Exploring Social Communication in Computer Conferencing

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This study explores the relationship between asynchronous, text-based forms of social communication and students' perceptions of the social climate of computer conferences. A 21-item questionnaire was administered to 74 students from 4 faculties. Students rated the social climate of the conference along six dimensions. A majority of students found the conference warm, friendly, trusting, disinhibiting, and personal. Students also rated the perceived frequency of 15 types of social communication. The correlation between aggregate scores for both sets of variables was $r = .4$, $p < .001$, r *squared* = .16. A series of one way-ANOVA's indicated that an increase in the perceived frequency of 7 of the 15 social expressions corresponded to more positive ratings of the social environment. The 7 social expressions included addressing others by name, complimenting, expressing appreciation, using the reply feature to post messages, expressing emotions, using humor, and salutations. Based on responses to two open-ended questions, moderators are encouraged to seek a balance between social communication and challenging and productive discussion.

Computer conferencing is becoming a popular component in the delivery of both distributed and on-campus education. This circumstance has

been driven, in its most defensible moments, by a growing interest in models of teaching and learning that use peer and peer- instructor interaction as a strategy for facilitating higher-order learning. However, the special nature of interaction in asynchronous, text-based environments is not well understood. Several authors advise instructors not to neglect the social environment of the conference, but few offer research-based suggestions about exactly what this entails. This study examines the relationship between computer-mediated forms of social communication and students' perceptions of the social climate of computer conferences.

Setting the Climate for Discussion

Climate setting is an important element in all models of teaching and learning that are based on peer collaboration. As Johnson and Johnson (1994) explained: "We are not born instinctually knowing how to interact effectively with others. Interpersonal and small group skills do not magically appear when they are needed. Students must be taught the social skills required for high quality collaboration and be motivated to use them if cooperative groups are to be productive" (p. 184). Communication theorists argue that these issues become particularly salient in novel communication environments such as asynchronous, text-based computer conferencing in which the communicative repertoire is limited to text. Short, Williams, and Christie's (1976), 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. (p. 59-60)

Three 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 information concerning mutual attention and awareness. Bullen (1998) summarized his students feeling in this regard: "The asynchronous communication left them feeling remote, detached, and isolated" (p. 10).

A second problem, also identified by Short et al. (1976), was the lack of immediate feedback. Feenberg (1989) observed 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, Phelps, and Ellis' (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).

Likewise, 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, for getting to know the people, and getting to know their style" (p. 45).

The lack of cues in this medium can also exacerbate *communication apprehension*. Defined as the fear of real or anticipated communication with people, Grint (1989) observed 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 (p. 191). Jonassen (2000) noted that although communication apprehension is not specific to computer conferencing, conferencing may amplify existing insecurities and can prevent individuals from participating openly and fully.

A third problem apparent in the literature is the difficulty in establishing a sense of group cohesion. One of Fabro and Garrison's (1998) students, who had the advantage of face-to-face meetings before conferences began, explained the importance of this strategy:

> 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)

Each of these factors can interfere with the ability of computer conferencing to support learning through peer and peer-instructor interaction. 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. Theoretical accounts of learning through discussion, such as social cognitive conflict theory (Piaget, 1964) regard these types of behavior as the very mechanism of learning. Thus, it is important to understand how to overcome these problems.

One element of online forums that can be manipulated to create an open, supportive, and cooperative environment is message content. Beals (1991) in her description of communication on the Beginning Teachers Communication Network (BTCN) noted: "Communication was not impersonal. Although the communication was purely textual, members found ways to convey paralinguistic emphasis and emotion." (p. 76) According to Beals, the students' tactics included the strategic use of capital letters, overuse of punctuation, and use of expression. Hillman (1999) conducted content analyses of conference transcripts, and he offered a similar conclusion: "Relevant personal vignettes, anecdotes, and [descriptions of personal] experiences encourage trust among participants and reduce anxiety. This fosters a receptive learning environment, enhancing the climate for motivation, creativity, brainstorming, and risk-taking (Hillman, 1999, p. 17). Fahraeus (1999) studied collaboration in electronic conferencing systems and found differences in the communication patterns of productive and unproductive groups. The content of productive groups' messages contained higher frequencies of greetings, vocatives (addressing each other by name), encouraging comments, and personal descriptions of participants' professional, social, technological context, and questions and feedback among group members.

