

The Sociocognitive Psychology of Computer-Mediated Communication: The Present and Future of Technology-Based Interactions

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ABSTRACT

The increased diffusion of the Internet has made computer-mediated communication (CMC) very popular. However, a difficult question arises for psychologists and communication researchers: "What are the communicative characteristics of CMC?" According to the "cues-filtered-out" approach, CMC lacks the specifically relational features (social cues), which enable the interlocutors to identify correctly the kind of interpersonal situations they find themselves in. This paper counters this vision by integrating in its theoretical frame the different psycho-social approaches available in current literature. In particular, the paper describes the characteristics of the socio-cognitive processes—emotional expression, context definition, and identity creation—used by the interlocutors to make order and create relationships out of the miscommunication processes typical of CMC. Moreover, it presents the emerging forms of CMC—instant messaging, shared hypermedia, weblogs, and graphical chats—and their possible social and communicative effects.

INTRODUCTION

THE INCREASED DIFFUSION of the Internet has made computer-mediated communication (CMC) very popular. However, a difficult question psychologists and communication researchers are trying to answer is "what are the communicative characteristics of CMC?" If face-to-face conversation occurs in a cooperative environment constantly regulated by mutual adjustment and correction,^{1,2} CMC occurs in a much less cooperative environment because of the special conditions imposed by the medium itself.³

This has a strong impact on the regulation of CMC interaction. In face-to-face communica-

tion, the regulation of interaction is obtained using a complex system of turn taking and yielding behaviors.^{4,5} For example, as stated by Patterson,⁵ when a listener is about to attempt to take a turn as speaker, he/she may exhibit some or all of the following behaviors:

- A shift of the head away from the speaker
- An audible inhalation
- The initiation of gesture
- Overloudness in the first segments of speech

In CMC, almost all of the above is completely impertinent. This difference in the regulation of the interaction can be explained by the following CMC characteristics:^{6,7}

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- The size of an utterance is determined entirely by the speaker. In general, however, in synchronous CMC, utterances are rather short: an average range of 5–13 words per utterances in conversations on MUDs. This increases the feeling of interactivity for participants and lets listeners know that the speaker is not idle and not finished speaking.
- It is impossible to overlap utterances. In synchronous CMC, two users may be typing at the same time, but it is only upon pressing “return” that their utterance is processed by the MUD/IRC and displayed to other users.
- In synchronous CMC, the order of utterances need not be sequentially relevant for meaningful conversation to take place.
- Due to the persistent nature of text-based CMC, a communicator need not be present at the time of the utterances, but rather has the option of returning to one’s computer later to catch up on what has been transmitted.

Moreover, in most CMC environments, and in asynchronous CMC environments especially, two typical features of face-to-face conversation are missing:⁸

- The collaborative commitment of participants and the co-formulation of the message
- Feedback, which allows the social meaning of the message to be processed immediately

As noted by Viegas and Donath⁹ in a text-only environment, the text element is overloaded as a multiple signifier: “In these environments, the participants type messages which are then displayed sequentially on each person’s screen. These messages convey two types of information: one is the content of the message; the other is the presence of the participant. Consequently, if the participant is not actively messaging, he or she is not present on the screen.” The possibility of disappearing from screen has a strong impact on the style of discourse. Users, in fact, often

send messages only so that the others will not forget them.

Contextual information, too, is difficult to perceive in a chat system.⁹ For instance, it is difficult to distinguish among the participants and form a coherent sense of their individual identities: all the users appear as a user name in text against the background.

Also the interactions among the users are not always clear: in a chat the conversation appears on the screen as a linear progression of lines of text, regardless of the conversation’s dynamics. Finally, the temporal information found in oral conversation, such as turn-taking and the negotiation of conversational synchrony by the participants, is not captured by these sequential lines of text. As noted by Mabry,¹⁰ this leads to a prevalence of argumentative exchanges that are in many cases characterized by a strong and destructive style.

In addition, CMC in no way guarantees that a user’s declared identity is the real one. The use of false identities, often of a different sex, is widespread in electronic communities and in IRC especially.^{11–14}

In this sense, CMC is usually described as an efficient form of miscommunication, that is, a necessarily “pared-down” or, perhaps, more accurately, rarefied form of conversation,^{15,16} which lacks the rules on which effective interaction depends. Computer mediation creates an asymmetrical imbalance in the sender–receiver relationship: the sender can transmit information and get cooperation underway, but has no guarantee that the receiver receives the transmission, while the receiver has no guarantee that the sender’s declared identity is the real one.¹⁷

How do these differences affect the interaction process? The paper aims to answer this question by integrating five different theoretical approaches: the miscommunication as a chance theory, the positioning theory, the situated action theory, the social identity model of deindividuation effect, and the social information processing perspective.

Moreover, it presents the emerging forms of CMC—instant messaging, shared hypermedia, weblogs, and graphical chats—and their possible social and communicative effects.

FROM THE DARK TO THE LIGHT: MAKING ORDER OUT OF CMC MISCOMMUNICATION

The dark side of CMC

Even if a meta-analysis on existing studies¹⁸ found that the incidence of offensive conduct is overrated, different areas of CMC are characterized by intense language, swearing, negative or hostile communication. As experienced by many users of Usenet Newsgroup or Internet Relay Chat, the intensity of many communicative exchanges is usually heat.

To reduce the number of offending messages, net groups have established a netiquette—norms of network usage—that specifically addresses how the user can write and post messages. These norms stress obligations for group and self-monitoring to insure that members maintain a correct language, respect for the interlocutor, and communicative relevance. Netiquette, however, is not the same everywhere. Some offenses are likely seen as more disturbing than others, and it is equally possible that what one group condemns, another condones. For example, while directing a particularly hostile message at another user is perfectly acceptable on some newsgroups (e.g., alt.fan.warlords, alt.flame, and alt.irc), this approach is usually censured by many socially oriented newsgroups.

