31 Computer-mediated Discourse

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0 Introduction

0.1 Definition

Computer-mediated discourse is the communication produced when human beings interact with one another by transmitting messages via networked computers. The study of computer-mediated discourse (henceforth CMD) is a specialization within the broader interdisciplinary study of computer-mediated communication (CMC), distinguished by its focus on *language and language use* in computer networked environments, and by its use of methods of *discourse analysis* to address that focus.

Most CMC currently in use is *text-based*, that is, messages are typed on a computer keyboard and read as text on a computer screen, typically by a person or persons at a different location from the message sender. Text-based CMC takes a variety of forms (e.g. e-mail, discussion groups, real-time chat, virtual reality role-playing games) whose linguistic properties vary depending on the kind of messaging system used and the social and cultural context embedding particular instances of use. However, all such forms have in common that the activity that takes place through them is constituted primarily – in many cases, exclusively – by visually presented language. These characteristics of the medium have important consequences for understanding the nature of computer-mediated language. They also provide a unique environment, free from competing influences from other channels of communication and from physical context, in which to study verbal interaction and the relationship between discourse and social practice.[1]

0.2 A brief history of CMD research

Human-to-human communication via computer networks, or *interactive networking*, is a recent phenomenon. Originally designed in the United States in the late 1960s to facilitate the transfer of computer programs and data between remote computers in

the interests of national defense (Levy 1984; Rheingold 1993), computer networks caught on almost immediately as a means of interpersonal communication, first among computer scientists in the early 1970s (Hafner and Lyon 1996), then among academic and business users in elite universities and organizations in the 1980s, and from there into popular use – facilitated by the rise of commercial Internet service providers – in the 1990s. The first wide-area network, the US defense department sponsored ARPANET, was replaced in the early 1980s by the global network Internet, which as of January 1999 comprised more than 58,000 networks supporting an estimated 150 million users (Petrazzini and Kibati 1999).

The study of computer-mediated discourse developed alongside of interactive networking itself, as scholars became exposed to and intrigued by communication in the new medium. As early as 1984, linguist Naomi Baron published an article speculating on the effects of "computer-mediated communication as a force in language change." The first detailed descriptions of computer-mediated discourse soon followed, with Denise Murray's (1985) research on a real-time messaging system at IBM, and Kerstin Severinson Eklundh's (1986) study of the Swedish COM conferencing system. However, it was not until 1991, with the publication of Kathleen Ferrara, Hans Brunner, and Greg Whittemore's "Interactive written discourse as an emergent register," that linguists and language scholars began to take serious notice of CMD. The immediately following years saw the rise of a wave of CMD researchers,[2] working independently on what has since emerged as a more or less coherent agenda: the empirical description of computer-mediated language and varieties of computer-mediated discourse.[3] Since the mid-1990s, CMD research has continued to expand at a rapid rate, staking out new areas of inquiry and resulting in an ever-growing list of published resources.

In part, the first wave of CMD scholarship was a reaction against misunderstandings about CMD that had gone before. Popular claims – some endorsed by published research – held that computer-mediated communication was "anonymous," "impersonal," "egalitarian," "fragmented," and "spoken-like," attributing these properties to the nature of the medium itself, and failing to distinguish among different types and uses of CMD. Ferrara et al. (1991), although contributing useful observations on one form of real-time experimental CMD, also overgeneralized, characterizing what they termed "interactive written discourse" as a single genre. In fact, subsequent research has revealed computer-mediated language and interaction to be sensitive to a variety of technical and situational factors, making it far more complex and variable than envisioned by early descriptions.

The remainder of this chapter is organized into four broad sections, each of them representing a currently active area of CMD research. Section 1, on the "classification of CMD," addresses the nature of CMD in relation to written and spoken language, and identifies some technologically and culturally determined CMC types. Section 2 describes the structural properties of CMD at the levels of typography, orthography, word choice, and grammar. Section 3 considers how participants in CMD negotiate turn-taking and maintain cross-turn coherence, despite constraints on interaction management imposed by CMC systems. Section 4, entitled "social practice," discusses CMD in the service of social goals ranging from self-presentation to interpersonal interaction to the dominance of some groups by others. The chapter concludes by considering the prospects for CMD research in the future.

1 Classification of CMD

1.1 Medium and channel

Computer networks are often considered a *medium* of communication distinct from writing and speaking. Thus CMD researchers speak of electronic "medium effects" on CMD, rather than treating CMD as a form of "writing" (typing) that happens to be distributed by electronic means (see, e.g., Murray 1988). The justification for this is that while the means of production of CMD is similar to that of other forms of typing, including allowing for the editing and formatting of text in asynchronous modes, other aspects of computer-mediated communication preclude easy classification with either writing or speaking. CMD exchanges are typically faster than written exchanges (e.g. of letters, or published essays which respond to one another), yet still significantly slower than spoken exchanges, since even in so-called "real-time" modes, typing is slower than speaking. Moreover, CMD allows multiple participants to communicate simultaneously in ways that are difficult if not impossible to achieve in other media, due to cognitive limits on participants' ability to attend to more than one exchange at a time (Herring 1999a). In addition, the dissemination of computer-mediated messages involves distribution to an unseen (and often unknown) audience, while at the same time creating an impression of direct and even "private" exchanges (King 1996). For these and other reasons, participants typically experience CMD as distinct from either writing or speaking, sometimes as a blend of the two, but in any event subject to its own constraints and potentialities.

