

Liking and Self-Disclosure in Computer-Mediated
and Face-to-Face Interactions

by

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The rapid expansion of Internet technology in the last twenty years has been accompanied by a surge in the amount of literature dedicated to the nature of computer-mediated communication and the causes and consequences of Internet use. However, despite a great deal of theoretical interest in the subject, there is relatively little empirical research that addresses how social bonds develop online. In online interactions, many of the factors thought to be involved in initial attraction, such as physical attractiveness and proximity (e.g., Berscheid & Reis, 1998; Walster, Aronson, Abrahams, & Rottmann, 1966), are absent. One might expect, then, that people who meet online would be less apt to like each other. Two recent studies actually suggest that the opposite is true – that people who meet online like each other more than people who meet face-to-face (McKenna, Green, & Gleason, 2002; Bargh, McKenna, & Fitzsimons, 2002).

If it is the case that people like each other more online, at least initially, there must be an explanation for this somewhat counterintuitive finding. One clue might come from new research by Tidwell and Walther (2002; also Joinson, 2001), who found that people self-disclose more online than they do face-to-face. A great deal of research has already shown that self-disclosure leads to liking, and vice versa (Collins & Miller, 1994), but this relationship has not been tested in computer-mediated communication.

Because the assertion that there might be greater liking online is based on only two studies, which were similar in several regards, one aim of the current study was to replicate this finding. This study also tested whether liking is related to self-disclosure in online interactions. In other words, it is possible that heightened self-disclosure leads to greater liking online, which would explain why people like each other more even in the absence of factors traditionally thought to be at the heart of interpersonal attraction.

Although this hypothesis is consistent with recent findings, it contradicts much of the conventional wisdom about the nature of online interaction (e.g., Kiesler, Siegel, & McGuire, 1984; Sproull & Kiesler, 1986).

Internet Research: A Major Debate

Almost from the earliest stages of Internet research, there has been a debate about whether the Internet is an “impoverished environment” in which it is difficult or impossible to form meaningful social relationships or whether it is a potentially rich social environment. Much of the theory and research relevant to this debate is grounded in comparisons between computer-mediated communication and face-to-face communication. There is no doubt that they differ in several important ways. The most obvious difference, of course, is the lack of visual and auditory information available online. Another is the relative anonymity – or control over the release of identifying information – experienced by people communicating online. Not only are they not seen by their partners, they are often identified by screen names or email addresses that give no clues as to their real identities. Both the relative anonymity (or feelings of being less identifiable or accountable) and the limited capacity for transmitting and receiving certain types of information have been explored by researchers and have fueled this debate.

In some of the earliest research on computer-mediated communication, Kiesler, Siegel, and McGuire (1984) examined emails sent between people in a corporate setting and found that people were more aggressive and more hostile over email than they were face-to-face. This led to much speculation and research about the potential impact of feeling deindividuated on negative behaviors such as “flaming.” Researchers proposed

that computer-mediated communication would be more negative in content because people would not feel as accountable for their own bad behavior online, where the target is – or feels – more distant (e.g., Sproull & Kiesler, 1986). Later meta-analyses concluded that the overall incidence of hostile or aggressive behaviors online is low overall (Postmes & Spears, 1998; Walther, Anderson, & Park, 1994), but this has not entirely wiped out the perception of the Internet as a potentially hostile environment.

The utility of the Internet for fostering social relationships has also been questioned on the grounds that computer-mediated communication lacks the bandwidth necessary to transmit the cues and information that people use when building relationships. In other words, whereas it is possible to send and receive many different kinds of verbal and non-verbal cues face-to-face (i.e., there is wide bandwidth face-to-face), computer-mediated communication is limited in the amount and type of information that can be conveyed. Theories that refer to the inability of the Internet to communicate certain types of information are together more generally called the “cues-filtered-out” hypothesis (Walther, 1995). The basic premise is that because computer-mediated communication lacks cues such as facial expressions, body language, vocal intonation, and physical touching, it is by its very nature a less personal medium (Kiesler et al., 1984; Sproull & Kiesler, 1986). This is compounded by the fact that the Internet is thought to lack social presence, or feelings of engaging in a shared interpersonal experience (Culnan & Markus, 1987; Short, Williams, & Christie, 1976).

If cues are “filtered out” online, there might be little hope of using the Internet to develop meaningful social relationships, at least ones that are as close and rewarding as face-to-face relationships¹. Indeed, many studies have found that people interacting

online do not communicate as effectively and are not as satisfied with their interactions (e.g., Dorado, Medina, Munduante, Cisnero, & Euwema, 2002; Hobman, Bordia, Irmer, & Chang, 2002; Joinson, 2001; Schneider, Kerwin, Frechtling, & Vivari, 2002; Kiesler & Sproull, 1992; Thompson & Coovert, 2003). Often, however, the participants in these studies were not allowed to interact naturally, as they might if they were really trying to develop social relationships. Instead, participants were usually given a discussion question or a problem to resolve cooperatively in dyads or small groups. While these types of studies are directly relevant to concerns about using the Internet in corporate or educational settings, it is not at all clear that the findings generalize to all manner of interpersonal interactions. It seems unsound to draw conclusions about how personal relationships develop online from this type of research.

Moreover, there is not universal support for the cues-filtered-out hypothesis. Walther and his colleagues have conducted extensive research on computer-mediated communication, and they question whether face-to-face communication is actually more personal or more productive (e.g., Tidwell & Walther, 2002; Walther, 1993, 1995, 1996, 2002; Walther & Burgoon, 1992). In one study, for example, Walther (1995) had triads of students work on “loosely structured” decision tasks at three points during a five-week course. Half the triads met face-to-face, and half conducted their discussions over an Internet message board, which allowed them to post and read at their leisure. Coders later watched videos of the face-to-face subjects and read postings from the online subjects. They rated the online discussants higher on immediacy/affection and similarity/depth for all three interactions. Online and face-to-face triads were initially given the same ratings on composure/relaxation, but then online triads’ ratings increased, and face-to-face triads’

ratings decreased. Also, although face-to-face triads were rated higher on trust at first, the ratings for online and face-to-face converged.

Studies such as these highlight the need for caution when drawing conclusions about the supposed disadvantages of computer-mediated communication. Walther and his colleagues have argued that research findings that highlight the apparent advantages of face-to-face communication can be explained by the short amount of time usually allowed for discussions online. According to Walther's (1992) Social Information Processing (SIP) Theory, "The critical difference between FtF [face-to-face] and CMC [computer-mediated communication] from this perspective is a question of rate, not capability" (p. 190). Given enough time, SIP theory predicts that the differences between face-to-face and computer-mediated communication should basically disappear. This is not to say that computer-mediated and face-to-face communication do not differ. Rather, SIP theory says that people who interact online are able to compensate for the ways computer-mediated communication is different and, over time, communicate just as effectively as they do face-to-face.

