Say not to Say:
New perspectives on miscommunication
L. Anolli, R. Ciceri and G. Riva (Eds.)
IOS Press, 2001

9 Communicating in CMC: Making Order Out of Miscommunication

Giuseppe RIVA

Abstract: Everyday, thousands of subjects engage in computer mediated communication (CMC) using a novel linguistic genre, which combines characteristics of both written and oral language. This "virtual" communication may be described as a particular form of *miscommunication*: a necessarily "pared-down" form of conversation, which lacks the many features and some rules on which traditional forms of interactions depend.
According to the "cues-filtered-out" approach, CMC lacks the relational features (social cues), which enable interactors to identify correctly the kind of interpersonal situations they find themselves in. The conclusions of this approach are that CMC occurs in a social vacuum where the personal identities of subjects tend to fade and vanish.
This chapter tries to counter this vision by integrating in its theoretical framework five different approaches: the Miscommunication as a Chance Theory (MaCHT), the Positioning Theory (PT), the Situated Action Theory (SAT), the Social Identity Model of Deindividuation Effect (SIDE) and the Social Information Processing (SIP) perspective.
In particular, starting from the analysis of the miscommunication processes typical of CMC, the chapter outlines how CMC users are able to make order and create relationships out of the miscommunication processes typical of this medium. Moreover, it presents the emerging forms of CMC - *instant messaging, shared hypermedia, weblogs and graphical chats* – and their possible social and communicative effects.

Contents

9.1 Introduction……. 204
9.2 Flaming, lurking, spamming and identity deception: the dark side of CMC…… 205
9.3 Making order out of CMC miscommunication……... 210
9.4 The future: emerging forms of CMC…….. 219
9.5 Conclusions……. 228
9.6 Acknowledgements……. 230

9.7 References…… 230

9.1 Introduction

The growth in the use of global networks of computers, commonly labeled the Internet, has increasingly led to questions about how the Internet can be understood and analyzed as an emergent communication tool.

In fact, computer-mediated communication (CMC) has created new opportunities for synchronous and asynchronous discussions among geographically dispersed individuals sitting at their computer keyboards. Everyday, thousands of subjects engage in "written" conversation using a novel linguistic genre, which combines characteristics of both written and oral language. They type their messages, and the text of these messages appears on the screens of their interlocutors, preceded by the "speaker's" nickname or e-mail address.

The commonest form of asynchronous CMC is e-mail, in which a sender leaves a message in a receiver's electronic letterbox, which the receiver must open before he can read the message [1]. Another more sophisticated type of asynchronous CMC is Usenet Newsgroup, an electronic notice board on which users can post messages referring to a specific topic or area of interest. Users can read the messages by opening the notice board, and send their own messages in turn. As with e-mail, there is no real-time link between the computers of the interacting subjects.

Unlike asynchronous CMC, the most important feature of synchronous CMC is that it does provide a real-time link between users' computers. Although the most frequently cited example is the videoconference, the most widespread system is the Internet Relay Chat, or IRC. 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.

Despite the predominance of the textual mode, it has been shown that CMC differs in psychosocial terms from non-electronic written communication, as well as from other existing means of communication. Experimental studies designed to compare CMC and non-electronic written communication [2, 3] have revealed significant differences in their respective degrees of social presence and media richness. *Social presence* is the user's perception of the ability of the means of communication to marshal and focus the presence of communicating subjects [4], while *media richness* is the ability of the means of communication to interlink a variety of topics, render them less ambiguous, and enable users to learn about them within a given time-span [5]. There is a technical reason for these differences. Communication with a keyboard and computer screen takes longer than normal face-to-face communication, and the absence of metacommunicative features like facial expression, posture and tone of voice encourages users to find other ways of making communication as complete as possible.

In this sense, CMC is usually described as an efficient form of *miscommunication*, i.e., a necessarily “pared-down” or, perhaps, more accurately, rarefied form of conversation [6, 7], 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 under way, 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 [8].

How do these differences affect the interaction process? The chapter 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.

In particular, starting from the analysis of the miscommunication processes typical of CMC – *flaming, lurking, spamming and identity deception* – the chapter discusses the miscommunication characteristics of CMC trying to identify how to exploit the full potential of the electronic media. Moreover, it presents the emerging forms of CMC - *instant messaging, shared hypermedia, weblogs and graphical chats* – and their possible social and communicative effects.

9.2 Flaming, lurking, spamming and identity deception: the dark side of CMC

The increased diffusion of Internet made CMC very popular. However, what are the communication characteristics of CMC? If face-to-face conversation occurs in a cooperative environment constantly regulated by mutual adjustment and correction [9, 10], CMC occurs in a much less cooperative environment because of the special conditions imposed by the medium itself [11].

This has a strong impact on the regulation of CMC interaction. In face-to-face communication the regulation of interaction is obtained using a complex system of turn taking and yielding behaviors [12, 13]. For example, as stated by Patterson [13, p.108], 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;
- over loudness in the first segments of speech.

In CMC, almost all of the above behaviors are completely impertinent. This difference in the regulation of the interaction can be explained by the following CMC characteristics [14, 15]:

- The size of an utterance is determined entirely by speaker. In general, however, in synchronous CMC utterances are rather short: 5 to 13 words per utterances in conversations on MUDs. This increases the feeling of interactivity for participants, and a lets listeners know that the speaker is not idle and not finished speaking.
- It is impossible the overlap of 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 utterance(s), 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 [16]:

- the collaborative commitment of participants and the co-formulation of the message;
- the feedback, which allows the social meaning of the message to be processed immediately.

As noted by Viegas and Donath [17] in a text-only CMC 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 (p. 10).

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 [17]. 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 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 [18], 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 [19-22]. In another chapter of this book Marby underlined how the anonymity of CMC, facilitating and facilitated by concealment in self-presentation, allows distortions to be made through omission of information as well as through selective presentation.

In general four particular form of miscommunication are common in CMC [23]: offensive conduct (flaming), listening without making his/her presence known (lurking), delivering a message to someone who would not otherwise choose to receive it (spamming and bombing) and identity deception (spoofing). In the next paragraphs we will try to deepen the analysis of these behaviors.

9.2.1 Flaming

Even if a meta-analysis on existing studies [24] 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. The 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" [25, p. 159].

However, the definition of flaming in CMC literature varies. For instance Rice [26] describes flaming as "the tendency to react more critically or with greater hostility, leading to an escalation of conflict" (p. 634). Following this line Walther [27] 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 [28]. 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.

