The Cooperative Principle and Computer-Mediated Communication

by

Mohammed Omari

A Thesis Submitted in Partial Fulfillment of the Requirements for the Degree of Master of Arts in Linguistics, Department of English Language and Literature, Yarmouk University, Irbid, Jordan.

Supervisor

Dr. Lutfi Abu Alhaija

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Abstract

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Some studies of multiparty text-based chat indicate that some of its properties, such as disrupted turn adjacency, can lead to interactional incoherence and relevance breakdown. Notwithstanding these limitations, this mode of computer-mediated communication (CMC) continues to grow in popularity. This study is, therefore, an attempt to evaluate relevance maintenance in group text chat on an Internet Relay Chat (IRC) channel. This study had two major goals: the first one was to find out if disrupted turn adjacency interfered with the observance of the relevance maxim in IRC interactions; at the same time, it endeavored to pinpoint the various strategies that CMC users rely on for maintaining coherence in their conversations.

The results show that there is a high degree of disrupted turn adjacency and overlapping conversational threads in IRC interactions. Nevertheless, few instances of miscommunication were the result of disrupted adjacency. Ability of users to adapt to the constraints imposed by the medium might be a plausible explanation for this finding. IRC users, in general, observed the relevance maxim in the construction of their messages; cooperative interaction appeared to be the

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norm. In addition to cohesive devices, other strategies were used to maintain coherence. It was, for instance, possible to establish the relatedness of non-adjacent relevant utterances based on sequencing. Uninformed assumptions about common ground between participants were found to contribute to the occurrence of miscommunication. The study concludes with suggestions for design improvements to the IRC system of group text chat and its client software.

Keywords: computer-mediated communication, cooperative principle, relevance, Internet Relay Chat, coherence.

Chapter 1

Introduction and Theoretical Background

1.1 Introduction

The introduction of the cooperative principle (CP) by Grice was one of the most influential developments in the field of pragmatics. According to Grice, in a talk exchange both the speaker and listener cooperate in order to make the conversation successful. The CP is expressed as follows: "Make your conversational contribution such as is required, at the stage at which it occurs, by the accepted purpose or direction of the talk exchange in which you are engaged" (Grice, 1975: 45).

Grice subdivided the CP into four different maxims, which are commonly known as the maxims of conversation: Quantity, Quality, Relation and Manner. These maxims can be seen as criteria for determining whether a conversational contribution is cooperative or not. In order to determine the cooperativeness of a conversational contribution, one only needs to check it against these maxims. If it complies with them, it is assumed to be in compliance with the CP as well.

Grice identified several different ways in which people can violate the maxims. For example, a speaker can violate the maxim of quantity by using redundant expressions for no specific purpose (Weizman, 2007). Functional redundancy, however, is not considered a violation of the maxim.

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A lot of research has been conducted with respect to the application of the Gricean maxims to spoken conversation in the various social contexts. In contrast, there is not as much research covering the application of these maxims to computer-mediated communication (CMC). One is inclined to believe that the CP could be implemented differently in CMC due to the many vital differences that hold between CMC and face-to-face conversation in the real world. The people interacting in text-based CMC contexts are unable to make full use of their communicative inventory. There are several factors which render CMC more problematic than typical real-world conversation. For example, in CMC, most people choose to remain anonymous; they use nicknames instead of their real names and they give little background information about themselves, if any at all. Also, the participants in a CMC interaction do not share the same context in terms of place and time.

CMC users, however, have developed new techniques for establishing context and avoiding misunderstandings. The use of emoticons (also known as smileys) is a technique that CMC discussants use to make up for the absence of facial gestures and emotional cues. In text-based CMC, interactants cannot make use of paralinguistic cues such as intonation and voice tones. One strategy that is commonly used to compensate for this shortcoming is the use of capitalization to signify shouting or emphasis.

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Furthermore, various strategies are used by CMC users to keep their interactions contextualized, relevant and coherent. For instance, it is common use for participants in Internet forums to quote either fully or partially the message to which they are replying. A user is more likely to do this when there are other messages intervening between his/her reply and the message to which s/he is responding. This practice gives context to those replies and maintains the consistency and coherence of the forum discussions (Serfaty, 2002).

1.2 Definition of Terms

Maxim: the term Grice uses for the four sub-principles of his cooperative principle. The four maxims enjoin the speaker to strive to provide appropriately informative, well-founded, relevant contributions to conversation in a perspicuous manner. These may be 'hedged' by meta-lingual glosses which indicate the extent to which the speaker is abiding by one or more of them. Examples include *I mean* and *by the way* (Grundy, 2000).

Cooperative Principle (CP): the central presumption underlying Grice's theory of conversational implicature (1975) which enjoins speakers to make relevant, expectable contributions to conversation (Grundy, 2000).

Computer-mediated Communication (CMC): any communicative transaction which occurs through the use of two or more networked computers (Herring, 1996).

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Emoticons (Smileys): graphical shapes used in CMC to indicate the emotional state of the chatter. They are termed as the paralanguage of the Internet (Crystal, 2006).