In short, although much early research and theorizing suggested that it was unlikely that people would be able to form or maintain close relationships online because of the impersonal and possibly hostile nature of computer-mediated communication, to date there is no conclusive evidence that the Internet is indeed an impoverished or hostile environment. The literature is filled with conflicting findings and arguments, which often only peripherally address the possibility of using the Internet for developing social relationships. In fact, research that has directly examined using the Internet for this purpose has found that computer-mediated relating actually fares more favorably than the

cues-filtered-out hypothesis would predict. For example, Parks and Floyd (1996) surveyed newsgroup users who had formed relationships with another person online and found that their relationships were moderately interdependent, deep, and committed. They also felt a sense of predictability and understanding, an important component of interpersonal relationships (e.g., Swann, 1990).

It is also worth noting here that it is certainly the case that people do use the Internet to foster social relationships. Surveys of Internet users have found that a common (often the most common) reason people use the Internet is to keep in touch with friends and family via email (e.g., D'Amico, 1998; Stafford, Kline, & Dimmick, 1999). This calls into question the notion that Internet technology is ill-suited for relational communication. Of course, it is possible that people are choosing to communicate with friends and loved ones via a medium that leads to hostile and impersonal interactions. However, it seems more likely that people find they are able to use computer-mediated communication as a substitute for, or supplement to, face-to-face interactions, and they are still able to maintain satisfying, warm interpersonal relationships.

But can the Internet really provide a place for people to develop relationships with people with whom they have not already bonded face-to-face? There is also theoretical and empirical support for the idea that the Internet can actually promote these relationships (e.g., McKenna et al., 2002). It is even possible that despite, or maybe because of, its different capabilities, the Internet opens up new possibilities for developing social relationships (McKenna & Bargh, 1998, 2000). The Internet allows people to transcend geographical boundaries and find others with similar interests, concerns, and beliefs. It might also allow people who are constrained in their face-to-face

interactions by such things as visible stigmas or social anxiety to “test the water” in an environment where they are less identifiable or have more control over the people with whom they interact and the information they share (Bargh et al., 2002; McKenna & Bargh, 2000; McKenna et al., 2002; Morahan-Martin & Schumacher, 2003)

There is now reason to think that, in some cases, computer-mediated communication might actually be more conducive to forming interpersonal relationships than face-to-face communication. Specifically, new studies have shown that in initial interactions, online partners self-disclose more and like each other more compared to face-to-face partners (Bargh et al., 2002; Joinson, 2001; McKenna et al., 2002; Tidwell & Walther, 2002). It is this research that inspired the present study, and it is to these findings that I now turn.

Self-Disclosure and Liking on the Internet

The question driving the present research is whether heightened self-disclosure online leads people to like each other more online than they do face-to-face. There is already some support for each of the separate components of this question. That is, previous studies have found that people like each other more online versus face-to-face (Bargh et al., 2002; McKenna et al., 2002), and that people self-disclose more when they interact online than when they interact face-to-face (Joinson, 2001; Tidwell & Walther, 2002). Self-disclosure has also been shown to increase liking (and liking has been shown to increase self-disclosure; e.g., Collins & Miller, 1994), but this was demonstrated in studies that, for the most part, were conducted before the widespread use of Internet technology.

A study by McKenna, Green, and Gleason (2002) provided some initial evidence that people who interact online like each other more than those who interact face-to-face. In this study, pairs of strangers were asked to get acquainted. Each pair had two 20-minute conversations in one of three conditions. The control group interacted face-to-face both times. In the “IRC” (Internet relay chat) condition, participants met first online and then face-to-face with the same partner, and they knew they were meeting the same partner both times. In the third condition, which the authors called “trading places,” participants met once online and once face-to-face (counterbalanced) but thought they were meeting different partners each time. After each conversation, participants were asked how much they liked their partners and about the quality of their conversations.

Results showed that participants who interacted face-to-face both times liked each other slightly (non-significantly) less after the second conversation than after the first. However, participants in the IRC condition liked each other significantly more after the second conversation, suggesting that meeting online before meeting face-to-face leads people to like each other more than simply meeting face-to-face². Most interesting is the finding that in the trading places condition, participants liked their online partners more than their face-to-face partners, even though they were rating *the same person* both times. They also reported feeling that they knew their online partners better.

These results are bolstered by additional research by Bargh, McKenna, and Fitzsimons (2002), which found that participants liked each other significantly more if they engaged in a 40-minute chat online than if they chatted face-to-face. However, contrary findings were reported by Mendelsohn, Connell, and Robins (unpublished manuscript), who conducted a study using a round robin design in which four participants

split into dyads and chatted with each of the other participants for 5 minutes face-to-face or 10 minutes online. They found no significant differences in liking in face-to-face versus online chats³.

Because there are only a few studies that directly compare liking online with liking face-to-face, and because there is not a consensus on whether liking is greater online, more research is needed. If liking is greater online, even though computer-mediated communication lacks many of the cues that usually lead to liking, it must be the case the people are able to compensate for the relative shortcomings of computer-mediated communication. One way people might overcome the lack of non-verbal cues online is to increase the amount of information they convey verbally (i.e., in writing). That is, increased liking online could be due to heightened self-disclosure in computer-mediated communication.

McKenna and her colleagues (2002) propose that this is the case but do not test this assertion directly (see also McKenna & Bargh, 2000). However, two lines of research can speak to this question. First, the link between liking and self-disclosure has already been explored (e.g., Collins & Miller, 1994). Second, there is evidence that people are more self-disclosing online than they are face-to face.

There is a very extensive literature devoted to liking and self-disclosure, which are thought to be positively related and important for the development of closeness and intimacy in interpersonal relationships (e.g., Altman & Taylor, 1973; Derlaga, Metts, & Margulis, 1993; Worthy, Gary, & Kahn, 1969). Self-disclosure can lead to closeness, and information can be disclosed as a symbolic gesture of feelings such as trust and affection. That is, it is possible to extrapolate from the depth and breadth of a person's self-

disclosure how much he or she likes an interaction partner. Similarly, it is possible to signal liking and desire for closeness with another simply by self-disclosing. On the flip side, it is possible to show dislike by withholding or failing to reciprocate self-disclosure.

Collins and Miller (1994) performed a meta-analysis of this literature and explored three possible links between liking and self-disclosure. First, people might like others who self-disclose (i.e., If Tom discloses to Betty, does Betty like Tom?). Second, people might self-disclose more to others that they like (i.e., if Tom likes Betty, does Tom self-disclose to Betty?). Third, people might like those to whom they self-disclose (i.e., if Tom self-discloses to Betty, does Tom like Betty?). Overall, they found evidence to support all three of these associations.

