collected on two aspects of the relational context:

1) number of friends in the conference before it began: open-ended
2) number of people known in the conference before it began: open-ended

Data Collection Procedures

The questionnaire technique of survey research was employed to collect data on these variables. Survey research is one of the most effective methods for collecting descriptive and correlational data about respondents' experiences and attitudes, which are the two primary objectives of this study (Borg, and Gall, 1996). The questionnaire technique of survey research was selected rather than the interview technique because of the researcher's limited access to the all members of the sample: A majority of the sample was enrolled in courses that were being delivered at a distance. Only one class in the sample was enrolled in classroom-based courses that used CMC to support interaction.

Sample

The accessible population for this study was identified through Academic Technologies for Learning's list of distance and distributed education courses offered by the University of Alberta (http://www.atl.ualberta.ca/disted). This list includes the educational technologies that are used in the delivery of instruction, the term in which the courses are offered, and the language of instruction. All courses on this list that used computer conferencing in delivery, that were being offered in the winter term of 2000, and that were offered in English were selected for inclusion in the sample. From this initial sample of 63 courses, 10 courses met the 3 requirements described above. Of these ten, eight classes participated in the survey. Faculty in the two remaining courses declined to cooperate in the administration of the survey. The eight courses included three from the Faculty of Education, three courses from the Faculty of Extension's Government Studies program, and one course each from the Faculty of Human Ecology and St. Stephen's College (see Table 2).

Table 2

Respondent Characteristics

Course Code	Faculty	Instructional Strategy	% for participation	Enrollment
EDAL 547	Education	peer help[a]	0	12
EDPY 497	Education	peer help, course content discussion[b]	15	48
EDIT 535	Education	peer help; course content	15	51
EDIT 572	Education	no specified purpose[c]	0	10
EDIT 489	Education	course content discussion	30	12
3224	Extension	course content	0	8

Course Code	Faculty	Instructional Strategy	% for participation	Enrollment
		discussion		
3225	Extension	course content discussion	0	7
3226	Extension	course content discussion	0	6
4221	St. Stephen's College	course content discussion	0	15
TCC 270	Human Ecology	course content discussion	0	12

Note.

[a] "Peer discussion" denotes an unmoderated discussion in which students were encouraged to seek answers to technical and content questions from other students.

[b]"course content discussion" denotes a moderated discussion forum in which the instructor and the students posted their thoughts concerning issues raised in the course.

[c]"no specified purpose" denotes computer conferences which were available to students, but were not official required.

Questionnaire

A message was posted to each to the conference boards soliciting participation in the survey (see Appendix A). The message briefly described the nature of the study and included a hyperlink to the questionnaire website. During the first two-weeks of data collection, 50 students or 26.04% of the sample (n =192) responded to the survey. At the beginning of the second week, an additional message was added to the conference offering a draw for dinner for two at a local restaurant, or the equivalent cash value, for participation. Ten more students responded, bringing the response rate to 60, or 31.25%. As a final strategy to increase the response rate, a personalized email was sent to each of the students in all eight classes reiterating the earlier requests for participation. At the

conclusion of data collection four-weeks later, 74 students (40.88%) had responded to the survey.

Data was collected using a 32-item questionnaire presented to the students online (see Appendix D). The questionnaire was divided into four sections. In the first section, students were asked to provide their first and last names and the registrar's code for the course in which they were enrolled. In the second section, nine questions were presented to gather data on the three contextual variables described earlier. In the third section of the questionnaire, students were asked to rate the frequency of 15 types of communicative expressions provisionally subdivided into three broad categories. The categories and their representative types of expressions have been described earlier in this chapter. Students were also presented with an open-ended question in this section that read: "If there were other types of behaviors that you feel had an influence on the social environment of the conference, describe them below." In the final section of the questionnaire, students were asked for their perceptions of the social environment as described earlier in this chapter. This section concluded with an additional open-ended question that read: "You may use the space below to submit any additional comments."

This questionnaire was a revised version of an earlier form that was pilot tested on 12 students. Three changes were made following the pilot test. First, the five-point Likert scale used in the social expression section was amended to a four-point scale. The five-point semantic differential scale was also reduced to a four-point scale. Second, the original version contained multiple forms of the social presence semantic differential items. Respondents indicated that they resented being asked the same question multiple times and that these additional items discouraged them completing the questionnaire.

Third, the phrasing of some of the questions was changed to resolve ambiguities in interpretation by respondents.

Data Analysis Procedures

This study includes both descriptive and causal-comparative objectives. Question 1, "What are students' perceptions of the social environment of the conference?" requires descriptive analysis. The data for this question comes from section four of the questionnaire in which students are prompted with the following statement: "In general, the social environment of the conference was:" to which they respond via the four-point semantic differential scale. The four points of the scale are originally coded as 1, 2, 3, and 4 proceeding from the adjective pair "warm" to the adjective pair "cold." To simplify interpretation, these items will be recoded so that strong agreement with "warm" corresponds to a score of four, and strong agreement with the adjective "cold" corresponds to a score of one. This procedure applied to all six dimensions of the social presence scale. Descriptive statistics including means and standard deviations for the six items will be calculated. Additional descriptive information will be provided by transforming the four-point interval scales into two nominal categories. For example, scores of one and two will be recoded to "cold;" scores of three and four will be recoded to "warm." Frequency and percentage distributions will then be presented for these nominal categories.

Question two, "What types of social communication do students exchange in this environment" also requires descriptive analysis. Data for this question is gathered in section 3 of the questionnaire in which students are asked to rate the frequency with which the 15 social expressions are exchanged in the conference using a four-point scale.

Data from the students' responses are initially recorded in the form of 1, 2, 3, and 4 corresponding to the frequency categories "almost always," "frequently," "rarely," and "never." To facilitate interpretation, data will be recoded so that an increase in frequency corresponds to an increase in number, i.e., "almost always" will be recoded from one to four. To analyze this data, frequencies will be tallied indicating how often the respondents perceive each of the individual expressions to be occurring.

The third and fourth research questions are, respectively, "Which types of social communication have are positively related to the students' perceptions of the social environment of the conference?" and "Does the instructional, technological, and relational context in which the conference operates influence this relationship?" Each of these questions involves inferential statistical analysis. Analysis will begin with question three. For each social expression, subjects will be divided into two groups: those who perceived the expression to be occurring frequently, and those who perceived the expression to be occurring infrequently. These two groups will be obtained by merging the four frequency categories into two nominal categories. Then, a grand social presence score will be calculated by summing the scores on the six social presence dimensions. Analysis of variance (ANOVA) will be used to explore the hypothesis that social presence means will be higher for groups who perceive the social expressions to be occurring frequently. Statistical analysis of question four will proceed in a similar manner. Respondents will be categorized based on their responses to the eight contextual questions in section one of the questionnaire, and ANOVA will be used to compare social presence means between these groups.

Before the individual ANOVA's for questions three and four begin, a factorial multivariate analysis of variance (MANOVA) will be performed to determine whether there are significant main effects for a linear combination of the dependent variables (i.e., the six social presence items) and a linear combination of the 15 independent variables (i.e., the 15 social expressions).

Research Design

The dependent variable in this study is social presence, measured along six dimensions. There are two sets of independent variables hypothesized to be related to the dependent variable. The first is social expressions of which there are 15, conceptually grouped into three categories--affective, interactive, and reinforcing. Each of the expressions has two levels--frequent and infrequent. The second independent variable is context, which has been divided into three categories--technological, instructional, and relational. This results in a 15 (social expressions) x 2 (frequent/infrequent) x 3 (instructional, technological, and relational context) factorial MANOVA design.

Limitations of study

The research goals of this study are descriptive and correlational. The proposed design will not justify causal conclusions. Any effects of the independent variable on the dependent variable will be regarded as coincident rather than causal. Also, the tools used to assess perceptions of social presence and frequency of social expressions are both subjective. Further, there is no reliability or validity data available for either of the measures. Therefore, measurement error will be an influential factor in the analysis of data.

Summary

Although computer conferencing has been used in educational settings for over a decade, few systematic research studies have been published on the topic. Mason and Romiskowski (1996) conducted a review of CMC research and offer the following description:

> Examination of these materials finds many of them to be anecdotal in nature, written by pioneers in implementing CMC technology for educational purposes, promoting the exciting educational possibilities of this new medium, and reporting case descriptions of their own experiences with these innovations. (p. 442).

Not discounting the value of this literature, the effective implementation of computer conferencing will benefit from more programmatic investigation. This exploratory study employs quantitative methods to achieve two objectives. The first is to provide descriptive information about students' impressions of the social environment of computer conferences and the types of social communication that they exchange. The second objective is to explore a possible relationship between these two variables. This relationship is regarded in the technological, relational, and instructional context in which the conferences occur. It is hypothesized that after accounting for contextual variables, an increase in the perceived frequency of 15 types of social expressions will be related to more positive perceptions of the social environment.

Chapter 4: Results

Overview of Statistical Procedures

The first section of this chapter describes the response rate to the survey, and presents descriptive statistics for the three issues presented above. Frequency and percentage distributions will be used to summarize the students' contextual characteristics. Means and standard deviations will be used to summarize responses to the questions on perceived frequency of the social expressions and student perceptions of social presence. The second section of this chapter presents a statistical analysis of the relationship between social expressions, context and students' perceptions of social presence. Factorial multivariate analysis of variance (MANOVA) followed by a series of one-way analyses of variance (ANOVA) are computed to explore these relationships. In the final section of this chapter, responses to the open-ended questions are analyzed.

Descriptive Statistics

Response Rate

181 students were enrolled in the 10 courses in the sample. Of these students, 74 responded to the online survey yielding a final response rate of 40.88%. It should be noted that this ratio involves the assumption that 100% of the students in the sample saw the request for participation posted in the conferences.

Contextual Issues

The course level of the respondents was determined through an examination of their course code. The frequencies and percentages of graduate, undergraduate, and certificate course students are presented in Table 2.

Table 2

Distribution of respondents by course level

	f	%
graduate	31	41.9
undergraduate	27	36.5
certificate course	16	21.6
total	74	100

Question two asked respondents from where they typically accessed the discussion forum. Response options were *home, school,* or *work.* Frequencies and percents are presented in Table 3.

Table 3

From where did you typically access the discussion forum?

	f	%
Home	30	40.54
School	11	14.86

Work	15	20.27
Missing	18	24.32
Total	74	100

In question three, respondents were asked about the speed of their modem connection. Options ranged from *14.4 kilobytes per second (kps)* to *T1 (university computer lab)* and included *not sure.* Frequencies and percentages for this question are presented in Table 4.

Table 4

What is the speed of your modem connection?

	f	%
28.8	7	9.5
56.6	23	31.08
cable modem	7	9.5
High-speed (ISDN)	9	12.16
T1 (university computer lab)	16	21.62
not sure	12	16.21
Total	74	100

In question four, students were asked whether their access to the discussion forum was *strictly limited, somewhat limited* or *unlimited.* 73% of students reported that their access to the conference was *unlimited.* All frequencies and percentages of their responses to this question are presented in Table 5.

