

Interpersonal Sensitivity in Computer-Mediated and Face-to-Face Conversations

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Two studies were designed to assess the impact of computer-mediated communication (CMC) on the development of dominant/subordinate status roles and on the accuracy of interpersonal perceptions during dyadic, text-based conversations. Results comparing face-to-face (FtF) and synchronous CMC interactions indicated: (a) that dyads established dominant/subordinate roles in both communicative environments, although these roles were more clearly differentiated in the CMC interactions; and (b) that the accuracy of interpersonal perceptions did not differ substantially during CMC and FtF interactions. Considered together, these data pose problems for theoretical accounts of CMC suggesting that the impoverished social cues in this form of text-based communication tend to equalize hierarchical differences in the status of participants and undermine the accuracy of interpersonal perceptions.

Computers currently play important roles in various forms of social communication (McKenna & Bargh, 2000). Most computer-mediated communication (CMC) is text-based and can be synchronous, as in Internet chat rooms or instant messaging, or asynchronous, as in electronic mail or bulletin board formats. This text-based medium has some obvious practical benefits, such as decreasing the importance of geographical proximity. There also are some important social effects; for example, the lack of contextual cues (e.g.,

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dress, manner, and other nonverbal cues in the physical environment) may undermine the influence of factors like social status during conversational exchanges (Kiesler, Siegel, & McGuire, 1984). Although there is some evidence for this “status equalization hypothesis” (e.g., Dubrovsky, Kiesler, & Sethna, 1991; Kiesler & Sproull, 1992), some have questioned its validity and argue that status roles can be maintained or even exaggerated in CMC (e.g., Flanagan, Tiyaamornwong, O’Connor, & [Seibold, 2002](#); [Postmes & Spears, 2002](#)).

To date, most of the empirical research concerned with the equalization hypothesis is based on group interactions in which status roles are manipulated in several different ways. In some procedures, individual participants are identified explicitly as high status (e.g., graduate students) or low status (e.g., undergraduates) with the intent of determining whether these labels have more or less impact in the context of CMC or FtF interactions (e.g., Dubrovsky et al., 1991; Silver, Cohen, & Crutchfield, 1994; Weisband, Schneider, & Connolly, 1995). In other procedures, participants are aware that status differentials exist during a group discussion, but the individual participants are not explicitly identified according to status. For example, Weisband et al. (1995; Experiment 2) informed participants that groups consisted of two graduate students and one undergraduate, but did not identify each participant. Their intent was to determine whether status differences would still have an impact on the interaction in the absence of labels (e.g., see also variations in France, Anderson, & [Gardner, 2001](#); [Hollingshead, 1996](#); Lippit, Miller, & Halamaj, 1980; Saunders, Robey, & Vaverek, 1994; Sproull & Kiesler, 1986). Finally, some procedures arrange interactions among equal-status individuals to determine if status differentials are more likely to emerge *sui generis* across CMC or FtF environments (e.g., Kiesler et al., 1984; Straus, 1997; Weisband, 1992; Weisband & Atwater, 1999).

Unfortunately, this diverse array of procedures has not provided consistent evidence for the intuitively appealing assumption that differences in social status are diminished in CMC contexts. Indeed, the evidence is decidedly mixed. Support for the equalization hypothesis stems largely from studies demonstrating that explicit status labels had little effect on participation rates in CMC (e.g., Dubrovsky et al., 1991). However, other studies with similar procedures have reported that, although the impact of status on participation rates may be weakened in CMC relative to FtF, significant status differences can persist ([Postmes & Spears, 2002](#); Saunders et al., 1994; Straus, 1997; Weisband et al., 1995). For instance, in their examination of computer-mediated discussions among doctors, nurses, and hospital administrators, Saunders et al. (1994) observed that doctors (high-status role) contributed more frequently during CMC interactions than individuals lower in the health care hierarchy. Other studies also have revealed differences in participation rates that are exaggerated in CMC relative to FtF, though participation in both environments may converge over time (see Berdahl & Craig, 1996).

A number of researchers have criticized the use of participation rates to measure status due to the fact that communicators can “talk” simultaneously in CMC but not in FtF ([Berdahl & Craig, 1996](#); [Valacich, Paranka, George, & Nunamaker, 1993](#)). Specifically, according to Valacich et al., FtF and CMC settings differ in terms of “concurrency”; FtF is a serial communicative environment in which only one person speaks at a time, whereas CMC is a parallel environment where all conversationalists can enter text simultaneously. Therefore, the fact that CMC reduces competition for speaking time could account for the equalized participation rates (Straus, 1996).

Nevertheless, a similarly inconsistent picture emerges when status differentials are measured in other terms. Supporting the equalization hypothesis, [Dubrovsky et al. \(1991\)](#) found that high-status members had greater influence than low-status members on the group decision when interacting FtF, but that this difference was reduced in CMC. Furthermore, [Kiesler et al.’s \(1984\)](#) description of more frequent uninhibited verbal behaviors (e.g., swearing and insults) in CMC can be interpreted as evidence for a reduced influence of social norms (including status hierarchies) in text-based social exchanges (see also [Sproull & Kiesler, 1986](#); [Weisband, 1992](#)). Other studies, however, have found that status differences in social influence persist ([Scott & Easton, 1996](#)). Similarly, when [Weisband et al. \(1995\)](#) addressed previous research shortcomings that confounded hierarchical status (i.e., graduate vs. undergraduate students) with minority/majority status (e.g., [Dubrovsky et al., 1991](#)), they observed that status effects on decision making were accentuated. [Postmes and Spears \(2002\)](#) also demonstrated that, even if status differences are not apparent in participation rates, they can emerge in the content of participants’ communication.

As the preceding overview indicates, there are some reasonably convincing data on each side of this issue. In some experimental procedures, the influence of social status appears to be diminished in text-based CMC, while other studies reveal a persisting effect of social status. Unfortunately, given the many procedural differences that exist across the various experiments concerned with the equalization hypothesis, it is very difficult to isolate any particular factor, or set of factors, that might resolve these inconsistent results.