The studies reviewed by Collins and Miller (1994) were mostly conducted before the Internet was commonly used for interpersonal communication and so, not surprisingly, they did not compare disclosure in computer-mediated and face-to-face communication. However, given the links they showed, and given the finding that liking is greater online, it makes sense to hypothesize that there should also be more self-disclosure between online partners than between face-to-face partners. Indeed, this seems to be the case. Joinson (2001), for example, gave participants a discussion question and had them chat in dyads either online or face-to-face. Although the absolute number of self-disclosures was low overall, online conversations yielded more self-disclosures on average.

In another study, Tidwell and Walther (2002) assigned their participants to dyads and asked half of the dyads to interact in person, while the other half chatted using semisynchronous email (that is, email that popped up and was read and responded to

right away; this is less immediate than chatting but more immediate than most email correspondence). The discussions were then coded. Although the face-to-face dyads averaged significantly more utterances per conversation⁴, the online dyads produced significantly higher proportions of self-disclosures and questions aimed at eliciting self-disclosure from their partners. Moreover, their questions were more intimate than the questions asked by participants in the face-to-face condition. Interestingly, coders also rated how effectively participants communicated with their partners. The correlation between asking questions and being rated as effective was moderately positive for online participants, but it was significantly negative for face-to-face participants.

Thus, there is some initial support for the hypotheses that people self-disclose online more than they do face-to-face and that they like each more. There is also evidence that liking leads to self-disclosure, and vice versa, in face-to-face communication. However, to my knowledge there is no study which explicitly tests whether the same relationships between liking and self-disclosure exist online. The present research aims to do just that.

Overview of the Present Research

In this study, participants chatted either online or face-to-face and then provided self-reports of liking and self-disclosure, as well as several other measures. I had two major aims for this research. The first was to replicate the previous findings that people like each other more online (Bargh et al., 2002; McKenna et al., 2002) and that they self-disclose more online (Joinson, 2001; Tidwell & Walther, 2002).

H1a: Liking will be greater online compared to face-to-face.

H1b: Online interactions will yield more self-disclosure than face-to-face interactions.

I also intended to test whether self-disclosure is positively associated with liking online in the same way as it is face-to-face, which would help explain why there is greater liking in a medium that lacks many of the social cues available face-to-face. Specifically, I hypothesized that in online interactions, people should like their partners more when they feel that their partners are self-disclosing. Those who self-disclose should also like their partners more.

H2a: Perceiving one's partner as self-disclosing will be related to greater liking for that partner online.

H2b: Perception of oneself as self-disclosing will be related to greater liking for one's partner online.

In addition to testing these primary hypotheses, I planned several additional analyses, which I hoped would shed more light on differences between social processes online and face-to-face. Because the second hypothesis addresses two of the three liking-disclosure links identified by Collins and Miller (1994), I also test the third, whether participants disclosed more to people they liked. I expected that this effect would be significant online, as it is face-to-face.

The dependent measures used in this study (described below) also allowed me to test whether partners reciprocated each other's liking and self-disclosure, and to compare reciprocity of liking and self-disclosure online versus face-to-face. That is, I tested whether each partner within a dyad reported that they liked and self-disclosed to the other the same amount and whether there were any differences between the two mediums. Additionally, I was able to test whether people online and face-to-face could accurately

judge how much their partners reported liking them and how much their partners reported self-disclosing. The reciprocity and accuracy tests were exploratory, so I did not make specific hypotheses about these analyses.

Thus, the present study extended and brought together research on liking and self-disclosure online and face-to-face. It also had several advantages over previous work. First, the dyads in this study had two active participants, as opposed to a participant interacting with a confederate, observing two other people having a conversation, or reading a vignette about people self-disclosing to each other. Such methods have been used often in the past to test the relationship between liking and self-disclosure (Collins and Miller, 1994), but they are not as externally valid as when two real participants interact.

Second, the dependent measure was a self-report of self-disclosure as opposed to coders' ratings, which have been used in previous studies (e.g., Joinson, 2001; Tidwell & Walther, 2002). This is important because computer-mediated communication does differ substantially from face-to-face communication, and therefore self-disclosure might be perceived differently in the two mediums. For example, Cozby (1972) found empirical support for a curvilinear relationship between self-disclosure and liking, with less liking occurring when people disclose too much or too little given the intimacy of the situation. What is considered the "right amount" of disclosure online might be different from what is considered appropriate face-to-face, and it might also be interpreted differently by an independent coder and by a participant. For that reason, it is important to ask participants about their subjective judgments.

Finally, this research used individuals as the unit of analysis in looking at the data, and the amount of non-independence in the dyads was addressed using appropriate statistical tests. Although much of the previous research on liking and self-disclosure included dyads or small groups in the studies, many were conducted before statistical methods had been developed that allow researchers to deal with the non-independence inherent in their designs. Even research conducted in recent years has generally used the dyad as the unit of analysis or has simply ignored the non-independence in the data and used individuals as the unit of analysis. Using statistical techniques that account for non-independence allows researchers to ask different questions and have more confidence in their analyses.

Method

Participants

Data were collected from 286 participants (143 dyads). Three dyads were excluded from the analyses, one because one member did not speak English proficiently and did not understand the dependent measures, one because a computer malfunction did not allow the pair to complete the chat, and one because the partners knew each other prior to the study. That left a final sample of 280 participants (80 men, 198 women, 2 unreported)⁵. All participants were undergraduate students from the UC Berkeley psychology department research participant pool who participated in exchange for partial credit toward fulfilling a psychology course requirement. They were run in dyads and were assigned to either the online chat ($n = 148$; 74 dyads) or face-to-face chat ($n = 132$; 66 dyads) condition.

Participants ranged in age from 17 to 35 years ($M = 19.83$, $SD = 2.02$). They reported having extensive experience using computers and the Internet. Two hundred fifty-eight participants (92.1%) started using a computer by age 15, and 215 (76.8%) started using the Internet by the same age. Nearly all participants (93.3%) said they used the Internet at least once per day, and no one reported that they used the Internet less than once per week. The most common reasons for using the Internet in our sample were chatting or sending instant messages with friends and family and emailing friends and family; 60.4% and 52.2% of participants, respectively, reported engaging in these activities at least once per day.