Internet Relay Chat (IRC): a popular way of online chatting, which is done via a special browser or IRC client such as Mirc and Pirch. IRC contains a large number of chatting rooms, known as channels, negotiating various topics. The IRC system requires all channel names to be preceded by a hash sign (#). IRC users can save their conversations as a 'log file'. In addition, 'overlaps and interruptions are impossible' in IRC (Werry, 1996).

Synchronous and Asynchronous CMC: synchronous CMC refers to communication that takes place between two or more users simultaneously, i.e., in real time. Asynchronous CMC, on the other hand, describes those CMC environments where the exchanges between users are not simultaneous, i.e., delayed.

Listserv: The term Listserv has been used to refer to a few early electronic mailing list software applications that allowed a sender to dispatch one email to the list, and then transparently sending it on to the addresses of the subscribers to the list. (Wikipedia, 2012)

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1.3 The Cooperative Principle

In 'Logic and Conversation', Grice introduced four conversational maxims and the cooperative principle. The CP runs as follows:

> Make your contribution such as is required, at the stage at which it occurs, by the accepted purpose or direction of the talk exchange in which you are engaged(Grice, 1975: 45).

The fact that Grice expressed the CP in the imperative mood has led some critics of his work to describe it as being prescriptive. Thomas (1995) pointed out that the CP is not telling speakers how they ought to behave but it is merely suggesting that people engaged in a conversation expect each other to abide by these rules. In Leech's terms (1983), the maxims proposed by Grice are 'descriptive rather than prescriptive' in nature. The CP is 'about how people *use* language' and not about how they ought to use it (Levinson, 1983). The wording of the CP has led some commentators to assume that Grice was suggesting that people are always cooperative in conversational interaction. This assumption is, however, inaccurate because Grice himself stated in his paper that there are numerous occasions when people fail to observe the CP.

1.3.1 The Four Conversational Maxims

In addition to the CP, Grice (1975) put forward four maxims of conversation which he considered as subdivisions of the CP. These maxims are formulated as follows:

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Quantity: Make your contribution as informative as is required (for the current purpose of the exchange).

Do not make your contribution more informative than is required.

Quality: Do not say what you believe to be false.

Do not say that for which you lack adequate evidence.

Relation: Be relevant.

Manner: Avoid obscurity of expression.

Avoid ambiguity.

Be brief (avoid unnecessary prolixity).

Be orderly.

Levinson (1983) gave a succinct account of what these maxims are supposed to achieve:

> In short, these maxims specify what participants have to do in order to converse in a maximally efficient, rational, co-operative way: they should speak sincerely, relevantly and clearly, while providing sufficient information (Levinson, 1983: 102).

Grice (1975) said that hearers assume that speakers observe the CP, and that it is the knowledge of the four maxims that allows hearers to draw inferences about the speakers' intentions and implied meaning. "Hearers assume that an utterance addressed to them is intended to be meaningful. Therefore, if the utterance doesn't

have an appropriate conventional meaning, they will look for a more useful interpretation" (Davies, 2000: 18). It is frequently the availability of extra-textual cues that helps generate alternative interpretations of ambiguous messages and in turn aids the hearer to grasp the real and implied intention (or the conversational implicature) of the speaker (Wang and Lu, 2007).

1.3.2 Non-Observance of the Maxims

There are many occasions when people fail to observe the maxims. In his first paper, Grice (1975: 49) listed three ways in which a participant in a talk exchange may fail to fulfill a maxim: the speaker may flout a maxim, violate a maxim or opt out of observing a maxim. He later added a fourth category of non-observance: infringing a maxim. Several writers since Grice have argued the need for a fifth category – suspending a maxim. Thus, we end up with five ways of failing to observe a maxim:

- flouting a maxim

- violating a maxim

- infringing a maxim

- opting out of a maxim

- suspending a maxim

There are several reasons why people may fail to observe a maxim. For example, a person may fail to observe a maxim because he is incapable of speaking clearly, or because he deliberately chooses to lie.

In this study, we are interested in only two types of non-observance, namely flouting and violation of the maxims.

1.3.2.1 Flouting a Maxim

A speaker is said to flout a maxim when he blatantly fails to observe it with no intention of deceiving or misleading, but because the speaker wishes to prompt the hearer to look for a meaning which is different from, or in addition to, the expressed meaning (Thomas, 1995). Grice (1975) called this additional meaning 'conversational implicature' and he termed the process by which it is generated 'flouting a maxim'.

Example 1

The following example from Crystal (2006) demonstrates how maxim flouting works:

> Joe: Where' Uncle Kevin?
> Jill: I expect there's a dilapidated blue bicycle outside The Swan?

When a speaker makes a conversational contribution that flouts the maxims, the interlocutor typically assumes the cooperativeness of the speaker and based on that he tries to find a way to make sense of the speaker's utterance.

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In this example, we take it for granted that Jill is being cooperative, and that (a) she has good grounds, probably from past experience, for knowing that a bicycle will be outside The Swan at this time; (b) she knows the mention of a bicycle is relevant in this context, because Uncle Kevin rides one; (c) she knows that its attributes include being dilapidated and blue; and (d) she knows that Joe knows all this, so that her answer will be perfectly clear (Crystal, 2006).