The typical breach of netiquette involves the use of flames. With this word Siegel and colleagues defined “messages that are precipitate, often personally derogatory, ad hominem attacks directed toward someone due to a position taken in a message distributed (posted) to the group.”¹⁹

However, the definition of flaming in CMC literature varies. For instance, Rice²⁰ describes flaming as “the tendency to react more critically or with greater hostility, leading to an escalation of conflict.” Following this line Walther²¹ defines it as “insults, swearing, and hostile instances of behavior.”

A more effective definition is the one provided by Thompsen and Ahn: flaming is composed by CMC behaviors that are interpreted to be inappropriately hostile.²² This definition focuses on an important point: for a flame to

take place two separate actions must occur. First the behavior has to be created. Then someone else has to interpret the behavior as being offensive. However, the use of inappropriate language is only one of the possible miscommunication processes typical of CMC.

The word “lurking” is used to define the behavior of subscribers to electronic forums who rarely or never send contributions to the discussions, content to read what others are writing.²³ In CMC, a “lurker” is equivalent to a spy: someone who listens to discussions within a chatroom but doesn’t make his or her presence known.

The motivations for this behavior are varied: having nothing to say, feeling “outclassed” by scholars who post frequently, or simply enjoying the exchange as a passive reader. Moreover, the use of lurking is a good strategy for getting a sense of what is acceptable in a new environment. However, the drawback to lurking is that, in an entirely text-based environment, if a user writes nothing he/she effectively ceases to exist. As one witty user noted, “I post, therefore I am.”

Another typical form of CMC miscommunication is e-mail spamming. As stated by Marvin,²³ the expression “spam” is used throughout the Internet, on both synchronous and asynchronous forms, for any “excess of words.” In particular the expression “spamming” is currently used for any attempt to deliver a message, over the Internet, to someone who would not otherwise choose to receive it.

The term was originally used in Usenet newsgroups to describe identical commercial or off-topic posts made to multiple newsgroups. It has since been expanded to include ordinary email messages. Most of the spam is composed by commercial advertising (unsolicited commercial e-mail or unsolicited bulk email). Potential target lists are created with automated searches by scanning Usenet postings, stealing Internet mailing lists, or searching the Web for addresses. A variant of email spamming is “bombing.” Email “bombing” is characterized by repeatedly sending an identical message to a specific e-mail address.

A final form of miscommunication, very common in CMC, is the use of false identities.

In general, if deceiving someone about your identity in the real world is indeed difficult, it seems to be far easier online, since the deceiver doesn't have to worry about the high number of relevant identity clues available offline. As noted by the literature in this area many impersonated postings are made simply by signing the target's name, without copying the writing style or forging the header information.

Switching on the light: from the "cues-filtered-out" approach to the social information processing perspective

The analysis of these behaviors is intriguing for communication researchers. In fact, as underlined by many communication researchers (e.g., Brown and Levinson²⁴) speakers typically display a "preference for agreement" in social interaction that seems lacking to flaming, lurking, spamming and identity deception. As noted by Mabry,²⁵ "The question arises as to how mediated groups manage this more adversarial communication context while retaining the discursive coherence and cohesiveness necessary for enacting socially appropriate rational discourse."

Starting from these limits, different researchers considered CMC as unable to support satisfactory socio-emotional and relational communication, if compared with face-to face. In particular, according to the American sociologists Sproull and Kiesler, CMC lacks the specifically relational features (social cues) which enable interactors to identify correctly the kind of interpersonal situations they find themselves in.²⁶

Sproull and Kiesler concluded from this that CMC occurs in a social vacuum where the personal identities of subjects tend to fade and vanish.²⁷ The most important consequences of this are as follows:

- CMC subjects tend to express themselves more openly and freely: "People who interact via computer are isolated from social rules and feel less subject to criticism and control. This sense of privacy makes them feel less inhibited in their relations with others."²⁷

- At the same time, however, loss of personal identity may encourage subjects to break social rules. Siegel et al.¹⁹ cite flaming as evidence of this.

This vision, usually defined in literature as the "cues-filtered-out" approach²⁸ is based on the concept of social presence: the feeling of the communicators that other actors are jointly involved in communicative interaction.²⁹ Social presence theory states that the attention paid by users to the presence of other social participants is directly linked to the channels or codes available within a medium: fewer channels, less attention.

However, most criticism has been directed at the alleged absence of social cues in CMC. Mantovani⁸ asserts that Sproull and Kiesler's claim that CMC occurs in a social vacuum "[is] unacceptable in general terms because it reduces social reality to some form of physical connection between individuals . . . To be excluded from the social context isn't simply a matter of being alone in a room."

Mantovani's criticisms are backed up by numerous studies of social identity and self-categorization, which show that the relationship between an individual and the social context and reference group is conceptualized in socio-cognitive rather than structural and relational terms.³⁰⁻³⁴ These studies have shown that subjects are characterized not by one fixed self, but by a variety of selves (self-categories), including the personal and social identities which emerge from the contexts in which they are rooted.³⁴ Since they play a crucial role in the creation of context, social categorization and individuation are a major influence on subjects' behavior, irrespective of the co-presence of other people.

This point of view is clearly expressed by the social identity model of deindividuation effect (SIDE).^{35,36} According to SIDE the actions of a CMC user, while tempered by individual awareness, stem in part from invisible social norms and identity. It is precisely the absence of non-verbal feedback in CMC, which makes these processes even more important than in face-to-face communication. According to Lea and Spears,³⁷ "it could be claimed that the absence of social rules coming from other people,

and the uncertain situation which results from this, force people to use social reference norms to regulate their own behavior.”

