Degree and Reciprocity of Self-Disclosure in Online Forums

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ABSTRACT

Cyberspace has become a common social environment in which people interact and operate in many ways. The purpose of the present study was to investigate the occurrence and reciprocity of self-disclosure, two subjects that are extensively studied in face-to-face interactions but only to a limited degree in virtual, computer-mediated, textual communication. Data was based on 240 first messages in a thread, sampled in equal numbers from six Internet forums (three discussion and three support groups), and written in equal numbers by each gender, and 240 first responses to them (a total of 480 forum messages). Trained, expert judges blindly rated each message on the degree to which it disclosed personal information, thoughts, and feelings. Linguistic parameters (total number of words and number of first-voice words) were also used as dependent variables. Results showed the following: (a) self-disclosure in support forums was much higher than in discussion forums, in terms of both total number and type of disclosure; (b) messages in support forums were longer and included more first-voice words than in discussion forums; (c) there were no gender differences interacting with level of self-disclosure; (d) reciprocity of self-disclosure was evident, yielding positive correlations between the measures of self-disclosure in messages and responses to them; (e) some differences appeared in level of reciprocity of self-disclosure between male and female participants, with female respondents tending to be more reciprocal than male respondents. The implications of these results are discussed in light of growing social interactions online, and possible applications are suggested.

INTRODUCTION

SELF-DISCLOSURE AND RECIPROCITY of self-disclosure have been topics of scientific investigation for several decades. These aspects of human behavior and interpersonal interactions have nevertheless barely been studied in the virtual social environment of cyberspace. As this emerging environment grows and becomes a routine and ordinary means of communication, it seems worthwhile to extend our knowledge of this environment too. The purpose of the present study was to investigate some aspects of self-disclosure in users of online forums and, more specifically, to focus on the reciprocity of self-disclosure. The main research questions of the study were these: Do people disclose personal information online depending on the nature of the virtual environment they are in? Does the phenomenon of reciprocity of self-disclosure exist in online, asynchronous communication as it does in face-to-face (F2F) human interactions?

Self-disclosure refers to the verbal expressions by which a person reveals aspects of himself or herself to others.[1] Definitions of self-disclosure have been

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as broad as including anything a person tells about oneself to another person or any statement starting with "I,"[2] to narrower, specific definitions limiting what is exposed to personal, private information.[3]

Conceptualizations of self-disclosure usually include several content categories of personal exposure, such as personal information (facts) and experiences, personal thoughts, and personal feelings.[3] An important and thoroughly investigated aspect of self-disclosing behavior is reciprocity. Various investigators have termed this process the "dyadic effect" or the "mutual effect".[1,2,4] This concept refers to the process of mutual exposure by communicating partners, in which a disclosure by one partner is followed (in fact, caused) by a disclosure by the other. Reciprocity of self-disclosure has been explained by several theoretical models relating to human interaction, including attribution theory,[5] social exchange theory,[6] and equity theory.[7]

As cyberspace is an emerging social environment (despite being virtual and based on computer-mediated communication), researchers only naturally have studied various personal and interpersonal behaviors in this particular habitat, with self-disclosure being one such behavior. This type of social environment is characterized by more open, straightforward, and candid interpersonal communication, a phenomenon explained by disinhibition effects.[8] Disinhibitory processes have been theorized to be related to deindividuation,[9,10] the emergence of "true self",[11,12] and a list of situational factors that includes anonymity, invisibility, neutralization of status, and lack of eye contact.[13,14] Although this "protected environment" and sense of privacy are only perceived as such and do not actually exist,[15] these virtual features contribute to the subjective experience of a person in cyberspace and, consequently, to disclosing personal, often intimate information. Disclosure behavior online is difficult to conceptualize and study, however, because of several cyberspace-specific moderating variables that intervene in one's psychological state and consequent behaviors.[16,17] For instance, Ben-Ze'ev[18] discussed the unique nature of interpersonal relations in cyberspace, which are characterized by a special combination of attachment and distancing factors that he called "detattachment." That is, "in online relationships, people are neither close, intimate friends nor complete strangers . . . 'detattachment' includes opposing features whose presence in offline relationships would be paradoxical." This subjective, unique, "deattached" feeling—experienced differently by people engaged in cyberspace—is difficult to assess, especially because of the lack of direct, in-person contact with identifiable research participants, as is common in offline psychological research.