Procedure

Participants in the online chat condition reported to different rooms and never saw their partners face-to-face. Participants in the face-to-face condition both reported to the same room and were seated apart from each other. Upon arrival at the experimental session, participants signed an informed consent that stated that the goal of the experiment was to study how individuals get to know each other. After signing the informed consent, some of the participants ($n = 164$) completed a computer use history containing several items about how long they had been using computers and the Internet, how often they used them, and for what purposes. They also rated 24 traits (e.g., imaginative, likeable, touchy) on how well they describe their personality using a 5-point Likert scale (1 = not at all; 5 = very). The rest of the participants ($n = 116$) filled out a short questionnaire that asked them to rate how much of each of 12 emotions (e.g.,

amusement, anxiety) they were feeling at that time using a 9-point Likert scale (0 = no emotion; 4 = moderate emotion; 8 = extreme emotion).

Participants were then told that they would take part in a 20-minute chat with their partners⁶. In the face-to-face condition, the participants were seated on either side of a table with a tape recorder between them. The experimenter started the recording, asked them to leave it running for the duration of the chat, and left the room. In the online condition, each participant in his or her respective room was seated at a computer that was already logged into a popular instant messaging program. Each participant was identified in the chat by a standard screen name designated for the purposes of the experiment. After making sure that participants understood the program, the experimenter left the room.

Twenty minutes later, the experimenter returned to the room and, in the face-to-face condition, stopped the tape recording. Participants in both conditions returned to their original seats to complete the dependent measures, which are described below, and participants filled out the computer use history if they had not done so already. Then all participants were probed for suspicion, debriefed, and thanked.

Dependent measures

Liking and self-disclosure. Liking and self-disclosure were assessed using a series of items, which are listed in Table 1. Some of the items referred to how much participants liked their partners and how much they disclosed to their partners. Others asked participants to estimate how much their partners liked and disclosed to them. All items were rated using 7-point Likert scales (1 =not at all/none to 7 = a great deal).

Emotion ratings. Participants were given a list of 12 emotions (e.g., amusement, anxiety) and were asked to rate how much of each emotion they felt during the conversation using a 9-point Likert scale (0 = no emotion; 4 = moderate emotion; 8 = extreme emotion). They then rated the same twelve emotions on how much of each their partners probably felt.

Trait ratings. Participants were then presented with 24 traits (e.g., imaginative, likeable, touchy). All participants completed the trait ratings twice, once describing how their partners probably perceived their personalities and once describing their partners' personalities, using a 5-point Likert scale (1 = not at all; 5 = very). A subset of ($n = 116$) also rated each trait for how well it described them as they were during the conversation.

Results

Self-Disclosure and Liking Scores

First I calculated three self-disclosure scores for each participant. Ratings of the five self-disclosure items listed in Table 1 were averaged to create an “overall disclosure” score (correlations between these items ranged from $r = .42$ to $r = .77$, all $ps = .000$, $\alpha = .87$). The overall disclosure score represents the total amount of self-disclosure each participant perceived there to be within his or her dyad (i.e., between him/herself and his/her partner).

Each participant was also given a “disclosure-to-partner” score, which is the average of the two items about how much he or she self-disclosed ($r = .65$, $p = .000$, $\alpha = .78$)⁷. Ratings on the two items which asked each participant to report how much his or

her partner self-disclosed were averaged into an “estimated-partner’s-disclosure” score ($r = .77, p = .000, \alpha = .80$).

Similarly, I calculated an “overall liking” score for each participant, which is the average of the two liking items listed in Table 1 ($r = .74, p = .000, \alpha = .85$). “Liking-for-partner” and “estimated-partner’s-liking” in this case were simply the single items.

Amount of Liking and Self-Disclosure Online Versus Face-to-Face

Overall liking was significantly greater in the face-to-face condition ($M = 5.06$) than in the online condition ($M = 4.71$), $t(278) = -2.692, p < .01^8$. Breaking the overall liking score into its components revealed an interesting pattern. The difference in how much participants liked their partners was statistically significant (liking-for-partner $M_s = 4.89$ and 5.42 for online and face-to-face, respectively), $t(278) = -3.885, p = .000$. However, there was no significant difference in how much participants thought their partners liked them (estimated-partner’s-liking $M_s = 4.53$ and 4.69 online and face-to-face, respectively). These results are shown in Figure 1.

Online and face-to-face participants did not differ in how much overall self-disclosure they reported ($M = 3.28$ and 3.44 , respectively). Looking separately at how much participants reported that they and their partners disclosed, there were still no differences between the two mediums (own-disclosure $M_s = 3.39$ online and 3.40 face-to-face; estimate-partner-disclosure $M_s = 3.29$ online and 3.46 face-to-face). These results are also shown in Figure 1.

These findings contradict the assertion that there is more liking online (Bargh et al. 2002; McKenna et al., 2002) and that there is more self-disclosure online (Joinson,

2001; Tidwell & Walther, 2002). The first hypothesis was not supported. However, this did not preclude testing the link between liking and self-disclosure online. It is still possible that self-disclosure might be associated with liking online, even if liking and self-disclosure are not greater online than they are face-to-face.

The Relationship between Liking and Self-Disclosure Online and Face-to-Face

The next step was to look at how self-disclosure and liking were related in the two mediums. Because the design of this study involved two real participants interacting naturally and completing dependent measures after a chat (i.e., neither liking nor self-disclosure was experimentally manipulated), it was not possible to conduct analyses that would directly test the three causal relationships identified in Collins and Miller's (1994) meta-analysis. However, I was able to test whether liking and self-disclosure were positively associated online and face-to-face to see if the data suggested that those relationships might hold true in the current sample.

First, I correlated the liking and self-disclosure ratings, adjusting the significance tests to account for the non-independence in the data, as suggested by Griffin and Gonzalez (1995). The correlation between liking-for-partner and disclosure-to-partner was significant both online ($r = .39, p < .01$) and face-to-face ($r = .22, p < .05$). The correlation between liking-for-partner and estimated-partner's-disclosure was also significant online ($r = .37, p < .01$) and face-to-face ($r = .33, p < .01$). These correlations offer initial support for the claim that liking is positively associated with how much participants thought they disclosed and how much they thought their partners disclosed.

Because the correlation between disclosure-to-partner and estimated-partner's-disclosure was very high ($r = .68$), partial correlations were also computed. When controlling for estimated-partner's disclosure, the correlation between liking-for-partner and disclosure-to-partner became marginally significant for the online participants ($r = .16, p = .06$), and it became non-significant for the face-to-face participants ($r = .06$). When controlling for disclosure-to-partner and correlating liking-for-partner and estimated-partner's-disclosure, the opposite pattern of results emerged. This time, the correlation remained significant for the face-to-face participants ($r = .26, p < .01$), but the correlation was no longer significant for the online participants ($r = .09, ns$).