Moreover, as underlined by Walther^{21,38,39} in his social information processing (SIP) perspective, users adapt existing communicative cues, within constraints of language and textual display, to support processes of relational management. This position is strongly supported by research and user experience. For instance, Sherbloom,⁴⁰ in his study on e-mail, concludes that communicators adapt computer-generated textual signals for specific relational purposes. Chesebro and Bonsall⁴¹ found that a third of all the messages sent in 14 public computer bulletin boards were interpersonal in nature.

In general, if sufficient time is available, CMC allows the development of interpersonal relationships, and even intimacy, between the communicators.³⁸ How is this possible? And in particular, what are the elements required for creating an interpersonal relationship between CMC users? The SIP perspective identified the following factors:

- *A priori* relational motivators: Possible drives are the affiliation motive, impression management or the need for dominance.
- Time: It takes longer to learn how to use the medium, to get to know each other and to build up trust and friendships via CMC.
- Encoding of relational messages: CMC users have to learn how to transmit relational content even with the limitations of the available channels. In particular they have to understand how to verbalize relational messages.
- Impression formation. In CMC, this happens by decoding the verbal messages of the communication partner. Despite the limits imposed by CMC users are able to create them. They use “knowledge-generation strategies such as interrogation, self-disclosure, deception detection, environmental structuring, and deviation testing to gather psychological knowledge-level information about other persons.”²¹

When this happens, the structure and the contents of CMC interaction change. In partic-

ular the following elements are possible indexes of the development of the relation.³⁸

- Low level of formality: When CMC users feel more comfortable communicating with each other, they will not be focused on the formal aspects of communication. The amount of formality can be evaluated by the attention to general rules, the form of address a communicator chooses, as well as the figures of speech he or she employs.
- Rate of information exchange: When CMC users create a sufficient level of trust and intimacy the rate of information exchanged increases. This also strengthens the personal relation: when more messages are sent, users grow more comfortable with each other and interesting topics of conversation are brought up. On the other side, a sufficient rate of information exchange is required for supporting any personal relation.
- Trust and receptivity: When CMC users feel more trust in another person, they are more likely to reveal personal details about themselves. The amount of trust is usually expressed through the vulnerability of people’s revelations and their self-disclosing opinions on different issues.

The interesting point raised by the two authors, is that CMC communication, in its initial stages, can be more intimate than traditional face-to-face communication.³⁸ In CMC people are less concerned about the impression they are making because of the possibility of identity concealment offered by this medium.

These points also support the miscommunication as a chance theory (MaCHT) recently presented by Anolli.⁴² According to Anolli, a strategic use of miscommunication may enhance the degrees of freedom available to the communicators during an interaction. In fact, miscommunication and in particular CMC may offer new communicative tools, that if correctly used can improve the efficacy of an utterance. If a user handles well the miscommunication processes typical of CMC, he/she may even obtain results difficult to achieve in face-to-face meetings. For instance, CMC may

initiate relationships that might never have begun if they required a face-to-face meeting.⁴³ In such a situation CMC allows for selective presentation of certain features of a participant's identity reducing the person's anxiety over how he or she will be judged.

Next, we will try to outline how the CMC users are able to make order and create relationships out of the miscommunication processes typical of this medium.

Emotional expression in CMC

CMC interlocutors are forced to find alternative way for reproducing the metacommunicative features (emotions, illocutionary force) of face-to-face conversation. According to Utz,⁴⁴ it is possible identify three different forms of emotional expressions in CMC: emoticons, social verbs and emotes.

Emoticons (also smileys) are the most used textual devices: ASCII glyphs designed to show an emotional state in plain text messages. They consist of various punctuation marks and are viewed by turning the page sideways or tilting one's head to the left. In particular, Walther and D'Addario⁴⁵ describe emoticons as "graphic representations of facial expressions that many e-mail users embed in their messages. These symbols are widely known and commonly recognized among computer-mediated communication users, and they are described by most observers as substituting for the nonverbal cues that are missing from CMC in comparison to face-to-face communication." As noted by Wolf,⁴⁶ many different emoticon collections exist online in several different languages. And as for non verbal emotional expression, there is some confusion in emoticon interpretations: "In some instances the emoticon :-Q means user smokes; others define it as meaning tongue hanging out in nausea or sticking out tongue. A more widely used emoticon for user sticking out tongue is :-P." In general there is a broad acceptance in the interpretation of the basic smiley, frowney, and winkey emoticons: their respective meaning is humor, sadness, and sarcasm. However, the more elaborate the emoticons become, the greater variation one finds in the interpretations available for them.

Even the large amount of information available on the Internet, only a few studies verified the real impact of emoticons in CMC communication. Utz⁴⁷ examined the impact of emoticons to the development of friendships in MUDs. The data obtained showed that emoticons are seen as helpful in expressing socioemotional contents. More interesting, the use of emoticons is correlated with development of online friendships. In a different study, Walther and D'Addario⁴⁵ studied the effects of three common emoticons on message interpretations. The results indicated that emoticons' contribution to the interpretation was limited and outweighed by verbal content. However, they found a negativity effect: any negative message, expressed either verbally or using an emoticon, shifts message interpretation in the direction of the negative element. In their last research, Utz⁴⁷ studied gender differences in emoticon use. After analyzing the messages posted in different mixed-gender newsgroups, they verified that, if women most frequently use emoticons to express humor (35%), men use emoticons most often to express teasing or sarcasm (31%). But for our goals, the most interesting part of the paper is in the conclusion: "What emerges from a closer inspection, however, is that while emoticons are defined as vehicles to express emotion—hence "emotional icon"—their actual function hinges on the definition of the word emotion."

As noted by the author, both male and female users have altered the definition of emoticon to suit their conception of emotion. On one hand, males have expanded on the conventional definition of emotion to include sarcasm and teasing. On the other hand, female users have expanded on the male definition of emoticons and their use "adding other dimensions including solidarity, support, assertion of positive feelings, and thanks." These results seem to support two different approaches to CMC we discussed before.