Furthermore, although the procedures employed in this area of research are diverse, we would also argue that the range of dependent measures has been limited primarily to indirect indices of social status effects. Specifically, most investigators have assessed the impact of social status in terms of differences in the frequency of participation or differences in the perceived influence of high- and low-status individuals. In addition to the problems with participation rates outlined above, our concern is that these measures do not tell us much about the nature of the process underlying any effects that are observed.

We believe there are two plausible explanations for the equalization of participation rates and perceived influence that have been overlooked. First,

it is possible that impressions formed in CMC are simply less accurate. That is, in CMC we may be less able, at least initially, to detect or perceive the traits and characteristics typically associated with particular status differences (Hancock & Dunham, 2001; Walther, 1993). Several researchers have argued that the lack of important affective information in CMC should make it more difficult to express and assess emotions and thoughts in these text-based interactions (Kiesler et al., 1984; Short, Williams, & Christie, 1976). For instance, social presence theory (Short et al., 1976) posits that tasks requiring the communicator to monitor a partner's reactions and feelings during the interaction should be particularly difficult when conducted in any medium with low social presence, such as CMC. Although previous research suggests that group identities (e.g., ingroup vs. outgroup, individual vs. group) are detected in CMC contexts (for review see Postmes, Spears, & Lea, 1998; Postmes, Spears, Lea, & Reicher, 2000), it is less clear whether the hierarchical status roles manipulated in research concerned with the equalization phenomenon (e.g., high vs. low status) are as easily detected.

Alternatively, one might argue that interpersonal perceptions in CMC are, in fact, accurate enough to detect status differences but that participants cannot establish and maintain status roles in more impoverished communicative environments. For example, given that text-based interactions remove many of the social cues that may indicate hierarchical social status differences (e.g., more expensive clothing, bigger office, etc.; Sproull & Kiesler, 1986), it may be more difficult for CMC participants to establish their social roles. Although previous research suggests that group identities can be established in CMC contexts (for review see Postmes et al., 1998, 2000), it is less clear whether the hierarchical status roles employed in the majority of research concerned with the equalization phenomenon can be as easily established in CMC as they can in FtF interactions.

Indirect measures, such as participation rates or perceived influence, are unlikely to resolve whether the equalization phenomenon observed in previous research comparing social status effects in CMC and FtF reflects differences in the *accuracy* of our interpersonal perceptions, the differences in establishing or maintaining the *strength* of status roles across these different communicative environments, or both. In order to explore these questions, we introduced two novel procedures in the present research that permitted us to measure (a) the accuracy of dyadic interpersonal perceptions more directly and (b) the ability of participants to maintain the strength of status roles detected in CMC and FtF communicative environments.

ACCURACY

To assess the accuracy of interpersonal interactions in CMC and FtF settings, we adapted a procedure initially developed by Snodgrass and her colleagues

(Snodgrass, 1985, 1992, 2001; Snodgrass, Hecht, & Ploutz-Snyder, 1998) in their research concerned with the influence of gender and social status in dyadic FtF interactions. Their procedure has been described as a measure of “interpersonal sensitivity,” or the ability to perceive the thoughts and emotions of our social partners accurately (Bernieri, 2001).

In her initial research, Snodgrass (1985, 1992) asked dyads to engage in several conversational tasks, and after each task, each member of the dyad (Participant A and Participant B) completed three questionnaires. Each of the questionnaires included the same 13 Likert scale items to assess the participants’ interpersonal perceptions from three different perspectives: (a) the participants’ perceptions of themselves during the task (e.g., *I was the dominant one, I enjoyed the task*), (b) the participants’ perceptions of their partner during the task (e.g., *S/He was the dominant one, S/He enjoyed the task*), and (c) the participants’ impressions of how their partner felt about them during the task (e.g., *S/He thought that I was the dominant one, S/He thought that I enjoyed the task*).

By correlating the dyad’s responses across the different questionnaires, one can operationally define two subtypes of interpersonal sensitivity described as perceives other (PO) and perceives other’s perceptions (POP). Considered from Participant A’s perspective, the first correlation is an index of A’s ability to perceive how his partner (B) felt about herself. Also from A’s perspective, the second correlation is an index of A’s ability to perceive how his partner felt about him. Similarly, the same two correlations can be calculated from B’s perspective.

Using this procedure, Snodgrass (1985, 1992) explored the effects of gender and status on interpersonal sensitivity in dyadic FtF interactions. The results indicated that males and females did not appear to differ in terms of their ability to perceive their partner’s thoughts and feeling accurately, but status differences had a robust impact on interpersonal sensitivity. Specifically, Snodgrass observed an interesting pattern of correlations indicating that those in a position of power (e.g., a boss) were relatively better at discerning how their subordinates felt about themselves (i.e., PO sensitivity). Conversely, individuals in subordinate positions (e.g., an employee) were relatively better at discerning how their superiors felt about them (i.e., POP sensitivity). This interesting interaction between status roles and the two subtypes of interpersonal sensitivity has been replicated across a number of different social contexts (Snodgrass 1985, 1992; Snodgrass et al., 1998).

These data indicate that this methodology (see Snodgrass, 2001) is particularly sensitive to status differences across various social contexts and, more importantly, it is easily extended to social interactions in CMC environments. The PO and POP correlations described above provide us with direct measures of the two subtypes of interpersonal sensitivity. These permit a direct assessment of the degree to which the CMC environment reduces the accuracy of impressions concerned with social status when compared

to FtF conditions. Additionally, we also can determine whether the CMC environment moderates the robust interaction between status roles and the subtypes of interpersonal sensitivity that consistently have been reported (Snodgrass 1985, 1992; Snodgrass et al., 1998). This procedure also permits testing the equalization hypothesis among dyads rather than groups, avoiding the potential confounding effects of group composition.

STRENGTH

The Snodgrass (2001) procedure also provides a direct measure of the strength of status roles maintained across CMC and FtF environments. Specifically, we looked at the intensity of the ratings on the three items embedded in the interpersonal sensitivity questionnaires that assess the strength of the boss and subordinate roles (i.e., *I was the dominant one*, *I was the leader*, and *I controlled the interaction*) from the three different perspectives (e.g., *I was the dominant one*, *S/He was the dominant one*, and *S/He thought that I was the dominant one*). The average strength of the ratings on these three items reflects the extent to which the participants in each dyad maintained their designated dominant and subordinate roles during the session. For example, if on these three questions the dominant member of a dyad is rated 7 on a 7-point Likert scale, and the subordinate member is rated 1, this particular dyad has obviously established and maintained strong status roles. The question of interest, then, is whether the CMC dyads are less likely to establish a status differential than FtF dyads.