1.3.2.2 Violating a maxim

In his first published paper on conversational cooperation (1975), Grice defines 'violation' as the unostentatious non-observance of a maxim. If a speaker violates a maxim, s/he 'will be liable to mislead' (1975: 49). When a speaker violates a maxim, he is liable to generate an intentionally misleading implicature (Thomas, 1995). The following example illustrates this type of non-observance:

Example 2

An English athlete, Dianne Modahl, the defending Commonwealth Games 800 meters champion, pulled out of her opening race and returned to England. Caroline Searle, press officer for the England team said:

'She has a family bereavement; her grandmother has died.' (Thomas, 1995)

However, it was found later on that Ms Modahl had been denied participation in the race because of taking drugs. Although the literal meaning of what MS Searle had said was true, the implicature it generated (that Modahl's

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missed the race because of a family bereavement) was false. Thomas (1995) asserts that pragmatically misleading utterances such as the above one are more commonly found in certain domains such as trials and parliamentary speeches.

1.4 Computer-Mediated Communication

Computer-mediated communication (CMC) refers to human communication via computers and includes many different forms of synchronous, asynchronous or real-time interaction that humans have with each other using computers as tools to exchange text, images, audio and video (Atifi, Mandelcwajg, & Marcoccia, 2011). Herring (1996) defines CMC as communication that takes place between human beings via the instrumentality of computers. Most modes of CMC are text-based, for example email, instant messaging, Internet Relay Chat, Internet forums, Usenet newsgroups, bulletin boards, etc.

It has become an established practice among CMC researchers to distinguish between synchronous and asynchronous situations of CMC. The distinction here is based on whether the interaction takes place in real time or in postponed time. This dichotomy is vividly manifested in chatgroups.

- In a synchronous situation, a user enters a chat room and joins an ongoing conversation in real time, sending named contributions which are inserted into a permanently scrolling screen along with the contributions from other

participants (Crystal, 2006). Internet Relay Chat (IRC) and instant messaging are popular examples of this CMC mode.

- In an asynchronous situation, the interactions are stored in some format, and made available to users upon demand, so that they can catch up with the discussion, or add to it, at any time – even after an appreciable period has passed (Crystal, 2006). Bulletin boards and newsgroups on Usenet are two examples of this type of CMC.

1.5 Characteristics of CMC as a Medium for Communication

Different communication media vary in their abilities to convey knowledge and information (Daft & Lengel, 1984). A medium, such as face-to-face communication or CMC, may be labeled "rich" or "lean" depending on the following four abilities: (1) immediacy of feedback; (2) capacity to transmit multiple cues; (3) language variety; and (4) personal focus (Daft & Lengel, 1984). The following is a discussion of these four capabilities of CMC and other features that could hinder the implementation of the CP in CMC.

1.5.1 Immediacy of Feedback

"Immediacy of feedback" refers to a medium's speed in transmitting feedback (Wang & Lu, 2007). Immediate feedback is critical to efficient communication because it enables speakers to adjust their messages in accordance with the response of their interlocutors. Most CMC systems transmit messages in

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their entirety, rather than keystroke by keystroke; the transmission process is, thus, 1-way rather than 2-way (Cherny, 1999; Herring, 1999). As a consequence, simultaneous feedback is lacking as senders type their messages. Garcia and Jacobs (1999) characterize real-time chat as "quasi-synchronous" for this reason. Wang and Lu (2007), who make similar observations, state that electronic communication still happens in two separate steps: message sending and *then* message receiving. The lack of simultaneous feedback in CMC is caused by reduced audio-visual cues and the fact that messages cannot overlap.

1.5.2 Multiple Cues

"Multiple cues" means the medium's ability to convey varied types of information that appeal to different senses of the communicators (Wang & Lu, 2007). Rich media allow a fuller range of verbal, paralinguistic, intonation, proxemic, kinetic, olfactory, and tactile cues to convey the subtleties and implications of a message in addition to the message's literal content (Lim & Benbasat, 2000). Some researchers call the extra cues of rich media "social cues" because they enhance social interaction (Daft, Lengel, & Trevino, 1987). Sproull and Kiesler (1986) argue that CMC is characterized by the absence of social context cues. It is hard to interpret participants' messages when you do not have access to their facial expressions, gestures and voice intonations.

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Reduced social context cues can cause several types of misunderstanding pertaining to the pragmatic aspects (mostly illocutionary force and propositional content) of the messages. For example, the emotional or ironical dimension of a computer-mediated discourse is very difficult to identify (Walther & Burgoon, 1992). CMC seems to favor mistaken inferences about the geographical location of the interlocutor and about the identity of the participants (age, gender, social identity, culture, values). The lack of co-presence of the participants makes it difficult to identify who is speaking to whom (Bazzanella and Baracco, 2003).

Furthermore, in computer-mediated discussions the participants' common ground is reduced, especially in intercultural situations. Personal and communal common-ground refers to the mutual knowledge, beliefs and assumptions that are essential to communication between people (Clark and Brennan, 1991).