Media may differ in the number of *channels*, or sources of communication, they comprise. Face-to-face communication is a "rich" medium, in that information is available through multiple channels: visual, auditory, gestural, etc. In contrast, CMD is a "lean" medium (Daft and Lengel 1984), in that information is available only through the visual channel, and that information is limited to typed text. This has led some to posit that the computer medium is "impoverished" and unsuitable for social interaction (Baron 1984). However, there is ample evidence that users compensate textually for missing auditory and gestural cues, and that CMD can be richly expressive. This is perhaps nowhere better illustrated than by the popularity of "virtual sex" (Deuel 1996; McRae 1996) – sex being an activity that normally requires *more* channels of communication than face-to-face speech (e.g. touch) – in which acts of physical intimacy are textually enacted.

1.2 Medium variables

While the case for the deterministic influence of the computer medium on language use is often overstated, properties of computer messaging systems nonetheless play a significant role in shaping CMD. One important distinction relates to *synchronicity* of participation (Kiesler et al. 1984). Asynchronous CMD systems do not require that users be logged on at the same time in order to send and receive message; rather, messages are stored at the addressee's site until they can be read. E(lectronic)-mail is

Table 31.1 Classification of some common CMD modes according to medium variables

	One-way transmission	*Two-way transmission*
Synchronous	Chat (IRC, webchat, etc.); MUDs and MOOs	UNIX "talk"; VAX "phone"; ICQ
Asynchronous	E-mail; e-mail-based systems (listserv discussion lists, Usenet newsgroups, etc.)	–

an example of this type. In synchronous CMD, in contrast, sender and addressee(s) must be logged on simultaneously, and messages are more ephemeral, scrolling up and off participants' computer screens as new messages replace them. "Real-time" chat – such as takes place in the chatrooms of commercial service providers and via Internet Relay Chat (IRC) – is a popular form of synchronous CMD.

A cross-cutting technological dimension has to do with whether or not simultaneous feedback is available; that is, whether the message transmission is *one-way* or *two-way* (Cherny 1999). In *one-way* transmission, a message is transmitted in its entirety as a single unit, with the result that recipients do not know that a message is being addressed to them until it arrives, thereby precluding the possibility of simultaneous feedback. Most CMD in current use makes use of one-way transmission. In contrast, oral modes of communication (such as face-to-face and telephone conversations) are *two-way*, with speaker and addressee both able to hear the message as it is produced. There are also two-way CMD systems, in which participants' screens split into two or more sections, and the words of each participant appear keystroke by keystroke in their respective sections as they are typed. An example of two-way synchronous CMD on the Internet is the currently-popular ICQ ("I seek you") protocol.[4]

Some common modes of CMD are classified according to synchronicity and transmission type in table 31.1.

Other physical properties of messaging systems that shape language use include limits on message size (what Cherny 1999 calls message "granularity"), the "persistence" of the text (whether, and for how long, previous messages remain accessible to participants; Condon and Čech forthcoming), what categories of communication commands a system makes available (Cherny 1995), the ease with which a system allows users to incorporate portions of previous messages in their responses (Severinson Eklundh and Macdonald 1994; Severinson Eklundh forthcoming), whether a system allows messages to be sent anonymously (Selfe and Meyer 1991), and whether it allows users to filter out or "ignore" messages from others selectively (Lunsford 1996; Reid 1994). Finally, the availability of channels of communication in addition to text, such as audio, video, or graphics, can have consequences for language use (Yates and Graddol 1996).

1.3 CMD modes

Another useful classification is in terms of emic (culturally recognized) categories of computer-mediated communication, or CMD mode. Popular modes such as private e-mail, listserv mailing lists, Usenet newsgroups, IRC, and MUDs are socially as well as technologically defined, each having its own unique history and culture of use.[5] For example, listserv mailing lists and Usenet newsgroups are both asynchronous, multiparticipant discussion groups to which messages are contributed ("posted") via e-mail. Yet there are recognizably distinct listserv and Usenet "cultures," the former tending to attract more academic professionals, and the latter, younger (predominantly male) users engaged in contentious exchanges of opinion.[6] The greater degree of contentiousness on Usenet (including a high incidence of "flaming," or targeting an addressee with overtly hostile message content; Kim and Raja 1991) is due in part to the fact that social accountability in the Usenet system is low – whereas listserv participants must subscribe to mailing lists, providing their name and e-mail address in the process, Usenet messages are publicly posted for anyone with access to a newsreader to read. It also reflects the history of Usenet, which was invented by young male "hackers" in the late 1970s as an alternative to the "elitist," government-funded ARPANET (Rheingold 1993), and which has continued to define itself in terms of "frontier" values (Pfaffenberger 1996).