Table 9.1 Offending messages in CMC (adapted from McLaughlin et al., 1995)

Offending messages	*Characteristics of offending messages*
Ethical Violations	Posting private email or personal information about others without permission, misattributions or misquoting of sources, harassment of individual posters
Inappropriate Language	Personal attacks, hostile or coarse language, linguistic affectations which distract or detract from message content
Violation of Newsgroup Conventions	Failing to use spoiler warnings, lack of familiarity with and failure to use appropriate subject headers or abbreviations, failing to conform to group spirit or style and group traditions regarding appropriate topics
Violation of Usenet Conventions	Incorrect or missing subject headers, failing to encrypt offensive material, posting to an inappropriate newsgroup or otherwise demonstrating lack of regular reading
Factual Errors	Spelling and grammatical errors, mistakes with respect to names, dates, places, and events, errors in summarizing others' posts
Bandwidth Piggery	Excessively long article or signature, quoted material longer than comment, indiscriminate cross-posting, asking a frequently answered question
Incorrect/novice use of technology	Editing and formatting errors, multiple postings or signatures, failing to use follow-on option

Following this approach McLaughlin and colleagues [29] analyzed characteristics of messages in five popular newsgroups and elaborated taxonomy of reproachable conduct on Usenet. In particular offending messages - those which presented behavior sufficiently in violation of normative expectations to prompt comment and spark remedial discussion and debate - were analyzed for gravity of offense. The result of their analysis is summarized in the Table 9.1.

As clearly shown by the table, the use of inappropriate language is only one of the possible offending behaviors in CMC.

9.2.2 Lurking

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]. Herz [23, pp. 4-5] describes lurking as follows:

Lurking is a larval phase in the nethead life cycle. It's that spooky, voyeuristic time when you haven't got your bearings yet, but you're fascinated enough to browse with bovine

contentment on the grassy pastures of online discourse. . . . Lurking is like one of those Sunday-night movies on network TV where a guy is struck by lightening or toxic waste and becomes Captain Undetectable, suddenly able to overhear boardroom conversations and sneak into the lingerie dressing room at Macy's at a single bound.

As clearly stated by this text, in CMC a "lurker" is equivalent to a spy: someone who listens to discussions within a chat room 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 IRC user noted, "I post, therefore I am." By corollary, a lurker does not exist in a way that can be perceived and responded to by others online: he or she is not an active part of the virtual community.

9.2.3 Spamming and bombing

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. There are two different forms of bombing:

- *Massmail bombing*: a subject sends to a specific e-mail address hundreds, or perhaps even thousands of pieces of email, usually by means of a script and fakemail. It is relatively easy to defend against, since the messages will be coming from just a few ee-mail addresses.
- *Mailing List bombing*: a subject subscribes a specific e-mail address to as many mailing lists as possible. This is much worse than a massmail because it requires to unsubscribe from each mailing list, a process that requires information and time.

9.2.4 Identity deception

In communication knowing the identity of those with whom you communicate is essential for understanding and evaluating an interaction. However, the common use of false identities in CMC is very intriguing for communication researchers.

In fact, the cost of identity deception for the typical CMC user is potentially high. As noted by Donath [30] it reduces both the motivation level and the possibility of information exchange, affiliation and support provision (see Table 9.2).

In the chapter on deception Anolli and colleagues clearly analyzed the characteristics of this behavior. However, it is interesting to analyze the possibility of identity deception offered by CMC.

Table 9.2 The cost of identity deception (adapted from Donath, 1999)

Areas	*Costs*
Information Exchange	The communicator's identity - in particular, claims of real-world expertise or history of accurate online contributions - plays an important role in judging the veracity of a message. Similarly, knowing the writer's motivation – e.g. political beliefs, professional affiliations, personal relationships – can greatly affect how we interpret his or her statements.
Providing affiliation and support	The creation of a shared community requires that the participants are sympathetic to the ideas around which the group is based; even if they disagree, there needs to be some fundamental common ground. Trust in the shared motivations and beliefs of the other participants – in other words, their social identity – is essential to the sense of community
Enhancing reputation	In most newsgroups, reputation is enhanced by posting intelligent and interesting comments, while in some others posting rude flames or snide and cutting observations enhances it. To the writer seeking to be better known, a clearly recognizable display of identity is especially important. No matter how brilliant the posting, there is no gain in reputation if the readers are oblivious to whom the author is.

If we follow Donath [30] we can identify the following forms of deception:

- *Identity concealment*: The most common form of CMC deception is identity concealment: hiding one's identity. Usually, Usenet and IRC users hide their identity for privacy issues: Usenet and IRC are public forums in which the participants have no control over who reads their posts. However, sometimes identity is hidden to circumvent message filters (killfiles) that allow the skipping of unwanted postings: if you put someone in your filter, you will see no more of his/her postings. In this domain is important to distinguish between two forms of identity concealment: *pseudonymity* and *pure anonymity*. A pseudonym, though it may have not a direct link to a real-world person, can build a well-established reputation in CMC and transmit a wealth of contextual information about the sender. A purely anonymous message, on the other hand, is a form of unattributed communication (spoof). As an unattributed line, spoofing attracts attention, is often used for humorous effect, but can be threatening, confusing, or frustrating in normal conversational patterns.
- *Category deception*: Gender deception is the most common form of category deception, especially in chatrooms. In newsgroups, gender deception appears to be much less common, except in forums where sex and gender are the most relevant topics. Also very used are age deception and status enhancement. Typical expression of status enhancement can be easily found in many newsgroups: the "well-built body" in *misc.fitness.weights* or the "expert hacker" in *alt.2600*.
- *Impersonation*: A very dangerous form of identity deception is impersonation. If a subject can pass as you, he can destroy your reputation, both on-line and off.

Usually the effect of an impersonation depends upon how defamatory the faked postings are and whether readers believe the false attribution.

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. Very interesting for communication researchers is how successful such simple imitations can be.

9.3 Making order out of CMC miscommunication

The analysis of these behaviors is intriguing for communication researchers. In fact, as underlined by many communication researchers (e.g., Brown and Levinson, [31]), speakers typically display a "preference for agreement" in social interaction that seems lacking to flaming, lurking, spamming and spoofing. As noted by Mabry [32]: "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."

As we have seen before, CMC can be described as a necessarily "pared-down" or, perhaps, more accurately, rarefied form of conversation [6], which lacks the rules on which effective interaction depends. This is due to the peculiar characteristics of CMC: communication with a keyboard and computer screen takes longer than normal, and doesn't support metacommunicative features like facial expression, posture and tone of voice that have an important role in face-to-face communication.

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 [33].

Sproull and Kiesler concluded from this that CMC occurs in a social vacuum where the personal identities of subjects tend to fade and vanish [34]. The most important consequences of this are that:

- In 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" [34, p. 48].
- At the same time, however, loss of personal identity may encourage subjects to break social rules. Siegel, Dubrovsky, Kiesler and McGuire [25] cite flaming as evidence of this.

This vision, usually defined in literature as the "*cues-filtered-out*" approach [35], is based on the concept of *social presence* that we discussed in the introduction: the feeling of the communicators that other actors are jointly involved in communicative interaction [4]. 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. Mantovani [16] 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" (pp.170-172).

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 [36-40]. 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 [40]. 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 [41, 42]. 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 [2], "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" (p. 286).