First, they are coherent with the social information processing perspective.^{21,38,39} In CMC, users adapt existing communicative cues, within constraints of language and textual display, to support processes of relational management.

Second, they also agree with the miscommunication as a chance theory presented by Anolli.⁴² According to this perspective, communicators try to manage their communicative focus in the best possible way, given the contextual constraints and their respective encyclopedia of knowledge.⁴⁸ Communicative focus is concerned with how the speaker lets the addressee know what, in particular, he or she notices about the prominent aspect of the communicative act: a communicative act arises as the focus moves through the field of structures of beliefs, driven by the communicator's goals and guided by thoughts and communicative devices.

Using the concept of communicative focus, we can predict that users, according to the contextual constraints and their respective knowledge of the situation, will try to communicate using any available tool. For instance, MUDs offer to communicators more expressive tools than traditional text-based IRCs. In fact, in them, we can find new emotional tools—emotes and social verbs—that are used together with emoticons to improve the communicative focus.⁴⁹

Emotes are narrative descriptions of conversational nonverbal behaviors typed-out by the users. For example, if my name were "Joe" in a MUD and I type "emote cries out loud," the result for others on the MUD would be "Joe cries out loud"—giving my "character" action and movement—and even emotion.

Another possibility offered by MUDs is the use of social verbs (also called feelings or feature objects): small pre-programmed scripts to express actions and emotions by simply typing an abbreviation. There are several hundreds of verbs and adverbs which can be combined at pleasure. For example, "smiir" results in "smile ironically"; it is possible to smile sadly, happily, knowingly, innocently, and so on. Other feelings are hug, laugh, cry, poke, kick, kiss, or sigh.

In advanced CMC, such as in instant messaging or shared hypermedia, emoticons have evolved in a list of graphical rich icons that are a standard feature of the client used. In these new forms of CMC, emoticons are used both in the textual chat to express a specific emotion, and as mood indicators attached to the user ID/avatar.

Definition of a common context in CMC

During the past 50 years, the most famous communication model, the "parcel-post model,"^{50,51} which describes communication as the passage of information from one person to another, became obsolete.

First, any communication theory must face and solve the dilemma of opposition between meaning stability and meaning instability of a word, an utterance, or a gesture.⁴² Within this perspective, meaning consists of a fuzzy set: a class of communicative units with a continuum of grades of membership.

Second, as underlined by many authors, the information-transfer model does not take into account the cooperative component of communication, which stimulates reciprocal responsibility for successful interaction and a series of subtle adaptations among interlocutors. As Dohény-Farina⁵² notes: "The theory of communication as information transfer separates knowledge from communication; it treats knowledge as an object that exists independently of the participants in the innovation venture. With this independent existence, information becomes an object that can be carried through channels." However, it is possible to communicate only to the extent that participants have some common ground for shared beliefs, recognize reciprocal expectations, and accept rules for interaction, which serve as necessary anchors in the development of conversation.⁵³

Ghiglione's definition⁵⁴ of communication as "the co-construction of a reality using systems of signs and a mutually acceptable set of principles which make exchange possible and provide the rules needed to govern it" applies equally well to CMC as a constructive form of miscommunication. The main difference is that in CMC, as we have extensively seen before, the reality is asymmetrically co-constructed. In fact, the receiver can decide at will to terminate interaction, or continue it by turning himself into a sender. This decision is far from casual: it depends on how the receiver interprets the situation, what his aims are, and the social rules that govern his behavior. Some researchers have even used the term "electronic opportunism" to describe this feature of

CMC.⁵⁵ In this sense, CMC may be defined as a process by which a group of social actors in a given situation negotiates the meaning of the various situations, which arise between them.⁵⁶

Stasser's definition of CMC may seem straightforward enough, but it has two important implications that have had a decisive effect on CMC studies.⁵⁷ If CMC is a process of negotiation:

- The only way to understand it is by analyzing the subjects involved in it, and in the environment in which they operate, meaning that the social context in which CMC occurs plays a crucial role
- New processes and activities will develop which challenge and modify the initial relationship between subject and context

Most researchers would broadly agree that these two statements are true. According to Mantovani,⁸ the early 1990s saw changes in the study paradigms of person-computer and person-computer-person interaction. The main outcome of this has been the understanding that interaction can only be fully understood through detailed analysis of the social context in which it occurs: "... at this point we should no longer see people simply as 'users' of given systems, but as social 'actors.' In other words, whether expert computer users or not, people act independently and have their own reasons for what they do, and it is computers and systems that have to adapt to people, not vice versa."⁸

Based on traditional cognitive analyses of information processing and symbolization, situated action theory (SAT) introduces a change of perspective very interesting for our analysis: action is not the execution of a ready-conceived plan, but the subject's adaptation to context.⁵⁸ As Suchman notes, "instead of separating action from the circumstances in which it occurs as the execution of a carefully thought out plan ... [SAT] tries to study how people use circumstances to develop an intelligent course of action."

This necessitates profound changes in how "social context" has previously been defined. In SAT, social context is not something physi-

cal and stable like an organization or the power structure within it. As Mantovani⁸ stresses, contexts are not given, but made. Thus:

- Context is conceptual as well as physical: actors perceive situations using cultural models, and act accordingly in cultural ways.
- Context is unstable: cultural models are constantly modified by subjects' actions and choices.

In this sense, social context may be considered as the symbolic system of a given culture that is continually being altered by practical human intervention.

Applying SAT to CMC, Mantovani^{8,59} concludes that CMC participants cannot be regarded simply as technology users. Rather, they are social actors with their own aims and autonomy in situations, and it is technology, which must adapt to them.

This idea poses serious problems, however. If social actors actively respond to their environment and end up changing it, how can context ever be analyzed properly? Mantovani meets the difficulty with a three-level model of social context that links situation and social norms to the use of computer technology. The first level is social context in general, the second, ordinary situations of everyday life, and the third, local interaction with the environment via computers.