Table 5

Your access to the discussion forum (based on cost, proximity of logon locations, availability, and any other factors) is:

	f	%
Strictly limited	1	1.4
Somewhat limited	19	25.7
Unlimited	54	73
Total	74	100

In question five, respondents were asked what percentage of their final mark was based on participation in the online discussion. Responses to this open-ended question ranged from 0% to 30%. 54.06% of respondents indicated that 10% or less of their final mark was based on participation in the conference. All frequencies and percents for this question are presented in table 6.

Table 6

Participation in the discussion forum accounted for what percentage of your total mark?

	f	%
0	22	29.73
5	6	8.11
10	12	16.22
15	10	13.51
20	13	17.57

30	2	2.70
Missing	9	12.16
Total	74	100

In questions six and seven, respectively, respondents were asked how many students in the conference they knew and were friends with before the conference began. The range for *know* was 0 to 20, with the most frequent response being 1 (f = 39). The range for *friends* was 0 to 8. The most frequent response was 0 (f = 48).

In question eight, respondents were asked who moderated the discussion. Response options included *course instructor, teaching assistant, students,* and *guest moderators.* Respondents were allowed to select multiple options if appropriate. 83.78% of respondents indicated that the course instructor moderated the conference. Frequencies and percents for this question are presented in Table 7.

Table 7

Who moderated the conference?

	f	%
Course instructor	62	83.78
Teaching assistant	11	14.86
Other students	8	10.81
Guest moderators	3	4.05
Missing	1	1.35

On question nine, respondents were asked how many hours they spent participating in the conference discussion per week. Fifty percent of the respondents

participated one hour or less per week. Sixty-three percent of the respondents participated three hours or more per week. All frequencies and percentages for this question are presented in Table 8.

Table 8

On average, how many hours per week did you spend participating in the online discussion?

	f	%
0	4	5.41
.25	4	5.41
.5	9	12.16
1	20	27.02
1.5	3	4.05
2	11	14.86
3	7	9.46
4	4	5.41
5	2	2.7
6	2	2.7
7	2	2.7
10	2	2.7
11	1	1.4
Missing	3	4.05

In question ten, respondents were asked what types of instructional activities they engaged in in the computer conference. Five response options were provided: *responded*

to questions by the moderator, responded to questions from other students, broke into groups and worked on problems, or *participated in debates.* An *other* option was also available to students. Highest frequencies were reported for the option *responded to questions from other students* (f = 58). All frequencies and percentages for this question are presented in Table 9.

Table 9

What type of activities did you engage in in the conference? (check all that apply)

	f	%
Responded to questions from moderator	47	63.51
Responded to questions from other students	58	78.38
Broke into groups and worked on problems	7	9.46
Participated in debates	0	0
Missing	8	10.81

This section has presented descriptive information concerning the contextual issues addressed in the questionnaire. The next section presents descriptive information concerning the perceived frequency of the social expressions.

Communicative Expressions

The second stage of the analysis focused on the reported frequency of the 15 types of social expressions. Respondents were asked to rate the frequency of the social expressions using a four-point scale. The four options on the scale were *almost always, frequently, rarely,* and *never.* The 15 social expressions and the abbreviations used to identify them in tables and figures in this chapter are presented in table 10.

Table 10.

The 15 social expressions and their abbreviations

1. *addressing others by name* (NAME)
2. *complimenting* (COMP)
3. *expressing agreement* (AGRE)
4. *expressing appreciation* (APRC)
5. *using the reply feature to post messages* (RPLY)
6. *referring explicitly to the content of others' messages* (REFR)
7. *using software features to quote from others' messages* (QOTE)
8. *asking questions of other students* (QEST)
9. *use of informal register* (NFRM)
10. *expression of emotions* (MOTE)
11. *use of humor* (HAHA)
12. *salutations* (SLTE)
13. *use of personal examples* (XMPL)
14. *chitchat* (CHAT)
15. *self-disclosure* (SELF)

The number of students who rated an expression as occurring *almost always* or *frequently* was largest for *expressing agreement, posting a message by using the reply feature,* and *addressing others' by name* (see figure 1). The number of students who rated an expression as occurring *rarely* or *never* was largest for *chitchat, self-disclosure,* and *expressions of emotions.*

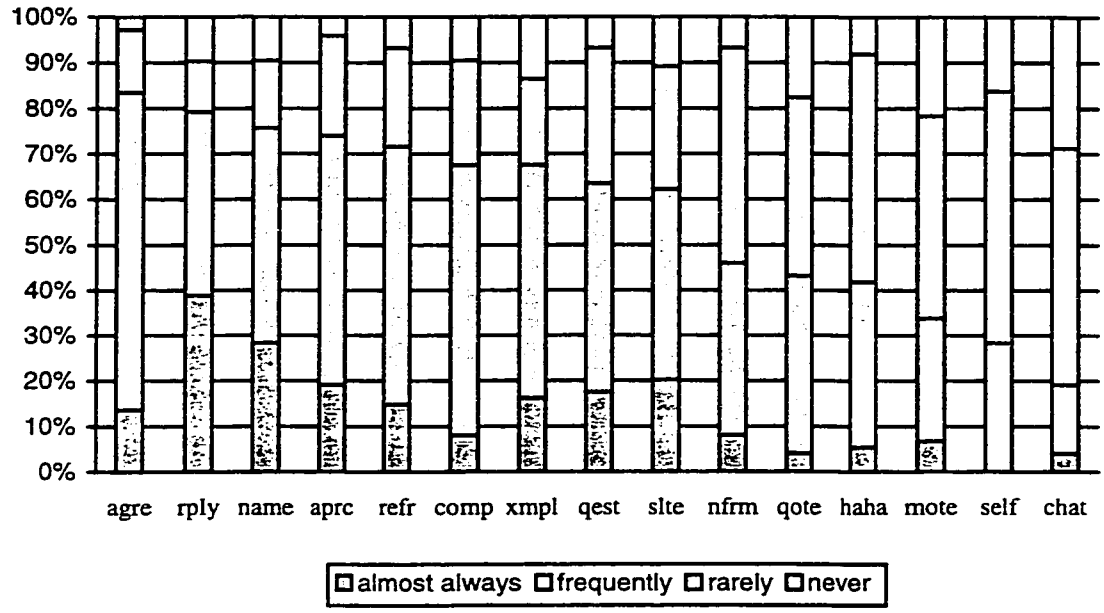


Figure 1. Percentage distribution for frequency of 15 social expressions.

For further analysis, the four frequency categories of the social expressions were collapsed into two nominal categories. *Almost always* and *frequently* were recoded to *frequent,* and *rarely* and *never* were recoded to *infrequent.* Data from this transformation are discernable in Figure 1.

This section has provided descriptive information on the perceived frequency of the 15 social expressions. The next section provides descriptive information on the students' perceptions of the social environment of the conference.

Students Perceptions of Social Presence

The third stage of the analysis focused on the students' perceptions of social presence. Students were presented with the prompt: "In general, the social environment of the conference was:" followed by a four-point semantic differential scale consisting of

six adjective pairs. The adjective pairs were *warm/cold, friendly/unfriendly, close/distant, trusting/untrusting, disinhibiting/inhibiting,* and *personal/impersonal.*

Means and standard deviations for each of the six dimensions of social presence are presented in table 11.

Table 11

Means and standard deviations for six dimensions of social presence.

	Friendly	warm	trusting	personal	disinhibiting	close
M	3.47[a]	3.16	3.07	2.73	2.74	2.37
SD	0.67	0.65	0.61	0.88	0.72	0.72

Note.
[a] Highest possible score is 4.

The items were then recoded into nominal categories so that the responses could be interpreted as either positive or negative: Scores of one and two were interpreted as negative, and scores of three and four were interpreted as positive. The percentage of students who responded positively to the items *Trusting, Warm, Friendly, Disinhibiting,* and *Close* were, respectively, ([n = 73] 89%, 89%, 84.9%, 66%, 62.2%, 47.2%). Frequency distributions of this data are presented in figures 2 through 7.

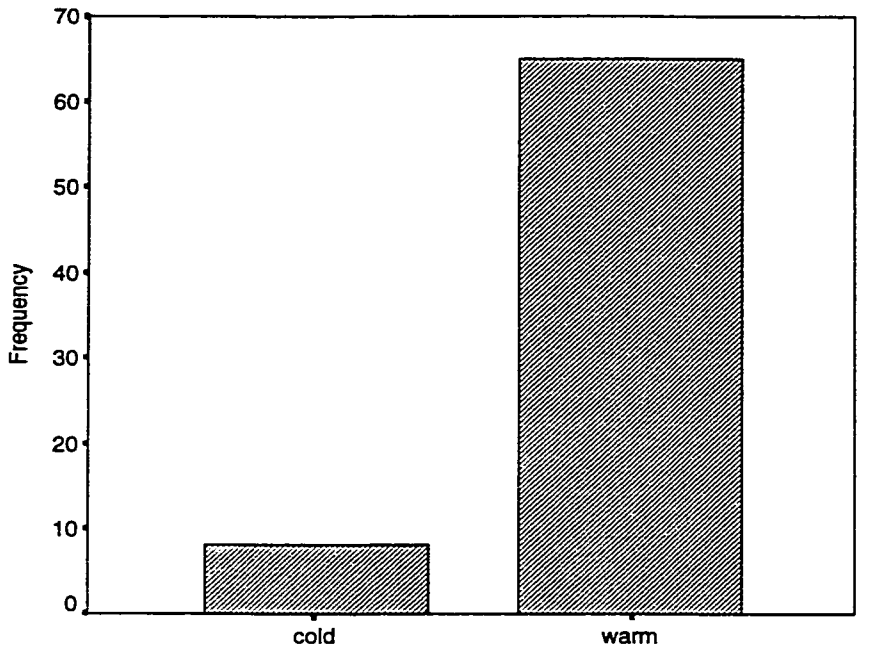


Figure 2. Frequency of students who perceived conference as "warm" or "cold.

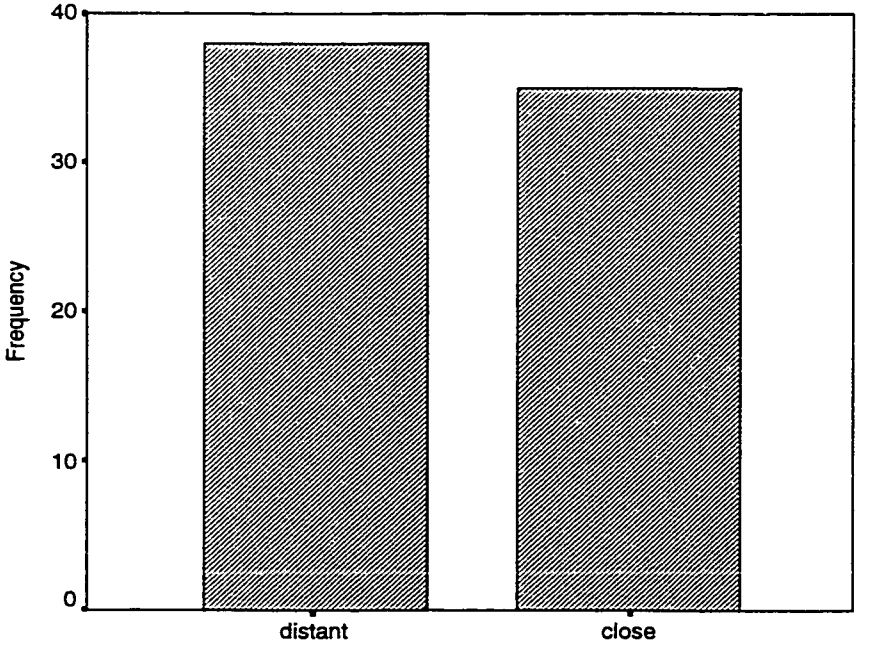


Figure 3. Frequency of students who perceived conference as "close" or "distant."