1.5.3 Language Variety

"Language variety" relates to the range and scope of meanings that language symbols may convey (Farmer & Hyatt, 1994). The occurrence of miscommunication is very common in CMC because most CMC is text-based. CMC users had to develop new techniques to overcome this shortcoming and get around the technological constraints imposed by the medium. One such technique is the use of keyboard characters to simulate facial expressions and paralinguistic features of conversation. These innovations are commonly referred to as

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"emoticons" (e.g., :-) or ☺ to imply a smiling face). Difficult-to-code expressions of emotions are thus reduced to textual codes which can be processed by the medium (Wang & Lu, 2007). The person that wishes to have his/her message interpreted as friendly teasing, for example, may have to interpose the extra and extraneous word or phrase of "grin" or "just kidding" (Parks & Floyd, 1996).

1.5.4 Personal Focus

"Personal focus" refers to a medium's ability to facilitate the communicators' expression of personal feelings and emotions (Wang & Lu, 2007). For greater personal focus, messages have to be tailored to the frame of reference, needs, and current situation of the interlocutor (Daft et al., 1987). With respect to this capability, face-to-face communication is considered a rich medium because the communicator is able to see the interlocutor as a real, physical human being. This physical co-presence of participants results in greater personal focus. However, physical co-presence of participants is not fulfilled in CMC. The participant is one step removed from the interlocutor and addresses but the immediate presence of an inanimate computer, compromising the personal focus of electronic messages (Wang & Lu, 2007).

1.6 CMC and the Gricean Maxim of Relevance

1.6.1 Relevance

A lot of research has been done on the topic of relevance in conversation. However, most of that research adopts spoken communication as its model of conversation. Little effort has been put into researching the status of relevance in other modalities of communication such as computer-mediated conversation. In textual CMC, the adjacency of logically-related turns is usually disrupted (Herring, 1999). The situation is even more compounded in multi-participant recreational chat where disrupted adjacency is the norm rather than the exception (Herring, 1999).

1.6.2 Relevance in Spoken Conversation

In "Logic and conversation", Grice (1975) stressed the importance of relevance and posited it as a prerequisite for rational conversation. He also showed how relevance can be clearly identified from the sequential relatedness of utterances. According to Grice (1975), true violations of relevance rarely occur, and most of the utterances that appear irrelevant when taken at face value tend to have an underlying relevant meaning which is achieved by means of implicature.

Sperber and Wilson (1986) further emphasized the importance of relevance by giving it prominence over Grice's other maxims in their general theory of communication. They suggest that any attempt of communication "comes with a

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tacit guarantee of relevance" (1986: 33). For Sperber and Wilson, relevance is a matter of degree. There are, for instance, occasions when a speaker assumes his conversational contribution to be relevant to the talk only to find that his/her interlocutors do not share the same view. When this happens, interlocutors rarely consider that the speaker is intentionally being irrelevant:

> When addressees are disappointed in their expectations of relevance, they rarely consider as a possible explanation that the communicator is not really trying to be optimally relevant. It would be tantamount to assuming that the apparent communicator is not really addressing them, and perhaps not communicating at all. (Sperber and Wilson, 1986: 159)

In order to be optimally relevant, the speaker should maintain awareness of the discourse context and the interlocutors' current knowledge state. These two variables shift as the conversation proceeds. The communicator should take the recipient's characteristics into account to produce a message that is appropriate to him/her. The recipient, in turn, should take the communicator's characteristics into account and, if possible, provide feedback regarding his/her understanding of the message.

People expect the maxim of relevance to be observed in conversation, especially in task-focused situations where the goal of communication is to be informative. The maxim may not be observed in antagonistic or playful situations where cooperation is not expected (Schwarz, 1996). Sperber and Wilson (1986)

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note several situations in which addressees may relax their expectations that speakers will try hard to be relevant: informal conversation among friends in a café, teachers encouraging students to communicate freely or creatively, a master talking to his servant (160-161).

None of the pragmatic theories referred to so far considers modality of communication with regards to their claims about relevance. CMC in the form of email, instant messaging, multiparty chat, newsgroups, blogs, microblogs, and the like provides an opportunity to address these claims about relevance, taking modality into consideration. Yus (2010) suggests that the technological properties of 'cyber-media' affect what counts as relevance, and that "a number of 'alterations' of relevance may be produced by the different qualities of these media" (p. 16).

1.6.3 Cross-Turn Coherence in CMC

Conversational relevance is a type of coherence across turns of talk. Nunan (1993: 116) defines coherence as the extent to which discourse is perceived to "hang together" rather than being a set of unrelated sentences or utterances. In their classic work, Halliday and Hasan (1976) define coherence as texture, created by the grammatical and lexical links in a text known as cohesion. Brown and Yule (1983) point out that a cohesive text is not necessarily coherent, nor does a

coherent text necessarily make use of cohesive devices; rather, coherence resides at the level of the pragmatic intentions of the speaker or writer.