Real-time chat modes also differ from one another culturally. Although IRC and chat in a social MUD are both types of synchronous, one-way CMD, and make use of similar commands (the ability, for example, to distinguish between an utterance and an action, and the ability to message someone privately), the nature of the conversations and the conventions associated with each are different. As Cherny (forthcoming: 12–13) notes,

> [a]lthough many abbreviations are common [to IRC and ElseMOO, the social MUD I studied], certain outsider forms are sneered at: e.g. "u" for "you", "r" for "are." When I asked ElseMOO regulars, "What part of the Internet do you think abbreviations like 'r u going 2 c the movie' are from?", two replied "the icky part" and "the part I avoid like the plague." One thought perhaps IRC users sometimes use those forms but admitted to an anti-IRC bias. When one new visitor came to ElseMOO (apparently used to IRC) and said, "this is just like IRC <g> . . . with fun things to do," Bonny, a regular, responded, "except we don't say <g> here."[7]

The fact that MUDding requires some computer programming skills to do well may account for the perception of Cherny's informants that their MUD culture is more sophisticated than that of IRC.

With these distinctions as background, we now move to consider some properties of computer-mediated discourse.

2 Linguistic Structure

It is a popular perception that computer-mediated language is less correct, complex, and coherent than standard written language. Thus a writer for *Wired* magazine

describes messages posted to the Internet as "a whole new fractured language – definitely not as elegant or polished as English used to be."[8] Similarly, Baron (1984: 131) predicted that participants in computer conferences would use "fewer subordinate clauses" and "a narrower range of vocabulary" – and that as a result of computer communication over time, the expressive functions of language could be diminished.

Actually, although computer-mediated language often contains nonstandard features,[9] only a relatively small percentage of such features appears to be errors caused by inattention or lack of knowledge of the standard language forms (see, e.g. Herring 1998a). The majority are deliberate choices made by users to economize on typing effort, mimic spoken language features, or express themselves creatively (Cho forthcoming; Livia forthcoming). Economy of effort seems to be the motivating force behind Murray's (1990: 43–4) observation that computer science professionals using synchronous CMD in a workplace environment "delete subject pronouns, determiners, and auxiliaries; use abbreviations; do not correct typos; and do not used mixed case", as illustrated in the following exchange between Les and Brian:

(1) *Les1*: as it stands now, meeting on weds?
Les2: instead of tues
Brian1: idiot Hess seemed to think you were there tues morning
Brian2: thot that mtg from 9 to 10 would solve
Brian3: if you not in ny I'm going to have mtg changed to wedne.

Another deliberate practice that results in unconventional orthography is the textual representation of auditory information such as prosody, laughter, and other non-language sounds, as illustrated in the following message posted to Usenet (from MacKinnon 1995):

(2) Al,
hahahahahahahhahahahahahahahahahahahahaa
sniff waaaaaaaaaaaaaaaaaaaaaaaaahhhhhh
I laughed, i cried. . . . that post was GREAT! :-)
Amusedly,
-Mirth-

Strategies such as these, rather than reflecting impoverished or simplified communication, demonstrate the ability of users to adapt the computer medium to their expressive needs. Significantly, this results in a linguistic variety that, despite being produced by written-like means, frequently contains features of orality.

One medium variable, however, does exercise a powerful influence over structural complexity: synchronicity. Just as the structure of unplanned speech reflects cognitive constraints on real-time language encoding, for example in length of information units, lexical density, and degree of syntactic integration (Chafe 1982), so too synchronous modes of CMD impose temporal constraints on users that result in a reduction of linguistic complexity relative to asynchronous modes. Thus in a study of InterChange, a type of synchronous CMD used in educational settings, Ko (1996) found fewer complements, more stranded prepositions, and shorter words than in a comparably sized corpus of formal writing. Moreover, for features involving "information focus

and elaborateness" (e.g. lexical density, ratio of nouns to verbs, and use of attributive adjectives), the InterChange messages had lower average frequencies than *either* writing or speaking. Ko attributes this finding to the heavy production and processing burden placed on users by the InterChange system – not only must they type, which is slower and requires more conscious attention than talking, but they must type quickly, leaving little time for message planning.

In contrast, asynchronous CMD permits users to take their time in constructing and editing messages. Variation in structural complexity in e-mail messages, therefore, must be understood as reflecting social situational factors which determine what level of formality – and with it, standardness and structural complexity – is appropriate to the context. For example, staff in an Australian university exchange private e-mail filled with informal, spoken language features: contractions, abbreviations, use of lower case in place of upper case, omission of punctuation, and omission of grammatical function words (Cho forthcoming). Yet the same e-mail technology, when used by computer scientists interacting professionally in a public discussion group on the ARPANET, produced highly standard messages containing features of syntactic complexity such as nominalizations, subordinate and complement clauses, use of the passive voice, and heavy noun phrases (Herring 1998a). Still, the ARPANET case notwithstanding, e-mail tends not to be as formal as other edited forms of writing. This is due in part to the less formal purposes e-mail is typically used to fulfill, and in part to the relative openness of e-mail as a new communication mode that has not yet been colonized by rigid prescriptive norms.[10]