EXPERIMENT 1

As discussed above, these two measurement operations adapted from the Snodgrass (2001) procedure should provide information on both the accuracy of dyadic interpersonal perceptions and the strength of the status roles maintained during CMC and FtF interactions. As such, the primary objectives of the present study were: (a) to determine if interpersonal sensitivity is undermined in dyadic CMC interactions relative to FtF interactions, and (b) to determine if the strength of status roles differ in CMC and FtF settings. Differences in either or both of these factors can offer viable explanations for the equalization phenomenon that has been reported in previous research (Dubrovsky et al., 1991; Kiesler et al., 1984; Sproull & Kiesler, 1986)

Method

Participants. Participants were 88 English-speaking undergraduate students who received partial course credit for their participation. They were

randomly paired to form 44 previously unacquainted, same-sex dyads. Dyads were randomly assigned to a communication environment (CMC or FtF), and within each dyad one member was randomly assigned to either a boss or subordinate role. Various procedural problems eliminated four dyads (3 CMC, 1 FtF) from the original sample. Of the remaining 40 pairs (20 CMC, 20 FtF), 13 dyads were male (6 CMC, 7 FtF) and 27 were female (14 CMC, 13 FtF). Participants had a mean age of 20.90 years ($SD = 3.91$), ranging from 18 to 41 years of age.

Materials

After completing the communication task (i.e., a job interview), each participant completed the three 13-item questionnaires noted in the introduction. The questionnaires were essentially the same as those used by [Snodgrass \(1992\)](#), but adapted to fit the specific task used in the current study. Participants were asked to rate each item on a scale from 1 (*not at all*) to 7 (*very much*) based on their own feelings (questionnaire 1), how they felt about their partner (questionnaire 2), and how they thought their partner felt about them (questionnaire 3). Items across the different questionnaires were essentially the same, but phrased differently to reflect these three different perspectives. Questionnaires were also similar for bosses and subordinates, but modified to suit the different status roles in the interview. Average ratings for both bosses and subordinates across items ranged from 2.07 ($SD = 1.12$) to 5.95 ($SD = 0.99$).

First, to measure the accuracy of interpersonal perceptions, the two interpersonal sensitivity scores described earlier were calculated for each participant. The first, PO score was obtained by correlating the participant's questionnaire 2 with his or her partner's questionnaire 1. This measure assesses how accurately the participant perceives how his or her partner feels about him- or herself. In this study, bosses had a mean PO score of .56 ($SD = .19$) whereas subordinates had a mean PO score of .11 ($SD = .32$). The second, POP score, was obtained by correlating the participant's questionnaire 3 with his- or her partner's questionnaire 2. This measure assesses how accurately the participant perceives how his- or her partner feels about the participant. Bosses had a mean POP score of .19 ($SD = .33$) and subordinates had a mean POP score of .55 ($SD = .22$).

Next, to assess the strength of the status roles that were established in each condition, responses to the three status-specific items were averaged (i.e., *I was the dominant one*, *I was the leader*, and *I controlled the interaction*). To the degree that status roles were maintained during the interactions, the ratings of the bosses should be consistently higher (more dominant) on these three items than the ratings of the subordinates. These six dominance indexes had excellent reliability with Cronbach's alphas ranging from .87 to .92 for bosses and from .84 to .90 for subordinates.

Procedure

Dyads randomly assigned to the CMC condition were seated at isolated computer terminals in separate rooms to avoid any direct contact between partners. The experimenter briefly demonstrated the communication software to the participants prior to starting the task. The software permitted partners to send text messages by constructing a complete message and then pressing the return key. During the session the experimenter monitored and stored all messages from a third computer on the network located in a separate room.

Participants assigned to the FtF condition were led separately to a room equipped with a small round table, two chairs, and a floor lamp. Chairs were positioned across from each other with the table located between the participants. Participants were instructed to proceed with the job interview. The instructions for this communication task in both CMC and FtF conditions were as follows:

[BOSS]:

In this task, you will be interviewing a subordinate for a position in the University bookstore. The duties of this position will include using the cash register, stocking shelves, and dealing with returns and exchanges of books.

Based on these duties, you will want to determine if the subordinate has had previous experience working with a cash register or customer service. The position also requires someone who is punctual, courteous, outgoing, intelligent, and hard working. You should ask the subordinate questions to determine whether they possess the traits and experience required for the position.

As the Boss, you can end the interview when you feel you have enough information to decide if the subordinate would be a good candidate for the job; this should take about 10–15 minutes.

[SUBORDINATE]:

In this task, the Boss will be interviewing you for a position at the University bookstore. The position's duties include using the cash register, stocking shelves, and dealing with returns and exchanges of books. The Boss will try to determine whether you possess the skills and personal characteristics required for this job, which could include punctuality, intelligence, courteousness, etc. In order to do so, they may ask about your previous work experience to assess whether you will be capable of performing the outlined duties. Try to be as honest as possible to the degree to that you feel comfortable giving the information. Keep in mind that you are trying to obtain the position.

The Boss will end the interview when they feel they have gathered enough information to decide if you would be a good candidate for the job; this should take about 10–15 minutes.

Once the boss decided to end the interview, participants were instructed to complete the three questionnaires. After completing these questionnaires, participants were introduced to one another and fully debriefed.

Results

Accuracy of Interpersonal Perceptions. The first measure of interest concerns the accuracy of interpersonal perceptions, or interpersonal sensitivity, across the two different communicative environments. Recall that two correlations, PO and POP, were calculated for each participant within the dyad. The first measure, PO, which assessed a participant's ability to perceive his or her partner's thoughts and feelings accurately, was calculated by correlating the items on each participant's second questionnaire with the items on his or her partner's first questionnaire. For example, the boss' responses on the second questionnaire, including items such as "S/He enjoyed the job interview" would be correlated with the corresponding responses on the subordinate's first questionnaire (i.e., "I enjoyed the job interview"). Similarly, the POP measure, which assessed a participant's ability to judge his or her partner's perceptions of the participant, was calculated by correlating the items on each participant's third questionnaire with his or her partner's second questionnaire. For example, the boss' responses on the third questionnaire, including items such as "S/He thought that I enjoyed the job interview" would be correlated with the corresponding responses on the subordinate's second questionnaire (i.e., "S/He enjoyed the job interview"). The four correlations based on responses to all items in the questionnaires were converted to Fisher's z-scores and analyzed using a 2 (Communication Medium) \times 2 (Status) \times 2 (Sensitivity Type) repeated-measures ANOVA. These data are presented in Figure 1.