Most CMC servers distribute messages in the linear order in which they are received since these servers currently have no way of identifying logically-related messages. This behavior of the servers results in *disrupted adjacency* of otherwise logically-related turns (Herring, 1999), especially when two or more people are communicating at the same time. And since the transmission process in most CMC systems is 1-way (Cherny, 1999; Herring, 1999),it impedes the occurrence of simultaneous feedback. It is common for adjacency pairs to get disrupted in 1-way CMC systems by messages from other conversations that are simultaneously taking place in the same system. All these factors combined make it inevitable for the different threads of conversation to become intertwined.

Disrupted adjacency results in unintended relevance violations, i.e., imposed by the system, which can cause online conversations to appear incoherent. It can generate ambiguity and confusion about which message is being responded to, especially if multiple threads of discussion are intertwined. McCarthy, Wright, and Monk (1992) observed that during text-based exchanges participants tended to address the intended listener more explicitly in an effort to maintain coherence (see also Werry, 1996). Lam and Mackiewicz (2007) identified three strategies that their instant messaging participants in a workplace setting used in order to

maintain cross-turn coherence: short, multiple, and sequential transmissions; topicalization; and the use of performative verbs. Berglund (2009) found that international students using instant messaging (IM) in a design course maintained coherence in cases of disrupted adjacency through lexical repetition and other forms of cohesion (such as lexical substitutions, anaphora, and explicit linking expressions). However, even in the absence of cohesive devices, it was clear which message was being referred to most of the time either because of the timing or because, in the case of second-pair parts of adjacency pairs, "the sequential structure of interaction [wa]s in itself an important clue in coherence creation" (p.12). Despite these adaptations, coherence remains indispensableto task-oriented CMC. In an experimental study, Ho and Swan (2007) found that student postings to an asynchronous discussion forum that were low in relevance in relation to immediately preceding postings received fewer responses, whereas "postings that were new, personal and relevant received the most responses" (p. 7).

In recreational contexts, the incoherence caused by disrupted adjacency may have advantages such as promoting playful communication (Herring, 1999). Much humor exploits violations of Gricean maxims, especially the maxim of relation (Yus, 2003). Disrupted adjacency creates maxim violations when adjacent messages are considered side by side; these unintended juxtapositions can suggest humorous interpretations (Herring, 1997, 1999). According to Herring (1999),

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there is a tendency in recreational CMC environments for participants to free-associate. This practice sometimes results in chains of associations that digress rapidly away from the original topic of conversation. Herring (1999) gives an example from a chat channel in which the conversation topic shifts in rapid sequence from blow-up dolls to a bald female singer to pool balls to pool tables to being under the table. The playful nature of online chat has also been noted by Danet (2001; Danet, Ruedenberg-Wright, and Rosenbaum-Tamari 1997). However, most of the work covering playfulness in CMCwas not in connection with the notions of coherence and relevance.

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Chapter 2
Review of Related Literature

The following is an overview of the research that has been done on CMC. It is meant to give the reader a general idea of the field. A special focus will be placed on surveying those characteristics of CMC that have been reported to affect the establishment of coherence. There are various modes of CMC based on the technologies that are used. Therefore, the various studies covered in this chapter investigated varied types of online communication.

Research work in the field of CMC is fairly recent as it only started in the mid-1980s. Since then, the field has expanded considerably. Researchers from a variety of disciplines have been involved in investigating this new form of communication. Different methods have been adopted by researchers for the study of this phenomenon; whereas some researchers based their work on naturalistic observation (Herring, 1999; Werry, 1996), others opted to use experimental methods and questionnaires.

In her study, Baron (2010) covered how instant messaging is used by young adults in a social setting. Her population consisted mainly of American college students. She found that it is very common for participants to break down their turns into multiple messages which are transmitted in quick succession. The

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following is one of the examples that Baron provided to illustrate this phenomenon:

IM Transmission 1: That must feel nice

IM Transmission 2: to be in love

IM Transmission 3: in the spring

IM Transmission 4: with birds chirping

IM Transmission 5: and frogs leaping (Baron, p. 4)

As we can see, the participant broke down his long turn into multiple short messages. The participant's choice to split his turn into five brief messages instead of sending it as one long utterance is motivated by a plethora of factors. Baron attempted to identify the relation between CMC and other communication modalities. In this regard, she found that the breakdown of utterances into multiple short messages draws IM further towards the direction of spoken language as opposed to written language. She also pointed out that IM utterance breaks have a lot in common with the kinds of chunking found in informal face-to-face conversation.

Based on her findings, she concludes that there are several factors underlying participants' preference for shorter transmissions. Breaking down one's

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utterance into multiple subsequent posts is one strategy that IM users rely on for maintaining the floor. By sending multiple short contributions in quick succession, the participant precludes the possibility of another participant interrupting his conversational turn. This, in turn, could result in enhancing the coherence of IM conversations. Baron noticed that male and female participants in her study did not use utterance breaks in the same way. The male participants "were significantly more likely to break their turns into multiple transmissions than were females."(Baron, 2010)

Berglund (2009) investigated the use of instant messaging by international students in a design course. The goal of the study was to determine how IM users manage to keep their conversations coherent despite the prevalence of disrupted turn adjacency. He found out that his participants employed the following strategies to maintain coherence: lexical repetition and lexical substitution. He also noted that participants relied on other factors in addition to these cohesive devices. The timing of the message and the sequential nature of the conversation were valuable cues for identifying the relatedness of non-adjacent messages. The notion of disrupted adjacency is not used consistently by the different CMC researchers. Whereas Herring (1999) employ this term to refer to sequential incoherence, Berglund used it to refer solely to those cases of incoherence that result in miscommunication.