3 Interaction Management

Along with claims of structural fragmentation, text-only CMD is sometimes claimed to be interactionally incoherent, due to limitations imposed by computer messaging systems on turn-taking. In contrast with the spoken conversation ideal of "no gap, no overlap" (Sacks et al. 1974), computer-mediated exchanges involve unpredictable and sometimes lengthy gaps between messages, and exchanges regularly overlap, although strictly speaking, individual transmissions cannot (Cherny 1999; Lunsford 1996; Murray 1989).[11] Two properties of the computer medium create obstacles to interaction management: (1) disrupted turn *adjacency* caused by the fact that messages are posted in the order received by the system, without regard for what they are responding to, and (2) lack of simultaneous *feedback* caused by reduced audiovisual cues (Herring 1999a).

The first property lends to many computer-mediated exchanges an initial aura of fragmentation. Consider the phenomenon of overlapping exchanges, as illustrated by the following excerpt of interaction from the Internet Relay Chat channel #punjab (from Paolillo forthcoming). Note that the IRC system automatically appends the user's name (in this case, the pseudonymous nickname selected by the user herself or himself) at the beginning of each message. Messages preceded by asterisks (***) are also generated automatically by the system, and indicate that a user has joined or left the channel. (Numbers in square brackets were added by the author for ease of reference.)

(3) [1] <ashna> hi jatt
[2] *** Signoff: puja (EOF From client)
[3] <Dave-G> kally i was only joking around
[4] <Jatt> ashna: hello?
[5] <kally> dave-g it was funny
[6] <ashna> how are u jatt
[7] <LUCKMAN> ssa all[12]
[8] <Dave-G> kally you da woman!
[9] <Jatt> ashna: do we know eachother?. I'm ok how are you
[10] *** LUCKMAN has left channel #PUNJAB
[11] *** LUCKMAN has joined channel #punjab
[12] <kally> dave-g good stuff:)
[13] <Jatt> kally: so hows school life, life in geneal, love life, family life?
[14] <ashna> jatt no we don't know each other, i fine
[15] <Jatt> ashna: where r ya from?

Two different dyadic interactions are interleaved in this stretch of discourse, one between ashna and jatt, and the other between Dave-G and kally. To complicate matters further, in l. 13, jatt addresses kally. However, despite the fact that almost every initiation–response pair is disrupted by intervening material, it is possible to track the intended recipient of each message because in each case, the message sender explicitly names the addressee. This practice, termed *addressivity* by Werry (1996), makes it possible to separate out the two dyadic interactions as follows:

(3′) [1] <ashna> hi jatt
[4] <Jatt> ashna: hello?
[6] <ashna> how are u jatt
[9] <Jatt> ashna: do we know eachother?. I'm ok how are you
[14] <ashan> jatt no we don't know each other, i fine
[15] <Jatt> ashna: where r ya from?

(3″) [3] <Dave-G> kally i was only joking around
[5] <kally> dave-g it was funny
[8] <Dave-G> kally you da woman!
[12] <kally> dave-g good stuff:)

Addressivity is one means by which users adapt to constraints on turn-taking in multiparticipant synchronous CMD.

A similar referential tracking problem, and an analogous adaptation, occur in asynchronous CMD such as takes place in discussion groups on the Internet. *Linking* is the practice of referring explicitly to the content of a previous message in one's response (Baym 1996; Herring 1996b), as for example when a message begins, "I would like to respond to Diana's comment about land mines." *Quoting*, or copying portions of a previous message in one's response (Severinson Eklundh and Macdonald 1994; Severinson Eklundh forthcoming), may also function as a type of linking, as in the following example from a soap opera fan newsgroup (example from Baym 1996: 326). In this example, the name and e-mail address of the person quoted are given in a

system-generated "pointer" line that precedes the quote, and each line of quoted text is set off with an angle bracket (>). The writer's comments follow the quote:[13]

(4) janed@ABC.bigtel.com (Jane Doe) writes:
>I can't believe how horrible Natalie looks. Has she put on a lot of weight?

I agree, but she has always had a somewhat round face, so if she did put on weight, I think that would be accentuated.

Quoting creates the illusion of adjacency in that it incorporates and juxtaposes (portions of) two turns – an initiation and a response – within a single message. When portions of previous text are repeatedly quoted and responded to, the resulting message can have the appearance of an extended conversational exchange (Hodsdon forthcoming; Severinson Eklundh forthcoming).