Assessing Social Communication

Rourke, Anderson, Garrison, and Archer (2000) used these types of communication as the basis of a content analysis tool for assessing the *social presence* of conferences. They defined social presence as "the ability of learners to project themselves socially and emotionally as 'real' people into a community of learners" (Garrison, Anderson, & Archer, 2000, p. 17). Using the quantitative content analysis technique, the occurrence of these types of text-based social communication in conference transcripts are identified and summarized. The frequency of these indicators is taken to be an indication of the level of social presence in an online forum. A complete list of the expressions, provisionally divided into three broad categories is presented in Table 1. These items form the constitutive definition of social communication in this study.

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 to one's messages	-Encourage participation -Strengthen posting behavior -Attenuate evaluation apprehension	-Present participants as multi-dimensional, "real" human beings -Develop trust, reduce inhibition -Facilitate impression management
Constitutive Expressions	-Posting messages 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

Computer conferencing offers the technological means for students and instructors to interact with each other. However, certain properties of this medium can leave students feeling isolated, anonymous, and apprehensive about participating. One characteristic of groups that overcome these problems is the rich socio-emotional content of their messages. This study explores the relationship between social expressions and students' perceptions of the climate of a computer conference. Two questions guided data collection and analysis:

1. What are students' perceptions of the social environment of the conference?

2. Which types of social communication are positively related to the students' perceptions of the social environment of the conference?

METHOD

The preceding questions focus on two variables—social presence and social expressions. Since Short et al. introduced the term in 1976, the general approach to measuring social presence has been subjective. Participants are asked to produce a conscious, introspective judgment regarding their experience in a medium, and this judgment is typically reported by way of semantic differential scales. A semantic differential scale asks individuals to rate an attitude object on a series of bipolar adjectives (Borg & Gall, 1989, p. 769). For this study, six adjective pairs were selected from existing social presence instruments (Andersen, 1979; Gunawardena & Zittle, 1997; Short et al., 1976). The six pairs were warm-cold, personal-impersonal, friendly-unfriendly, trusting-untrusting, disinhibiting-inhibiting, and close-distant.

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. Fifteen specific social expressions, which are listed in Table 1, were selected for study. The frequency of social expressions were measured 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 were "frequently" and "rarely."

Data Collection Procedures

Data was collected using a 32-item questionnaire presented to the students online. The questionnaire was divided into two sections. In the first section, students were asked for their perceptions of the six dimensions of social presence. This section concluded with an open-ended question that read: "You may use the space below to submit any additional comments." In the second section, students were asked to rate the frequency of 15 social expressions (Table 1). Students were also presented with an open-ended question: "If there were other types of behaviors that you feel had an influence on the social environment of the conference, describe them below."

Sample

The accessible population for this study was identified through Academic Technologies for Learning's (http://www.atl.ualberta.ca/disted) list of distance and distributed education courses offered by the University of Alberta. 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, 8 courses met the 3 requirements previously described. The eight courses included three courses in Education, three courses in Government Studies, and one course each in Human Ecology and Religious Studies.

RESULTS

Response Rate

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 e-mail 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.

Social presence

Question 1 asked: What are the students' perceptions of the social environment of the conferences? Means and standard deviations for each of the six dimensions of social presence are presented in Table 2.

Table 2

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] Scores based on responses to a four-point semantic differential scale where, for example 1 = cold, 4 = warm.

The items were then recoded into nominal categories in which 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, personal, disinhibiting, and close were, respectively, ([n = 74] 89%, 89%, 84.9%, 66%, 62.2%, 47.2%).