The links between the three levels can be studied in either direction, starting from use of computers or from social context. Thus, the use of computers may be regarded as part of everyday life, which is in turn part of the broader social context. By interacting with each other, the physical environment and the social context, subjects activate a spiral of actor-environment exchanges. First-level person-computer interaction leads to interaction in everyday situations, and thence to cultural changes.

Working in the opposite direction, social context supplies the elements needed to interpret situations correctly, and situations generate the aims, which determine local interaction with the environment via computer. So, as we

have seen, social context may be defined as the symbolic system of a given culture, which is continually being altered by practical human intervention; it cannot be explained exclusively in terms of the interpersonal relationships, or physical environment, in which information exchanges take place. Social context is a prerequisite of communication, "a shared symbolic order in which action becomes meaningful, and so generates meaning."⁸

Thus, SAT implies a radical redefinition of the meaning of communication. Context may be co-constructed by social actors, but they use communication to exchange meanings, not pieces of information. More precisely, the content of communication is interpretations of the situations which actors are involved in. In this sense, the most effective way of clarifying the meaning of messages is to relate them to a shared context of meaning.

Studies of positioning theory (PT) have served to reinforce this view. As recently formulated by Rom Harré,^{60,61} PT replaces the traditional concept of role with the concept of positioning. The main difference between the two is that a role is a stable and clearly defined category, while positioning is a dynamic process generated by communication.

Developing on Bakhtin's ideas and Vygotsky's studies, PT identifies two distinct processes underlying social activities. The first, naturally enough, is discourse-generated positioning, which Harré defines as "the way in which subjects dynamically generate and explain their own and other people's behavior."⁶¹

Harré defines the second process as the rhetorical redescription by which subjects shape their social context, "the discursive production of stories about institutions and macro-social events undertaken to make them intelligible in the form of social icons."⁶¹

As in SAT, context is not given in PT, but is constructed socially in ways, which are endlessly different because of the changes communication brings about in the structuring of the cultural context. The main difference between SAT and PT lies in the role attributed to discourse production. PT sees conversation as the most important human activity of all because it encompasses virtually all known mental phenomena. As Harré and Van Lan-

genhove⁶¹ state, "many mental phenomena like attitudes and emotions are immanently present in discourse production."

Identity awareness and construction in CMC

As we have seen in the previous paragraphs, CMC allows identity deception and anonymity. But there is a problem here: how can you communicate and activate the positioning process without staking your own identity on the outcome? As we have seen, communication always requires a framework of rules and meanings, and this is especially true of CMC in which many features of face-to-face conversation are "rarefied." One solution is to represent you by "coding cultural expectations at a symbolic level."⁶² In constructing a false identity, the subject has to make wider use of social stereotypes than would be the case in normal conversation if he wishes his identity to be recognized and accepted. This means that CMC, and virtual reality in particular, may force subjects to resort to massive use of stereotypical attitudes and behaviors if they are to achieve any shared understanding of actions and situations.¹⁴

What are the possible effects of this process? According to SIDE theorists,^{35,36} a social or a group identity will replace individual identity in CMC. Through experimentation, SIDE researchers found a salient shift from an individual identity to a group identity with individuals adhering to group norms.⁶³

A recent research investigated the intergroup properties of flaming in CMC. In particular the researchers tried to investigate how some form of identifiability affects flaming language: name, e-mail address, or geographical location.⁶⁴

Using for their analysis the SIDE model the authors verified that communicators produced more stereotype-consistent (group-normative) descriptions of out-group members' behaviors when their descriptions were identifiable to an audience. In particular, identifiability to an in-group audience was associated with higher levels of stereotype-consistent language when communicators described anonymous out-group targets. According to SIDE, this result can be explained by strategic reasons: to gain

acceptance from the in-group, to avoid punishment from the out-group, or to assert the identity to the out-group.

In a different study, 75 group members were primed with a certain type of social behavior (efficiency vs. prosocial norms). Consistent with the model, anonymous groups displayed prime-consistent behavior in their task solutions, whereas identifiable groups did not.⁶³

These results suggest that anonymous individuals in CMC are inclined to accept "in-group" norms and identity and reject "out-group" norms and identity. In-group favoritism increases, while stereotyping and bias between groups prevails. The SIDE model can be applied to broader social categories such as gender, race and nationality. For instance, when anonymity maintains and gender is revealed in CMC, individuals tend to behave in terms of gender norms. The prediction is that these social categories remain firm or become fossilized in anonymous CMC.

At the same time, however, the diffusion of CMC may produce changes in how personal identity develops. In fact, external language and interior dialogue are intimately related, and the link plays a crucial role in the formation of the subject's identity and higher mental processes.^{65,66} The way interaction with other subjects mediates meaning is fundamental to this shift from external language to interior dialogue.

As Davies and Harré⁶⁷ point out, during conversation subjects' selves "participate in an observable and subjectively coherent way in the joint production of story lines." In this phase, which uses interlocution in the manner described by Jacques,⁶⁸ subjects see themselves as "contradictors"⁶⁷ and use the positioning process to construct "a variety of selves" closely linked to the outcome of interaction.

This is very similar to the "transactional contextualism" developed by anthropologists and sociologists. For example, Rosaldo⁶⁹ says that the notion of self develops not from some internal essence relatively unaffected by the social world, but from experience accumulated in the world of meanings, images and social relationships in which each person is unavoidably involved. Hsu⁷⁰ defines this unbroken link between self and environment as

"psychosocial homeostasis," the unremitting effort to establish a balance between satisfaction of intrinsic needs and the demands of socio-cultural context.