The study of self-disclosure and reciprocity of self-disclosure through online communication has emerged, however, in spite of methodological difficulties. These topics have been investigated prevoiusly in the general context of online relationships and online interpersonal communication, as well in the study of anonymity and privacy in cyberspace. Rollman et al.[19] and Rollman and Parente[20] were among the first to report evidence of self-disclosure and reciprocity of self-disclosure in Internet chat rooms. Joinson[21] investigated reciprocity of self-disclosure in which users interacted with a website; he found that participants who received personal information about experimenters disclosed more about themselves when filling out online questionnaires than did participants who received no such information. Making use of an online group chat, Dietz-Uhler et al.[22] found that an established norm of self-disclosure increased both the level and reciprocity of self-disclosure. Leung[23] found that communicating through instant messaging software (i.e., ICQ) caused higher levels of intimate communication and self-disclosure than shown by people in the same environment who interacted only F2F. Moon[24] found that reciprocal self-disclosure existed in interacting with computers and that this principle can be manipulated and exploited to influence consumers. Tidwell and Walther,[25] in textual analyses comparing online interactions using email with F2F interactions, showed that the processes of reducing uncertainty and subsequently elevating self-disclosure were faster in computer-mediated than in F2F communication. Sheese et al.[26] took the phenomenon of elevated openness and online self-disclosure a step further by using disclosures about personal trauma as a means of psychological intervention to change health-related problems. Finally, anonymous online interactions in virtual communities and in private communication channels were seen to promote more self-disclosures, compared to F2F interactions, thus enhancing the development of close and romantic relationships.[27]

Thus, the cumulative research reveals that self-disclosure not only takes place online but is accelerated by this communications means, which contributes to a growing certainty in interactions and, therefore, enables its use for relief and mutual support. However, no research to date has investigated specific content or types of self-disclosure online. Moreover, no re-

search has examined the occurrence of reciprocity of self-disclosure in interpersonal interactions. Little is known, furthermore, about gender differences in relationship to self-disclosure in cyberspace.

The results of the research described in this paper are intended to close the gaps in knowledge regarding these specific topics. Following the literature cited above concerning self-disclosure in offline as well as in online interactions and following qualitative previous analyses,[28] we hypothesized that in human interactions in the context of sharing emotional distress and mutual help (i.e., online support groups), the degree of self-disclosure would be elevated relative to a more neutral context (i.e., online discussion groups). In addition—assuming that reciprocity of self-disclosure is a *general* psychological phenomenon, independent of its situational antecedents—we hypothesized that reciprocity of self-disclosure would be duplicated in online interactions. Also, we aimed at investigating gender differences in relation to these hypotheses.

METHODS

Data

The data collected for the study were based on forum messages published by male and female writers in three open support groups (*Cancer—Not Alone*, *Emotional Support for Adolescents*, and *Loss and Bereavement*) and three open discussion groups (*Vegetarianism and Naturalism*, *Harry Potter—The Book*, and *Motorcycles*), all of which were conducted through an Israeli Internet portal (*Tapuz*). These forums were selected on a random basis from each category of forums published on this portal; they all had been in operation for at least one year and had displayed dynamic posting activity. Forty first messages (i.e., messages that started a new thread), 20 from each gender, were randomly sampled from each of these six forums, making a total of 240 messages. The gender of the writers was determined by the words used in the messages, made possible by the gendered Hebrew language. For each message, the first response message was selected, as well. The response messages were submitted by 90 and 56 female writers in the support and discussion forums, respectively, and by 30 and 64 male writers in the respective forums. Altogether, 480 messages—written by 214 male and 266 female writers—were analyzed. It should be noted that the database used for analyses was based on messages, not peo-

ple. This means that it is possible that one person may have posted several first messages and/or response messages, resulting in the inclusion of this person more than once in the sample.