The analysis of turn-taking in asynchronous CMD is additionally complicated by the fact that a single message may contain two or more conversational moves which are physically, but not functionally, adjacent (Baym 1996; Condon and Čech forthcoming). This creates problems for equating "messages" with "turns," since some e-mail messages effectively convey what would have been communicated through multiple turns in synchronous interaction.[14] Conversely, a synchronous message may contain less than a turn, as when for example a sender has more to say than fits in a single message (which in some chat systems is limited to about 100 characters), and continues his or her turn in an immediately following message (Lunsford 1996; Murray 1989). However, as soon as a message is sent, the possibility exists for a message from another participant to follow, effectively "interrupting" the first person's turn. In order to retain the floor through an extended turn, therefore, some synchronous CMD users have innovated floor-holding conventions, for example appending a special character at what might otherwise appear to be a turn-completion point to indicate that the turn is not yet finished (Herring 1999a). Alternatively, an empowered participant may allocate turns to other participants by calling on them by name, perhaps after they have put in a bid for the next turn by "raising their hand" (e.g. typing "[Character name] raises his hand"; Cherny 1999: 181). These adaptive strategies compensate for a lack of simultaneous feedback in one-way computer communication systems by providing explicit mechanisms for speaker change.

4 Social Practice

Many early researchers believed that computer-networked communication was a "cool" medium well suited to the transfer of data and information, but poorly suited to social uses (Baron 1984; Kiesler et al. 1984). Others saw in CMC a utopian, egalitarian potential – with social status cues "filtered out," anyone could participate freely in open, democratic exchanges (Landow 1994; Poster 1990). The social life that teems on the Internet in the late 1990s bears out neither of these idealized visions, but it does provide a rich source of data for the study of discourse and social practice.

4.1 Socially conditioned variation

Language use is highly variable in computer-mediated environments, even within a single mode. This variation reflects the influence on the linguistic choices of CMD users of social factors such as participant demographics and situational context.

That participant demographics make a difference in an "anonymous" (faceless, bodiless) medium such as the Internet is interesting in and of itself. It also raises problems for traditional variationist methods which assume that reliable information about participant gender, age, social class, race, geographical location, etc., is available to the researcher (e.g. Labov 1966). The dispersed nature of Internet groups renders the *geographic location* of users difficult to determine, and less relevant than in studies of face-to-face communication, since physical proximity is not a condition for shared membership in a computer-mediated speech community. *Social class*, *race*, and *ethnicity* have also tended to be relatively invisible on the Internet, although this may reflect the fact that until recently, most people participating in public group CMD have been highly educated, middle- to upper-middle-class, white speakers of English (Nakamura 1995; Reid 1991).[15] Even in racially polarizing debates, the racial identity of participants may only be inferable from the content of their messages, not from their language use (Hodsdon forthcoming). The exception to this generalization is intra-group CMD – especially when race/ethnicity is the theme that defines the group, as in the soc.culture newsgroups on Usenet – which makes use of discursive markers of racial and ethnic identity, including culture-specific lexis and verbal genres, and code-switching between English and the group's ethnic language (Burkhalter 1999; Georgakopoulou forthcoming; Jacobs-Huey forthcoming; Paolillo 1996, forthcoming). Provided that participants' names or language competencies do not identify them, signaling race or ethnicity on-line appears to be an option at the participants' discretion (Burkhalter 1999).

In contrast, other features of "real-life" identity are relatively apparent, even when the participants themselves do not orient toward them consciously, and may actively seek to mask them (cf. Danet 1998). Information about participants' *educational level* is given off largely unconsciously by their sophistication of language use, including adherence to prescriptive norms (e.g. Herring 1998a); similarly, *age* is often revealed through the preoccupations and life experiences communicated in message content (Herring 1998c). Most apparent of all is participant *gender*, which is indicated by participants' names in asynchronous discussion groups, and is often a focus of conscious attention even in pseudonymous synchronous CMD. Participants in chat rooms request and provide information about their real-life genders, and many choose gender-revealing nicknames, e.g. Cover_Girl, sexychica, shy_boy, and GTBastard. On a less conscious level, participants "give off" gender information through adherence to culturally prescribed gendered interactional norms,[16] sometimes interacting in ways that exaggerate the binary opposition between femaleness and maleness, for example by engaging in stereotyped behaviors such as supportiveness and coyness for females, and ritual insults and sexual pursuit of females for males (Hall 1996; Herring 1998c; cf. Rodino 1997).

Traditional gender stereotypes can be reified even when people believe they are freely choosing their on-line gender identity in nontraditional ways, as illustrated in the comment of one social MUD participant:

(5) Gilmore says, "And in a V[irtual]R[eality], people can become someone else. I can be a 6'5" steroid stud, or someone can be a sexy hot babe and do things they'd never hve the guts to do IRL['in real life']."

In his attempt to imagine new, liberatory gender identities, this MUDder instead evokes a traditional male gender fantasy: the "steroid stud" and the "sexy hot babe." The author further cues his gender by his choice of a male character name and use of a first person pronoun in reference to "steroid stud." Other linguistic behaviors for which (presumably unconscious) gender differences have been observed in CMD include message length, assertiveness (Herring 1993), politeness (Herring 1994, 1996a), and aggression (Cherny 1994; Collins-Jarvis 1997), including "flaming" (Herring 1994).[17]

Variation in CMD is also conditioned by situational factors that constitute the context of the communication. Different *participation structures* (Baym 1996) such as one-to-one, one-to-many, or many-to-many; the distinction between public and private exchanges; and the degree of anonymity provided by the system all have potential consequences for language use. Participants' previous *experience*, both off and on the Internet, also shapes linguistic behavior; thus users may transfer terms and practices from off-line cultures into CMD (Baym 1995), and experienced users may communicate systematically differently from new users or "newbies" (Weber forthcoming).