To further investigate differences in liking between the two mediums, I correlated how much participants liked their partners and how much *their partners* reported that they self-disclosed. This between-partner correlation was only significant face-to-face ($r = .16, p < .05$). It was near zero online ($r = .003, ns$).

Taken together, these correlation analyses imply that different processes were occurring in the two mediums. Among face-to-face participants, liking was primarily associated with how much they thought their partners disclosed. This was not the case for the online participants, for whom liking was more related to their own self-disclosure.

Another way of looking at these data is to use Kashy and Kenny's (2000) actor-partner interdependence model to disentangle actor and partner effects. Actor effects occur when one person's ratings on a variable affect his or her ratings on a second variable (a *within-person* effect). Partner effects are when one's ratings on a variable influence his or her *partner's* ratings on another variable (a *between-person* effect). It is important to calculate these separately. Looking only at dyad-level effects obscures this

distinction and makes interpreting one's findings difficult because it can be unclear whether one or both partners is responsible for a particular outcome (or whether it is something about the unique combination of the two partners).

Although the actor-partner interdependence model is based on regression analyses, actor and partner effects are not the same as the unstandardized betas derived from regressions, although they can be interpreted in the same way. Also, it is important to note once again that because neither liking nor self-disclosure was manipulated in the current study, these effects should not be taken to indicate causality. Rather, the purpose of these analyses was to see if liking could be predicted from self-disclosure, and vice-versa, which would be indicative of a relationship between the two variables. Additional studies are needed before causal inferences can be drawn.

First, I tested whether participants' liking-for-partner predicted their disclosure-to-partner. This calculation was within-person, since one's own liking score was used to predict his or her own disclosure score, so actor effects were computed. There were significant positive actor effects both online (.36, $p < .01$) and face-to-face (.20, $p < .01$).

Next, I tested whether participants' disclosure-to-partner predicted their liking-for-partner, another within-participant (i.e., actor) effect. I once again found significant effects for participants in both conditions (online: .43, $p < .01$; face-to-face: .22, $p < .01$).

Finally, I examined whether one's disclosure-to-partner predicted his or her *partner's* liking-for-partner (in other words, whether how much Tom said he self-disclosed predicted how much Betty reported liking Tom), which is a partner effect. There was no significant partner effect in the online condition (-.09, ns), but it was significant in the face-to-face condition. The face-to-face partner effect was .17, $p < .05$.

These results partially support the second hypothesis. Online, liking was related to perceiving oneself as self-disclosing, but it was not related to perceiving one's partner as self-disclosing. Liking one's partner online was also not related to how much that partner reported that he or she self-disclosed. In contrast, liking between face-to-face participants was related to perceptions of oneself and one's partner as self-disclosing, and it was also related to one's partner's reports of his or her own self-disclosure. In sum, the within-person effects – correlations and actor effects – were significant both online and face-to-face (with the exception of the one partial correlation). However, the between-partner correlations and partner effects were only significant face-to-face. While the analyses reported here are not meant to imply causality, they do lead to some interesting hypotheses that should be tested empirically in future studies. These results are considered in more detail in the discussion.

Reciprocity

Within each dyad, I compared partners' liking and self-disclosure scores to assess the degree of reciprocity between them. Reciprocity indicates how similar each participant's self-ratings were to his or her partner's self-ratings on the same dimension. The statistic used to calculate reciprocity is simply a Pearson correlation, with the significance test adjusted for non-independence between dyad members, following guidelines by Griffin and Gonzalez (1995).

In the case of liking, reciprocity analyses specifically address the question: If Partner A likes Partner B, does Partner B also like Partner A? Reciprocity findings are presented in Table 2. There was not evidence that this occurred between participants in

the online condition ($r = .03$, ns). However, reciprocal liking was found between face-to-face participants, and this effect was significant ($r = .20$, $p < .05$).

Likewise, reciprocity of self-disclosure indicates whether both members of a dyad report self-disclosing the same amount. Analyses revealed that participants only seemed to reciprocate each other's self-disclosure *online* ($r = .21$, $p < .05$). Reciprocity was not significant face-to-face ($r = -.05$, ns).

Accuracy

Accuracy is the correlation between one partner's self-rating on a dimension (e.g., Partner A's liking-for-partner) and the other partner's estimate of his or her rating (e.g., Partner B's estimated-partner's-liking). Accuracy might also be thought of as agreement, in that it represents whether both partners agree about how much one of them liked the other, for example. It is calculated in the same way as reciprocity. These results are also shown in Table 2.

Results showed that participants in both conditions accurately judged how much their partners reported self-disclosing (face-to-face $r = .40$, $p < .01$; online $r = .26$, $p < .01$). However, partners who chatted online could not accurately judge how much their partners liked them ($r = .05$, ns), although participants who chatted face-to-face were able to do so ($r = .28$, $p < .01$).

Summary

To summarize the findings presented so far, participants in this study liked each other more if they chatted face-to-face than if they chatted online. In addition,

participants in the face-to-face condition reciprocated each other's liking (e.g., partners' liking ratings matched within dyads) and accurately judged how much they liked each other. Neither was true in the online condition. Turning to self-disclosure, there were no differences in how much participants reported self-disclosing online compared to face-to-face. Participants in both conditions accurately judged how much their partners self-disclosed, but there was only evidence of reciprocity online.

Positive and Negative Emotions

The analyses described so far show that while participants who got acquainted face-to-face demonstrated patterns of liking and self-disclosure like those found in numerous prior research studies (Collins & Miller, 1994), quite a different picture appeared online. Not only did online participants not like their partners more if their partners self-disclosed, but they also liked each other less overall. One possible explanation for this is that participants in the online condition might have experienced more negative affect, which could have influenced how they judged their partners. It is, after all, probably more unusual to report to an experiment and be asked to talk to a stranger on the Internet than it is to be asked to talk to another person face-to-face. This less familiar situation could have lead to feelings such as anxiety, which could partially account for these findings.

In order to address this possibility, means were calculated for each of the 12 emotions participants rated after the chat. T-tests revealed differences for three of the emotions: anxiety, embarrassment, and tension. Interestingly, in all three cases, face-to-face participants actually reported feeling *more* negative emotion than their online

counterparts, although it should be noted that the overall means were extremely low in both mediums. The emotions were rated using a scale from 0 = no emotion to 8 = extreme emotion. For anxiety, $M_{\text{online}} = 1.52$ and $M_{\text{face-to-face}} = 1.92$, $t(278) = -1.88$, $p = .06$; for embarrassment, $M_{\text{online}} = 0.69$ and $M_{\text{face-to-face}} = 1.15$, $t(242) = -2.764$, $p < .01$; and for tension, $M_{\text{online}} = 1.01$ and $M_{\text{face-to-face}} = 1.58$, $t(265) = -2.890$, $p < .01$.