Instruments and measurement

Self-Disclosure Rating Scale. This instrument is based on a rating scale developed by Vondracek and Vondracek[29] and adjusted to further definitions provided by Chelune.[3] Level of self-disclosure was defined as the degree to which a person revealed something about herself or himself to another person in three categories: information (facts), thoughts, and feelings. In order to measure the level of self-disclosure operationally in online forum messages, we used three expert judges, all of them therapists with at least an M.A. degree in counseling or clinical psychology. The judges rated self-disclosure in each category on three levels: (1) no disclosure; (2) little disclosure; and (3) high disclosure. Table 1 provides the definitions and examples of the three levels for each of the three categories. Before their actual ratings, the judges went through an intensive workshop that acquainted them with conceptual definitions through numerous examples. They then practiced rating of numerous forum messages (not included in the study) and discussed differences until reaching a consensus. At the end of this training, the judges rated 30 forum messages (also not included in the study) to test their level of agreement. Kappa coefficients were 0.77, 0.71, and 0.74 for the categories of information, thoughts, and feelings, respectively, thus allowing the use of the ratings by these judges in the research. The mean ratings of the judges were used for data analysis. Overall level of self-disclosure was calculated by adding up the three category scores.

Linguistic parameters of self-disclosure. Objective examination of words and writing style can be a valid measure of personality and personal state.[30,31] Therefore, in addition to ratings of self-disclosure, we used two objective, quantitative parameters related to personal exposure: length of writing and employment of first-voice words. Length of writing (operationally defined as the number of words in a forum message) reflects, to some degree, a writer's self-exposure through sharing personal information, thoughts, and feelings with others. First-voice words (operationally defined as the number of such words as "I," "me," "mine," and so on) have been used in several studies as indicative of self-disclosure in offline,[2] as well as in online[14] communication.

TABLE 1. DEFINITIONS AND EXAMPLES OF THE THREE LEVELS OF SELF-DISCLOSURE CATEGORIES

Category	Level	Definition	Examples
Information	1	Statements that provide general or routine information only, without any personal reference	"You need at least one month to travel in India." "Brazil won the soccer game against Ecuador last night."
	2	Statements providing general information about the writer	Age, occupation, description of family members, interests, and hobbies
	3	Statements revealing personal information that exposes self or people close to th writer, such as descriptions of physical appearance and behavior	Personal characteristics and traits, description of personal experiences, reporting of problematic behaviors of self and family members
Thoughts	1	No indication of any thoughts or ideas on any subject that refer to the writer personally; expressing of *general* ideas only	"I think feeding dogs with human food causes them damage." "I think that people may become dependent on grass if it's used for medical reasons."
	2	Statements expressing the writer's personal thoughts on past events or future plans	"I think I'd like to study biology when I go to college." "I remember the day my mother died."
	3	Statements expressing thoughts relating to the writer's personal characteristics, physical appearance, health, or intimate and wishful ideas	"I hate myself for insulting someone and apologizing immediately afterward." "I wish I had bigger breasts." "I don't like myself when I hurt people and immediately apologize; it's pathetic."
Feelings	1	No expressing of feelings at all	Writing may include a prosaic description of facts or personal ideas, without expressin any emotions or affective relevance
	2	Expressing of some mild feelings, such as confusion or inconvenience; expressing ordinary concerns, frustrations, or minor deficiency	"I was frustrated by getting a B in math. I envied my girlfriends for getting higher marks." "I'm tired of my boss. He makes me nervous."
	3	Expressions of deep feelings, including humiliation, agony, anxiety, depression, fears, pain, and so on	"I'm desperate. I don't want to live anymore. Kill me now." "There is nobody home. I'm sooooo afraid. Oh, my God. I'm shaking with fear."

Reciprocity of self-disclosure. The level of reciprocity of self-disclosure was defined as the correlation coefficient of each of the measures of self-disclosure between a first message and the first response posted to it; this is viewed as an acceptable statistical estimation of reciprocity.[32] The use of first responses in a thread was necessitated, as additional responses in the thread might be affected by any of the prior mes- sages posted, not necessarily the first message. That is, the use of first messages and first responses controlled for the effects of other messages in a thread.