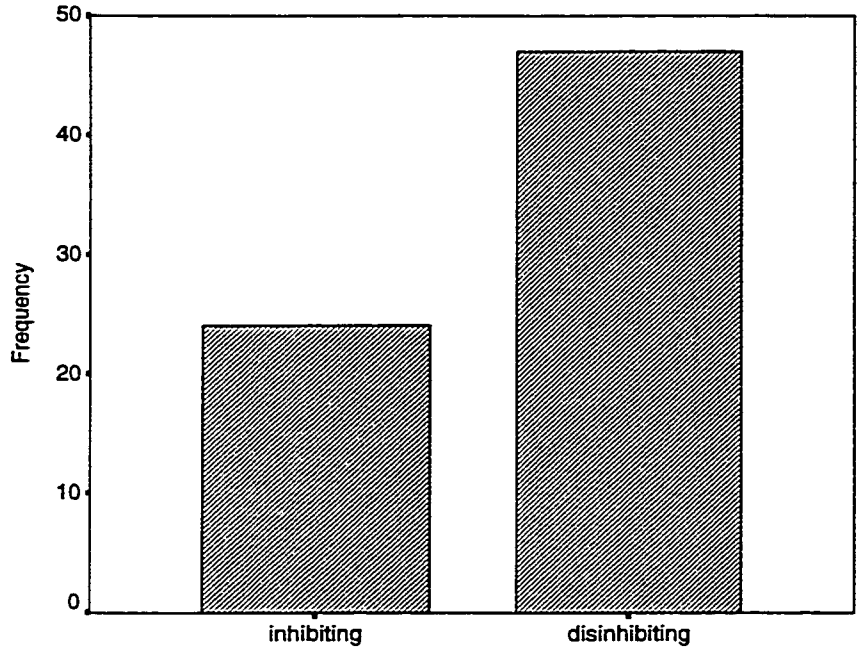


Figure 4. Frequency of students who perceived conference as "disinhibiting or "inhibiting."

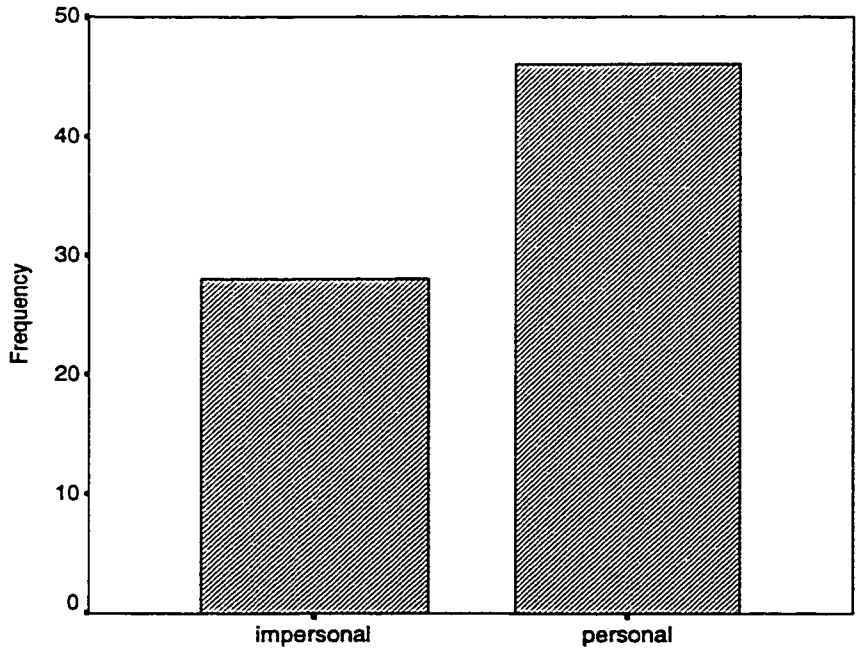


Figure 5. Frequency of students who perceived conference as "personal" or "impersonal".

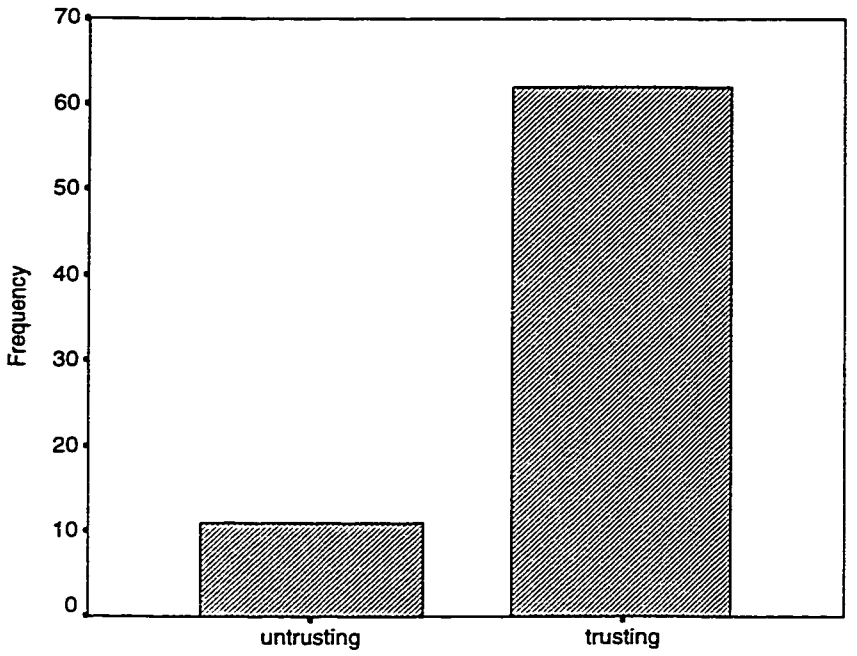


Figure 6. Frequency of students who perceived conference as "trusting" or "untrusting."

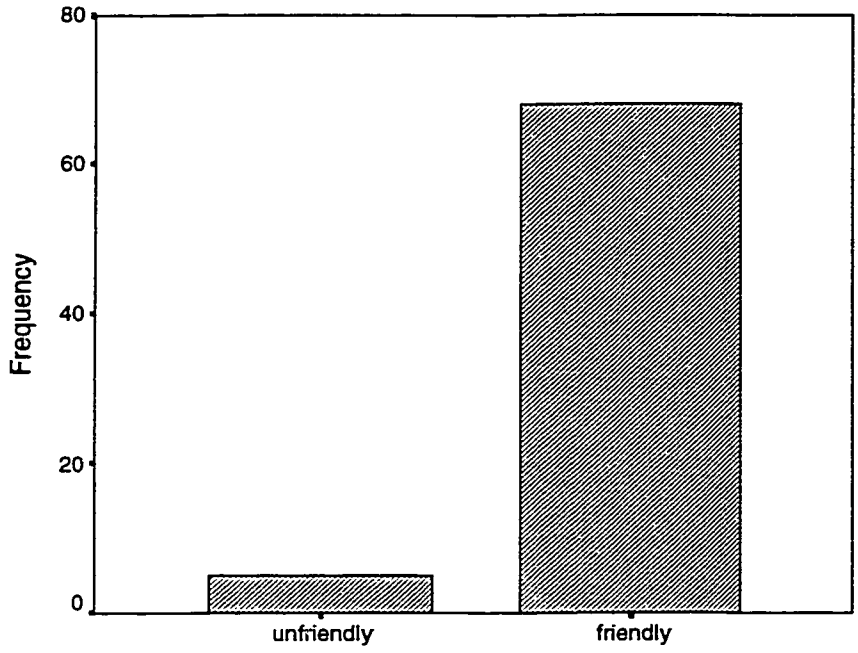


Figure 7. Frequency of students who perceived conference as "friendly" or "unfriendly."

This section has presented a descriptive analysis of the students' perceptions of the social dimensions of the conference. In the next three sections, an analysis of the relationship between context, frequency of social expressions, and perceptions of social presence is presented.

Inferential Statistics

A factorial MANOVA was proposed to examine the relationship between linear combinations of the independent variables and a linear combination of the dependent variables. The 15 social expressions, each with two levels (frequent and infrequent) were represented as one set of factors in the model, and the nine contextual variables represented another set of factors. However, because only 74 students responded to the

questionnaire, this analysis, which requires a minimum of five subjects per cell was not possible. Therefore, an alternative analysis was undertaken to explore the relationship between the two sets of independent variables on social.

To begin the analysis, frequency scores for each of the social expressions were summed to yield a grand total for frequency of all social expressions. Similarly, scores on the six social presence dimensions were summed to yield a grand social presence total for each respondent. These figures were used to calculate a gross correlation between the frequency of social expressions and social presence. The Pearson Product-to-Moment Correlation between these two variables was $\underline{r} = .40$, $p < .001$, r squared = .16 (see Figure 8).

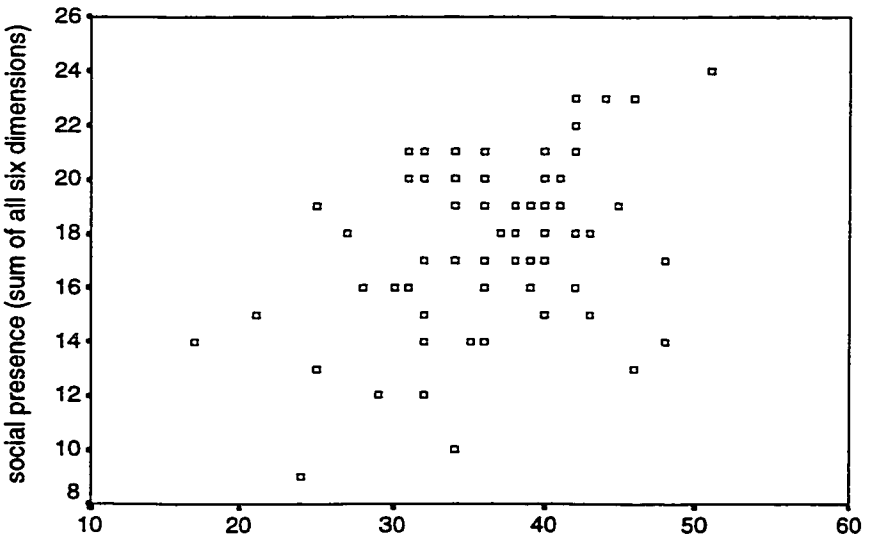


Figure 8. Correlation between social expressions and social presence.

A factorial MANOVA was then conducted in which the six dimensions of social presence acted as the dependent variables and the 15 social expressions represented the independent variables. Each social expression had two levels--frequent and infrequent. Only the main effects between the independent variables the dependent variables were studied.