To put this explanation fully to rest, I conducted a factor analysis of the emotion ratings and extracted two factors⁹. The first loaded most heavily on discomfort and also include anxiety, embarrassment, shyness, and tension ($\alpha = .84$). Face-to-face participants scored significantly higher on this discomfort factor than online participants, $M_{\text{face-to-face}} = 1.66$ and $M_{\text{online}} = 1.25$, $t(278) = -2.48$, $p < .05$. The second factor loaded most heavily on happiness and included amusement, attraction, and liking ($\alpha = .77$). There were no significant differences between face-to-face participants' scores on this happiness factor ($M = 3.86$) and online participants' scores ($M = 3.78$), $t(278) = -.46$, ns. These findings lead to the conclusion that the differences in liking and self-disclosure between the online and face-to-face participants cannot simply be explained by general negative affect or by experiencing specific negative emotions.

Shyness

To try to explain why the liking and self-disclosure findings from the current study did not replicate previous findings (e.g., McKenna et al., 2002; Tidwell & Walther, 2002), I went back to the literature. Although admittedly post hoc, one possibility that appeared was that liking and self-disclosure might only be positively linked online for people who are generally shy or reserved in face-to-face interactions (e.g., McKenna et

al., 2002; Morahan-Martin & Schumacher, 2003). In other words, the Internet might be the only place where shy (or otherwise socially constrained) people can have a social outlet, so they might be more likely to display the expected liking-disclosure link.

Although the design did not include a trait measure of shyness, some of the participants ($n = 116$) did report how shy they were feeling as part of the emotions questionnaire they completed before the chat. There were no significant differences in initial shyness online ($M = 2.81$) and face-to-face ($M = 2.88$), $t(114) = -.35$, ns. Shyness was not correlated with self-disclosure online ($r = .07$, ns) or face-to-face ($r = -.08$, ns). Likewise, shyness did not correlate with liking in either medium ($r_{\text{online}} = .01$; $r_{\text{face-to-face}} = .06$, ns).

Also, as part of the dependent measures, all participants reported how much shyness they had felt during the chat. Post-chat shyness was uncorrelated with how much participants said they liked or self-disclosed to their partners either online or face-to-face (r s from $-.083$ to $.039$).

Furthermore, a subset of participants ($n = 164$) provided ratings of their personalities before the chat¹⁰. Included in the trait list were “reserved” and “inhibited,” two synonyms of shy. Neither trait was associated with liking or self-disclosure for the online participants (r s from $-.001$ to $.153$). For the face-to-face participants, the relationships were significant and negative, except the correlation between inhibited and disclosure-to-partner, which was marginal: $r = -.21$, $p < .07$. Coincidentally, the correlations between reserved and liking-for-partner, reserved and disclosure-to-partner, and inhibited and liking-for-partner were all the same, r s = $-.29$, $p \leq .01$. Taken together, these analyses show that shyness was not a moderator of liking and self-disclosure online.

Trust

Another potential explanation for the current liking and self-disclosure findings is that interpersonal bonds develop differently online and face-to-face. For example, it is possible that liking might develop quickly face-to-face because of the larger number of cues such as physical attractiveness available, but online partners might need to develop trust before they really begin to like each other. After all, one of the supposed benefits of computer-mediated communication is that one can control the information that partners have about oneself. The flip side of this is that one's partners can do the same, and the veracity and completeness of their statements is never assured.

Research has shown that there is less trust in computer-mediated interactions than in face-to-face interactions (e.g., Naquin & Paulson, 2003). Moreover, there is some evidence that people actually are somewhat less honest online (e.g. Cornwell & Lundgren, 2001; Whitty & Gavin, 2001; see also Whitty, 2002). That could explain why partners' self-disclosure did not lead to liking among the online participants – because participants could not be sure of the truthfulness of the disclosures. If this is the case, once trust develops, online relationships should proceed like face-to-face relationships, but it might take somewhat longer for liking to eventually catch up (cf. Walther & Burgoon, 1992).

One of the traits on which participants rated their partners as part of the dependent measures was “trustworthy.” There was no significant difference in how trustworthy participants thought their partners were online ($M = 3.13$) and face-to-face ($M = 3.29$), $t(114) = -.909$, ns. Participants' ratings of their partners' trustworthiness was significantly correlated with how much they liked their partners both online ($r = .33$, $p < .001$) and

face-to-face ($r = .45, p < .001$). Trustworthiness was also marginally related to self-disclosure online and face-to-face (both $r_s = .15, p_s < .08$).

Furthermore, pre-chat self-ratings of “cautious” and “distrustful” provided by participants ($n = 164$) were not correlated with liking or self-disclosure in either medium (r_s from $-.18$ to $.11$). In sum, there is no evidence that there was any difference in trust between online or face-to-face partners that might account for the liking and self-disclosure findings.

Discussion

The present study did not replicate previous findings that people like each other more (Bargh et al., 2002; McKenna et al., 2002) and self-disclose more (Joinson, 2001; Tidwell & Walther, 2002) online than they do face-to-face. Participants in this study liked each other significantly more face-to-face, although they reported disclosing to each other the same amount in the online and face-to-face conditions. Further tests showed that liking was positively associated with both how much participants self-disclosed and how much their partners self-disclosed in the face-to-face dyads, but only participants' own disclosure was linked to liking online.

Thus, the data failed to confirm the first hypothesis and only partially supported the second hypothesis. These findings cannot be accounted for by differences in the emotional experiences of the participants, because those in the face-to-face condition actually reported feeling more negative emotions than online participants. Trait ratings related to shyness or trust also failed to explain why this study did not find more liking and self-disclosure online.

Additional analyses revealed differences in reciprocity and accuracy. Participants in the face-to-face condition reciprocated liking but not self-disclosure. Online, however, the opposite was true – participants reciprocated self-disclosure but not liking. And whereas face-to-face participants were able to accurately judge both how much their partners reported liking them and how much they reported self-disclosing, online participants were only able to accurately judge how much their partner's reported self-disclosed. They did not know how much their partners liked them.

Differences in the way liking and self-disclosure were assessed might partially account for the discrepancies between this study and the ones it was intended replicate. In the studies by McKenna, Bargh, and colleagues (Bargh et al., 2002; McKenna et al., 2002), liking was assessed using a single-item self-report similar to the liking-for-partner item in the current study, making it unlikely that this accounted for the difference. However, as already mentioned, this study used self-reported self-disclosure as a dependent variable, although previous studies used coders' ratings (Joinson, 2001; Tidwell & Walther, 2002). The choice to use self-report was deliberate because I was interested in knowing how much participants *thought* they and their partner self-disclosed. However, raters are in the process of coding the data from the current study to see if self-disclosure findings similar to those reported in other studies emerge.