In psychology, these ideas have carried over into the work of Gergen⁷¹ and Bruner.⁷² Gergen in particular has looked in detail at the construction of self, in studies of how an individual's self-esteem and concept of self vary in a set of different situations. These studies show that the concept of self varies both in relation to the kind of people the subject spends time with, and in response to the positive and negative comments they make. On the whole, then, the self may be seen as a product of the situation in which the subject acts. For his part, Bruner, though accepting the subject's autonomy, speaks of "creatures of history" whose selves are both "a guarantee of stability and a barometer reflecting changes in the cultural climate."

Markus and Nurius' concept of possible selves⁷³ offers atheoretical explanation of the relationship between identity and context. According to these authors, possible selves "give a specific cognitive form to our desires for control, power and belonging, and our widespread fears of failure and incompetence."⁷³

Although possible selves constitute our repertoire of different selves, their main feature is that they are exempt from direct social control and social negotiation. As Markus and Nurius say, "individuals have ideas about themselves which are not firmly anchored in social reality. As representatives of the self at some future time, possible selves are visions of the self which have not been tested and validated by social experience."⁷³

Potentially, a subject may be in a position to create an infinite number of possible selves, but in normal circumstances the repertoire of possible selves is a combination of the subject's personal experience, and the living and communication environments he is familiar with. As well as being a source of more or less appropriate behavioral models, the media also offer a range of images and symbols that people can identify with easily. Under normal circumstances, subjects can control media symbols and models, but this is much more difficult in a virtual environment. Interactivity

and telepresence also endow virtual environments with a degree of conviction and suggestiveness that is increasingly immune to the balancing effects of direct experience and "traditional" social contexts.

As Meyrowitz⁷⁴ points out, communication technology has changed our social context. Especially in younger people, the influence of social context on the construction of identity is beginning to wane as reference communities like the family, school or church, which in the past anchored social contexts in shared sets of rules, gradually loosen their grip. Recently, Kraut and colleagues examined the Internet's impact on emotional well being.⁷⁵ The results, discussed in the *American Psychologist*, showed that greater use of the Internet resulted in small but statistically significant increase in depression and loneliness and decreases in social engagement.

THE FUTURE: EMERGING FORMS OF CMC

The present situation would seem to be that the new media are accelerating the dissolution of traditional rule-based social contexts, and that this dissolution is itself draining the media of content and meaning. Doheny-Farina⁷⁶ argues that once we begin to divorce ourselves from geographic space and start investing ourselves in virtual communities, we further the dissolution of our real communities.

However, as noted by Wallace,⁷⁷ "the most important mediator of behavior in Internet environments is the purpose of the people who visit or inhabit them." Particularly, their use depends on how they are interpreted, what projects are in them, and what we think about daily reality.⁸

In this sense, as we have seen before, the CMC experience may be defined as a process by which a group of social actors in a given situation negotiate the meaning of the various situations which arise between them.⁵⁶ One of the consequences of this approach is that new processes and activities will develop out of this negotiation process, challenging and changing the initial relationship between subject and context.⁷⁸ To understand better what

are these processes and activities, the following paragraphs will analyze the emerging forms of CMC: instant messaging, shared hypermedia, weblogs, and graphical chats.

Instant messaging

As we have seen before, IRC is a form of synchronous CMC allowing a group of users to "chat" by exchanging written messages: they can interact in two different ways: by sending a message either to a specified user, or to all members of the group. In e-mail, instead a sender leaves a message in a receiver's electronic letterbox, which the receiver must open before he can read the message

The mixing of IRC and e-mail has produced instant messaging (IM). Instant messaging is a particular form of CMC that enables the user to create a private chatroom with one or more users (for a list of available IM clients, see Table 1). How does it work?

Each user defines a list of people that he or she wishes to interact with: IM users can send messages to any of the people included in this predefined list (buddy list or contact list) as long as that person is online. Typically, the instant messaging system alerts you whenever somebody on your private list is online. You can then initiate a chat session. Sending a message opens up a small window where the interlocutors can type in messages that all of them can see.

Instant messaging appeared in the CMC scene in November 1996, when ICQ (a combination of letters that is shorthand for the phrase "I seek you"), a free IM utility, was launched.

Historically, the diffusion of text based CMC is linked to the low bandwidth available to many Internet users. However, the increasing availability of fast Internet connection (e.g., ISDN, ADSL, Cable) is pushing software developers to integrate new communication tools in standard IM clients. The first step in this trend was the inclusion of audio communication: second generation IM clients allow talking with users anywhere in the world using the computer microphone and speakers. Other typical features of second-generation IM clients is real time file sharing and e-mail support.

TABLE 1. IM CLIENTS

<i>Tool</i>	<i>Channels</i>	<i>Developer</i>	<i>Website</i>
AOL Instant Messaging	Text	AOL	http://www.aol.com/aim/homenew.adp
EyeBall	Text, Audio, Video	NovaWiz	http://www.odigo.org
ICQ 2001	Text, Audio	ICQ	http://web.icq.com/index/
Jabber	Text	Jabber.com	http://www.jabber.org
MSN Messenger 4	Text, Audio	Microsoft	http://messenger.msn.com
MSN Messenger XP	Text, Audio, Video	Microsoft	http://messenger.msn.com
Netmeeting	Text, Audio, Video	Microsoft	http://www.microsoft.com/windows/netmeeting/
PalTalk	Text, Audio, Video	Paltalk.com	http://www.paltalk.com
Yahoo! Messenger	Text, Audio, Video	Yahoo	http://messenger.yahoo.com/

A further step in this trend is the creation of video instant messaging, which also allows both video chat live, and the video messages recording/sending to the users who are in the chatrooms. To use the video features of a video IM the user needs a video capture card and a normal camera or a webcam.

Third-generation IM clients have even more features. Below are listed the more interesting from a communicational viewpoint:

- Remote assistance: a user can see and, if permitted, take control of the computer of another users. That's like sitting next to each other and looking at the same screen.
- Application sharing: Use the same application in real-time. If a user open a program, for example a word processor, the connected users can work on the document together.
- Shared sketching: Draw diagrams with other user at the same time. Communicators can sketch their ideas simultaneously as if they were both drawing on the same whiteboard.