Tests of homogeneity of variance showed that the assumption was satisfied for all six dependent variables (*warm/friendly/trusting/personal/disinhibiting/close*). The dependent variables were found to be significantly correlated as tested by Bartlett's test of sphericity (Chi Square = 86.47, $p < 0.001$). However, there was no problem of multicolinearity in the data.

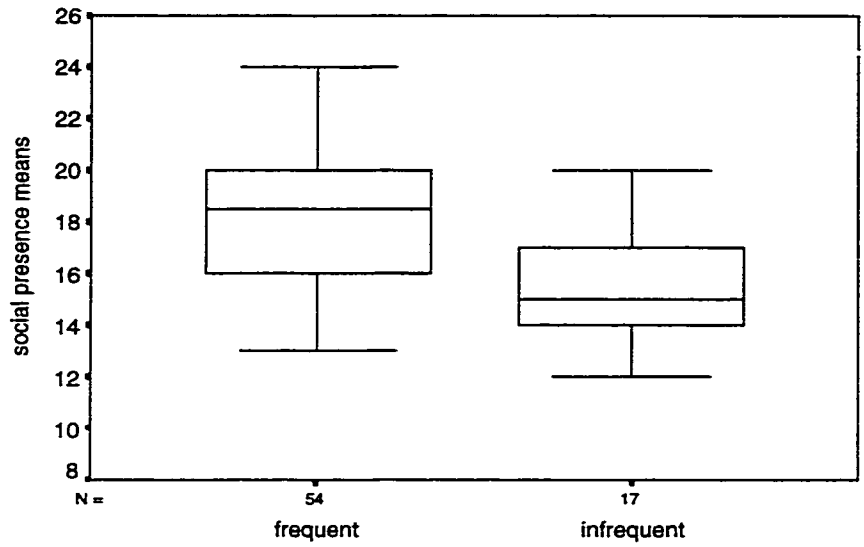
The results of the factorial MANOVA reveal a main effect for social presence by social expressions. The social presence means for groups who perceived the social expressions to be occurring frequently were higher than the means for groups who perceived the expressions to be occurring infrequently ($F[6,47] = 137.60$, $p < 0.001$, eta squared = .95). The significant result of the MANOVA prompted a series of one-way ANOVA's to determine the relationship between each social expression and social presence.

ANOVA: Social Presence by Social Expressions

To begin this analysis, scores for each of the social presence dimensions were summed to provide one social presence total. A series of one-way ANOVA's were then used to test the null hypothesis that social presence means would be equal across two frequency levels of the 15 social expressions. The two frequency levels were frequent

(FREQ) and infrequent (INFR), computed by recoding the original frequency categories (almost always, frequently, rarely, never) into the two categories. This procedure was undertaken because of the small n of some of the frequency categories for some of the social expressions.

The null hypothesis tested with this procedure is that social presence means will be equal for both social expression frequency groups. The null of equality of social presence means was rejected for the social expressions *addressing others by name, complimenting, expressing appreciation, posting messages using the reply feature, expressing emotions, use of humor, and salutations.* The null of equality of social presence means could not be rejected for *expressing agreement, referring explicitly to the content of others' messages, using software features to quote from others' messages, asking questions of other students, using informal register, use of personal examples, chitchat, and self-disclosure.* Means, F-values, and p values for significant and non-significant differences are presented in figures 9 through 23.



F(1,69) = 10.69, $p < .01$, eta squared = .13

Figure 9. Social presence means by two levels of *addressing others by name*

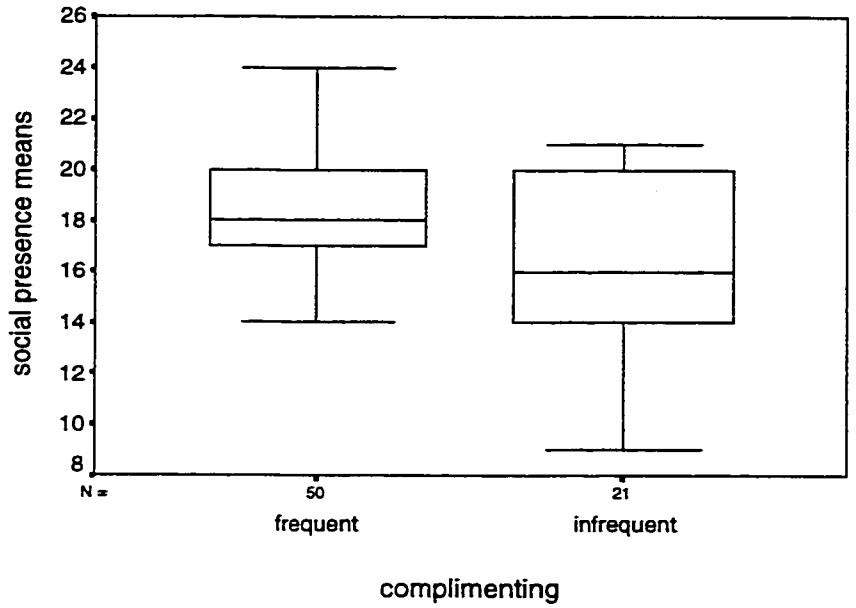


Figure 10. Social presence means for two levels of complimenting.

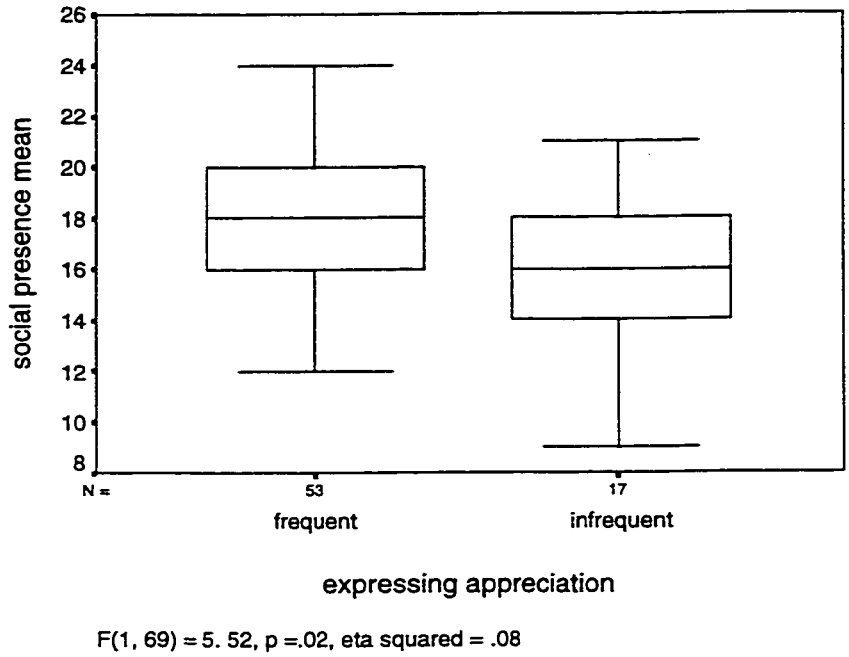


Figure 11. Social presence means for two levels of expressing appreciation.

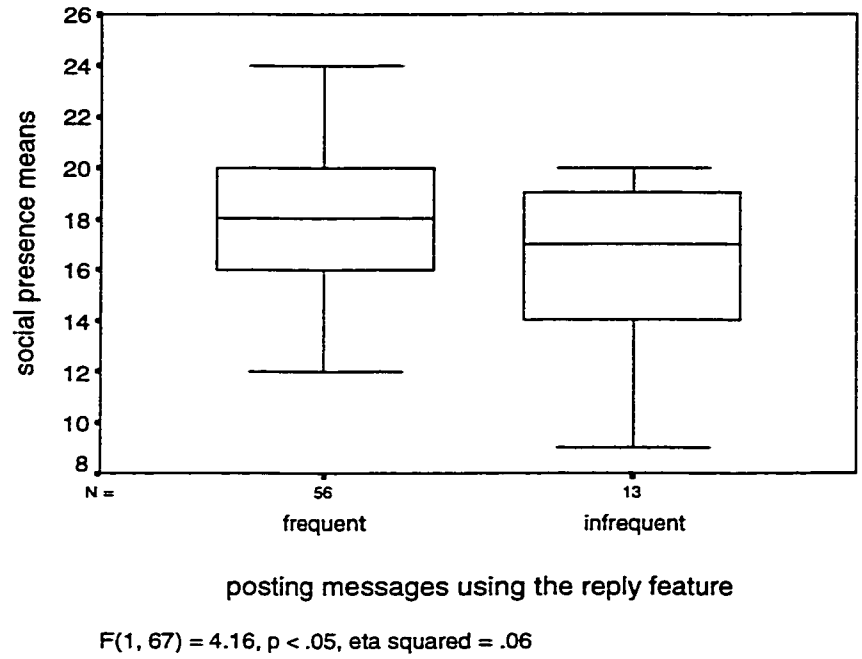


Figure 12. Social presence means for two levels of posting messages using the reply feature.

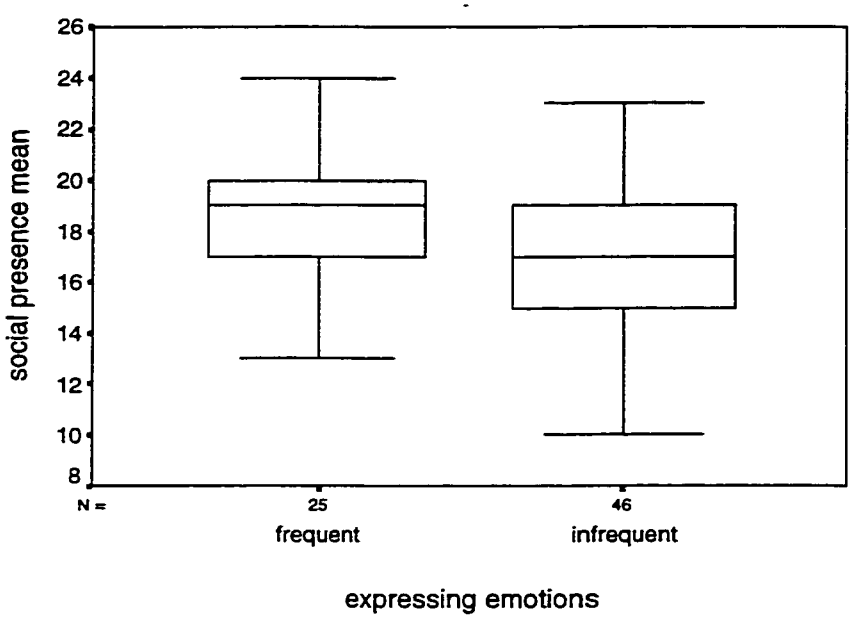


Figure 13. Social presence means for two levels of expressing emotions.