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In their study of coherence and instant messaging (IM) in a workplace setting, Lam and Mackiewicz (2007) focused on the interaction of one dyad over 95 days. They concluded that the IM conversations investigated were not incoherent, as the researchers were able to identify very few examples of miscommunication. They identified three strategies that their participants used in order to maintain coherence: *short, multiple, and sequential transmissions*; *topicalization*; and the use of *performative verbs*. It should be noted, however, that in Lam and Mackiewicz's study, disrupted turn adjacency (which Herring, 1999, refers to as sequential incoherence) was not considered as a sign of incoherence. Instead, they employed the term incoherence to refer to miscommunication and ambiguities.

Woerner, Yates, and Orlikowski (2006) take the two problems identified by Herring (1999), namely lack of simultaneous feedback and disrupted turn adjacency, as a starting point for their study. Their study revolves around the use of IM in the workplace among physically dispersed co-workers. The researchers identified two additional problems which are specific to the context of a workplace: *multitasking* and *authority*. In response to the lack of simultaneity, Woerner et al. show that participants in IM conversation use specific openings or *preambles* to notify others that they would like to converse. The participants also make use of the persistent records of their IM and leave their IM client on

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continuously throughout the day. Further, they note that disrupted turn adjacency was uncommon in their data. A possible explanation could be that most of the topics discussed were work-related. When engaged in multiple IM conversations, participants used a number of strategies to manage the stream of incoming messages. The strategies used included keeping the different conversations in separate windows, making use of color coding to separate contributions from different participants, and putting off-turn information within brackets. Woerner et al. also show that verbal techniques, such as *naming*, *partial sequences*, and *lexical repetition* across IM conversations, were used to keep conversations on track. The strategies employed to deal with multitasking also include separate windows and even separate screens for work-related and conversation tasks. The challenge of authority was met by adapting language to the style of the leader.

In their study, Rintel, Pittam, and Mulholland (2003) dealt with the different types of no-responses that can be found in IRC interaction. Chat conversations are plagued with gaps that frequently occur between messages. They identified some of the strategies that participants employ to make sense of the different types of ambiguous silences in the IRC conversation. Among the strategies identified is one in which participants specify if a non-response is user-motivated or the result of a technical issue. For example, the participant reconnects to the channel and re-greet other participants as a way of clarifying non-responses. Rintel et al. gave a few

suggestions for improving the IRC system so that ambiguous non-responses could be avoided. One suggestion was implementing a feature that notifies the participant when his interlocutor starts typing. They also proposed borrowing some features from instant messaging clients such as the feature that allows participants to see each other's connectivity status.

Simpson (2003) studied the implementation of conversation floor in computer-mediated communication. His source of data was a virtual community known as *Webheads* which has currently ceased to exist. Webheads had a synchronous textual chat forum which had gradually grown into a large virtual community for both English learner and teachers. The logs of this chat forum were the actual data that Simpson analyzed. In contrast to prior research, Simpson arrived at the conclusion that electronic chat is not merely a combination of speech and writing. CMC bears resemblance to speech because it enables real-time written communication between people at different physical locations. Simpson found out that conversational floor is present in CMC in three different manifestations: the multiple conversational floor, the speaker-and-supporter floor and the collaborative floor.

In his study of the use of quoting in asynchronous conversation, Reed (2001) found that participants tend to limit the depth of reference of the discussion as

revealed in the quoted text. He found that in their quoting of previous messages, discussants usually go back no more than two or three messages, and never exceeded five, regardless of the number of preceding turns in the thread. Reed suggested that this practice contributes to the conversational feel of the discussion and gives discussants control over the context into which they insert their responses. The disadvantage of this practice, however, is that it limits participants' view of the discussion and thus makes their contributions more likely to drift away from the original topic of discussion despite the availability of the complete discussion transcript.

Hahn and Subramani (2000) investigated the effect of the communication medium on CMC group interaction. They demonstrated that the design of the communication medium can greatly impact the flow of communication between participants. The impact is, however, pervasive and influences all aspects of the conversation such as the level of participant engagement, the communicative purposes for which the medium is used, and the complexity of conversational turns. Hahn and Subramani used the phrase *conversation interface* to refer to the ways in which the design of a CMC medium shapes the proceeding of conversation in that medium. The focus in their study was mainly on group communication as opposed to dyadic interaction. The characteristics of the conversation interface as defined by the authors were demonstrated in the paper. They also provided

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concrete examples of how the conversation interface can influence group communication by applying this notion to the CMC modes present at the time of their study.