Shared hypermedia

The term "hypermedia" refers to an "on-line setting where networks of multimedia nodes connected by links are used to present information and manage retrieval."⁷⁹ In fact this term can be considered an umbrella term, referring to any computer-stored information related and retrieved by links.

The World Wide Web is a well-known hypermedia environment that users can access through the Internet by using interactive browsers, such as Microsoft's Internet Ex-

plorer or Netscape's Navigator. If the information is textual in the first place, we talk of a hypertext, and if there are certain visual, musical, animation elements or the like included, we talk of a hypermedia.⁸⁰

Hypertexts and hypermedia are structured around the idea of offering a communication environment that mimics human thinking—that is, an environment that allows the user to make associations between "concepts" rather than move sequentially from one to the next, as in an alphabetical list. Hypermedia concepts are thus linked in a manner that allows the user to jump from subject to related subject in searching for information. For example, a hypermedia presentation on navigation might include links to such topics as astronomy, bird migration, geography, satellites, and radar. For this reason, hypermedia tools are widely used in distance learning.

How is it possible to integrate the advantages of hypermedia with traditional synchronous CMC? A possible answer comes from shared hypermedia (SHY): new Internet tools attaching computer mediated communication to Web browsing.^{81,82}

In SHY, different users, who are simultaneously browsing the same Web site, can communicate with each other and share files or web addresses (see Table 2 for a list of available SHY). Using a simple interface, usually resembling a little remote control, SHY users can get a constantly updated list of all the other online users who are visiting the same Web site.⁸¹

All they have to do is click on any person icon, open a message window, and start the communication as happens in traditional instant messaging. The twist is that the chatters

TABLE 2. SHARED HYPERMEDIA CLIENTS

<i>Tool</i>	<i>Developer</i>	<i>Website</i>
<i>ICQSurf</i>	ICQ	http://www.icq.com/icqsurf
<i>Odigo</i>	NovaWiz	http://www.odigo.org

automatically have something in common: the Web page they're reading.

Usually, a SHY lets the user conduct group and private chats, exchange information or files, and share the same web pages (for a more detailed characteristics of a typical SHY, see Table 3).

On any web site, SHY users can see a list of other users and talk with them on group and private levels. SHY further enhances the user experience by consolidating different form of computer mediated communication (e.g., e-mail, IM) into one fully integrated interface. Many SHY also have a search engine that can be used to find users with a specific age and/or similar interests. In this way it is really easy to set up a group with a common interest, like social psychology, or get online to practice a foreign language with a mother-tongue users.

By assembling people with similar interests and surfing habits, this new Internet platform transforms Web browsing into a social activity. In this sense a SHY can be the starting point of community-centered environments based on communities of practice.⁸²

What are communities of practice? At the simplest level, they are a small group of people who share a common goal over a period of time. They are not a team, a task force, or an identified group but attend the same course, collaborate on a shared task or work together on a product.^{83,84} More specifically, they are peers in the execution of "real activities."

What holds them together is a common sense of purpose and a real need to know what each other knows.

Weblogs

If SHYs are the product of the union of hypermedia with synchronous CMC, the union of hypermedia and asynchronous CMC-produced weblogs. A weblog (also blog) is a web page made up of usually short, frequently updated posts that are arranged chronologically as in newsgroups (see Table 4 for a list of Weblog clients). The content and purposes of blogs are mainly expressive: links and commentary about other web sites, news about a company/person/idea, photos, poetry, project updates, even fiction.

Most weblogs are personal, and used as individual's logs of the web: public diaries of web pages to recommend to other users. Some others are collaborative efforts based on a specific topic or area of mutual interest. They help small groups communicate in a way that is simpler and easier to follow than email or discussion forums.

Using a private weblog on an intranet allows team members to post related links, files, quotes, or commentary. As noted by blogger, one of the sites where is possible to set up a weblog for free,⁸⁵ this new form of CMC "can help keep everyone in the loop, promote cohesiveness and group culture, and provide an informal voice of a project or department to outsiders."

Graphical chats

Graphical chats (Table 5) are a different variant of classical text-based IRC. As we have

TABLE 3. FEATURES OF SHARED HYPERMEDIA (ADAPTED FROM RIVA, 2001)

<i>One-on-one or multi-user chat (text, audio and video)</i>	Users can make calls to multiple people up to 100/1,000 users. In multi-user chat one ore more moderators can control group participation by sharing the microphone. It is also possible to broadcast a radio-style Internet talk show where the host maintains control and invites listeners to participate to the event.
<i>Email (text and voice)</i>	User can send text and voice messages to users who are not online.
<i>Web tour</i>	Users can create their own Web Tour and escort other users through a list favorite web sites.
<i>Search engine</i>	Users can find other users with a specific sex, age and/or similar interests.
<i>Transfer of files</i>	Users can upload and download from other users documents and files.

TABLE 4. WEBLOG CLIENTS

<i>Tool</i>	<i>Developer</i>	<i>Website</i>
<i>Blogger</i>	Pyra Labs.	http://www.blogger.com
<i>Diaryland</i>	Diaryland	http://www.diaryland.com/
<i>Livejournal</i>	Livejournal.com	http://www.livejournal.com/
<i>GrokSoup</i>	GrokSoup.com	http://www.groksoup.com/

seen extensively before, text chats lack nonverbal cues that facilitate face-to-face conversations, such as gestures or physical distance. To overcome these limitations graphical chats add visual representations for physical bodies and spaces to a text chat window. In particular, graphical chats provide a visual representation of both the rooms as a 2D/3D space, and the different users.

In fact, each user can choose a graphical representation—picture, drawing or icon—of himself or herself that is called avatar. Usually it is possible to select a standard avatar provided by the program, an avatar created by another user, or to create a custom avatar.