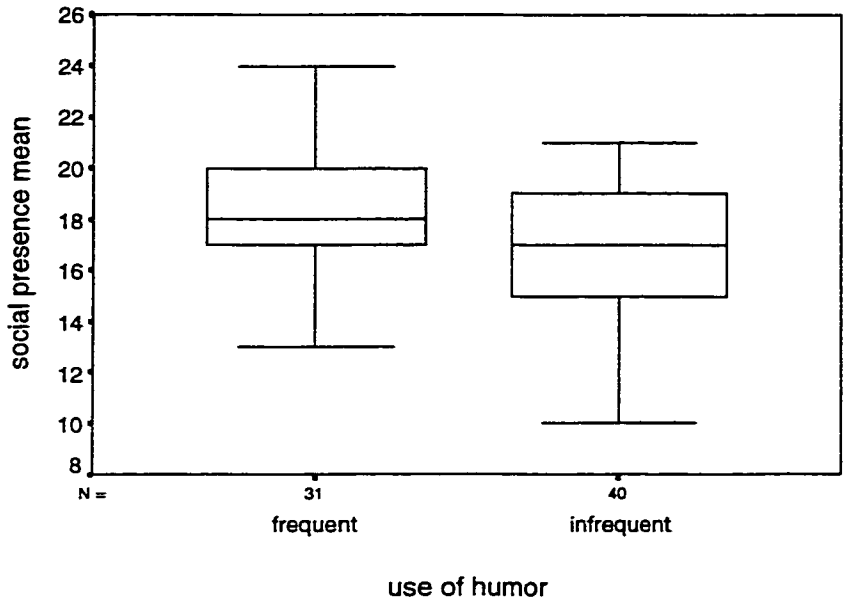


Figure 14. Social presence means for two levels of use of humor.

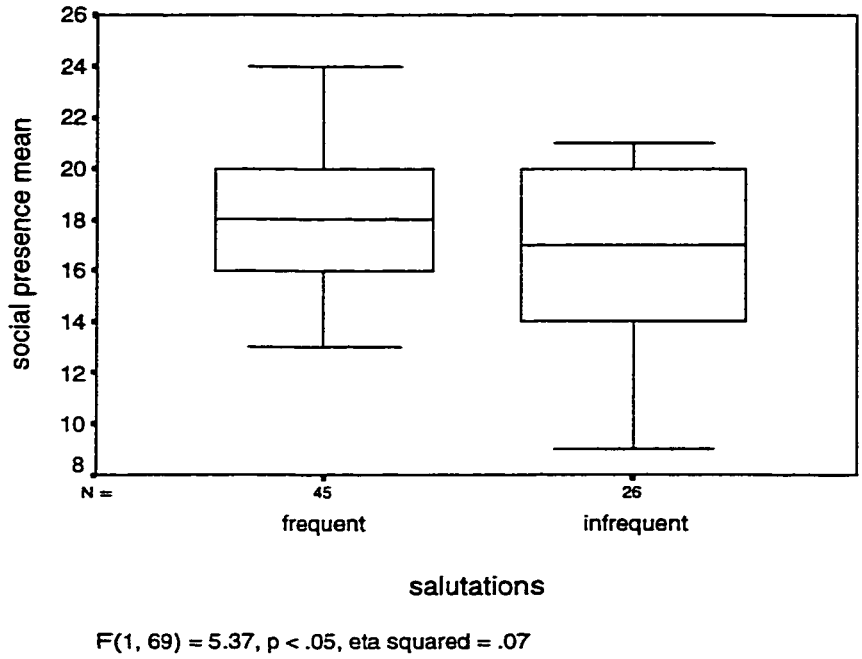


Figure 15. Social presence means for two levels of salutations.

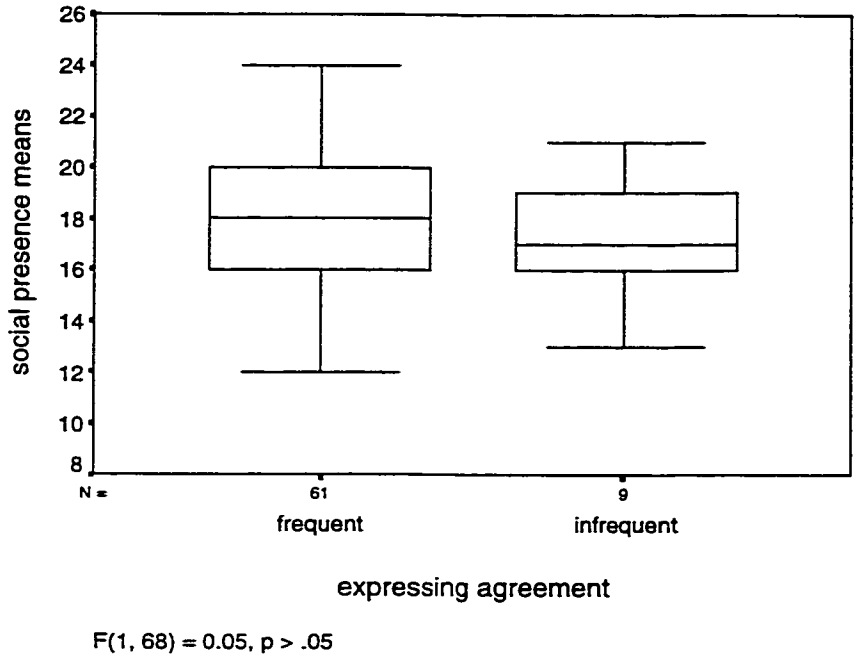


Figure 16. Social presence means for two levels of expressing agreement.

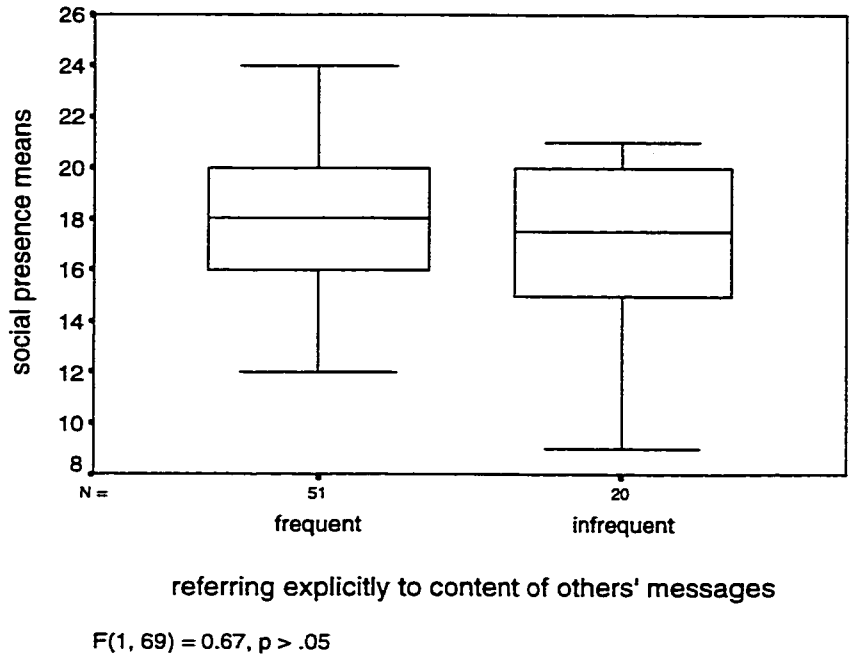


Figure 17. Social presence means for two levels of referring explicitly to content of others messages.

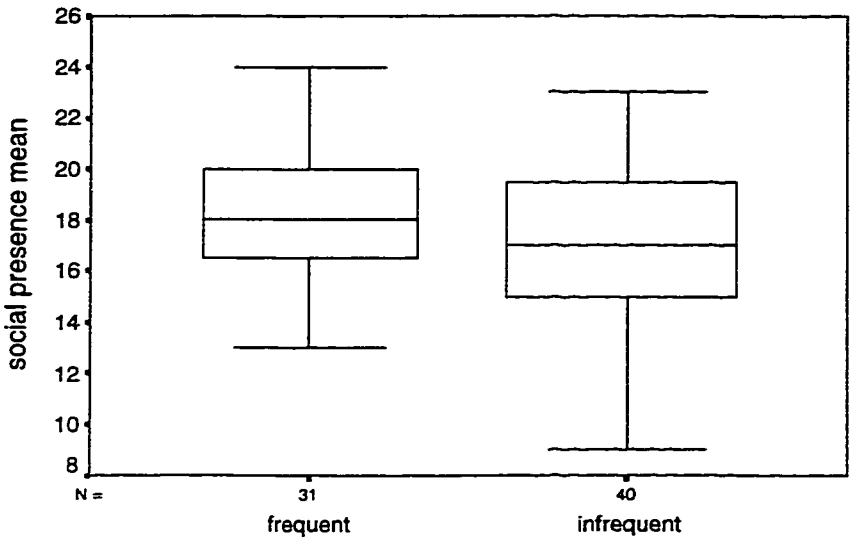


Figure 18. Social presence means for two · levels of using software features to quote from others' messages.

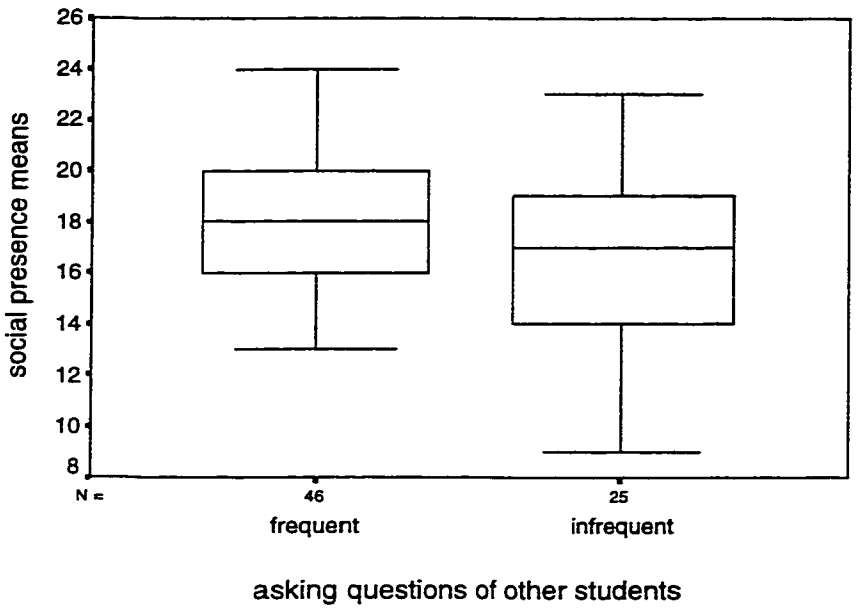


Figure 19. Social presence means for two levels of asking questions of other students.