Procedure

Upon completion of the training workshop, the judges received the 480 forum messages, 240 first

messages and 240 first response messages to them, for rating. Each message was printed on a separate page, and the messages within each type (first message and response message) were presented to the judges in random order, so that the judges could not match a message with its response. Messages were marked by codes to enable identification of dyads (a message and its response), type (discussion or support forum), and writer's gender. Names and nicknames were deleted from messages to avoid possible associations between messages and to eliminate the effects of meaningful nicknames (e.g., TheDepressed, BenInLove). The judges marked their ratings of each message on a separate form, also identified by code. Judges' ratings took approximately one month to complete. Length of messages (word count) was measured by Word software. The count of first-voice words was conducted by two persons. In cases of disagreement, a tally was made by a third person to determine the correct number.

RESULTS

We first compared the overall level of personal disclosure written in first messages in support forums with those posted in discussion forums (Table 2). As can be seen, over 80% of the messages posted in the discussion forums revealed no disclosure at all, versus less than 7% in the support forums. On the other hand, almost 55% of the messages posted in the support forums exhibited a high level of personal exposure as against less than 2% in the discussion forums. The relationship between level of disclosure and type of forum was found to be very high ($\chi^2 = 150.55$; $df = 2$; $p < 0.0001$), corresponding to a Cramer's V of 0.79. Similar analyses were conducted on the different *types of disclosure* (infor-

mation, thoughts, and feelings; Table 3). As can be seen, a similar relationship to that for the overall level of disclosure was found for each of its components, too (for information, $\chi^2 = 102.74$; $df = 2$; $p < 0.0001$, $V = 0.65$; for thoughts, $\chi^2 = 146.34$; $df = 2$; $p < 0.0001$, $V = 0.78$; for feelings, $\chi^2 = 143.26$; $df = 2$; $p < 0.0001$, $V = 0.77$). These findings mean that people generally disclose more personal matters, as well as specific content related to personal information, thoughts, and feelings, in support groups than in discussion groups conducted in online forums.

Next, we compared the level of self-disclosure between the two types of forums, using the linguistic parameters related to personal exposure: length of writing and use of first-voice (Table 4). People who posted first messages in support forums used 154.23 words, on average, compared to 114.81 words, on average, by people who posted first messages in discussion forums. The difference between the types of forums was found to be significant ($t = 2.72$, $df = 238$, $p < 0.01$). As for the first-voice words, those who wrote in support forums used 19.98 first-voice words in a first message, on average, versus an average of 11.26 first-voice words written by people who wrote in discussion forums. This difference, too, was found to be significant ($t = 4.90$, $df = 238$, $p < 0.0001$).

The next stage compared self-disclosure between female and male writers in each of the two types of forums. This analysis did not reveal any significant differences for overall level of disclosure ($\chi^2 = 2.41$; $df = 2$; $p > 0.05$, $V = 0.10$ for support forum, and $\chi^2 = 2.78$; $df = 2$; $p > 0.05$, $V = 0.11$ for discussion forum). Similar null results were obtained for the components of self-disclosure. These findings mean that the differences in level of self-disclosure between the two types of forums are not associated with the authors' gender: both male and female fo-

TABLE 2.   FREQUENCIES OF FIRST MESSAGES BY
TYPE OF FORUM AND LEVEL OF DISCLOSURE

| | Type of forum | | | |
| | Support | | Discussion | |
	Frequency	%	Frequency	%
Level of disclosure				
No disclosure	8	6.7	100	83.3
Low disclosure	47	39.2	18	15.0
High disclosure	65	54.1	2	1.7
Total	120	100	120	100

TABLE 3.   FREQUENCIES OF FIRST MESSAGES BY TYPE OF FORUM,
LEVEL OF DISCLOSURE, AND TYPE OF DISCLOSURE

	Type of forum											
	Support						Discussion					
	Information		Thoughts		Feelings		Information		Thoughts		Feelings	
	n	%	n	%	n	%	n	%	n	%	n	%
Level of disclosure												
No disclosure	8	6.7	6	5.0	16	13.3	69	57.5	91	75.8	107	89.2
Low disclosure	44	36.7	42	35.0	41	34.2	46	38.3	28	23.3	12	10.0
High disclosure	68	56.6	72	60.0	63	52.5	5	4.2	1	0.9	1	0.8
Total	120	100	120	100	120	100	120	100	120	100	120	100

rum participants similarly made more personal disclosures in support forums than in discussion forums.