On all graphical chat systems, however, text is still used for the actual conversation; users communicate with others via typed text that appears in “speech balloons” that pop up next to the participants’ avatars. All users within the same 2D/3D space can see each other’s messages (with the exception of whispers—private point-to-point messages), irrespective of the distances between avatars.

Moreover, most avatars have a preset range of expressions—happy, angry—and behaviors—jump, fight, kiss—that can be used to convey nonverbal cues.

However, as noted by Viegas and Donath,⁹ the use of avatars introduces new problems: “Space needs to be allocated for every user’s avatar as well as for their speech bubbles. The screen becomes quickly cluttered, which can hinder communication. More subtly, the avatars can distort expression and intent by providing a small range of (often broadly drawn) expressions that overlays all of a user’s communications. Even if an avatar has several expressions, and many do, it is still a far cry from the subtlety of verbal expression, let alone our physical gestures.”

Churchill and Snowden⁸⁶ recently identified a series of key issues a 3D chat developer has to face for supporting effectively the communication process:

- The transition between shared and individual activities: Actors should know what is currently being done and what has been done in the context of the task goals.
- Flexible and multiple viewpoints and representations: Tasks often need use of multiple representations each tailored to a different point of view and different subtasks.
- A shared context: The shared context is composed of symbolic references which allow

TABLE 5. GRAPHICAL CHATS

<i>Graphical chats</i>	<i>Web address</i>
2D	
<i>Donny World</i>	http://www.donnyworld.com/
<i>IRC Toons</i>	http://www.irctoos.com/
<i>Talking Heads</i>	http://www.on-line.co.uk/talk/
<i>The Palace</i>	http://www.thepalace.com/
<i>V-Chat 2.0</i>	http://www.tucows.com/preview/193892.html
3D	
<i>Active Worlds</i>	http://www.activeworlds.com/
<i>ChatPOP</i>	http://www.hellopop.com/ENGLISH/index.asp
<i>Cyber Net Worlds</i>	http://www.cybernetworlds.com/
<i>Galaxy Worlds</i>	http://www.galaxyworlds.com/welcome.htm
<i>Outerworlds</i>	http://www.outerworlds.com/
<i>Talk World</i>	http://www.talkworld-online.com/

actors to orient and coordinate themselves. It includes the shared knowledge of each other's current activities, shared knowledge of each other's past activities, shared artifacts and shared environment.

- The awareness of others: This awareness includes both the knowledge of shared task related activities and the sense of co-presence.
- The support to communication activities: Negotiation through face-to-face talks is important for collaboration. In fact, conversation analytic studies of negotiation at work have detailed how subtle verbal and non verbal contribute to such negotiation.

Also in this vision the key content of communication is the interpretation of the situations which actors are involved in. So, the most effective way of clarifying the meaning of messages is to connect them to a shared context of meaning.

CONCLUSION

CMC is a new form of communication with significant differences from non-electronic written communication, as well as from other existing means of communication. There are two main reasons for these differences:

- Communication with a keyboard and computer screen takes longer than normal face-to-face communication
- The absence of metacommunicative features like facial expression, posture and tone of voice

This is why CMC is usually described as a form of miscommunication, that is, a necessarily "pared-down" or, perhaps, more accurately, rarefied form of conversation,^{15,16} which lacks the rules on which effective interaction depends.

According to the "cues-filtered-out" approach,²⁸ CMC lacks the specifically relational features (social cues), which enable interactors to identify correctly the kind of interpersonal situations they find themselves in.²⁶

The conclusions proposed by these authors are that CMC occurs in a social vacuum where

the personal identities of subjects tend to fade and vanish.²⁷ The paper tried to counter this vision using in its theoretical frame five different approaches here listed in alphabetical order:

- The Miscommunication as a CHance Theory (MaCHT):⁴² A strategic use of miscommunication may enhance the degrees of freedom available to the communicators during an interaction. If a user handles well the miscommunication processes typical of CMC, he/she may even achieve results difficult to obtain in face-to-face meetings.
- The Positioning Theory (PT): PT replaces the traditional concept of role with the concept of positioning. The main difference between the two is that a role is a stable and clearly defined category, while positioning is a dynamic process generated by communication.^{60,61}
- The Situated Action Theory (SAT): Action is not the execution of a ready-conceived plan, but the subject's adaptation to context.⁵⁸
- The Social Identity Model of Deindividuation Effect (SIDE): A social or a group identity replaces individual identity in CMC.^{35,36}
- The Social Information Processing (SIP) Perspective: Users adapt existing communicative cues, within constraints of language and textual display, to support processes of relational management.^{21,38,39}

Starting from the above theories, the paper outlined how the CMC users are able to make order and create relationships out of the miscommunication processes typical of this medium. Moreover, it presented the emerging forms of CMC—instant messaging, shared hypermedia, weblogs, and graphical chats—and their possible social and communicative effects.

This analysis enables us to reach the following conclusions:

- Communication is as the outcome of a complex coordinated activity, an event that generates conversational space within the weave of personal and social relationships. Thus, communication is not only—or not so much—a transfer of information, but also the activation of a psychosocial re-

relationship, the process by which interlocutors co-construct an area of reality. In CMC this happens inside a rather special kind of container—cyberspace—that tends to rarefy the structural and process features of communication.

- The CMC experience may be defined as a process by which a group of social actors in a given situation negotiate the meaning of the various situations, which arise between them. In this sense, the most important mediator of behavior in CMC is the purpose of the people who use them. Particularly, their use depends on how the CMC processes are interpreted, what projects are in them.

Obviously, the issues raised in this paper are just a first step towards a definitive analysis of CMC and its effects on our lives. But it allowed us to demonstrate that communication technologies are no longer seen by researchers as rigid prostheses—external tools marking the limits and limitations of users who are slaves rather than masters—but as an opportunity: ways of genuinely enhancing the communication of the interlocutors who use them.

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