The first question of interest was whether overall levels of accuracy would differ across the two communicative environments. Much to our surprise, we observed no difference in overall interpersonal sensitivity (collapsed across PO and POP subtypes) between the CMC and FtF conditions: $F(1, 38) < 1$, $\eta^2_{\text{partial}} = 0.01$; CMC ($M = 0.46$, $SE = 0.06$), FtF ($M = 0.40$, $SE = 0.06$). Note also that, in absolute terms, the average interpersonal sensitivity measures summed across all conditions in the present experiment were very similar to those reported by Snodgrass (1992; $M = 0.43$, $SD = 0.26$, and $M = 0.39$, $SD = 0.21$, respectively).

There was also no main effect of sensitivity type: $F(1, 38) = 2.49$, *ns*, $\eta^2_{\text{partial}} = 0.06$. Participants were equally accurate on both the PO ($M = 0.40$, $SE = 0.04$) and POP ($M = 0.45$, $SE = 0.004$) measures. Finally, there was no main effect of the boss-subordinate role factor: $F(1, 38) = 2.95$, *ns*, $\eta^2_{\text{partial}} = 0.07$. When collapsed across all other conditions, the bosses ($M = 0.46$, $SE = 0.04$) and subordinates ($M = 0.40$, $SE = 0.04$) did not differ in their overall levels of interpersonal sensitivity.

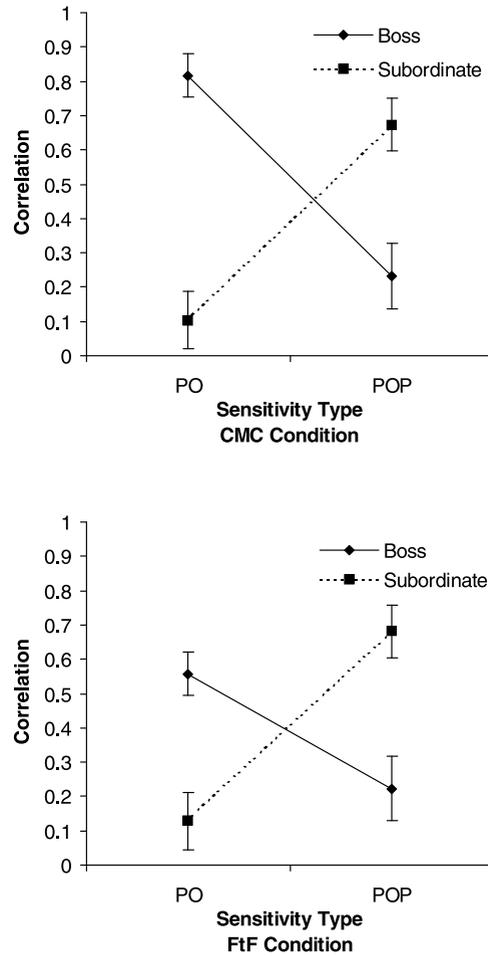


FIGURE 1 Mean perceives other (PO) and perceives other's perceptions (POP) sensitivity measures (with standard error bars) for bosses and subordinates in CMC condition (panel 1) and FtF condition (panel 2) in Study 1.

The next question of interest was whether the bosses were better at judging how subordinates felt about themselves, and whether subordinates were better at judging how bosses felt about them. This is essentially the robust interaction between status roles and type of interpersonal sensitivity reported consistently (Snodgrass 1985, 1992; Snodgrass et al., 1998). The present study replicated this same Sensitivity Type \times Role Interaction observed in previous research: $F(1, 38) = 62.18, p < 0.001, \eta^2_{\text{partial}} = 0.62$. Simple effects tests confirmed that bosses ($M = 0.69, SE = 0.004$) were indeed better than subordinates ($M = 0.23, SE = 0.07$) for the PO correlation, $t(39) = 8.51, p < 0.001$, and significantly worse ($M = 0.23, SE = 0.07$) than

subordinates ($M = 0.68$, $SE = 0.05$) for the POP correlation, $t(39) = -5.56$, $p < 0.001$.

Finally, how was this robust pattern reflected in the Sensitivity Type \times Role Interaction affected by the CMC environment? The relevant information is contained in the second-order interaction of communication medium \times role \times sensitivity type. As suggested by comparing Panels 1 and 2 in Figure 1, this second-order interaction was not significant: $F(1, 38) = 1.058$, $p = 0.31$, *ns*, $\eta^2_{\text{partial}} = 0.03$. The robust pattern of status effects was additive across the FtF and CMC conditions. These data clearly indicate that the status manipulations are producing an equivalent pattern of effects in both communicative environments very similar to those previously reported by Snodgrass (1992).

Strength of the Status Roles. To determine the degree to which participants maintained the boss and subordinates roles in each communicative environment, responses to the three embedded items from each of the three questionnaires that directly inquired about the dominant-subordinate roles were averaged for each participant. Table 1 summarizes these average ratings for each of the three different questionnaires in the CMC and FtF conditions. As the data in Table 1 indicate, the boss and subordinate roles were clearly maintained in both the CMC and FtF exchanges. Within the CMC condition, on questionnaire 1 bosses and subordinates differed, on average, by 3.21 units along the Likert scale. Similarly on questionnaires 2 and 3, they differed by 2.79 units and by 3.10 units, respectively. Correlated *t* tests indicated that each of these differences was significant at the .001 level. Within the FtF condition, on questionnaire 1 bosses and subordinates differed, on average, by 1.55 units. Similarly, on questionnaires 2 and 3, they differed by 1.71 units and by 1.37 units, respectively. Again, each of these differences was significant at the .001 level. Put most simply, the status manipulation (i.e., boss vs. subordinate roles) was clearly successful in both the CMC and FtF environments.