Cues Filtered Out?

The cues-filtered-out hypothesis asserts that fewer types of information are transmitted in computer-mediated-communication, and so, by extension, interactions

online are bound to be less personal and less fulfilling (Sproull & Kiesler, 1986; see Kiesler et al., 1984; Walther, 1995). Does the current research support this viewpoint?

First, it is worth noting that while the face-to-face participants liked each other more, this should not imply that online participants disliked each other. Actually, on average, they were above the midpoint of the scale ($M = 4.71$ on a scale of 1 to 7), meaning they felt at least neutral to somewhat positive about their partners. Within the online dyads, however, partners' liking was not reciprocated, nor were partners able to judge how much each liked the other, although face-to-face partners did both. In light of the finding that only the within-person liking-disclosure links (actor effects) were significant online, it does seem that liking is not transmitted in computer-mediated communication as easily as it is face-to-face. This makes sense, because liking is often indicated by facial expressions, physical closeness or touching, and body language (and dislike can be signaled by the opposite cues), which are not communicated online.

In McKenna, Green, and Gleason's (2002) study, participants who interacted with a partner online (in both the IRC and trading places conditions) were more likely than control participants to have told their partners what they liked about them. Of course, there is no obvious reason why the participants in that study would have been more explicit than the participants in mine (coders are investigating whether participants in the current study explicitly stated their liking online). However, this finding supports the notion that expressions of liking must be made more overt online, which fits nicely with the cues-filtered-out hypothesis.

Despite this, it still is not clear that liking cues are not *available* online. Alternatively, it could be that online participants simply did not attend to the cues

available to them. The participants in this study who interacted online were not able to accurately judge how much their partners reported liking them, even though they did know how much they self-disclosed. This can be interpreted to mean that the online participants did not process their partners' behavior deeply enough to draw inferences about liking. Coupled with the finding that online participants liked partners to whom they self-disclosed, but not partners who self-disclosed to them, this suggests that they were not attending to their partners' behavior during the chat.

In other words, when interacting online, people might focus primarily on themselves, whereas face-to-face they attend more to their partners. This is compatible with beliefs about the Internet being a place where people can overcome barriers to face-to-face social interaction such as stigma and shyness (Bargh et al., 2002; McKenna et al., 2002; Morahan-Martin & Schumacher, 2003). It also fits with research in which Bargh, McKenna, & Fitzsimons (2002) showed that people are more able to express their "true selves" online. If it is true that people see the Internet as a place where they can "finally be themselves," then it might also be true that, when interacting online, social interaction motives are less important than motives such as self-exploration or authenticity (cf. McKenna & Bargh, 2000).

This does not mean, of course, that people could not be motivated to use the Internet to meet both personal and social goals. However, if the Internet does allow people to address needs that otherwise go unmet face-to-face, that should be factored into research on social interactions online. Focusing on oneself online might interfere with or change the course of a burgeoning relationship, if, for example, it affects the kinds of information to which people attend and attach importance online.

Whether cues are not available online (i.e., are filtered out), or whether people do not use all the information available to them, is a question for future research. While it is obviously true that cues such as facial expressions and physical closeness are not transmitted in computer-mediated communication, the current findings do not definitively show that liking cues in general are not present online. All that can be said based on this research is that self-disclosure does not seem to be related to liking online in the same way as it is face-to-face.

The Bigger Picture

What can this research say about the bigger question of how the Internet is changing and shaping contemporary social life? Caution should be taken, of course, in interpreting a single study, especially one that yielded results different from those found in previous studies. More research is obviously needed to explore whether there is more self-disclosure and more liking online compared to face-to-face. The current research suggests that there is not. Although it is unwise to draw too many conclusions about computer-mediated relating at this time, one possibility that the current research raises is that the norms and nature of computer-mediated communication are shifting. Perhaps this research did not replicate earlier findings because the way people interact on the Internet really has changed since the time the other studies (e.g., McKenna et al., 2002; Tidwell & Walther, 2002) were conducted.

If, for example, future research finds that new samples of Internet users do not self-disclose more online, this raises several intriguing possibilities (assuming that users previously did self-disclose more; Joinson, 2001; Tidwell & Walther, 2002). One

possibility is that, in the last several years, Internet users have begun disclosing less online – that is, disclosing only as much as they generally disclose face-to-face. Why might this be the case? Five or ten years ago (presumably when Joinson, Tidwell, and Walther were collecting their data), having access to the Internet in one’s home, for personal use, was still relatively novel. Drawing from the concerns raised in the 1980s about deindividuation and anonymity leading people to behave online in ways they would not face-to-face (e.g. Kiesler et al., 1984; Sproull & Kiesler, 1986), it is possible that when people first started to use email and chat in their personal relationships, they succumbed a bit to feelings of anonymity or unaccountability. This could have led people to disclose more online than they would face-to-face. Over time, however, tendencies to self-disclose online might have abated as the fun and novelty of the technology wore off and people started to learn that the things that are said online are still part of the “real world” and often have real-world consequences.

Another possibility is the computer-mediated communication has changed the way people interact face-to-face. Heightened disclosure online might be changing people’s threshold for what they consider appropriate (or inappropriate) self-disclosure. People are liked best when they self-disclose an amount that is deemed fitting for a particular situation and recipient; too much or too little self-disclosure can lead to negative evaluations of the over- or under-discloser (Cozby, 1972). That is, there is a curvilinear relationship between self-disclosure and liking. Continuing in statistical terms, heightened disclosure online could have raised the overall mean level of self-disclosure in all interactions (i.e., shifted the curve up). If so, levels of disclosure that were previously on the low end of appropriate might now have crossed into the “too

little” category; likewise, it should be harder for a disclosure to be categorized as “too much.” Furthermore, regression to the new mean would predict an increase in face-to-face disclosure such that it more closely approximates the levels of disclosure found online. The current data might reflect that shift.

It is impossible to know which of these explanations, if either, is the correct one without some objective measure of the amount of self-disclosure in online and face-to-face interactions from five or ten years ago that could be compared with the same measures today. However, it does seem possible that the current study found that participants disclosed the same amount online and face-to-face because the norms of self-disclosure have been changing. Whether face-to-face disclosure has been on the rise or online disclosure has been declining, either could explain why face-to-face participants in the current study liked each other more than online participants. If self-disclosure in face-to-face interactions has been increasing, the current findings could be due to the fact that face-to-face liking is also increasing. Likewise, if self-disclosure online has been declining, one would expect a subsequent drop in liking online, which could be why there was more liking face-to-face in my study. Either of these explanations follows naturally from what we know of the relationship between self-disclosure and liking (Collins and Miller, 1994), although, again, it is very difficult to test these assertions without objective, longitudinal data.