Moreover, as underlined by Walther [27, 43, 44] 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 [45] in his study on e-mail, concludes that communicators adapt computer-generated textual signals for specific relational purposes. Chesebro and Bonsall [46] 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 [43]. 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.
- *Impression formation*. In CMC, this happens by *decoding* the verbal messages of the communication partner. This is possible by using "knowledge-generation strategies such as interrogation, self-disclosure, deception detection, environmental structuring, and deviation testing to gather psychological knowledge-level information about other persons" [27, p.71].
- *Encoding of relational messages*: CMC users have to learn how to transmit relational content within the limitations of the available channels. In particular they have to understand how to verbalize relational messages.
- *Time*: to learn how to use CMC effectively requires time. In particular, to get to know each other and to build up trust and friendships via CMC.

When this happens, the structure and the contents of CMC interaction change. In particular the following elements are possible indexes of the development of the relation [43, p.56]:

- *Low level of formality*: when CMC users feel more comfortable communicating with each other, they will be less 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.
- *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.

- *Rate of information exchange*: when CMC users create a sufficient level of trust and intimacy the rate of information exchanged increases. This also strengthen 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.

The interesting point raised by the two authors, is that CMC communication, in its initial stages, can be more intimate that traditional face-to-face communication [43]. In CMC, the users 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) presented by Anolli in the first chapter of this book. 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 [47]. 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.

In the next paragraphs 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.

9.3.1 Expressing emotions in CMC

CMC interlocutors are forced to find alternative way for reproducing the metacommunicative features (emotions, illocutionary force, etc.) of face-to-face conversation. According to Utz [48] it is possible identify three different forms of emotional expressions in CMC: emoticons, social verbs and emotes (see Table 9.3).

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 (a list of the most common emoticons are reported in Table 9.3).

In particular, Walther and D'Addario [49] 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" (p. 324).

As noted by Wolf, [50] 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 s*ticking out tongue*. A more widely used emoticon for *user sticking out tongue* is :-P" (p. 829). In general there is a general acceptance in the interpretation of the basic smiley, frowney, and winkey emoticons (see Table 9.4): 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.

Utz [51] 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'Addario [49] 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.

Table 9.3 Different forms of emotional expression in text-based CMC (adapted from Utz, 2000)

Emotional Expression	***Description***	***Example***
Emoticons	ASCII glyphs designed to show an emotional state in plain text messages	**:-)** humor **:-(** sadness **;-)** sarcasm
Social verbs (feelings)	Small pre-programmed scripts to express actions and emotions by simply typing an abbreviation	*command*: laugh *appears on screen*: You fall down laughing *command*: smi Aron und *appears on screen*: You smile understandingly at Aron
Emotes	Narrative descriptions of conversational nonverbal behaviors	*command*: emote/say/pose is so happy that he could embrace the whole world *appears on screen*: <Name> is so happy that he could embrace the whole world.

In the last research, Utz [51] studied gender differences in emoticon use. After analyzing the messages posted in different mixed-gender newsgroups, the author 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 the Conclusion [, 2001 #1197; p. 832]:

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 males and females users have altered the definition of emoticon to suit their conception of emotion. On one side males have expanded on the conventional definition of emotion to include sarcasm and teasing. On the other side female users have expanded on the male definition of emoticons and their use "adds other dimensions including solidarity, support, assertion of positive feelings, and thanks"

(p.833). These results seem to support two different approaches to CMC we discussed before.

First, they are coherent with the *social information processing* perspective [27, 43, 44]: in CMC users adapt existing communicative cues, within constraints of language and textual display, to support processes of relational management.

Table 9.4 The most common emoticons

Symbol	*Meaning*	***Symbol***	***Meaning***
:-)	Basic smiley face; used for humor and sometimes sarcasm	/\/\/\	Laughter
:-(	Basic frowney face; used for sadness or anger	**:-D**	Laughing
;-)	Half-smiley or winkey face; used for sarcasm	**!-(**	Black eye
:-/	Wry face; used for wry humor	**8-O**	Astonished
#:-o	Shocked (1)	**8-]**	Surprise
8-o	Shocked (2)	**: (**	Sad
%-	Hung over	**: [**	Bored
%-{	Ironic	**:,(**	Crying
>>:-<<	Furious	**:-@**	Screaming
>-	Female	**(:-**	Very sad (1)
:-	Male	**:-<**	Very sad (2)
>:-<	Mad	**:-,**	Smirk
>:-(	Annoyed	**:-6**	Exhausted
<:-|	Dunce	**:-e**	Disappointed
(:&	Angry	**%-(**	Confused
(:-*	Kiss	**8-#**	Death

Second, they also agree with the *miscommunication as a chance theory* presented by Anolli in this book. According to this perspective, communicators try to *manage their communicative focus in the best possible way*, given the contextual constraints and their respective encyclopaedia of knowledge [52]. *Communicative focus* is concerned with how the speaker lets the addressee know what in particular he/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 [53].

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, "smi iro" 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 (see paragraph 9.4), 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.

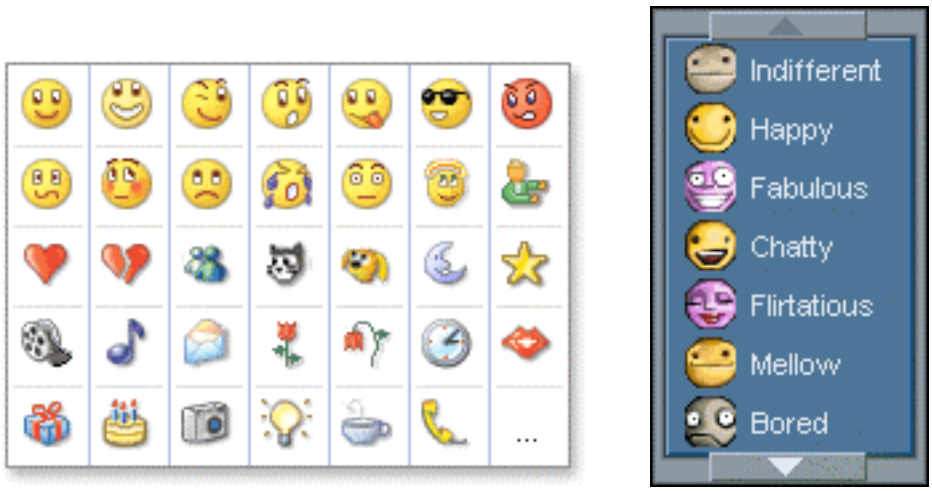

Figure 9.1 Advanced emoticons (MSN Messenger XP, left, and Odigo, right)

9.3.2 Definition of a common context in CMC

As already suggested in other chapters of this book, during the last fifty years the most famous communication model – the "*parcel-post model*" [54, 55], which describes communication as the passage of information from one person to another – became obsolete.

First, as noted by Anolli in the first chapter of this book, 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. 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-Farina [56] 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" (p.8). 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 [57].

Ghiglione's definition [58] 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" (p. 102), 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 [59]. 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 [60].

Stasser's definition of CMC may seem straightforward enough, but it has two important implications that have had a decisive effect on CMC studies [61]. 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, challenging and modifying the initial relationship between subject and context.