As mentioned, reciprocity of self-disclosure was examined by observing the correspondence of the level of self-disclosure in people's postings (in both types of forums) and the level of self-disclosure expressed in reacting to these postings. For this purpose, we calculated the correlations between level of self-disclosure (total, and for each of component) in first messages and the level of self-disclosure in the first response to them. As the pattern of the results was similar in the two types of forums, Table 5 shows the findings across them (that is, for all six forums together). The Pearson correlation coefficients are all positive and significant. It can also be seen in Table 5 that the correlations for the types of self-disclosure, as well as the total level of self-disclosure, generated higher coefficients than did those related to the linguistic parameters of disclosure. This proclivity apparently implies that reciprocity in self-disclosure is more salient in the *content* of disclosure than in its *pattern* or process. However, the findings support the hypothesis concerning the existence of reciprocity of self-disclosure in online forums: the more one reveals about oneself, the more that is revealed in reaction.

Next, we examined gender differences in reciprocity of self-disclosure. Table 6 presents the correlation coefficients between self-disclosure in first messages and self-disclosure in their first responses, by gender of authors of responses (i.e., reactors). The table shows that there were similar positive significant correlations for both female and male reactors for self-disclosure based on judgments of content of writings. For the linguistic parameters, however, while reciprocity was found significant in female reactors, it was not in male reactors (though only the difference in correlations of number of words was found to be significant). Generally, it seems that reciprocity of self-disclosure operates in a similar way in male and female reactors to forum messages.

Lastly, we compared reciprocity in more specific terms; that is, by gender of the response writer and gender of the writer of the first messages. To do this, pairs of messages (first message and its response) were divided into four groups in accordance with

TABLE 4.   MEANS AND STANDARD DEVIATIONS OF LINGUISTIC VARIABLES BY TYPE OF FORUM

| | Type of forum | | | | |
| | Support | | Discussion | | |
Variable	M	SD	M	SD	t
Total number of words	154.23	115.27	114.81	109.13	2.72*
First-voice words	19.98	15.20	11.26	12.21	4.90**

*$p < 0.01$, one-tailed.
**$p < 0.001$, one-tailed.
$n = 120$ in each group.

TABLE 5. CORRELATION COEFFICIENTS BETWEEN LEVEL OF SELF-DISCLOSURE IN FIRST MESSAGES IN FORUMS AND IN REACTIONS TO THEM, BY TYPE OF SELF-DISCLOSURE ($n = 240$)

Type of measurement	Type of self-disclosure	r
Evaluation by judgment	Overall disclosure	0.49***
	Information	0.38***
	Thoughts	0.42***
	Feelings	0.53***
Linguistic parameters	Total number of words	0.20**
	First-voice words	0.21**

**$p < 0.01$, one-tailed.
***$p < 0.001$, one-tailed.

the gender of the authors of both messages (Table 7). It can be observed that correlations, which reflect reciprocity, were generally higher for the judgments of self-disclosure and much lower for the linguistic parameters related to self-disclosure. Interesting differences emerged among correlation coefficients: it seems that male response writers, when reacting to male writers, are more reciprocal in their self-disclosure than when responding to female writers. For female reactors, however, reciprocity operates similarly when reacting to either gender. In reflecting the results reported in Table 6, the correlations of the linguistic parameters of self-disclosure in Table 7 show that female response writers, unlike their male counterparts, reciprocate through linguistic parameters, not only through the content of their personal exposure.