Conclusion

Tempting though it might be, it is too soon to draw conclusions about how the Internet is changing interpersonal communication – including that which occurs via other

mediums. Whether relationships that are formed and/or maintained on the Internet will be qualitatively different than those that involve all or nearly all face-to-face (and telephone) contact remains to be seen. In the meantime, there is much work to be done if researchers hope to gain an understanding of how the Internet is helping to shape social life.

Although the current study was just a first step in this line of research, it is apparent that different social processes were operating online and face-to-face. Not only were there mean differences in liking, but there were also interesting differences in reciprocity and judgment accuracy online versus face-to-face. Obviously, more research is needed to further spell out the relationship between liking and self-disclosure on the Internet. The present research ended up raising more questions than it answered about how liking develops online, in the relative absence of visual and auditory connections between people, and about the role self-disclosure. The next phase of this research project is already underway. A study is currently being conducted in which participants are given more time to interact to see if differences emerge once participants get past the initial “getting-to-know-you” phase of their interactions. Additional studies are planned in which self-disclosure is manipulated to see how it impacts liking online.

More broadly, in trying to understand how people interact online, sampling and cohort effects should be very important to Internet researchers. It is not clear, for example, whether findings such as the ones reported here are unique to the college-aged samples generally used in research. Quite different patterns might be found among people of different ages or between populations who use the Internet for different reasons (e.g., those who use the Internet more for keeping in touch with family versus those who use it to seek out new romantic partners). Furthermore, as collegiate samples are flooded with

students who were raised with the Internet in their homes, and for whom computer-mediated communication might be as natural as talking on the telephone, they less and less resemble the participants from research conducted five, ten, or twenty years ago.

As the Internet touches more and more aspects of our social lives, it is increasingly inappropriate for scientists simply to assume that the same factors that are involved in face-to-face relationships necessarily operate in relationships that exist primarily or entirely online. This area of inquiry needs much more attention and empirical refinement if researchers want to gain a better understanding of computer-mediated relating. There is probably a great deal of overlap between computer-mediated relating and more traditional modes of interacting. Learning about their similarities and their unique qualities will inform researchers not only about how people interact online, but also about interpersonal interaction more generally.

Parks and Floyd (1996), in discussing classic literature on interpersonal attraction, assert, “The emphasis placed on factors like physical appearance or proximity may reflect less of a theoretic necessity than a consequence of the fact that most theories of relational development predate the current explosion in computer-mediated communication technology” (p. 84). I think it is useful, in considering the value and relevance of Internet research, to remember that the Internet is not just a technology. It is a social environment, in which different rules might apply and different phenomena might occur. For that reason, as Parks and Floyd point out, it can be a powerful tool that allows social scientists to test existing theories and find out if we really know what we think we know about the way people interact (cf. Bargh and McKenna, 2004, p. 587). As more and more people use the Internet in their everyday social interactions, researchers should take notice and

take advantage of the excellent opportunities afforded by the Internet to expand our understanding of human interaction.

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Footnotes

¹ By “face-to-face” relationships I mean any relationships in which the members at least occasionally interact face-to-face, although it is very likely that individuals use a combination of face-to-face communication and communication via other media such as the telephone to maintain these relationships.

² Similar findings were reported in a study by Dietz-Uhler and Bishop-Clark (2001). In that study, however, the dependent variables were enjoyment of conversation and diversity of perspectives expressed during a semi-structured conversation.

³ In this study, there was also a telephone condition, which yielded the most liking between participants.

⁴ Tidwell and Walther (2002) took their definition of an utterance from Hosti (1969), according to whom an utterance is “a single assertion about some subject” (p. 116, quoted in Tidwell & Walther, 2002).

⁵ Data were actually collected from two samples. The basic design was the same for each sample, although the order of the questionnaires was slightly different. One of the samples also completed additional dependent measures not relevant to the current research. Initial analyses indicated that including sample as a factor did not change the pattern of results, so all analyses were conducted on the entire sample of 280 participants unless otherwise stated.

⁶ Participants were also randomly assigned to one of three conditions and were asked to read short written instructions. In the control condition, the instructions read, “Please introduce yourself to your partner and then chat for the remaining time.” In the two remaining conditions, the instructions continued on and read either “During this conversation, you and your partner should try to become friends,” or “During this conversation, you and your partner should try to get to know each other.” Both members of a dyad got the same instructions. However, this manipulation is not relevant to the current research question, so data were collapsed across instruction condition for the purposes of the analyses reported here.

⁷ The correlation reported in this section were calculated for the entire sample. All of the correlations between the liking and self-disclosure items were also significant beyond $p = .01$ when calculated separately for participants in the online and face-to-face conditions.

⁸ Controlling for self-disclosure when comparing liking, and controlling for liking when comparing self-disclosure, online and face-to-face did not change the results substantially.

⁹ This scale was also administered to 120 participants in a study by Canny, Mendelsohn, and Williams (unpublished manuscript). Factor analyses on data from that sample yielded the same two factors.

¹⁰ In this pre-chat measure, the instructions said to rate their personalities, implying a more generalized or global rating. Participants who did not complete the trait self-ratings before the chat did so after the chat, but their instructions read that they should describe themselves as they were during the conversation. It is not clear, therefore, that those ratings reflect how participants see themselves more generally, so only the pre-chat trait ratings were used in this analysis.

Table 1

Liking and Self-Disclosure Items from the Dependent Measures

Liking	
Liking for partner	How much did you like your partner?
Estimate of partner's liking	How much do you think your partner liked you?
Self-Disclosure	
Disclosure to partner	How much did you tell your partner about yourself? How much personal or intimate information did you share with your partner?"
Estimate of partner's disclosure	How much did your partner tell you about himself/herself? How much personal or intimate information did your partner share with you?
Other	How well do you think you got to know your partner?

Note. All items were measured using a 7-point Likert scale (1 = not at all/none; 7 = a great deal).

Table 2

Reciprocity and Accuracy Online and Face-to-Face

		<u>Reciprocity</u>	<u>Accuracy</u>
Liking	Online	.03	.05
	Face-to-Face	.20*	.28**
Self-Disclosure	Online	.21*	.26**
	Face-to-Face	-.05	.40**

* $p < .05$ ** $p < .01$ *Note.* These values are Pearson correlations.

Figure Caption

Figure 1. Only significant difference is between “liking for partner” online and face-to-face, $p = .000$.

Figure 1

Mean liking and self-disclosure scores