Most researchers would broadly agree that these two statements are true. According to Mantovani [16], 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" [16, p.63].

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 [62]. 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" (p.167).

This necessitates profound changes in how "*social context*" has previously been defined. In SAT, social context is not something physical and stable like an organization or the power structure within it. As Mantovani [16] 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 [16, 63] 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, 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" [16, p.106].

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 [64, 65], 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" [65, p.405].

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" [65, p.394].

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 & Van Langenhove [65] stated, "many mental phenomena like attitudes and emotions are immanently present in discourse production" (pp.394-395).

9.3.3 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” [66, p. 102]. 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, 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 [22].

What are the possible effects of this process? According to the *Social Identity Model of Deindividuation Effect* – SIDE theorists [41, 42], 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 [67].

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 [68].

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 [67].

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 [69, 70]. The way interaction with other subjects mediates meaning is fundamental to this shift from external language to interior dialogue.

As Davies and Harré [71] point out, during conversation subjects' selves “participate in an observable and subjectively coherent way in the joint production of story lines” (p. 48). In this phase, which uses interlocution in the manner described by Jacques [72], subjects see themselves as “*contradictors*” [71, p. 47] and use the positioning process to construct “a variety of selves” (p. 47) closely linked to the outcome of interaction.

This is very similar to the “*transactional contextualism*” developed by anthropologists and sociologists. For example, Rosaldo [73] 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. Hsu [74] 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 Gergen [75] and Bruner [76]. 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" (p.108).

Markus and Nurius' concept of possible selves [77] offers a theoretical 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" [77, p.960].

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" [77, p.955].

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.

As Meyrowitz [78] 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 [79]. 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.

9.4 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-Farina [80] 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 [81] "the most important mediator of behavior in Internet environments is the purpose of the people who visit or inhabit them" (p. 5). Particularly, their use depends on how they are interpreted, what projects are in them, and what we think about daily reality [16].

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 [60]. One of the consequences of this approach is that new processes and activities will develop out of this negotiation process, which challenge and change the initial relationship between subject and context [82].

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*.

9.4.1 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 9.5). How does it work?

Each user defines a list of people that he/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.

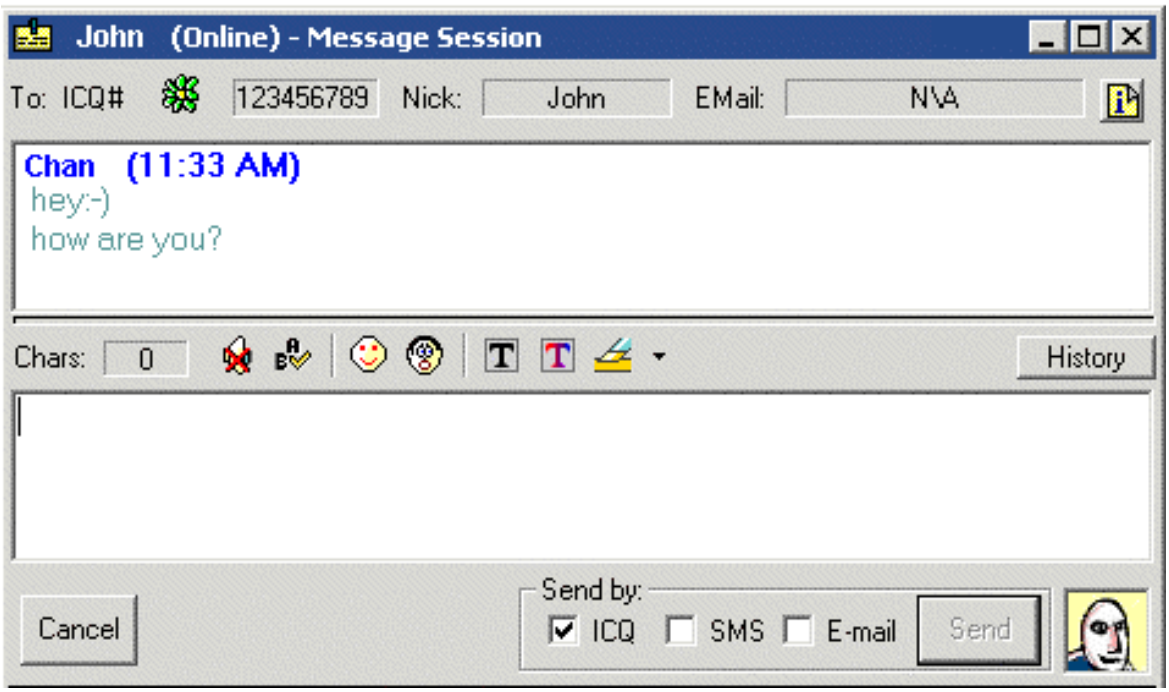

Figure 9.2 Instant Messaging interface (ICQ 2001)

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 instant-messaging 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 (ISDN, ADSL, Cable, etc.) 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.

A further step in this trend is the creation of *Video Instant Messaging:* Video IM 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.

Figure 9.3 Video IM Interface (Eyeball chat)

Table 9.5 IM clients

Tool	*Channels*	*Developer*	*Website*
AOL Instant Messaging	Text	AOL	http://www.aol.com/aim/homenew.adp
EyeBall	Text, Audio, Video	NovaWiz	http://www.eyeballchat.com
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/

9.4.2 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" [83, p. 662]. 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 Explorer 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 [84].

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 [85, 86]

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 9.6 for a list of available SHY). Using a simple interface, usually resembling a little remote control (see Figure 9.4), SHY users can get a constantly updated list of all the other online users who are visiting the same Web site [85].

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

Table 9.6 Shared hypermedia clients

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

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 9.7).

Figure 9.4 Shared Hypermedia interface (Odigo)

Table 9.7 Features of shared hypermedia (Adapted from Riva, 2001)

One-on-one or multi-user chat (text, audio and video)	Users can make calls to multiple people up to 100/1000 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.
Email (text and voice)	Users can send text and voice messages to users who are not online.
Web tour	Users can create their own Web Tour and escort other users through a list favorite web sites.
Search engine	Users can find other users with a specific sex, age and/or similar interests.
Transfer of files	Users can upload and download from other users documents and files.

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-mail, Instant Messaging, etc.) 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 [86].

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 [87, 88]. 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.

9.4.3 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 9.8 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: public diaries of web pages to recommend to other users (see Figure 9.5). 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.