In a study of turn-taking in synchronous online conversations, Phillips (2000) started with the hypothesis that the notion of alternating and orderly turns between dialogue participants attributed to Sacks, Schegloff, and Jefferson (1974) is inapplicable to synchronous online conversations and ineffective for achieving collaborative objectives. Phillips suggested that restricting discussants to a strict alternation of turns would result in lower quality collaboration. To test his hypothesis, Phillips set up three synchronous conversation interface conditions and observed how they affect the performance of a small group of pairs of participants. The first condition, which he called the WYSWIS (*what you see is what I see*) *open condition*, allowed the participants to see one another's activity on a keystroke-by-keystroke basis. The second condition, called the WYSIWIS *turn-marker* condition, was similar to the first except that each participant needed to press a special keystroke to signal when they were ready to yield the floor to the other participant. Thus each participant could monitor what the counterpart was typing stroke by stroke, but could not respond until the special keystroke is entered. Finally, the third condition, called the *chunked* condition, was set up in such a way that participants could not see what their counterparts were typing until

the full message is sent. Under these three conditions, the participants were given two tasks to perform. The results of this study show that participants using the moment to moment interaction modality (the WYSIWIS open condition) were collaboratively superior to those operating under the other conditions. These participants experience fewer disruptions in question-answer pairings and statement-response pairing. The open condition participants also achieved better results with regard to idea development and level of detail. Moreover, the participants were able to work out these details using significantly fewer words than were required by the other two groups.

Although Phillips' results do not give any ground-breaking solutions to the turn-taking issues experienced in online discussions, they supply some important observations regarding interactional coherence. First, Phillips' work suggests that even small changes in the conversation interface can greatly impact the effectiveness of communication. Also, the turn-marker and chunked contribution strategies were found to be ineffective for enhancing online communication.

Herring (1999) proposed that the problematic nature of coherence in CMC can be reduced to two factors: *lack of simultaneous feedback* and *disrupted turn adjacency*. She came to this conclusion after carefully inspecting the patterns of turn-taking and sequencing in CMC. Her analysis of synchronous CMC was based

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on a corpus of Internet Relay Chat (IRC) conversations. She shows the innovative strategies that participants devised to adapt to the limits and constraints of IRC with regard to *back-channels, turn-change signals,* and *address*. Further, she points out that "CMC is both dysfunctionally and advantageously incoherent" and suggests that the "incoherence" of CMC might encourage linguistic playfulness.

Herring observes that the IRC software used at the time of her study had many flaws. Based on her observations, she makes suggestions for design improvements that could enhance interactional coherence while maintaining some of the benefits of what she refers to as incoherence. The three main suggestions she makes are: better logging and visualization possibilities, two-way interaction, and innovative ways of linking connected turns.

Paolillo (1999) studies the speech community of an IRC-channel called #india. He uses a 24-hour log from that channel as his data and conducts a social network analysis based on it. This analysis was developed by sociolinguistics and it correlates linguistic variables with network ties. Network ties is used here to denote the relative closeness of people to each other. Frequency of contact is one way of establishing the difference between strong and weak social network ties. Paolillo points out that, unlike in real life, IRC has the unique advantage of enabling the researcher to exactly quantify and measure the contacts the participants have with each other.

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It is usually very easy to identify the speaker and the addressee in IRC. Paolillo's corpus consisted of over 6000 lines of text; all the messages in the corpus were sorted according to speaker and addressee and entered into a database accordingly. A sophisticated statistical program was used to establish the social network ties. Finally, the following five linguistic variables were assessed and correlated with the social network database:

- use of Hindi

- use of 'u' for 'you'

- use of 'r' for 'are'

- use of 'z' for 's', especially in word final position

- use of obscenities

Paolillo finds that the use of Hindi is the in-group variable for the most central group of participants with the strongest network ties. The use of obscenity seems more popular in groups that contain many operators. This is probably due to the fact that obscenity would result in the removal from the channel for normal participants. The other linguistic variables are dispersed in other parts of the social network and do not correlate with any particular group of speakers. Paolillo concludes that linguistic variables in IRC do not correlate with social ties in a simple and straightforward way. A major shortcoming of Paolillo's study is the fact that he did not provide any explanation for the choice of the variables which were examined. Three of the variables are IRC-specific spellings, one is a code-

switch, and no clear-cut definition of what obscenity signifies is given in the article.

Osborne's (1998) study of topic development in Usenet groups reveals important differences between asynchronous discussions and spoken conversation. In the latter, the number of participants is limited, and only one topic is discussed at a time. In one of the online discussions that Osborne studied, there were over 300 participants, and participants engaged in multiple discussions at the same time. Topics in online discussions are frequently split into sub-topics; these sub-topics are simultaneously discussed with one another. It is unlikely for these topics to converge once divergence takes place. Whereas turns in a conversation typically consist of only a few sentences, asynchronous messages can be lengthy, extending to hundreds of words. According to Osborne, this contributes to the coherence and makes for more reasoned discourse.