DISCUSSION

Cyberspace has become a parallel social environment for many. Although most users, especially of more popular applications, are youngsters, the Internet has created a multi-channel, rich, and dynamic communication network that attracts people of all ages worldwide. Deepening our understanding of this emerging environment and the way people interact in it will enhance our ability to provide better services and applications, as well as to intervene more professionally in attempts to promote a better culture. The number of publications in this area has been growing in recent years, but psychology is still in an early stage of understanding cyberspace.[33,34]

The aim of this study was to examine processes related to self-disclosure in a virtual environment based on computer-mediated, textual communication. These specific processes have been thoroughly investigated in regard to offline verbal interactions, but hardly in regard to the virtual environment. Generally, our findings showed that personal self-disclosure in cyberspace appears to be characterized by attributes similar to those typifying self-disclosure in F2F interactions. Specifically, it was revealed that people generally disclose more in an emotional support than in a neutral situation. This gap in

TABLE 6. CORRELATION COEFFICIENTS BETWEEN LEVEL OF SELF-DISCLOSURE IN FIRST MESSAGES IN FORUMS AND IN REACTIONS TO THEM, BY TYPE OF SELF-DISCLOSURE AND GENDER

Type of measurement	Type of self-disclosure	Male reactors (n = 94)	Female reactors (n = 146)	Z
Evaluation by judgment	Overall disclosure	0.47***	0.47***	0
	Information	0.31***	0.39***	−0.68
	Thoughts	0.45***	0.37***	0.72
	Feelings	0.54***	0.50***	0.41
Linguistic parameters	Total number of words	−0.02	0.35***	2.87**
	First-voice words	0.09	0.28***	1.48

**$p < 0.01$, two-tailed.
***$p < 0.0001$, two-tailed.

Table 7. Correlation Coefficients between Level of Self-Disclosure in First Messages in Forums and in Reactions to Them, by Type of Self-Disclosure and Gender

Type of measurement	Type of self-disclosure	M-M (n = 53)	M-F (n = 67)	F-M (n = 41)	F-F (n = 79)
Evaluation by judgment	Overall disclosure	0.61**	0.40**	0.26*	0.52**
	Information	0.42**	0.36**	0.15	0.44**
	Thoughts	0.61**	0.34**	0.10	0.40**
	Feelings	0.64**	0.40**	0.41**	0.61**
Linguistic parameters	Total number of words	−0.08	0.26*	0.10	0.43**
	First-voice words	0.16	0.23*	0.04	0.34**

*$p < 0.05$, one-tailed.
**$p < 0.01$, one-tailed.
M-M, male reactors to male writers; M-F, female reactors to male writers; F-M, male reactors to female writers; F-F, female reactors to female writers.

depth of disclosure, furthermore, is true of all three ingredients of disclosure (information, thoughts, and feelings) examined. Differences between the two environments were also reflected in message length and amount of self-referrals. Finally, these results were similar for both genders. In regard to *reciprocity* of self-disclosure in virtual communication, the findings showed much consistency with F2F communication, too. That is, the degree of self-disclosure made by respondents—in total as well as in each of its ingredients—was proportional to the depth of self-disclosure made by initiators of messages. This finding was reflected in both the judgments of the depth of self-disclosure and the linguistic parameters used although the former showed a stronger association. Reciprocity of online self-disclosure was somewhat different between the genders, as it was more salient in female than in male respondents. Male respondents tended to be more reciprocal in their disclosures when responding to other male writers, but not to female writers, whereas female respondents responded to women and men with equal reciprocity. The results of the current research, though preliminary in their special focus, are consistent with previous research that aimed at investigating self-disclosure and reciprocity of self-disclosure online.[21] The present findings also provide foundations for a theoretical background of the flourishing social and intimate relationships over the Internet as shown and discussed in numerous publications.[19,20,27,34]

The present study has several implications. First, the findings support the notion that common psychological rules apply to cyberspace although textual communication on the Internet—generally conducted through chat, instant messaging, forums, and e-mail—is typically casual, offhanded, sponta-

neous, and instinctive, and often initiated by anonymous participants.[11] It seems, in this context, that basic human nature and perhaps the personality of people and the patterns of personality dynamics[35,36] predominate in people's actions, regardless of the nature of the environment, whether real or virtual. Moreover, as has been argued theoretically and shown in research,[8,13,14,21] the online environment may elicit human responses through disinhibition processes, but their nature apparently remains unchanged.