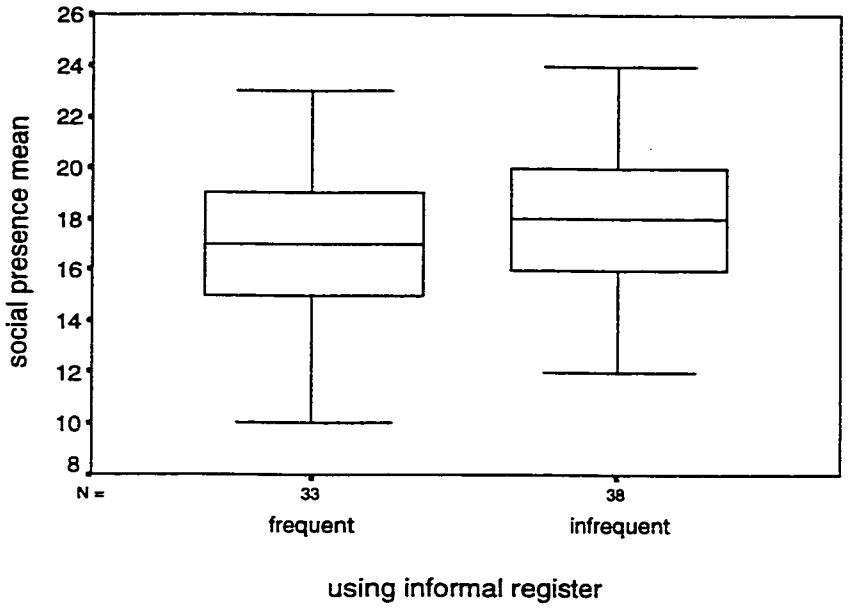


Figure 20. Social presence means for two levels of using informal register.

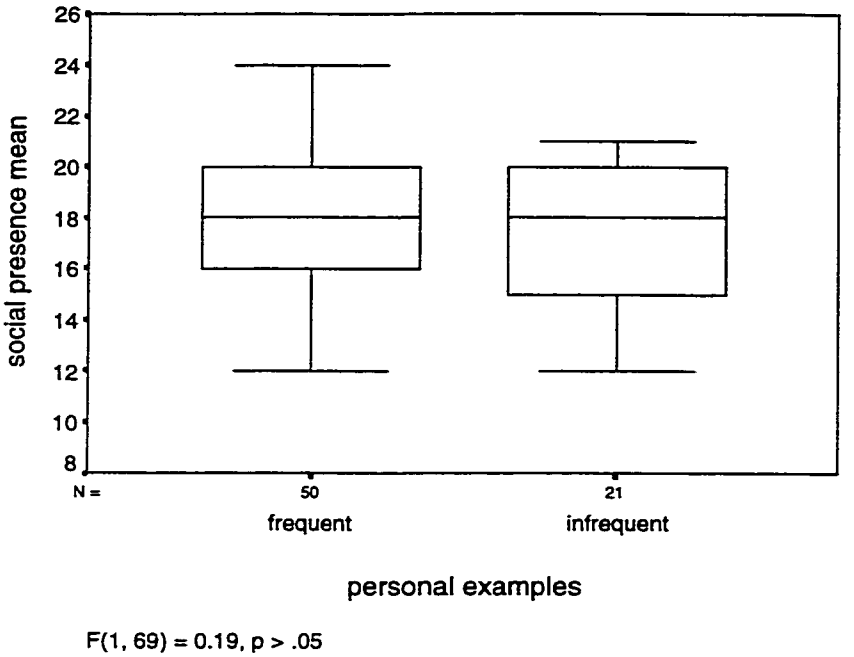


Figure 21. Social presence means for two levels of personal examples.

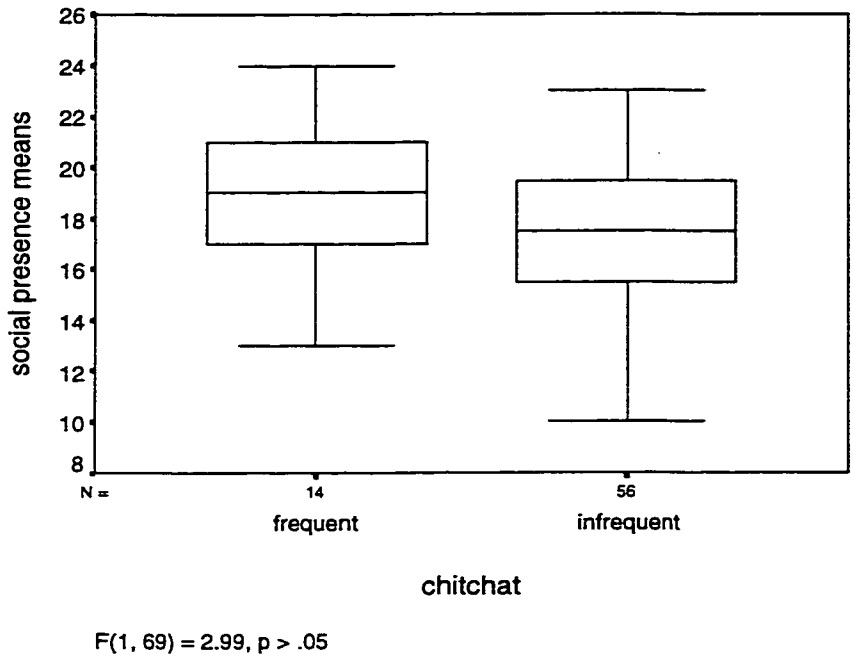


Figure 22. Social presence means for two levels of chitchat.

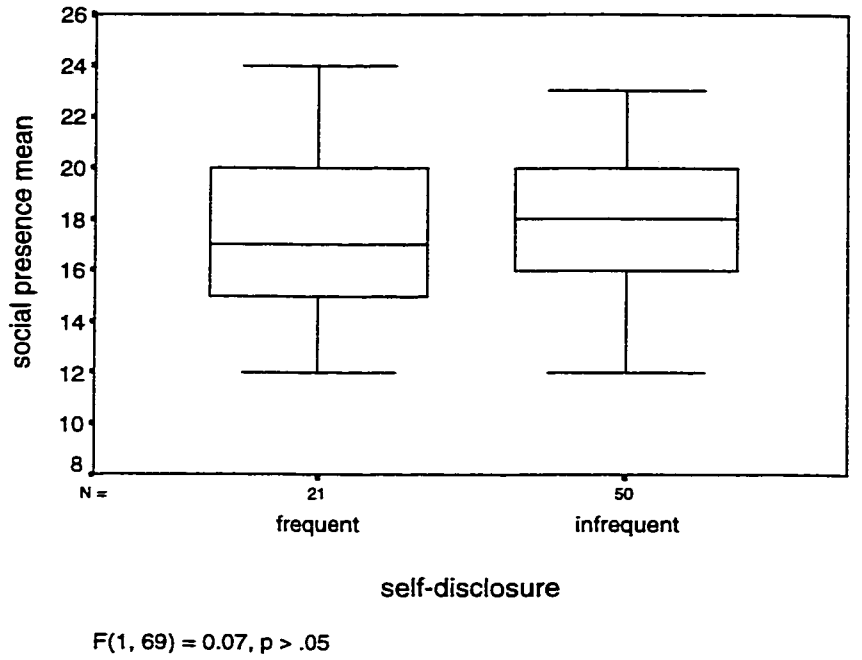


Figure 23. Social presence means for two levels of self-disclosure.

Contextual Variables and Social Presence

Factorial ANOVA was used to compare *social presence* means for each of the contextual variables, including *course level* (LEVEL), *location of access* (WHERE), *speed of connection* (SPEED), *number of acquaintances in conference* (KNOW), *number of friends in conference* (FRIENDS), *moderator of conference* (MODERATOR), *hours spent in conference per week* (HOURS), *and types of conference activities* (ACTIVITY). The null hypothesis predicted that *social presence* would be equal across of levels of each variable. The null hypothesis could not be rejected ($F[1, 42] = 1.58$, $p = .23$).

Contextual Variables and Social Expressions

Factorial ANOVA was used to compare *social presence* means for each of the contextual variables, including *course level* (LEVEL), *location of access* (WHERE), *connection speed* (SPEED), *number of acquaintances in conference* (KNOW), *number of friends in conference* (FRIENDS), *moderator of conference* (MODERATOR), *hours spent in conference per week* (HOURS), *and types of conference activities* (ACTIVITY). The null hypothesis predicted that *social presence* would be equal across levels of each variable. The null hypothesis was not rejected ($F[1, 43] = 1.42$, $p = .19$).

Open-ended questions

Seventeen students responded to the two optional open-ended questions, which read: "If there were other types of behaviors that you feel had an influence on the social environment of the course, describe them below," and "You may use the space below to add any additional comments." Responses to the two questions were combined for analysis because of the considerable amount of overlap in their content and themes. Two distinct themes were prominent among the comments. In the first theme, students indicated that the form and frequency of social communication had a differential effect on two functions of social presence. A second theme was the students' emphasis on the role of the moderator in establishing communication norms.

The two functions of social presence discussed by Garrison et al. (2000) are climate setting and supporting discourse. Student comments indicated that a moderate amount of social communication supports both of these functions. On climate setting, students made comments such as: "I felt a sense of relief when others expressed feelings

of frustration because I was feeling the same way," or "It's been a good way to keep in touch especially since I'm on the East coast of the country," and "the humor was a nice way to relax the situation." On supporting discourse, students offered comments such as "I learned a great deal from this exercise and it was interesting to see the diversity of opinions." These comments suggest that open communication can help to set a climate that is conducive to to productive discussion.

However, when social communication overtook critical discourse as the predominant theme of messages or of the conference, some students became exasperated. One comment in particular illustrates this theme:

> The social environment is difficult to judge because on the one hand, the contributions were superficially friendly, but there was also an unwillingness to upset this friendly character by bringing up issues that might conflict with other's opinions. The character of communication was almost too nice to be useful. While I was not inhibited from commenting in general, I was reluctant to bring up points of dispute. The environment became much more social than useful in the exchange of ideas. I grew tired of the niceties of online protocol and wished that other participants would just get to the point.

The ideal situation, some felt, was to have two forums—a main forum for collegial but productive discussion, and an alternate forum for personal, affective chat. Several students made comments similar to the following: "This course has a virtual 'Pub,' and there was a more relaxed setting in that conference thread. This allowed for more casual conversation and left the other conference threads for educational discussions." In short,

these students seemed to be saying that social expressions are good if they further the goals of the course but are time—consuming and inappropriate otherwise.

The second theme concerned the influential role of the moderator in setting the conversational mood of the discussion. One student reported that "the tone and attitude of the instructor/moderator plays a key role, I believe, in the feeling/tone of the online environment. A relaxed style or an uptight style will rub off on the online participants." Another student's comments provided the evidence for this hypothesis: "We were asked to begin with a bio. The instructor included personal information in hers (an unsuccessful teaching experience, comments about her children etc.). I followed her lead and also used an informal tone, and so did the other participants."

Summary

This chapter has provided a detailed description of the analysis of the data collected through the questionnaire. The analysis was grouped into three main sections. First, descriptive information was presented that covered three areas—context, social presence, and social expressions. Second, the relationship between these variables was explored. In the final section, emergent themes from the open-ended questions were described. In the next chapter, these results will be interpreted in light of the original hypotheses and previous research.