TABLE 1 Ratings of Status Roles from the Perspective of Boss and Subordinate Members of Dyad in CMC and FtF Conditions

	Average CMC Ratings				Average FtF Ratings			
	Boss	Subord.	Mean	Diff.	Boss	Subord.	Mean	Diff.
Questionnaire #1	<i>M</i>	5.78	2.57	3.21*		5.11	3.56	1.55*
e.g., I was the dominant ...	<i>SD</i>	.74	1.18			1.03	1.09	
Questionnaire #2	<i>M</i>	2.66	5.45	2.79*		3.10	4.81	1.71*
e.g., S/He was the dominant ...	<i>SD</i>	1.08	.93			1.33	.97	
Questionnaire #3	<i>M</i>	5.70	2.60	3.10*		5.02	3.65	1.37*
e.g., S/He thought I was the dominant...	<i>SD</i>	.74	1.21			1.07	1.10	

**t*-tests significant at $p < .001$.

More interesting, however, is a direct comparison of the strength of this status differential across the CMC and FtF dyads. As the data in Table 1 indicate, the status differential was consistently larger in the CMC dyads. Independent t tests comparing the difference scores for each of the three questionnaires across the FtF and CMC conditions revealed significantly enhanced status differences in CMC on each questionnaire (questionnaire 1: $t(38) = 3.84$, $p < .001$, Cohen's $d = 1.25$; questionnaire 2: $t(38) = 2.20$, $p < .03$, Cohen's $d = 0.72$; questionnaire 3: $t(38) = 3.83$, $p < .001$, Cohen's $d = 1.24$). The results from questionnaire 1 suggest that, relative to FtF, CMC participants rated themselves more extremely on the dominance scale. That is, CMC bosses rated themselves as more dominant while CMC subordinates rated themselves as less dominant compared to their FtF counterparts. The results from questionnaire 2 also suggest that, relative to FtF, CMC participants rated their partners more extremely on the dominance scale. That is, CMC bosses rated their subordinates as less dominant while CMC subordinates rated their bosses as more dominant compared to FtF participants.

DISCUSSION

The first question of interest in the present experiment was whether the accuracy of interpersonal perceptions, or interpersonal sensitivity, differs across the FtF and CMC conditions. Surprisingly, we observed essentially the same absolute levels of interpersonal sensitivity. When asked about their partner's feelings of enjoyment, comfort, and confidence following the interactions, individuals participating in the CMC conditions perceived these thoughts and feelings as accurately as individuals interacting FtF. More impressively, we observed the same robust interaction between the status roles and the two interpersonal sensitivity subtypes (PO and POP) in both of these communicative environments. In both CMC and FtF, bosses were most accurate when asked to judge how the subordinates felt about themselves (PO measure), and subordinates were most accurate when asked to judge how bosses felt about them (POP measure).

The equivalent levels of interpersonal sensitivity across our CMC and FtF conditions are particularly surprising given the lack of important affective information available in the text-based interactions. Theories concerned with media richness, such as social presence theory (Short et al., 1976), suggest that tasks requiring participants to monitor how their conversational partners are feeling should be particularly difficult in CMC. So how is it that individuals in our CMC condition were able to estimate the degree to which their partner was enjoying him- or herself, feeling competent, or feeling dominant as accurately as FtF participants?

One potential explanation is that the status labels and task we employed may have triggered a shared set of social stereotypes (boss and subordinate)

during the job interview. Indeed, such stereotypes appear to be readily triggered in text-based interactions (Epley & Kruger, 2005). If this was the case, each dyad in the CMC group could be generating a set of self- and other-judgments on the questionnaires that are congruent with the attributes inherent in the shared stereotypes. In spite of the impoverished cue environment, both participants may assume on the basis of shared stereotypical representations that bosses will, for example, be more comfortable, enjoy the job interview more and feel more dominant than the subordinate. As such, the surprisingly equivalent interpersonal sensitivity scores across the two communicative environments may not reflect our ability to sense another's feelings and thoughts, but instead may simply mark the influence of these shared representations that are not easily changed by the absence of various social cues during the short interview session.

Alternatively, CMC may not undermine situational judgments, like those measured by Snodgrass's (2001) interpersonal sensitivity paradigm. In fact, Graham and Ickes (1997) have argued that while nonverbal cues may provide sufficient information for judging broad emotional states (e.g., sadness), they are inadequate when making more specific judgments (e.g., specific thoughts and feelings). Therefore, more specific sorts of interpersonal judgments, such as the ones assessed by the interpersonal sensitivity paradigm, appear to require access to verbal information. Moreover, communicators tend to use linguistic patterns to convey emotional states in CMC (Hancock, Landrigan, & Silver, 2007). Therefore, verbal cues may be sufficient for making accurate situational judgments, which would suggest that interacting in a text-based environment would not undermine these judgments. Indeed, recent research suggests that we can accurately identify emotional states in CMC (Hancock et al., 2007), and that levels of "empathic accuracy" (cf., Ickes, 1997) are also equivalent across CMC and FtF settings (Currie, Jacobson, & Boucher, 2006; Jacobson, Bondy, & Boucher, 2006).

The second question of interest in the present experiment was whether the strength of the dominant and subordinate status roles developed and maintained during social interactions would differ across FtF and CMC conditions. Contrary to the predictions of the equalization hypothesis, the present data indicated that the boss and subordinate roles were actually more robust in the CMC environment. In spite of the fact that the cues available in the CMC interactions were limited to those available in a text-based exchange, participants in the CMC environment assigned stronger ratings to both their own and their partner's status roles.

These accentuated status differences are clearly inconsistent with studies supporting the equalization hypothesis (e.g., Dubrovsky et al., 1991). Why were the status differences exaggerated in CMC? Unlike previous research that employed group majority–minority manipulations (e.g., Dubrovsky et al., 1991; Weisband et al., 1995), the dyadic nature of the interactions rule out explanations related to increased solidarity between high-status members.