Over time, computer-mediated groups develop *norms* of practice regarding "how things are done" and what constitutes socially desirable behavior; these may then be codified in "Frequently Asked Question" documents (FAQs; Voth 1999) and netiquette guidelines (e.g. Shea 1994). Norms vary considerably from context to context; for example, flaming is proscribed in many academic discussion groups, but positively valued in the Usenet newsgroup alt.flame (Smith et al. 1997).

This last example points to the importance of communication *purpose* – recreational, professional, pedagogical, creative, etc. – in shaping language use. Social and pedagogical IRC, for example, may differ widely in level of formality, use of directive speech acts, and topical coherence (Herring and Nix 1997). Discourse *topic* and *activity* type (such as "greeting", "exchanging information," "flaming," etc.) also condition linguistic variation. Thus, for example, contractions are used more often in discussing "fun" topics (such as profanity) than serious topics on an academic linguistics discussion list, and more often in information exchanges than in extended debates (Herring 1999c). These findings on socially motivated variation show that CMD, despite being mediated by "impersonal" machines, reflects the social realities of its users.

4.2 Social interaction

In addition to being shaped by social circumstances, CMD constitutes social practice in and of itself. Text-only CMD is a surprisingly effective way to "do" interactional work, in that it allows users to choose their words with greater care, and reveals less of their doubts and insecurities, than does spontaneous speech (Sproull and Kiesler 1991). Thus participants negotiate, intimidate, joke, tease, and flirt (and in some cases, have sex and get married)[18] on the Internet, often without having ever met their interlocutors face to face.

Computer users have developed a number of compensatory strategies to replace social cues normally conveyed by other channels in face-to-face interaction. The best-known of these is the use of emoticons, or sideways "smiley faces" composed of ascii characters (Raymond 1993; Reid 1991), to represent facial expressions. While the prototypical emoticon, a smile :-), usually functions to indicate happiness or friendly intent, emoticons cue other interactional frames as well: for example, a winking face sticking its tongue out, ;-p (as if to say "NYA nya nya NYA nya"), can signal flirtatious teasing, and Danet et al. (1997) describe a spontaneous IRC "party" where emoticons were creatively deployed to represent the activity of smoking marijuana.[19]

In addition to facial expressions, physical actions can be represented textually. Typed actions such as <grin> and *yawn* may serve as contextualization cues (Gumperz 1982) for a playful or relaxed discourse frame. Synchronous CMD such as MUDs and IRC further provides a special communication command which can be used to describe actions or states in the third person. This command is often used to expand dialog into narrative performance, as in the following flirtatious IRC exchange (example from Herring 1998c):

(6) <Dobbs> come on, Danielle!!
<Danielle> No.
<Danielle> You have to SEDUCE me . . .
*** Action: jazzman reaches out for Danielle's soft hand.
*** Danielle has left channel #netsex
*** Action: Dobbs whispers sweet nothings in Danielle's ear
*** Action: Butthead moves closer to Danielle
<jazzman> danielle's gone dumbass

In this example, the four present tense actions (preceded by asterisks) are *performative* in nature; they count as "acts" (in this case, of seduction) solely by virtue of having been typed.

Since anyone can potentially create reality in this way, it follows that participants may type different, incompatible versions of reality, resulting in what Kolko (1995) calls a "narrative gap." Gaps of this sort may require the involvement of a third participant to resolve which version of the virtual reality will stand. The following MUD example is reported in Cherny (1995):

(7) The guest hugs Karen.
Karen is NOT hugged by Guest.
[another character later addresses Karen, referring to "the guest who hugged you"]

In this example, Karen attempts to deny the performative nature of the guest's unwelcome action, but the third participant's comment affirms it – as Cherny notes, "[i]n some sense, the action occurred as soon as the message showed up on people's screens."

From this and other research into on-line social interaction, language emerges as a powerful strategic resource – indeed, the primary resource – for creating social reality in text-based CMC.

4.3 Social criticism

The socially constitutive power of computer-mediated language is not limited to the accomplishment of interactional work between individuals. We owe to Foucault (1980) the insight that societal institutions are themselves constructed and maintained through discourse. Nowhere is this more true than on the Internet, where "communities" of users come together, sharing neither geographical space nor (in the case of asynchronous CMD) time, and create social structures exclusively out of words (Jones 1995; Rheingold 1993; Smith and Kollock 1999). In some on-line communities, this process generates rules, sanctions against the violation of those rules, and systems of governance to enforce the sanctions, headed by empowered individuals or groups (Kolko and Reid 1998; Reid 1994, 1999). That is, "virtual communities" may develop internal power hierarchies, contrary to utopian claims that computer-mediated communication is inherently egalitarian.