Chapter 5: Discussion

Social Presence

The guiding hypothesis of this research was that the social environment of a computer conference can be influenced by the type and frequency of social communication exchanged by students. To explore this hypothesis, four questions were addressed. The first question was: "What are students' perceptions of the social environment of a computer conference? An overwhelming majority of students rated the social environment of the computer conferencing as *friendly*, *warm*, and *trusting*, and a majority of students perceived the environment as *personal* and *disinhibiting*. These results support findings by Beals (1991), Gunawardena (1997, 1998), Hara et al. (2000), Kanuka and Anderson (1998), McCormick and McCormick (1992), and Zhu (1996) who found that educational applications of computer conferencing are perceived by students as sociable environments that support interpersonal interaction. The pervasive notion that asynchronous, text-based communications technologies are unable to support social interaction is becoming untenable in the light of mounting evidence to the contrary. Authors who persevere with these claims should present evidence to support their anomalous findings. When students express dissatisfaction with computer conferencing, it is often because conferences are too social, not because they are too task-based (see for example Fabro and Garrison, 1998; Hara et al., 1999; Kanuka and Anderson, 1998).

The results contrast with the hypotheses of communication theorists who postulate that asynchronous, text-based communication is bound to be cold and terse and best suited to the efficient transmission of pragmatic information (Short et al., 1976; Sproull and Keisler, 1986). Walther (1996) observed this disparity of results and argued

that many experimental studies fail to consider important variables such as mode, purpose, and organizational context in which CMC is used. Media capacity theorists have concentrated their studies mainly on organizational settings, and include diverse modes of CMC such as bulletin boards, listserves, chat rooms, and email in the same category as computer conferencing (Rice, 1993; Rice and Shook, 1990). The growing body of results, including those from the current study, indicates that there may be important differences between these settings and educational settings. These differences, it appears, have an important influence on users' ratings of the sociability of computer conferencing.

Although the students found the environment warm, friendly, and trusting, less than half of the students reported that the conference was *close*. Responses to the open-ended questions provided insight into this observation. Many of the comments implied that the students were not seeking a *close* environment, and they evaluated this dimension of social presence negatively: "The course was well run and very professional. Everyone kept the postings very professional and somewhat *distant*" (italics added). The adjectives "professional" and "somewhat distant" appear to describe the type of environment that many students expect and prefer from an educational computer conference. Fabro and Garrison (1998) uncovered similar themes in their analysis of a computer conference in which students expressed frustration with a social environment that was overly polite. This theme reoccurred in the present study. Other comments indicated two possible explanations for this. First, the students often reported on the inordinate amount of time that the conference demanded. These students may have perceived the purely affective statements and messages as inefficient. One student commented: "I grew tired of the

niceties of online protocol and just wished that other participants would just get to the point." Some students made a clear distinction between the content forums and cafes. Although these students valued the sharing of personal information, they did not feel it was appropriate for the content forums. For many students, it seems, the appropriate environment is sufficiently social so that students are comfortable communicating with each other, but not overly, or purely social.

Many models of group behavior (Lundgren, 1977; Shutz, 1958) argue that successful groups pass through predictable stages of development. In the early stages, communication is friendly and cordial as members get to know one another. However, if collaboration is to be productive, interaction must become more challenging and confrontational (Fahraeus, 1999). Once groups move beyond the first stage, members should begin to exchange ideas, opinions, and feelings and maintain an appropriate balance between concern for task performance and relationships among members. A study by Hara et al. (2000) supports this analysis. They conducted a content analysis of a educational computer conference and found that the ratio of purely social communication to cognitive communication declined over time, and that this decline was associated with the development of strong relationships.

Social Expressions

The second question was: "What types of social communication do students exchange in text-based, asynchronous, educational settings? The most frequently occurring social expressions were *addressing others by name, posting a message using the reply feature*, and *expressing agreement.* The least frequently occurring social expressions were *chitchat, self-disclosure, and expressions of emotions.* These results are

to some extent consistent with Rourke et al. (1999). In the two conference transcripts that they analyzed, *addressing students by name* and *posting messages using the reply feature* were the most frequently occurring social expressions; *expressions of emotions* were the least frequently occurring. The results are also consistent with Fahraeus (1999) who found that the frequency of feedback and expressions of agreement were common in successful collaborative groups.

Social Expressions and Social Presence

The third question focused on the relationship between social expressions and students' perceptions of social presence. The results show that *addressing others by name, complimenting, expressing appreciation, posting messages using the reply feature, expressing emotions, using humor,* and *salutations* were positively related to social presence. Social presence means were highest for students who reported that these expressions occurred frequently or almost always. No significant differences were observed in social presence means for varying levels of the remaining eight social expressions, which include *expressions of agreement, referring explicitly to the content of others' messages, using software features to quote from others' messages, asking questions of other students, using informal register, chitchat, use of personal examples, and self-disclosure.*

The simplest interpretation of this result is that some types of social expression are more strongly related to the climate of the conference than others. However, there is evidence in the data for an alternative interpretation. Each of the social expressions was positively related to the students' perceptions of social presence; however, the differences were not statistically significant according to the results of the ANOVA. This may be due to the influence of two key operands in the calculation of ANOVA: individual

differences and measurement error. Many of the social expressions for which there was no significant difference had large within-groups variance. It can hypothesized that social expressions such as *humor* or *self-disclosure* are perceived and interpreted differently across individuals.

Based on the comments offered by the respondents, it can be postulated that there may be (at least) two different types of students who are participating in the computer conference. One group of students may select distance education because it has traditionally allowed students to work towards their goals independently, without having to interact with others. For this group, an increase in the frequency of social expressions would negatively influence their satisfaction. A second distinct group of students may find themselves in an independent study course longing for the social interaction that they are accustomed to in a face-to-face setting. For these students, an increase in the frequency of social expressions would have a positive influence on their satisfaction. It must be cautioned that this investigation was not designed to examine student satisfaction, and therefore this conclusion is offered tentatively.

There is support for this conclusion in the literature. Gee (1990) used the Canfield Learning Styles Inventory (CLSI) to examine the influence of learning style on student attitudes in on-campus versus distance education courses. The CLSI measures preferences in environmental conditions such as students' need for affiliation with other students and the instructor, and students' need for independence. Gee found that students who had an independent learning style preferred the distance education environments that had limited social interaction between students and teachers. Conversely, students who had a dependent, social learning style preferred the opportunity to work with others

offered by the on-campus environment. Diaz (1999) conducted a similar study in which he used the Grasha-Reichmann Student Learning Style Scale (GRSLSS) to investigate differences among students whom self-select into distance versus on-campus courses. The GRSLSS focuses on how students interact with the instructor, other students, and with learning in general. As Diaz describes it, "the scale addresses one of the key distinguishing features of distance courses--the relative absence of social interaction between instructor/student and student/student" (p. 133). Diaz found that the students who had selected distance education environments strongly favored independent learning styles, and that "this preference was well suited to the relative isolation of the distance learning environment" (p. 133). Students in the equivalent on-campus class, on the other hand, were significantly more dependent in their learning style and enjoyed sharing experiences with peers and teachers. Finally, Diaz also observed that the independent students were willing and able to participate in collaborative work, but only if it was tied to obtaining rewards. Perhaps there is an interaction effect between student satisfaction in computer conferencing and level of need for affiliation.

The second operand in the ANOVA equation is measurement error. The instruments used to assess both social presence and the frequency of social expressions are susceptible to measurement error. Both of the instruments ask for respondents' subjective perceptions of these phenomena; moreover, semantic differential adjective pairs such as "warm" and "cold" may prompt idiosyncratic interpretation among students. In fact, these differences in interpretation are one of the long-standing criticisms of the semantic differential technique (Borg and Gall, 1989). The combination of measurement

error and individual differences may have exceeded the influence of the treatment effects in this study.

Contextual Issues and Social Presence

The relationship between context and social presence was also explored in the data analysis. The interesting result is the lack of significant relationships between social presence and the contextual issues. Several early studies that examined user satisfaction with communications technology focused solely on contextual issues and reported significant results (Hiltz and Johnson, 1990, 1989; Rice, 1993; Rice and Love, 1987). However, the absence of significant relationship between context and social presence in this study may be attributed to the process of subdividing a small heterogeneous sample into multiple contextual groups.

Weaknesses of Study

The response rate for the survey was low. Ad hoc measures to increase participation such as personalized requests and incentives increased the response rate only marginally. Two factors were useful in increasing response rates. The researcher had face-to-face access to one of the classes, and for this group, the response rate was close to ninety percent. In another class, the researcher developed a committed working relationship with the instructor who was interested in the results of the study. For this group, the response rate was over eighty percent. Some of the remaining instructors had included computer conferencing in the delivery of their course in response to outside forces. These instructors were less enthusiastic about participating in the study and were not motivated to encourage their students to participate. Moreover, activity in these latter conferences was limited. When the researcher posted a request for participation in two of these conferences, it was the only message present. Subsequent researchers are

encouraged to target active discussion forums and develop sufficient levels of cooperation from instructors.

One problem with a low response rate is that it brings into question the randomness of the sample (Fraenkel and Wallen, 1996). This in turn has an adverse effect on the generalizability of the results. Researchers (Borg and Gall, 1989) suggest that when a response rate is low, the investigator should interview a selection of respondents who did not reply to the survey. However, the distant characteristic of this population, the timing of the study (which concluded at the end of the school year), and the lack of contact information available for this sample precluded this process. Fortunately, there was considerable variability in the contextual variables, suggesting that the sample was representative of a diverse population.

Another problem that resulted from the low response rate was the combining of many heterogeneous students into one group. This study combined one class that used computer conferencing as a supplement to face-to-face discussion, with other classes in which the students interacted with each other intermittently during the day, along with classes in which the students were completely at a distance. The original intent was to explore comparisons between these groups; however, the small enrollment in some courses and the low response rate made between-groups comparisons impossible. Many studies (see for example Fabro and Garrison, 1998; Kazmer, 2000) find that an initial, one-time meeting of distance students has a significant effect on subsequent mediated interpersonal interaction. Kazmer for instance recorded the following comments from his students: "The two-week introductory session really made a group out of us. Even though we are in different parts of the country, we made friends face-to-face during the first two

weeks. Then it is easy to maintain those relationships through your computer" (p. 11). Therefore, the combining of these distinct groups in one analysis was not ideal.

As discussed earlier, measurement error was a factor that may have concealed important, but subtle, effects in the data. The combination of two subjective measures, neither of which has established levels of reliability or validity may have confounded the interpretation of results. However, no psychometrically--robust means of assessing social presence currently exists, although the subject is garnering increasing attention (Lombard and Ditton, 2000).

A further measurement problem concerns the restricted range of the social presence and social expression scales. Semantic differential scales are generally constructed using seven-point scales (Borg and Gall, 1989); however, for this exploratory analysis, a four-point scale was used. Although others have successfully used five-point scales (Gunawardena and Zittle, 1997), the four-point scale is exceedingly restrictive and constrains the statistical techniques that may be meaningful applied to the results.

Practical Implications

Several of the students in this study commented that the moderator had an important role in establishing an environment that is conducive to discussion. These students suggested that they modeled their communication style after the moderators'. The results from the current study suggest that there are specific types of interaction that moderators should model and encourage. Social expressions such as *addressing others by name, complimenting, expressing appreciation, posting messages using the reply feature, expressing emotions, using humor,* and *salutations,* had a positive effect on the social presence of the conference.