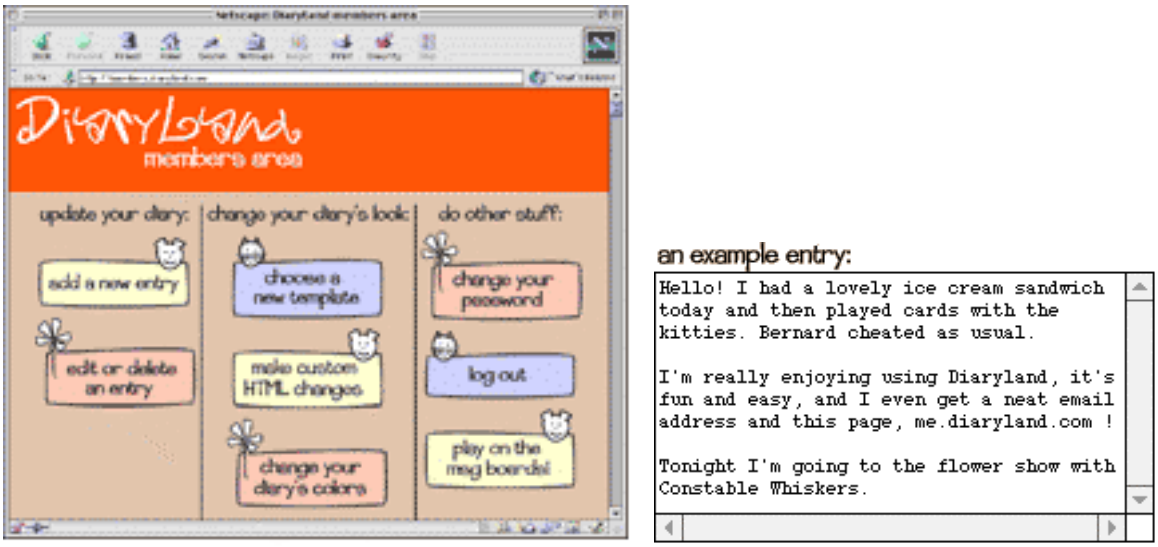

Figure 9.5 Weblog interface (Diaryland)

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 [89], 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".

Table 9.8 Weblog clients

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

9.4.4 Graphical chats

Graphical chats (see Table 9.9) are a different variant of classical text-based IRC. As we have 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.

In graphical chat clients, 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, etc. – and behaviors – jump, fight, kiss, etc. – that can be used to convey non verbal cues.

Table 9.9: Graphical chats

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

Figure 9.6: 2D Graphical Chat interface

However, as noted by Viegas and Donath [17] 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." (p. 10).

Churchill & Snowdon [90] recently identified a series of key issues a 3D chat developer has to face for supporting effectively the communication process (pp. 5-7):

- *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 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.

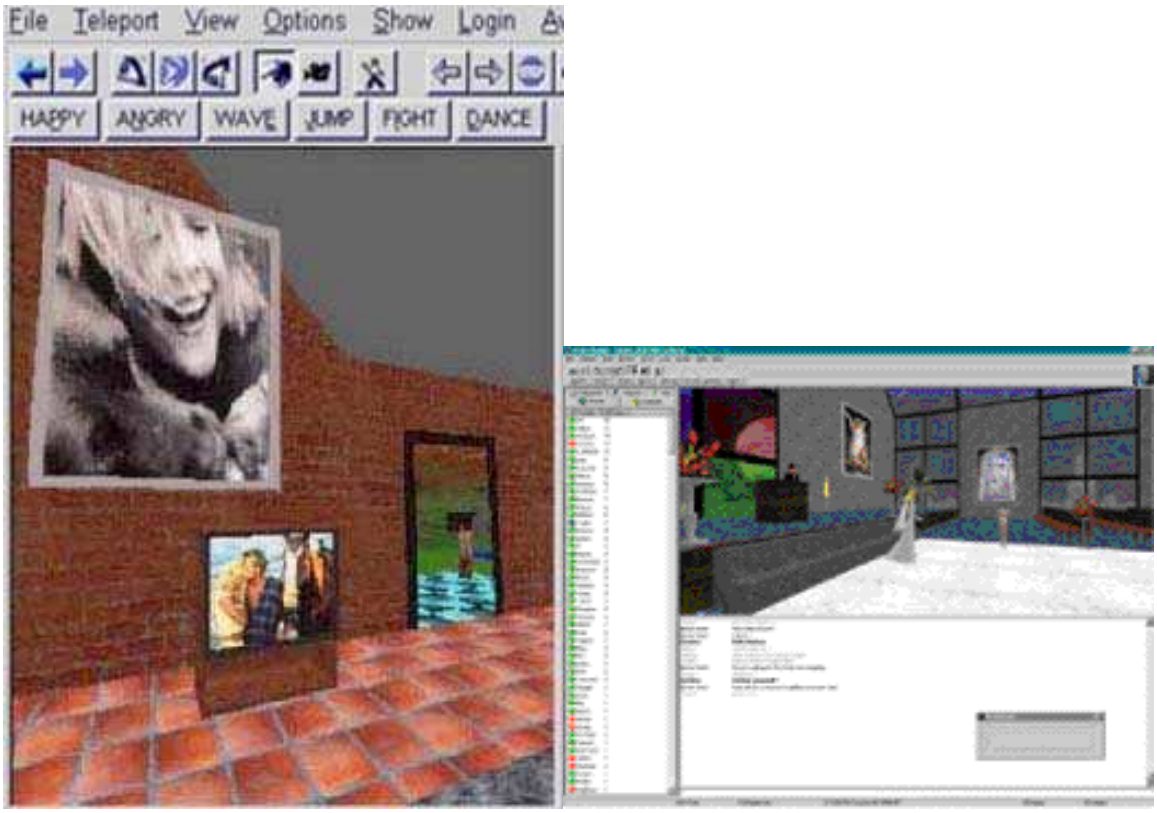

Figure 9.7: 3D Graphical Chat interface

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.

Generally, development of CVEs calls for conceptual mechanisms with which groups can be built and vehicles through which groups can express themselves [91]. To address this issue, 3D chat designers usually use some tricks. For instance, even if 3D chat fail to

convey eye contact, facial expressions and real body images of people, some of the effort in their design is focused to the development of tools for the creation of faces. This choice reflects the considerable societal attention on the face as medium for expression and information display. Particularly, facial expressions exceed verbal reports to enhance context comprehension. Many developers of graphical chats systems are also aware of the need to "create community" in the context of their efforts [91]. Even if many traditional means for creating community are not available, a great effort is given to the creation of virtual town squares or meeting rooms. According to Coate [92] the work of maintaining virtual communities is similar to the one of an innkeeper: facilitating interaction and keeping order among patrons. In fact, if graphical chats have to serve as community for their users, they have to embody, or replace with adequate substitutes, some functions of community life that parallel those commonly provided by "traditional" communities [93].

9.5 Conclusions

The emergence of information technology is changing the way people interact with computers [61]. Technological advances have gradually shifted the focus from computers that have become less of an end in themselves, and more of a means in terms of what people actually do with them. The most evident sign of this change has been the diffusion of the CMC.

The technological evolution of the media leads us to believe that CMC could become in the very near future, the predominant *medium*, or rather, it is possible that will become a general communication interface: an interface used for interpersonal relationship and for the creation and management of information. Its success is creating a new psycho-social space that is the fertile ground for social relationships, roles, and a new sense of self [6, 82]. As recently noted in a recent interview [94] by Sherry Turkle, a Massachusetts Institute of Technology researcher, the CMC and in particular Internet, "is the identity technology – much of what people do online, is self-explanation and presentation, from searching and e-mailing, to chatting or creating a home page" (p. 17).