One possibility is that CMC may simply provide a more effective communicative environment for role play. Several researchers have argued that CMC provides a malleable environment for creating new identities (see Bruckman, 1992; [Flanagin et al., 2002](#)). If this is the case, it is possible that undergraduate students assigned to interview or be interviewed by another undergraduate student may have been more comfortable playing their designated role in the relatively anonymous context of CMC than when they were in full view of each other.

This pattern of results also is consistent with theoretical perspectives that consider the social psychological aspects of interacting via CMC. One theory that focuses on interpersonal processes in CMC, Walther's (1996) Hyperpersonal framework, describes a variety of factors that may lead to exaggerated attributions regarding both a communicative partner and perceptions of the self. In particular, in CMC, Participant A can selectively present information about herself (i.e., selective self-presentation), which may lead her partner (B) to have idealized perceptions (i.e., exaggerated attributions) about her. Then, due to behavioral confirmation (see Snyder, Tanke, & Berscheid, 1977), B's idealized perceptions also will lead A to perceive herself in a more exaggerated manner. Walther refers to this interactive process, in which participants' perceptions of both other and self become exaggerated, as an "intensification loop" (p. 28). Participants in the loop cooperate in a manner that selectively enhances the salience of the specific social roles they want to convey during an interaction.

Although Walther's (1996) analysis was not specifically developed to address the status equalization phenomenon, it certainly seems compatible with the data obtained in the present study. We explicitly assigned labels (boss and subordinate) to participants in the social interactions and these are likely to trigger the intensification loop Walther has described. Therefore, in the context of our procedure, Walther's analysis suggests that the CMC environment should actually facilitate role playing and the subsequent emergence and maintenance of more robust boss and subordinate roles.

Similarly, Lea and Spears' (1994) Social identification deindividuation (SIDE) model, which draws on social identity theory ([Tajfel & Turner, 1986](#)), suggests that in the absence of other individuating cues, the few social identity cues available in CMC become more salient and influential. In fact, this explanation has been used to counter the equalization hypothesis in a number of studies examining group-based identities (e.g., [Spears & Lea, 1994](#); [Spears, Postmes, Lea, & Wolbert, 2002](#)). According to this model, equalization should only occur when all cues to social status and group membership are eliminated. From this perspective, the boss and subordinate labels used in the current study should have been sufficient to produce the enhanced status differential. That is, given the lack of other cues available in the CMC environment, participants should perceive themselves and their partners less as individuals and more as representatives of a social category (e.g.,

bosses or subordinates). This, in turn, should influence their interpersonal perceptions and behavior, producing the more extreme dominance ratings in CMC relative to FtF.

Consistent with our data, both the hyperpersonal and SIDE models predict that the lack of contextual cues should exaggerate status roles. In other words, participants interacting in CMC in our study did not assign stronger ratings to status roles *in spite of* reduced contextual cues, but rather, *because* of them.

The data also are consistent with previous empirical research suggesting that interpersonal perceptions can be exaggerated in CMC contexts. For example, Hancock and Dunham (2001) also have observed that impressions regarding a partner's personality traits tend to be intensified in CMC relative to FtF interactions. In the present study, CMC participants' perceptions of status were similarly exaggerated relative to those of FtF participants. As noted above, the responses to questionnaire 2 (e.g., *S/He was the dominant one*) revealed that CMC participants rated their partners as more dominant or submissive than FtF participants. More importantly, the present data also suggest that this overattribution process is not limited to perceptions of the partner, but also applies to perceptions of the self. As noted above, responses to questionnaire 1, which assessed participants' rating of themselves (e.g., *I was the dominant one*), also were more extreme in the CMC condition than in the FtF condition.

EXPERIMENT 2

To explore the surprising equivalence of interpersonal sensitivity across FtF and text-based interactions, we replicated Experiment 1 in the absence of any stereotyping labels. When explicit status labels are eliminated from the procedure, there should be no salient shared stereotypes on which to base self and other judgments. If the equivalent levels of interpersonal sensitivity observed in Experiment 1 are due to shared stereotypical representations we should see reduced interpersonal sensitivity in CMC relative to FtF. In contrast, if the information available in CMC exchanges is sufficient for interpersonal sensitivity judgments, then we should see equivalent sensitivity across the CMC and FtF conditions.

As in Experiment 1, participants were asked to engage in a discussion with an unacquainted partner and, following this discussion, to complete the same three questionnaires used previously. Half of the participants communicated in the synchronous CMC environment and half in an FtF setting. However, in contrast to the first study, participants were not labeled as "boss" or "subordinate" but rather as "A" or "B" in order to remove the presumed influence of status labels. Similarly, the simulated job interview was replaced with a discussion topic that did not impose status roles.

If self and other ratings in Experiment 1 were based purely on shared stereotypical representations of status roles, then in the absence of labeled stereotypes, interpersonal judgments must now be based only on information available during the actual interactions and, thus, should be less accurate in the more impoverished CMC condition. In contrast, if perceivers depend more on verbal cues to make situational judgments about what others are thinking and feeling, then levels of interpersonal sensitivity should remain equivalent for the CMC and FtF conditions.

Method

Participants. Participants were 82 English-speaking undergraduate students who received partial course credit for their participation. They were randomly paired to form 41 previously unacquainted, same-sex dyads. Dyads were randomly assigned to a communicative environment (CMC or FtF), and within each dyad one member was randomly labeled as A or B. Data from one dyad in FtF were dropped for procedural reasons. Of the remaining 40 pairs (20 CMC, 20 FtF), 9 dyads were male (3 CMC, 6 FtF) and 31 were female (17 CMC, 14 FtF). Participants had a mean age of 21.90 years ($SD = 5.96$), ranging from 18 to 54 years of age.

Materials and Procedure. The basic procedure used in the current experiment was essentially the same as that used in Experiment 1, except that participants were randomly assigned to the role of A instead of boss or B instead of subordinate. To eliminate any other explicit cues to status, the job interview task was replaced with a discussion about whether students should work while attending university. This topic was chosen so that the nature of the discussion would parallel the job interview used in the first experiment. The instructions for this task were as follows:

[A/B]:

In this task, you will be discussing the effects of employment during the school year on the academic performance of university students. Drawing on your own past experience, discuss with your partner whether university students should work during the school year and what jobs may be most and/or least harmful to academic performance. A good place to start might be discussing what types of jobs you and your partner have had, and how these may have affected your studies.