CMD also inherits power asymmetries from the larger historical and economic context of the Internet. These include the traditional dominance of the United States as the leading source of computer network technology (Yates 1996b), the fact that the cost of the equipment required to set up and access computer networks creates "haves" and "have nots," both within the US and globally (Petrazzini and Kibati 1999), and the continuing overrepresentation of white, middle-class, English-speaking males in positions of control as Internet mode and site administrators (Shade 1998). These circumstances advantage certain groups of Internet users over others, and thus call for critical CMD analysis that is sensitive to issues of power and control.

One area that has been explored extensively for Internet groups is gender asymmetry.[20] Much of this research finds that gender differences in CMD, such as those described in section 4.1 above, disproportionately disfavor female participants. In discussion groups, for example, the contentiousness of many male messages tends to discourage women from responding, while women's concerns with considerateness and social harmony tend to be disparaged as a "waste of bandwidth" in male-authored netiquette guidelines (Herring 1996a). Even extreme acts of aggression, such as narrative enactments of sexual violence against women, find ideological justification in dominant male discourses – for example, through invoking principles of "freedom of expression" (Herring 1998b, 1999b), or denying the pragmatic force of words to constitute actions in the case of a MUD rape (Dibbell 1993). Critical discourse analysis exposes the mechanisms that are employed to create and maintain gender asymmetry in computer-mediated environments, as well as analyzing the discourse strategies that are used by women to resist such attempts (Herring 1999b; Herring et al. 1995).

Another growing concern is the dominance of the English language on the Internet, and the possible effects of this dominance on the global spread of US values and cultural practices (Mattelart 1996; Yates 1996). Discourse analysts address these issues by studying the communication – including the language choices and attitudes – of speakers of other languages on the Internet. Paolillo (1996, forthcoming) finds little use of South Asian languages in CMD among South Asians, but suggests that nondominant languages may fare better when computer networks are located entirely within the nation or region where the language is natively spoken, when fonts are readily available which include all of the characters of the language's writing system,

and when there has been no colonial legacy of English within the home culture. Other researchers are less sanguine: Yoon (forthcoming) finds that young people in Korea tend to accept the dominance and importance of English on and for the Internet without question, and concludes that this is due to the symbolic power of the technology, which is fueled by commercially driven mass media. These findings point to a need for critical analysis not just of CMD, but of public discourse about computer technology which transmits ideological (including commercial) messages.

Computer networks do not guarantee democratic, equal-opportunity interaction, any more than any previous communication technology has had that effect. Pre-existing social arrangements carry over into cyberspace to create an uneven playing field, and computer-mediated communication can be a tool of either oppression or resistance. While utopian theorists might be disappointed by this outcome, for socially oriented discourse analysts, it is a boon. The discursive negotiation and expression of social relations in cyberspace, including asymmetrical relations, constitutes one of the most promising areas of future investigation for students of computer-mediated discourse.

5 Conclusions

As the above discussion shows, we have come far from the view of CMD as a single genre. It should also be clear that not all properties of CMD follow necessarily and directly from the properties of computer technology. Rather, social and cultural factors – carried over from communication in other media as well as internally generated in computer-mediated environments – contribute importantly to the constellation of properties that characterizes computer-mediated discourse.

The wide variety of discourse activities that take place in CMD and the range of human experiences they evoke invites multiple approaches to analysis, including approaches drawn from different academic disciplines as well as different subfields of discourse analysis. This richness and diversity of CMD, concentrated into a single (albeit vast) phenomenon which is the Internet, is its strength. CMD study enables us to see interconnections between micro- and macrolevels of interaction that might otherwise not emerge by observing spoken or written communication, and potentially to forge more comprehensive theories of discourse and social action as a result.

That said, further specialization in CMD research is desirable and inevitable, given that the field covers a vast array of phenomena and is still new. In this overview, I have focused on issues of categorization, linguistic structure, interaction management, and social practice in computer-mediated environments. Other important topics, such as the effects of computer mediation on language change over time (Herring 1998a, 1999c), children's learning and use of CMD (Evard 1996; Nix 1998, forthcoming), pedagogical CMD (Herring and Nix 1997; Warschauer 1999; Zyngier and de Moura 1997), and cross-cultural CMD (Ma 1996; Meagher and Castaños 1996), have not been treated here. Each potentially constitutes a subdiscipline of CMD research that can be extended in its own right.

The future prospects for the field of CMD analysis are very bright. As of this writing, new research on computer-mediated communication is appearing almost

daily, and a growing proportion of that work is making language its focus. This flurry of activity is certain to turn up new areas of research, as well as problematizing existing understandings; such are the signs of a vital and growing field of inquiry. Moreover, as CMC technology continues to evolve at a rapid pace, new and up-to-the-minute research will be needed to document its use. For example, we can anticipate structural and cultural changes in on-line communication as the worldwide web increasingly integrates Internet modes such as e-mail, newsgroups, and chat rooms under a single graphical interface. We can also look forward to new understandings (and new analytical challenges) as CMD enhanced by audio and video channels comes into more popular use. CMD is not just a trend; it is here to stay. For as long as computer-mediated communication involves language in any form, there will be a need for computer-mediated discourse analysis.