Social Expressions

Question 2 asked: "Which types of social communication are positively related to the students' perceptions of the social environment of the conference?" To begin the analysis, frequency scores for each of the social expressions were summed to yield a grand total for all social expressions. Similarly, scores on the six social presence dimensions were summed to yield a social presence total for each respondent. These figures were used to calculate a correlation between the frequency of social expressions and social presence. The Pearson Product-to-Moment Correlation between these two variables was $r = .40$, $p < .001$, r squared $= .16$ (Figure 1).
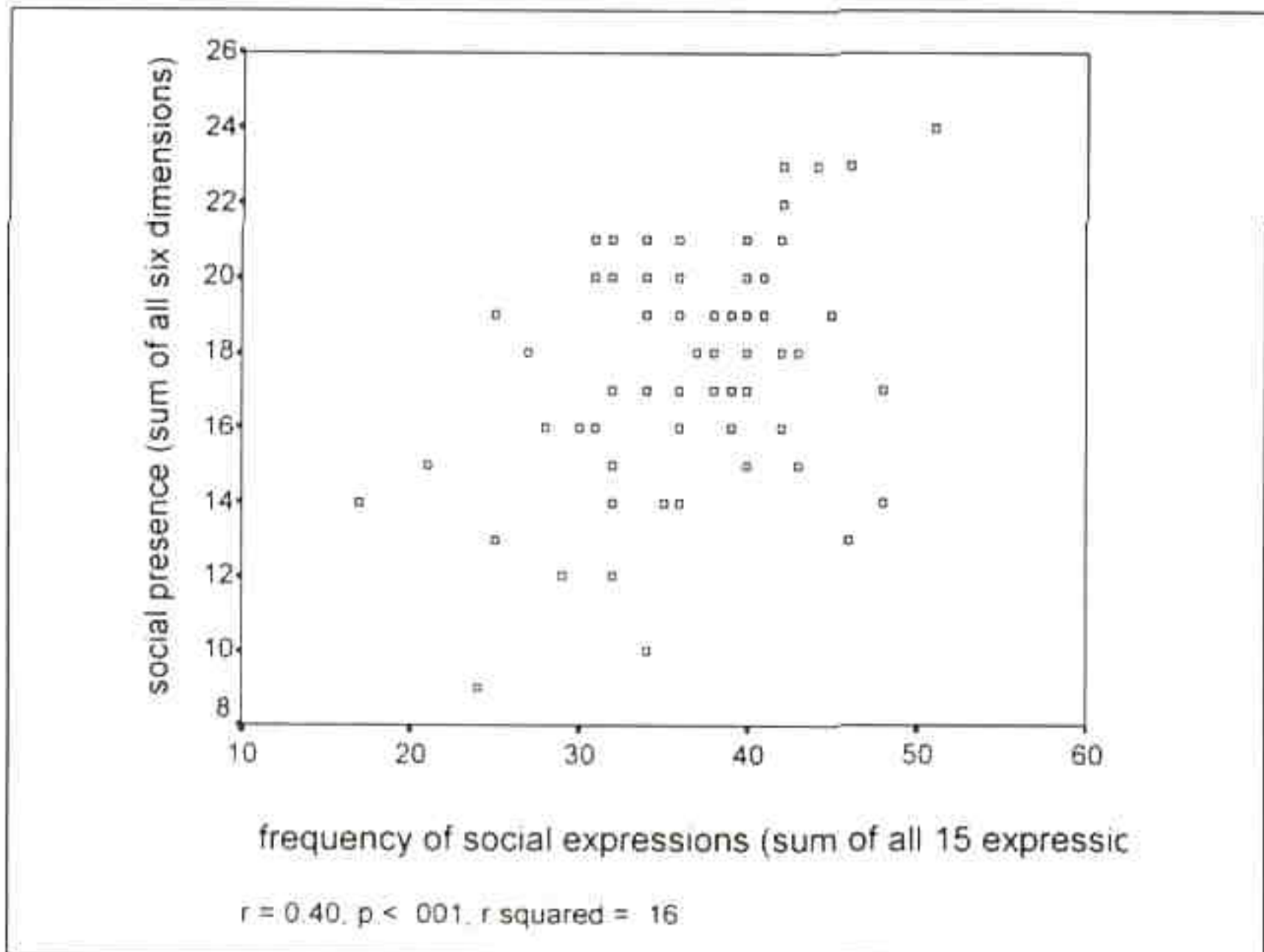
Figure 1. Correlation between perceived frequency of social expressions and social presence

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 and infrequent 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 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 differences are presented in Table 3.