Discuss the issue with your partner until you come to some conclusion about what types of employment might be best or worst for university students; this should take about 10–15 minutes.

Once participants finished this task, they were instructed to complete the three interpersonal sensitivity questionnaires. These questionnaires were essentially the same as those used in Experiment 1, but adapted to remove any

reference to status labels (i.e., “boss” was replaced with “A” and “subordinate” was replaced with “B”). In Study 2, participants’ average ratings across questionnaire items ranged from 3.82 ($SD = 1.34$) to 5.95 ($SD = 1.11$). After completing the questionnaires, participants were introduced to one another and fully debriefed.

Results and Discussion

Accuracy of Interpersonal Perceptions. As in the first study, the two interpersonal sensitivity correlations, PO and POP, were calculated for each participant within the dyad; mean PO scores for A and B were .34 ($SD = .40$) and .30 ($SD = .38$) respectively, and mean POP scores for A and B were .33 ($SD = .29$) and .36 ($SD = .34$) respectively. The four correlations were converted to Fisher’s z-scores and analyzed using a 2 (Communication Medium) \times 2 (role) \times 2 (Sensitivity Type) repeated-measures ANOVA. The results are presented in Figure 2.

The primary question of interest was whether, in the absence of explicit status labels, different levels of interpersonal sensitivity would emerge in CMC and FtF. Consistent with the data presented in the first study, we observed no significant difference in overall interpersonal sensitivity between the CMC and FtF conditions: $F(1, 38) = 1.01, p = 0.14, ns, \eta^2_{\text{partial}} = 0.06$; CMC ($M = 0.32, SE = 0.07$), FtF ($M = 0.48, SE = 0.05$). Also, the average interpersonal sensitivity measures summed across all conditions ($M = 0.40, SD = 0.11$) were very similar to those reported by Snodgrass (1992; $M = 0.39, SD = 0.21$) and those we reported earlier in Experiment 1 ($M = 0.43, SD = 0.25$). Therefore, the removal of explicit cues to status did not undermine the overall accuracy of participants’ interpersonal perceptions. As was the case in Experiment 1, participants in both CMC and FtF conditions were relatively accurate in evaluating their partner’s thoughts and feelings.

One possible concern is that in the absence of status roles and associated social stereotypes, participants would simply make neutral ratings on all three questionnaires, thereby artificially inflating accuracy scores in both communicative environments. However, mean ratings across the questionnaire items in the current study revealed substantial variability from the neutral point and were roughly equivalent across the two studies (ranging from 2.07 to 5.95 in Study 1 and from 3.82 to 5.95 in Study 2), suggesting that this does not seem to be a plausible explanation for the equivalent levels of accuracy observed across our CMC and FtF conditions.

The next question of interest was whether the pattern of status effects on interpersonal sensitivity observed in the first experiment would be moderated in the absence of status cues. As expected, the sensitivity type \times role interaction was not significant: $F(1, 38) < 1, ns, \eta^2_{\text{partial}} = 0.02$. In contrast to Experiment 1, participants A and B were equally accurate on the PO ($M = 0.42, SE = 0.08$ and $M = 0.34, SE = 0.07$, respectively) and POP

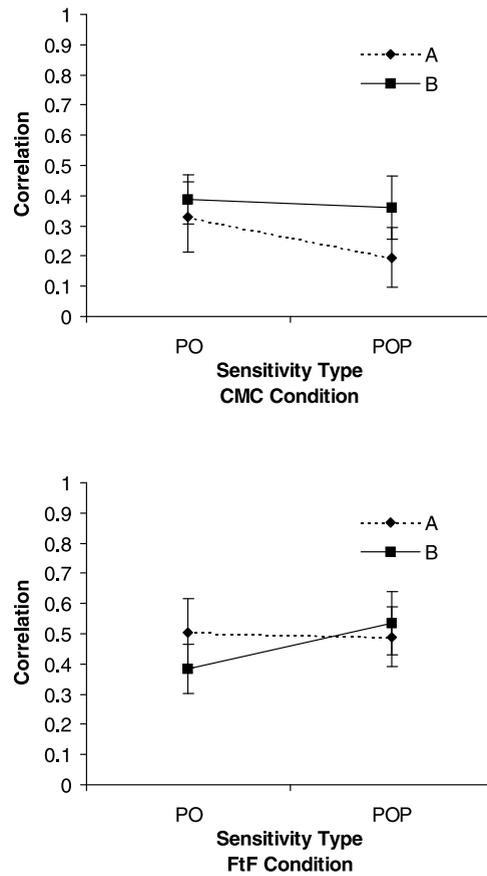


FIGURE 2 Mean perceives other (PO) and perceives other's perceptions (POP) sensitivity measures (with standard error bars) for A and B in CMC condition (panel 1) and FtF condition (panel 2) in Study 2.

($M = 0.39$, $SE = 0.05$ and $M = 0.45$, $SE = 0.07$, respectively) measures. In addition, the second-order interaction of Communication Medium \times Role \times Sensitivity Type failed to reach significance: $F(1, 38) < 1$, *ns.*, $\eta^2_{\text{partial}} = 0.001$, indicating that in the absence of status labels this pattern continued to be additive across the CMC and FtF conditions. Finally, the main effects for sensitivity type, $F(1, 38) = 0.95$, $p = 0.33$, $\eta^2_{\text{partial}} = 0.02$, and role, $F(1, 38) < 1$, $\eta^2_{\text{partial}} = 0$, were not significant.

Taken together, these data suggest that the equivalent levels of interpersonal sensitivity we observed in Experiment 1 cannot be explained by shared stereotypical representations. Even in the absence of status labels or any ancillary cues to status (e.g., nature of conversational task), there was no difference between the FtF and CMC conditions for either type of interpersonal sensitivity. Instead, it appears that such situational judgments

are not undermined in CMC, suggesting that verbal cues are, in fact, sufficient for judging what others are currently thinking and feeling.