"The Web is a safe place to try out different roles, voices and identities" confirms John Suler [94], psychologist and Web researcher for the Rider University. "It's a sort of like training wheels for the self you want to bring out in real life" (p. 17).

The result of these new selves is a new sense of presence that fills the space with a fluid form of network/community that is usually called *cyberspace* [6, 8, 61, 95]. Cyberspace is a universe made up of things that can be seen and heard, but they are neither physical objects nor necessarily a representation of physical objects. They are built of information coming partly from operations of the physical world, but largely from the accumulation and exchange of knowledge arising from human initiatives in the fields of culture, science and art. In this sense, a key goal for psychology and communication researcher is doing more thinking and theorizing about how to get people to make better connections between the cyberspace and the rest of their lives [96].

However, this is not an easy task. In fact, 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, and;
- the absence of metacommunicative features like facial expression, posture and tone of voice.

This is why CMC can be described as a form of *miscommunication*, i.e., a necessarily "pared-down" or, perhaps, more accurately, rarefied form of conversation [6, 7], which lacks the rules on which effective interaction depends.

According to the "cues-filtered-out" approach [35], CMC lacks the specifically relational features (social cues), which enable interactors to identify correctly the kind of interpersonal situations they find themselves in [33].

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 [34]. The chapter 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) presented by Anolli in the first chapter of this book: 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 [64, 65].
- *the Situated Action Theory* (SAT): action is not the execution of a ready-conceived plan, but the subject's adaptation to context [62].
- *the Social Identity Model of Deindividuation Effect* (SIDE): a social or a group identity replaces individual identity in CMC [41, 42].
- the *Social Information Processing* (SIP) perspective: users adapt existing communicative cues, within constraints of language and textual display, to support processes of relational management [27, 43, 44].

Starting from the above theories, the chapter 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 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 and what projects are in them.

Obviously, the issues raised in this chapter 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.

9.6 Acknowledgements

I would like to thank Fondazione "Piero, Pietro e Giovanni Ferrero" (Alba, Italy) for the support given to this study.

The present work was also supported by the Commission of the European Communities (CEC), in particular by the IST programme (Project VEPSY UPDATED, IST-2000-25323 - http://www.psicologia.net - http://www.vepsy.com).

Moreover, the author has benefited from discussions on topics relevant to this chapter with other colleagues. Their support and contributions are hard to overestimate. These people include Luigi Anolli, Carlo Galimberti and Fabrizia Mantovani.

9.7 References

[1] G. Riva and F. Davide, Communications through Virtual Technologies: Identity, Community and Technology in the Communication Age, in *Emerging Communication: Studies on New Technologies and Practices in Communication*, G. Riva and F. Davide, Eds. Amsterdam: Ios Press. Online: http://www.emergingcommunication.com/volume1.html, 2001.

[2] M. Lea, Rationalist assumptions in cross media comparisons of computer mediated communication, *Behavior and Information Technology* **10** (1991) 153-172.

[3] R. R. Rice, Media appropriateness - Using social presence theory to compare traditional and new organizationa media, *Human Communication Research* **19** (1993) 451-458.

[4] J. Short, E. Williams, and B. Christie, *The social psychology of telecommunications*. London: Wiley, 1976.

[5] R. L. Daft and R. H. Lengel, Organisational information requirements, media richness and structural design, *Management Science* **32** (1986) 554-571.

[6] G. Riva and C. Galimberti, Interbrain frame: interaction and cognition in computer-mediated communication, *CyberPsychology & Behavior* **1** (1998) 295-310.

[7] G. Riva and C. Galimberti, Towards CyberPsychology: Mind, Cognition and Society in the Internet Age, in *Emerging Communication: Studies on New Technologies and Practices in Communication*, G. Riva and F. Davide, Eds. Amsterdam: Ios Press. Online: http://www.emergingcommunication.com/volume2.html, 2001.

[8] G. Riva and C. Galimberti, Computer-mediated communication: identity and social interaction in an electronic environment, *Genetic, Social and General Psychology Monographs* **124** (1998) 434-464.

[9] C. Goodwin and J. Heritage, Conversation analysis, *Annual Review of Anthropology* **19** (1990) 283-307.

[10] C. Galimberti, *La conversazione [Conversation]*. Milan: Guerini e Associati, 1992.

[11] S. E. Brennan, Conversation with and through computers, *User modelling and user-adapted interaction* **1** (1991) 67-86.

[12] M. L. Patterson, *Nonverbal behavior: a functional perspective*. New York: Springer-Verlag, 1983.

[13] M. L. Patterson, Functions of non-verbal behavior in social interaction, in *Handbook of Language and Social Psychology*, H. Giles and W. P. Robinson, Eds. Chichester, UK: Wiley, 1990, pp. 249-270.

[14] L. Cherny, *Conversation and Community: Chat in a virtual world*. Stanford, CA: CSLI Publications, 1999.

[15] L. Cherny, The MUD register: Conversational modes of action in a text-based virtual reality, in *Linguistics Department*. Palo Alto, CA: Stanford University, 1995.

[16] G. Mantovani, *New communication environments: from everyday to virtual*. London: Taylor & Francis, 1996.

[17] F. B. Viegas and J. S. Donath, Chat Circles, presented at CHI 99 conference on Human factors in computing systems, Pittsburgh, PA, USA, 1999.

[18] E. A. Mabry, Textual framing as a communication climate factor in online groups, in *Perspectives on media and our understanding of the social world*, S. D. Reese and O. H. Gandy, Eds. Hillsdale, NJ: Lawrence Erlbaum Associates, 2001, pp. 323-336.