NOTES

1 This chapter does not consider the discourse properties of documents on the worldwide web. Web "pages" tend to be prepared in advance and monologic rather than reciprocally interactive; as such, they constitute a separate phenomenon deserving of study on its own terms. Nor does the chapter take up the question of what leads users to choose a particular medium of communication (CMD as opposed to speaking or writing) or mode of CMD (e.g. e-mail as opposed to real-time chat) for any given communicative purpose, as this falls outside our focus on the properties of computer-mediated exchanges themselves. For an early but still instructive treatment of this issue, see Murray (1988).

2 For example, Nancy Baym, Lynn Cherny, Brenda Danet, Susan Herring, Elizabeth Reid, and Simeon Yates; see references for examples of this early work.

3 The term "computer-mediated discourse" as a label for this kind of research was first used, to the best of my knowledge, at a pre-session of the Georgetown University Round Table on Languages and Linguistics that I organized in March of 1995.

4 I know of no examples of two-way asynchronous CMD, perhaps because it would serve no useful function for messages to be transmitted one keystroke at a time to the screens of addressees who were not present to appreciate the temporal aspects of the transmission.

5 Listserv mailing lists are thematically based discussion groups to which individuals "subscribe" by sending an e-mail request to the appropriate listserver; once added to the list of subscribers, they receive all communications posted to the list in the form of e-mail messages. Usenet is a large collection of "newsgroups" or discussion groups to which messages are posted as if to an electronic bulletin board; individuals must access Usenet using a web browser or newsreader in order to read the messages. IRC is a network of servers, accessed via a piece of software called an IRC client, which permits individuals to join a chat "channel" and exchange typed messages in real time with others connected to the channel. MUDs (Multi-User Dimensions or Multi-User Dungeons, from the early association of MUDs with the role-play

adventure game Dungeons and Dragons) and MOOs (MUDs, Object Oriented) are text-based virtual reality environments which, in addition to allowing real-time chat among connected users, are programmable spaces through which individuals can navigate and create text-based descriptions and objects. Access to all four modes is free via the Internet. Useful descriptions of mode-specific cultural practices include Hert (1997) for an academic discussion list, Baym (1995) and Pfaffenberger (1996) for Usenet, Reid (1991) for IRC, and Cherny (1999) and Reid (1994) for social MUDs.

6 However, see Baym (1993, 1995, 1996) for an example of a Usenet newsgroup, rec.arts.television.soaps (r.a.t.s.), that is predominantly female and cooperative in its orientation.

7 The abbreviation <g> or <grin> represents the action of grinning.

8 Jon Katz, quoted in Hale (1996: 9).

9 See, e.g., Danet (1992); Ferrara et al. (1991); Kim (1997); Maynor (1994); Murray (1990); Reid (1991); Ulhírová (1994); Werry (1996); and Wilkins (1991).

10 Recent evidence suggests that this may already be starting to change. As e-mail use becomes more common, increasingly replacing other forms of writing for both formal and informal purposes, expectations seem to be rising that e-mail language will be standard and "error-free," even in relatively informal communication (Erickson et al. 1999). For a study that documents a trend toward increasing formality over the 1990s in messages posted to a listserv discussion group, see Herring (1999c).

11 Unless otherwise noted, remarks in this section refer to one-way CMD.

12 The abbreviated Punjabi greeting "ssa" – "sat siri akal" (lit. "God is truth" = "hello") – illustrates the tendency toward reduction in synchronous CMD.

13 Quoted portions of previous messages may also appear after or interspersed with the writer's comments, depending on where the writer chooses to position the quotes, and on the default position of the cursor in relation to the quote for any given mailer system (Severinson Eklundh forthcoming).

14 In this sense, asynchronous CMD is more efficient than synchronous modes of communication; see Condon and Čech (1996, forthcoming.)

15 For current statistics on the demographics of Internet users, updated semi-annually, see the Graphic, Visualization, and Usability Center's WWW User Survey at http://www.cc.gatech.edu/gvu/user_surveys/.

16 The notion that people "give off" information about themselves unconsciously through their self-presentation is from Goffman (1959).

17 See Herring (2000) for a recent summary of research on gender differences in computer-mediated communication.

18 Weddings have been reported in MUD environments, in which the bride and groom exchange vows in a public ceremony, with other MUD participants as witnesses and guests. In some cases, the bride and groom also have a relationship "in real life." In other cases, the relationship exists only in the virtual realm (Jacobson 1996; Turkle 1995).

19 One such sequence looks like this: :-Q :| :| :\ssssss :) (Danet et al. 1997).

20 See, for example, Collins-Jarvis (1997); Ebben (1994); Hall (1996); Herring (1992, 1993, 1994, 1996a, *inter alia*); Herring et al. (1992, 1995); Hert (1997); Kendall (1996); Kramarae and Taylor (1993); Savicki et al. (1997); Selfe and Meyer (1991); Sutton (1994); We (1994).

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