Second, many online communicators in a group environment, such as the online forums used in the current research, relate to one another as if they are isolated and communicating in a one-to-one situation.[37] The virtual environment apparently enables them to relate to one another in this way, facilitating self-disclosure and reciprocity of self-disclosure. In other words, the dyadic communication is apparently unswayed by the transparency of the situation, since the participants subjectively experience close interpersonal relationships.[12] Despite the fact that reciprocity of self-disclosure is dependent upon the social context, it is likely that this principle does not refer to differences between real and virtual environments, but to the nature (e.g., goals, norms, culture) of environments: this was found to be the case with the differences in level of disclosure between the two types of forums employed in the current research.

Third, it was interesting to find that although gender differences in reciprocating self-disclosure were minimal, female participants tended to be more reciprocal than male participants. Moreover, female participants reciprocated regardless of the gender of the responding partner, whereas male participants tended to show a higher reciprocity

with male partners. This implies that male participants might be affected by other factors than main effect of the level of self-disclosure of their communication partners, such as gender stereotypes or certain gender-linked inhibitions. Indeed, gender differences in F2F self-disclosure were documented in a meta-analysis,[38] and it seems important to continue examining gender differences in online self-disclosing behaviors.

Fourth, in relation to a methodological issue, although the linguistic parameters used in this study generally showed a similar trend in results to that of the experts' ratings, the findings of the latter were much more salient and clear. This does not mean that linguistic parameters are non-usable in analyzing online phenomena; quite the contrary is true, as studies have successfully employed users' linguistic expressions when investigating various online environments.[26,39–41] However, the concept of self-disclosure is perhaps better operationalized qualitatively by the depth of specific content, just as it is usually investigated offline, than through quantitative verbal expressions.

Fifth, in addition to testing the pervasiveness of hypotheses relating to self-disclosure in the cyberspace environment, the findings on reciprocity of self-disclosure online have direct, applicable implications. For therapeutic purposes, which are apparently more cumbersome to conduct online than offline, increasing a client's self-disclosure can be elicited through the therapist's own disclosures.[42] Similarly, disclosures by forum moderators may encourage forum users to reveal more of their thoughts and experiences. Online interviewers, too, whether conducting Internet-assisted interviews for purposes of research, job application, or personality assessment, may draw more information from interviewees by using their own self-disclosure. More generally, people who communicate online, especially for romantic purposes, can learn that their own exposures may stimulate the enhancement of a partner's self-disclosure.

The present research has several limitations that warrant attention. First, although the total numbers of participants and messages were extensive, the research used six only forums. Strengthening the generalizations advanced here would require the study of more forums, representing a broader scope of subjects and populations. Second, a writer's gender was identified by the written text, which is enabled by a gendered language like Hebrew. Users, however, could have faked their gender for innocent or malicious motives, causing the identification by gender to be wrong to some degree. Our approach, which avoided directly approaching participants and, instead, involved observing their online textual behavior, necessitated a reliance on participants' self-identification. Future research, using a different methodology, could study gender effects more validly. Third, the observational, non-experimental methodology exploited in this study had several additional limitations, especially by limiting the ability to control possible relevant important variables, such as participants' age, history of and proclivity for self-disclosure, and verbal skills. Although Web ethnographic research methods have become commonly accepted,[43,44] it seems that applying other methodologies in parallel could enhance research validity, on the one hand, and allow better use of moderators, on the other. Fourth, it would be interesting to ascertain whether the effects identified in the present study apply to one-to-one online communication, as opposed to group situations. Similarly, it might be important to examine the moderating effects of the modality of online communication channels (text versus audio versus video), as well as the effects of the level of synchronicity of communication.

Future research into this emerging area should not only apply other methods but also test the applicability of the current findings. That is, identifying interesting associations is one thing, but actively applying them when attempting to cause certain effects is another. An interesting study, for instance, could experimentally manipulate level and type of self-disclosure of messages, in different online environments, while following responses to them, in trying to more carefully substantiate causal relationships in investigating reciprocity of online self-disclosure. The present study, however, has added new and important knowledge about online communication that might prove beneficial for both social science theory and practice.

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