Table 3

Social Presence Means[a] Across Two Levels of Perceived Frequency of
Seven Social Expressions[b]

Social expression	frequent	infrequent	F	p	eta²
address others by name	18.20 (2.76)	15.58 (3.22)	10.69	.002	.13
complimenting	18.14 (2.74)	16.24 (3.43)	6.09	.02	.08
expressing appreciation	18.02 (3.00)	16.05 (2.93)	5.57	.02	.08
using the reply feature to post	17.89 (2.87)	16.00 (3.67)	4.16	.046	.06
expressing emotions	18.56 (2.86)	17.04 (3.08)	4.13	.046	.06
using humor	18.29 (3.27)	17.02 (2.82)	4.14	.05	.05
salutations	18.20 (2.61)	16.50 (3.53)	5.37	.02	.07

Note. [a] Social presence means represent a sum of scores on all six dimensions of
social presence.
[b]Two levels of perceived frequency were obtained by recoding original four-point
scale into two nominal categories.

Open-Ended Questions

Seventeen students responded to the two optional open-ended ques-
tions, which have been combined for analysis because of the considerable
amount of overlap in their content and themes. Comments generally ad-
dressed themes of student satisfaction with the computer conference in gen-
eral, and in particular, types of communication within the conference.

Student comments indicated that a moderate amount of social communi-
cation can accomplish climate setting task. Students made comments such
as: "I felt a sense of relief when others expressed feelings of frustration be-
cause 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." Two comments supported the hypothesis
that peer interaction can be an important element in learning: "It was inter-
esting to see the diversity of opinions," and "I learned a great deal from this
exercise."

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 illustrated this point:

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. (Anonymous student comment)

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 useful if they further the goals of the course but are time-consuming and otherwise inappropriate.

DISCUSSION

The potential of computer conferencing to facilitate learning through peer and peer-instructor interaction may be restricted if students do not feel comfortable enough to communicate openly with each other. The study explored the possibility of a relationship between asynchronous, text-based forms of social communication and students' perceptions of the social environment of their conferences. The first question asked 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 and Zittle (1997), Hara, Bonk, and Angeli (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 & Garrison, 1998; Hara et al., 2000; Kanuka & Anderson, 1998).

The second question focused on the relationship between the frequency of social expressions and students' perceptions of the social environment. 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 environment.

Based on the comments offered by the respondents, it is 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. There is support for this tentative conclusion in the literature. Research from Gee (1990) and Diaz and Cartnal (1999) showed that students with independent learning styles prefer distance education environments with limited social interaction while students with dependent, social learning styles prefer the opportunity to work with and share experiences with peers and teachers.

Weaknesses of Study

The response rate for the survey was low. Ad hoc measures to increase the response rate had only marginal effects. Some of the 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 activity in these conferences was limited.

The low response rate created two problems. First, it brings into question the randomness of the sample (Fraenkel & Wallen, 1996). There is no convincing data with which to reject the claim that the respondents represent a peculiar subsample of the initial sample. Another result of the low response rate was the need to combine heterogeneous respondents into one group (e.g., graduate, undergraduate, certificate course students) rather than separate these groups for between-groups comparisons. Along with the measurement error inherent in the data collection instruments, the within-groups differences that this grouping produces may have hidden important but subtle effects in the data.

Practical Implications

The relationship between the frequency of social expressions and social presence offers qualified support for Rourke, Anderson, Archer, and Garrison's (1999) tool for assessing these constructs. It also reveals one possible strategy that moderators could use to influence the social climate in the computer conferences.

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. Ultimately, the purpose of the conference is to facilitate reflective thinking through peer and instructor discussion. 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 may be more interested in, and dependent upon, social interaction with other students and with instructors (Diaz & Cartnal, 1999; Gee, 1990). The practice of setting up "cafes," that is, 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 10 years, systematic research reports are only beginning to appear. The present study was exploratory in nature, in part because there is a paucity of theories, tools, 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, leaving 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. Additional-

ly, 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 claimed has 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 (1996), Hara et al. (2000), Henri (1991), 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 respective reliability and validity of the content analysis instruments.

More work needs to be done on the categorization of social expressions. The current taxonomy (i.e., interactive, affective, reinforcing) was offered as a conceptually convenient method of presenting the 15 social expressions. It was not an empirically-based division. 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 (Brown & Yule, 1983). Future researchers, perhaps using multidimensional scaling techniques or factor analysis, 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 communication and learning. 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 & Garrison, 1998; Garrison et al., 2000; Hara et al., 2000; Kanuka & Anderson, 1998) in which researchers find a paucity of critical discourse in the transcripts of computer conferences.

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Note