[19] P. Curtis, Comunicazione via MUD: i fenomeni sociali delle realta virtuali basate su testo. (Communication via MUD: Social phenomena of virtual reality based on text.), *Sistemi Intelligenti* **8** (1996) 229-253.
[20] P. Curtis, Mudding: Social phenomena in text-based virtual realities, in *Culture of the Internet*, K. Sara, Ed.: Lawrence Erlbaum Associates, 1997, pp. 121-142.
[21] M. R. Parks and K. Floyd, Making friends in Cyberspace, *Journal of Communication* **46** (1996) 80-97.
[22] G. Mantovani, Virtual reality as a communication environment: Consensual hallucination, fiction, and possible selves, *Human Relations* **48** (1995) 669-683.
[23] L. A. Marvin, Spoof, Spam, Lurk and Lag: the Aesthetics of Text-based Virtual Realities, *Journal of Computer-Mediated Communication* **1** (1995) on-line: http://www.ascusc.org/jcmc/vol1/issue2/marvin.html.
[24] J. B. Walther, J. F. Anderson, and D. W. Park, Interpersonal effects in computer-mediated interaction: A meta-analysis of social and antisocial communication, *Communication Research* **21** (1994) 460-487.
[25] J. Siegel, V. Dubrovsky, S. Kiesler, and T. W. McGuire, Group processes in computer-mediated communication, *Organizational Behaviour and Human Decision Processes* **37** (1986) 157-187.
[26] R. R. Rice, Computer-mediated communication system network data: Theoretical concerns and empirical examples, *International Journal of Man-Machine Studies* **32** (1990) 627-647.
[27] J. B. Walther, Interpersonal effects in computer mediated interaction: A relational perspective, *Communication Research* **19** (1992) 52-90.
[28] P. A. Thompsen and D. K. Ahn, To be or not to be: An exploration of E-prime, copula deletion and flaming in electronic mail, *ETC: A Review of General Semantics* **49** (1992) 146-164.
[29] M. L. McLaughlin, K. K. Osborne, and C. B. Smith, Standards of conduct on Usenet, in *Cybersociety*, S. Jones, Ed. Thousand Oaks, CA: Sage, 1995, pp. 90-111.
[30] J. S. Donath, Identity and deception in the virtual community, in *Communities in Cyberspace*, M. A. Smith and P. Kollock, Eds. London: Routledge, 1999, pp. 29-59.
[31] P. Brown and S. Levinson, Universals in language usage: Politeness phenomena, in *Questions and Politeness*, E. Goody, Ed. Cambridge: Cambridge University Press, 1978, pp. 256-310.
[32] E. A. Mabry, Framing Flames: The structure of argumentative messages on the net, *Journal of Computer-Mediated Communication* **2** (1997).
[33] L. Sproull and S. Kiesler, Reducing social context cues: Electronic mail in organizational communication, *Organizational Behavior and Human Decision Processes* **37** (1986) 157-187.
[34] L. Sproull and S. Kiesler, *Connections: New ways of working in the networked organizations*. Cambridge, MA: MIT Press, 1991.
[35] M. J. Culnan and M. L. Markus, Information technologies, in *Handbook of organizational communication: An interdisciplinary perspective*, F. M. Jablin, L. L. Putnam, K. H. Roberts, and L. W. Porter, Eds. Newbury Park, CA: Sage, 1987, pp. 420-443.
[36] D. Abrams and M. A. Hogg, *Social identity theory*. Hemel Hempstead: Harvester Wheatsheaf, 1990.
[37] M. A. Hogg and D. Abrams, *Social identifications: a social psychology of intergroup relations and group processes*. London: Routledge, 1988.
[38] R. Spears and M. Lea, Social influence and the influence of the "social" in computer-mediated communication, in *Contexts of computer-mediated communication*, L. Lea, Ed. Hemel Hempstead: Harvester Wheatsheaf, 1992, pp. 30-65.
[39] H. Tajfel and J. C. Turner, The social identity theory of intergroup behaviour, in *Psychology of intergroup relations*, S. Worchell and W. G. Austin, Eds. Chicago: Nelson-Hall, 1986, pp. 7-24.
[40] J. Turner, M. A. Hogg, P. J. Oakes, S. D. Reicher, and M. S. Wetherell, *Rediscovering the social group: A self categorization theory*. Oxford: Blackwell, 1987.
[41] T. Postmes, R. Spears, and M. Lea, Breaching or Building Social Boundaries? SIDE-Effects of Computer-Mediated Communication, *Communication Research* **25** (1998) 689-715.
[42] S. Reicher, R. M. Levine, and E. Gordijn, More on deindividuation, power relations between groups and the expression of social identity: Three studies on the effects of visibility to the in-group, *British Journal of Social Psychology* **37** (1998) 15-40.
[43] J. B. Walther and J. K. Burgoon, Relational communication in computer-mediated interaction, *Human Communication Research* **19** (1992) 50-88.
[44] J. B. Walther, Computer-mediated communication: Impersonal, interpersonal, and hyperpersonal interaction, *Communication Research* **23** (1996) 3-43.
[45] J. Sherbloom, Direction, function, and signature in electronic mail, *Journal of Business Communication* **25** (1988) 39-54.
[46] J. W. Chesebro and D. G. Bonsall, *Computer-mediated communication: Human relations in a computerized world*. Tuscaloosa, AL: University of Alabama Press, 1989.

[47] F. Mantovani, Networked seduction: A test-bed for the study of strategic communication on the Internet, *CyberPsychology and Behavior* **4** (2001) 147-154.
[48] S. Utz, Social information processing in MUDs: The development of friendships in virtual worlds, *Journal of Online Behavior* **1** (2000) online: http://www.behavior.net/JOB/v1n1/utz.html.
[49] J. B. Walther and P. D'Addario, The impacts of emoticons on message interpretation in computer-mediated communication, *Social Science Computer Review* **19** (2001) 324-347.
[50] A. Wolf, Emotional expression online: Gender differences in emoticon use, *CyberPsychology and Behavior* **3** (2000) 827-833.
[51] S. Utz, Der Aufbau von interpersonalen Beziehungen in MUDs: Die Rolle von Motiven und Kommunikationsstrategien [The formation of interpersonal relationships in MUDs. The role of motives and communication strategies], *Gruppendynamik* **32** (2001) 145-160.
[52] R. E. Turner, C. Edgley, and G. Olmstead, Information control in conversation: Honesty is not always the best policy, *Kansas Journal of Sociology* **11** (1975) 69-89.
[53] J. B. Walther and L. C. Tidwell, Nonverbal Cues in Computer-Mediated Communication, and the Effects of Chronemics on Relational Communication, *Journal of Organizational Computing* **5** (1995) 355-378.
[54] C. E. Shannon and W. Weaver, *The mathematical theory of communication*. Urbana: University of Illinois Press, 1949.
[55] D. G. Tatar, G. Foster, and D. G. Bobrow, Design for conversation: Lessons from Cognoter, *International Journal of Man-Machine Studies* **34** (1991) 185-209.
[56] S. Dohény-Farina, *Rhetoric, innovation, technology: case studies of technical communication in technology transfers*. Cambridge, MA: MIT Press, 1991.
[57] H. H. Clark and E. F. Schaefer, Contributing to discourse, *Cognitive Science* **13** (1989) 259-294.
[58] R. Ghiglione, *L'homme communiquant*. Paris: A. Colin, 1986.
[59] E. Rocco and M. Warglien, La comunicazione mediata da computer e l'emergere dell'opportunismo elettronico [The growth of electronic opportunism in computer-mediated communication], *Sistemi Intelligenti* **7** (1995) 393-420.
[60] G. Stasser, Pooling of unshared information during group discussion, in *Group processes and productivity*, S. Worchell, W. Wood, and J. A. Simpson, Eds. Newbury Park, CA: Sage, 1992, pp. 48-67.
[61] G. Riva and C. Galimberti, The psychology of cyberspace: a socio-cognitive framework to computer mediated communication, *New Ideas in Psychology* **15** (1997) 141-158.
[62] L. Suchman, *Plans and situated action*. Cambridge, UK: Cambridge University Press, 1987.
[63] G. Mantovani, Social context in HCI: A new framework for mental models, cooperation and communication, *Cognitive Science* **20** (1996) 237-296.
[64] R. Harré, Language and science of psychology, *Journal for the Theory of Social Behaviour and Personality* **4** (1989) 165-188.
[65] R. Harré and L. Van Langenhove, Varieties of positioning, *Journal for the Theory of Social Behaviour* **21** (1991) 393-408.
[66] A. R. Stone, Will the real body please stand up? Boundary stories about virtual cultures, in *Cyberspace: First steps*, M. Benedikt, Ed. Cambridge, MA: MIT Press, 1991.
[67] T. Postmes, R. Spears, K. Sakhel, and D. de Groot, Social influence in computer-mediated communication: The effects of anonymity on group behavior, *Personality & Social Psychology Bulletin* **27** (2001) 1243-1254.
[68] K. M. Douglas and C. McGarthy, Identifiability and self-presentation: Computer-mediated communication and intergroup interaction, *British Journal of Social Psychology* **40** (2001) 399-416.
[69] C. Fernyhough, The dialogic mind: A dialogic approach to the higher mental functions, *New Ideas in Psychology* **14** (1996) 47-62.
[70] A. Saito, Social origins of cognition: Bartlett, evolutionary perspective and embodied mind approach, *Journal of the Theory of Social Behaviour* **26** (1996) 399-422.
[71] B. Davies and R. Harré, Positioning: the discursive production of selves, *Journal for the Theory of Social Behaviour* **20** (1990) 43-63.
[72] F. Jacques, *L'espace logique de l'interlocution*. Paris: PUF, 1985.
[73] M. Rosaldo, Toward an anthropology of self and feeling, in *Culture theory: Essays on the mind, self and emotion*, R. A. Shweder and R. A. LeVine, Eds. Cambridge, UK: Cambridge University Press, 1984, pp. 124-136.
[74] F. Hsu, The self in cross-cultural perspective, in *Culture and self*, A. Manella, G. DeVos, and F. Hsu, Eds. New York: Tavistock, 1985.
[75] K. J. Gergen, *Toward transformation in social knowledge*. New York: Springer, 1982.
[76] J. Bruner, *Acts of meaning*. Jerusalem:: Harvard University Press, 1993.
[77] H. Markus and P. Nurius, Possible selves, *American Psychologist* **41** (1986) 954-969.