Two issues are important to note, however. First, a majority of the students perceived the conferences as warm, friendly, trusting, personal, and disinhibiting. Thus, the baseline for social presence may be somewhat more positive than the theoretical literature suggests. Furthermore, if conferences are overly social, some students become frustrated and question the value of the conference. Group behavior models indicate that the encouragement of social exchanges may be most important during the early stages of the conferences, and less so as the discussions mature (Lundgren, 1977; Shutz, 1958). Ultimately, the purpose of the conference is to facilitate reflective thinking through peer and instructor discussion. According to social cognitive theory, learning occurs not through cordial conversation, but through conflict and the resolution of conflict. Therefore, it may be equally important for the instructor or moderator to encourage students to challenge each other's ideas.

Instructors should also be aware that some groups of students are more interested in, and dependent upon, social interaction with other students and with instructors (Diaz, 1999; Gee, 1990). This is the basis of personality theory and its educational interpretation--learning styles. The practice of setting up "cafes," i.e., special subconferences that are designated specifically for social interaction, may be a solution to this issue. The cafes appear to simultaneously satisfy the needs of students whom long for interpersonal interaction with other students, without antagonizing students who have less need for affiliation.

Directions for Future Research

Although computer conferencing has been used for educational purposes for over ten years, objective and programmatic research reports are only beginning to appear. The present study was exploratory in nature, in part because there is a paucity of theories and

cumulative results upon which to build. Therefore, several topics need to be addressed in future research.

This study focused only on the relationship between the social properties of messages and the students' perceptions of the social environment of the conference. The correlation between social expressions and social presence was .40. This correlation is in the weak to moderate range, and it leaves 84 percent of the variance in social presence scores unexplained. Garrison et al. (2000) have identified several issues that may influence the students' perceptions of the social environment including individual differences, instructional design, and face-to-face meetings among distance students. Additionally, some of the collaborative learning strategies developed by authors such as Slavin (1980) and Johnson and Johnson (1994) should also be examined for their ability to influence the social environment of conferences.

There is also a need to develop instruments for assessing social presence that have demonstrable reliability and validity. The social presence concept in particular and the broad area of social interaction in general are currently receiving much attention in the educational literature; therefore, sound measures of investigation are becoming increasingly important. Gunawardena and Zittle (1997) have initiated some work in this area, and reported on an instrument that they claim as reliability level of .88 as measured by Cronbach's alpha. Lombard and Ditton (2000) have also begun a process of developing reliable and valid instruments; however, their focus is on the broader concept of "presence," and it remains to be seen whether these instruments will be suitable for educational technology researchers.

Along with this measurement issue, there is a need to triangulate the results of the current study. The subjective data provided by students in this survey should be corroborated by other means such as interviews and observation. Content analysis instruments such as those developed by Howell-Richardson and Mellar (1997), Hara et al. (2000), Henri (1989), and Rourke et al. (1999) could be used in combination with surveys and interviews to provide a more complete picture of social interaction and social presence in educational computer conferences. At the same time, this combination of instruments could also reveal the relative reliability and validity to the content analysis instruments.

Further, the current explorative study culminated in descriptive and correlational results. Therefore, one can only offer relational conclusions concerning the variables. Future work should move towards causal conclusions. In this vein, it would also be valuable to develop weightings for the fifteen social expressions. Linear regression analysis would permit researchers to explore the relative impact of each of the social expressions on the students perceptions of social presence. Rourke et al. (1999) have hypothesized that expressions such as *using the reply feature to post messages* and *referring explicitly to others' comments* should be viewed on a continuum from weak to strong indicators of social presence. However, there is little data to support this tentative, yet reasonable conclusion.

Additionally, more work needs to be done on the categorization of social expressions. The current taxonomy (i.e., interactive, affective, reinforcing) was offered as as a conceptually convenient method of presenting the fifteen social expressions. It was not an empirically-based division. In Garrison et al. (2000), an alternative taxonomy is

offered: open communication, group cohesion, and affective. Traditionally, no such refined division has been offered in the sociological or linguistic literature. The conventional division goes no further than to distinguish between "task" versus "socio-emotional" communication (see for example Bales, 1951; Brown and Yule, 1996; Buhler, 1934; Halliday, 1970; Jokobson, 1960; and Lyons, 1977). An exploratory factor analysis conducted with the current set of data did not yield a theoretically defensible result. However, the data collection instruments were not structured to facilitate a factor analysis. Future researcher, perhaps using the multidimensional scaling technique, may have more success at establishing an empirical basis for creating a taxonomy of social expressions. Or, it may be discovered that the traditional division is the most appropriate description.

One final issue that requires further investigation is the nature of the relationship between social presence and critical discourse. One of the assumptions of this study was that social presence would be an important antecedent to critical discourse. Although this study was not designed to study this relationship, the picture that emerges from the data is that social presence may not be a sufficient condition to precipitate this outcome. In fact, some students perceived the high proportion of social communication as interfering with or replacing the critical and challenging exchanges that would constitute a valuable learning experience. This observation is consistent with several recent findings (see for example Bullen, 1999; Fabro and Garrison, 1998; Garrison et al., 2000; Hara et al., 2000; Kanuka and Anderson, 1998) in which researchers find a paucity of critical discourse in the transcripts of computer conferences.

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Appendix A

Request for Participation

Fellow Students

The course that you are enrolled in is one of over 400 courses offered by the University of Alberta that includes some form of computer conferencing. Educational theorists and experienced instructors believe that this technology is a powerful addition to distance and face-to-face courses. However, few researchers have systematically asked students about their perceptions of computer conferencing. As a university student, you have over thirteen years of experience in formal education, and your insights could guide the development of theories and applications of this new technology.

Please take ten minutes to fill out my survey at http://www.atl.ualberta.ca/liam. It has been approved by the University's ethics board, and your anonymity will be maintained.

Thank you for your assistance.

Liam Rourke
lrourke@ualberta.ca
office phone: 492-3662

Appendix B

Website Introduction

Online Immediacy

You are invited to participate in a study on the use of computer conferencing in higher education. Your participation is entirely voluntary, and you may decline without consequence. The course that you are enrolled in is one of over 400 courses offered by the University of Alberta that includes some form of computer conferencing. Educational theorists and experienced instructors believe that this technology is a powerful addition to distance and face-to-face courses. However, few researchers have systematically asked students about their perceptions of computer conferencing. As a university student, you have over thirteen years of experience in formal education, and your insights could guide the development of theories and applications of this new technology.

Data will be collected using a thirty-two item, closed-form, questionnaire. The survey is presented online for your convenience, and pre-testing indicates that an average of 5 minutes is required for completion. Your responses are not anonymous, but no one except I will have access to the information you provide. Your instructor will not have access to your responses. At no time during the questionnaire are you asked to evaluate the course or the instructor. The final results of the study will be available to you upon request. The second method is observation, in which I will observe some of the online interactions that occur on the conference board. Click the consent button to read about informed consent, and then go to the survey.

Sincerely,

Liam Rourke

Principal Researcher,
Graduate student
Department of Educational Psychology
lrourke@ualberta.ca
492-3667

Appendix C

Website Informed Consent

Informed Consent

1) I understand that my participation is completely voluntary.
2) The general plan of this study has been outlined to me, including any possible known risks.
3) I understand that the results of this research may be published or reported but my name will not be associated in any way with any published results.
4) I understand that my responses will be held in strict confidence and will not be related in any way with grade or other student assessments.

I understand and agree to these conditions.

Appendix D

Website Questionnaire

Online Immediacy

Name: (first last)
Course Code (eg. EDPY 501):

Part 1:

Select the appropriate response or responses to the following questions.

Please do not use the Enter or Tab keys to fill out the form.

Remember: Answer all questions based on your experiences in this course only.

1. The course that you are in is a(n):
   - Graduate course
   - Undergraduate course
   - Certificate course
   - Other

2. From where did you typically access the discussion forum? (Select all that apply)
   - Home
   - School
   - Work
   - Other

3. What is the speed of the modem connection that you typically use to access the discussion board:
   - 14.4
   - 28.8
   - 36.6
   - 56.6
   - cable modem
   - high speed internet access
   - T1 (University of Alberta computer lab)
   - not sure
   - Other:

4. Your access to the class discussion forum (based on cost, proximity of logon locations, availability, and any other factors) is:
   - strictly limited
   - somewhat limited
   - unlimited

5. Participation in the discussion forums accounted for what percentage of your total

mark?
Enter a number:

6. How many of the discussion forum participants did you know before the discussion forum began?
Enter a number:

7. How many people in the discussion forum were you friends with before the conference began:
Enter a number:

8. Who moderated the conference? (check all that apply)
The course instructor
The teaching assistant
Students took turns moderating
Guest moderators
Other:

9. On average, how many hours per week did you spend participating in the online forum conference?
Enter a number:

10. What types of activities did you do in the conference? (check all that apply)
Responded to questions posted by the moderator (Instructor, teaching assistant, etc.).
Responded to questions posted by other students.
Broke into groups and worked on problems.
Participated in debates
Other:

Part II:

Please indicate how often the following events occurred during the conference. The statements do not refer solely to your behavior, but to the behavior of the discussion group in general.

A participant in the conference:

11	Referred to another participant by name:	almost always	often	rarely	never
12.	Complimented the contents of someone else's message:	almost always	often	rarely	never
13.	Expressed agreement with something someone else wrote:	almost always	often	rarely	never

14.	Express appreciation for someone's contribution:	almost always	often	rarely	never
15.	Replied to someone's message by using the 'reply' feature of the conferencing software.	almost always	often	rarely	never
16.	Referred explicitly to the contents of someone else's message.	almost always	often	rarely	never
17.	Quoted someone else's message in whole or in part:	almost always	often	rarely	never
18.	Someone other than the moderator asked the group, or specific members of the group, a question:	almost always	often	rarely	never
19.	Used informal conversational language (e.g., slang, incomplete sentences, etc...):	almost always	often	rarely	never
20.	Expressed emotion (includes the use of smiley faces ;-) excessive punctuation !!!!!, excessive CAPITALIZATIONS) and conventional expressions of emotion (e.g. "I hate this textbook!").	almost always	often	rarely	never
21.	Wrote something humorous:	almost always	often	rarely	never
22.	Began or ended their message with a salutation: (e.g., "Hi guys," "Cheers," "Bye for now"):	almost always	often	rarely	never
23.	Used an example from their life outside of the class to illustrate a point.	almost always	often	rarely	never
24.	Used part of their message just to be social, e.g., made a remark about the weather, engaged in small talk:	almost always	often	rarely	never
25.	Disclosed some personal information (e.g., that they have two cats, are afraid of flying, etc.):	almost always	often	rarely	never

If there were other types of behaviors that you feel had an influence on the social environment of the course, describe them below:

Part III

Assess the social environment of your conference using the following scale.

In general, the social environment of the conference was:

Warm	___	___	___	___	Cold
Unfriendly	___	___	___	___	Friendly
Close	___	___	___	___	Distant
Untrusting	___	___	___	___	Trusting
Disinhibiting	___	___	___	___	Inhibiting
Impersonal	___	___	___	___	Personal

You may use the box below to submit any additional comments.

That concludes the questionnaire.
Once you press the submit button, your responses will be recorded.
Please submit only once.