Strength of the Status Roles. Again, the three embedded items from each questionnaire that directly inquired about the dominant–subordinate dimension were averaged for each participant, and for each questionnaire type. As in Experiment 1, these dominance indexes had excellent reliability with Cronbach's alphas ranging from .88 to .92 for A, and from .90 to .94 for B. These were compared using correlated *t* tests. Since status labels and other explicit cues to status were removed in the current study, one would expect that participants randomly assigned to the A and B labels would not differ in terms of their dominance ratings. Indeed, the results indicate that in both CMC and FtF, A (CMC: $M = 4.04$, $SD = 0.67$; FtF: $M = 3.99$, $SD = 0.70$) and B (CMC: $M = 4.22$, $SD = 0.86$; FtF: $M = 4.12$, $SD = 0.70$) made similar ratings across all questionnaire types, CMC: $t(19) = -0.81$, $p = 0.43$, *ns*, Cohen's $d = 0.23$.; FtF: $t(19) = -0.63$, $p = 0.53$, *ns*., Cohen's $d = 0.19$ (note also that similar results are obtained for each individual questionnaire type). These data indicate that the removal of explicit cues about status effectively created equal-status dyads with the average ratings falling midway between the dominant and subordinate ratings observed for each role in Experiment 1. Moreover, the difference between A and B's ratings on all questionnaire types was comparable across the CMC ($M = -0.18$, $SD = 0.98$) and FtF ($M = -0.13$, $SD = 0.94$) environments, $t(38) = -0.15$, $p = 0.88$, *ns*, Cohen's $d = 0.05$.

GENERAL DISCUSSION

As indicated earlier, research suggests that there are conditions under which status roles are diminished in CMC environments (e.g., [Dubrovsky et al., 1991](#)). These data are based largely on indirect measures indicating that participation rates in CMC groups tend to be evenly distributed across individuals differing in social status. In the present research, we extended the analysis of the equalization phenomenon to include more detailed analyses of the dyadic social interactions that occur in CMC and FtF environments. Specifically, we introduced two novel measures designed to determine if the accuracy of interpersonal perceptions is undermined in the impoverished CMC setting and whether the strength of status roles detected during an interaction is diminished.

Considered together, the results from these two experiments add at least two interesting and important observations to the current literature concerned with the equalization hypothesis. First, the measures of interpersonal sensitivity we employed in these experiments indicate that the accuracy of our interpersonal perceptions do not appear to differ across the CMC and FtF conditions. These data further suggest that the diminished impact of social

status in CMC interactions where participation rates are equally distributed across status roles (e.g., [Dubrovsky et al., 1991](#)) should not be attributed to a failure to detect or perceive status role differences in the impoverished social context.

Second, our data indicate that in some contexts the CMC environment does not diminish, but actually enhances status differentials, even when high-status members are not in a majority position. When compared to the FtF condition, participants in the dyadic CMC interactions established the boss and subordinate roles more clearly in their self- and other-ratings. These results directly contradict the equalization hypothesis. As noted above, the enhanced status differentials observed in Study 1 are more in line with theoretical perspectives that consider social psychological factors associated with CMC, such as the interpersonally oriented hyperpersonal model ([Walther, 1996](#)), or the social identity-oriented SIDE model ([Spears & Lea, 1994](#)).

The data generated by the interpersonal sensitivity measure are particularly surprising and potentially important. Essentially, this measure revealed equivalent performance across the FtF and CMC conditions. As discussed earlier, our initial interpretation of the data in Experiment 1 assumed that the interpersonal sensitivity measures (PO and POP) might be mediated by shared stereotypical representations of the status roles triggered by the labels (e.g., [Epley & Kruger, 2005](#)). However, this interpretation is undermined by the fact that accuracy scores were equivalent across the CMC and FtF conditions even without status labels in Experiment 2. Given these effects, it would be difficult to argue that the results obtained in Experiment 1 reflect only the operation of shared stereotyping mechanisms.

Alternatively, one could argue that the PO and POP correlations are not sensitive enough to capture the effects the CMC environment is having on interpersonal judgments. However, this seems unlikely given that, in Experiment 1, the well-established interaction between status and the interpersonal sensitivity subtypes in the FtF condition was equally robust in the CMC setting. Moreover, other studies have yielded similar findings using other measures of judgmental accuracy. For example, [Hancock et al. \(2007\)](#) demonstrated that communicators can identify a conversational partner's emotional state accurately in CMC, and [Jacobson and her colleagues](#) found equal levels of empathic accuracy in CMC and FtF interactions ([Currie et al., 2006](#); [Jacobson et al., 2006](#)). Therefore, it seems that we are able to assess some very subtle differences in the various thoughts and feelings individuals have about themselves and others in both of these communicative environments.

Although the comparable levels of interpersonal sensitivity across CMC and FtF would seem to suggest that nonverbal information is not necessary to form accurate judgments in these contexts, information used for situational judgments could differ from that used for judging more stable personality traits. It is possible that perceiving traits accurately requires nonverbal infor-

mation as well as verbal information, while situational judgments, such as those measured by interpersonal sensitivity, may rely more on verbal cues. If this is the case, a trait-based judgmental accuracy measure, such as Kenny's (1994) social relations model, may be more sensitive to the presumed impact of the CMC environment. Indeed, a study using measures based on this model found that individuals communicating in CMC rated their partners as less agreeable, conscientious, neurotic, and open, but more extraverted than the partners perceived themselves (Markey & Wells, 2002).

Although additional research is required to determine if accuracy for more stable and generalized judgments is undermined in text-based CMC, it appears that the removal of nonverbal cues in CMC settings may not necessarily undermine judgmental accuracy. Contrary to the social presence theory (Short et al., 1976), the current data suggest that communicators are able to monitor their partner's reactions and feelings as effectively in CMC as those interacting face-to-face.

CONCLUSIONS

Although the "equalization assumption" has some prior empirical support and considerable intuitive appeal, the present research suggests that it may be premature to assume that impoverished CMC environments will inevitably undermine hierarchical status differences in social forums like online chat rooms. When we address these questions about social status in CMC across different contexts with more sophisticated measures of the communicative process, our data suggest that when social status cues (e.g., boss vs. subordinate) are present, social roles are readily maintained and may even be intensified in some CMC settings. Finally, and perhaps most surprisingly, communicators appear to be just as sensitive to their partner's thoughts and feelings in text-based communication as in more traditional FtF interactions.

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