[78] J. Meyrowitz, *No sense of place: The impact of electronic media on social behavior*. New York: Oxford University Press, 1985.
[79] R. Kraut, M. Patterson, V. Lundmark, S. Kiesler, T. Mukopadhyay, and W. Scherlis, Internet paradox: A social technology that reduces social involvement and psychological well-being?, *American Psychologist* **53** (1998) 1017-1031.
[80] S. Dohény-Farina, *The wired neighborhood*. New Haven: Yale University Press, 1996.
[81] P. Wallace, *The psychology of the Internet*. New York: Cambridge University Press, 1999.
[82] G. Riva, The mind in the Web: Psychology in the Internet age, *CyberPsychology and Behavior* **4** (2001) 1-6.
[83] P.-A. Federico, Hypermedia environments and adaptive instructions, *Computers in Human Behavior* **15** (1999) 653-692.
[84] Encarta, *World English Dictionary*. Seattle, WA: Microsoft Press, 1999.
[85] G. Riva, Shared Hypermedia: Communication and interaction in Web-based learning environments, *Journal of Educational Computing Research* **25** (2001) 205-226.
[86] G. Riva, From real to virtual communities: Cognition, knowledge and intention in the World Wide Web, in *Learning and teaching on the World Wide Web*, C. R. Wolfe, Ed. San Diego, CA: Academic Press, 2001, pp. 131-151.
[87] J. Lave and E. Wenger, *Situated Learning: Legitimate Peripheral Participation*. Cambridge, MA: Cambridge University Press, 1991.
[88] H. McLellan, *Situated Learning Perspectives*. Englewood Cliffs, NJ: Educational Technology Publications, 1995.
[89] Blogger.com, What is a weblog/blog?, vol. 2001: Pyra Labs., 2001.
[90] E. F. Churchill and D. Snowdon, Collaborative virtual environments: an introductory review of issues and systems, *Virtual Reality* **3** (1998) 3-15.
[91] J. A. Oravec, *Virtual individuals, virtual groups: Human dimension of Groupware and Computer Networking*. Cambridge, UK: Cambridge University Press, 1996.
[92] J. Coate, *Innkeeping in Cyberspace. Proceedings of Directions and Implications of Advanced Computing*. Palo Alto, CA: Computer Professional for Social Responsibility, 1992.
[93] G. Riva and G. Mantovani, The need for a socio-cultural perspective in the implementation of virtual environments, *Virtual Reality* (2000) 32-38.
[94] B. Murray, A mirror on the self, *Monitor on Psychology* **31** (2000) 16-19.
[95] S. Kiesler, Culture of the Internet. Mahwah, NJ, US: Lawrence Erlbaum Associates, Inc., Publishers, 1997, pp. xvi, 463.
[96] S. Turkle, Parallel lives: Working on identity in virtual space, in *Constructing the self in a mediated world. Inquiries in social construction*, T. R. L. Debra Grodin, Ed.: Sage Publications, Inc, Thousand Oaks, CA, US, 1996, pp. 156-175.

Volume 1: **Communications Through Virtual Technologies: Identity, Community and Technology in the Communication Age**
Editors: G. Riva and F. Davide
ISBN: 1 58603 162 7

Price: US$90/EUR95/£60 Order: ☐ Copies: ……..

Volume 2: **CyberPsychology: Mind, Cognition and Society in the Internet Age**
Editors: G. Riva and C. Galimberti
ISBN: 1 58603 197 X

Price: US$95/EUR95/£60 Order: ☐ Copies: ……..

Volume 3: **Say not to Say: New perspectives on miscommunication**
Editors: L. Anolli , R. Ciceri and G. Riva
ISBN: 1 58603 215 1

Price: US$95/EUR95/£60 Order: ☐ Copies: ……..

TOTAL AMOUNT:……..

EURO prices are definitive. In the USA and Canada the US$ prices are definitive. Customers in EU countries please mention your V.A.T. number (MwST, TVA, BTW,) to receive an invoice without V.A.T. charge. Otherwise we will have to charge 6% V.A.T. For prepaid book orders we do not charge any postage or handling.

Name:…….
Organization: ……..
Department: ……
Address: ……*ZIP/Postal Code*:……..……
City: …… *Country*: ……..
E-mail:…… *V.A.T. No*:……

Please bill me (postage and handling charges will be added): ☐

Charge my credit card: *American Express*: ☐ *Euro/Mastercard*: ☐ *Visa*: ☐
Card No.:……*Expiration date*:……..

Send the order form to one of the addresses below (by fax, traditional mail or e-mail)

IOS Press Nieuwe Hemweg 6B 1013 BG Amsterdam The Netherlands Tel: +31 20 688 3355 - Fax: +31 20 620 3419 market@iospress.nl	IOS Press, Inc. 5795-G Burke Centre Parkway Burke, VA 22015 U.S.A. Fax: +1 703 323 3668 iosbooks@iospress.com