Asynchronous online discussions defy the orderly turn-taking which is typical of spoken conversation. This can be clearly observed in Usenet discussions because the distribution of the network is global and messages arrive at nodes in unpredictable ways. It is not uncommon for a reader to see a reply to a message when the message being replied to has not arrived yet. Furthermore, because messages can be cross-posted to multiple newsgroups, it is not unusual for the same or overlapping discussions to appear in multiple groups. Although

asynchronous CMC appears to enhance coherence in the composition of individual messages, inter-turn coherence seems to be greatly disrupted as compared to spoken conversation.

Werry's study (1996) deals with the linguistic and interactive features of IRC. His data consist of logs of two 10-minute conversations that are taken from two channels, one in English and the other in French. Werry gives a description of some general characteristics of IRC conversation, such as the absence of turn-taking mechanisms and overlap. He then proceeds to examine the conventions of addressivity. He finds that most of the time participants put the intended adressee's name at the beginning of a message. He explains this convention as an attempt to avoid ambiguity. He also notes that participants do not stick to this convention when addressing all the users in a chat room or when the intended addressee can be clearly inferred from the context.

Next, Werry addresses the abbreviation phenomenon which is very common in IRC. According to him, this phenomenon results from factors such as screen size, average typing speed, minimal response times, competition for attention, channel population, and the pace of channel conversations. All these factors combined lead to the pervasive use of abbreviations. For example, the average length of messages in Werry's corpus is around six words. Furthermore, Werry

gives examples illustrating the frequent use of syntactically reduced forms, acronyms, symbols, and clipping of words. A popular example of syntactically reduced forms is the frequent deletion and reduction of subject pronouns, particularly for first and second person pronouns. Illustrations of the other three phenomena include commonly used Internet acronyms such as 'lol', emoticons, and the abbreviation of participants' names and words to the least number of letters possible. Another, more technical, way of overcoming the medium's restrictions is the use of macros to store phrases that a participant uses quite often. A succession of certain preprogrammed keys is pressed to run the macro which triggers the display of these phrases.

He also considers the attempts made by participants to recreate aspects of spoken language through graphic and orthographic means an indicator of the essential "orality" of IRC. According to Werry, participants on IRC simulate the effects of voice, tone, and gesture through the creative use of capitalization (WHAT was that?), spelling (Cooool!), and punctuation (I don't know … We'll see.), the written reproduction of particular registers or dialectal qualities of speech ("G'day," "vewy intewestin") and graphic simulations of sounds such as laughter (Ha ha) and snarls (Grrrrr) (pp. 57-59). Capitalization most often signals stress and volume, periods and hyphens signal pauses, and reduplication of letters signals drawn-out intonation. In this context, Werry also notes that IRC tends to be highly

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colloquial. He states "[c]olloquial verbalizations and non-standard spelling appear to be self-consciously selected in preference to 'standard' linguistic expressions." (Werry, 1996: 57)

Lastly, he surveys the different ways in which IRC users employ words and visual images to symbolize gestural aspects of face-to-face interaction. For instance, users spelled out an action and enclosed it by asterisks such as *shakes hands*, *offers coffee*, or *hugs*. Werry also mentions special programs that allow users to display graphical images (e.g. Rose) consisting of ASCII characters. The images then accompanied actions: Juliet sends thee a rose …@}-,-`,--- (Werry, 1996: 61).

Werry concludes that the linguistic and interactive features discussed in his study are the result of IRC users' attempts to compensate for and adapt to the constraints of the medium and that "communication on IRC is shaped at many different levels by the drive to reproduce or simulate the discursive style of face-to-face spoken language." (Werry, 1996: 61)

In his study of turn-taking organization, Lunsford (1996) applies the conversational model proposed by Sacks et al. in 1974 to IRC. His data consists of the logs of four 15-minute IRC conversations. Lunsford finds that although turn-taking occurs in the sense that speakers alternate, IRC technology imposes some

specific adaptations on its mechanisms. For example, due to the fact that the IRC server automatically displays the messages in the order in which it receives them, there is neither speaker selection nor overlap in the conversation. Lunsford argues that because of this, repair mechanisms do not exist since turn-taking errors cannot occur and all forms of overlap are manifested as separate turns. Furthermore, the technology enables the user to participate in multiple simultaneous conversations. Lunsford notes that there is a tendency for messages to be short and that users add the name of the intended addressee at the beginning of their messages. He also finds that gaps regularly occur between logically related turns and between messages and responses. He concludes his work by identifying two outstanding issues for future research: miscommunication due to physical distance and backchanneling.

McCarthy, Wright, and Monk (1992) studied coherence in text-based electronic conferencing. They relied on conversation analysis to investigate the factors that interfere with coherence in synchronous online conversation. The main point of their study is what they call *parallel topic development*. This concept refers to a practice, which is very common in synchronous CMC, in which several topics are introduced and developed in an intertwined manner over the course of several exchanges. According to McCarthy et al. (1992), parallel topic development is far less common in face-to-face conversation as opposed to CMC.

They propose that CMC users are able to simultaneously engage in multiple conversations because they have access to a persistent record of these conversations. Also, McCarthy et al. (1992)suggest that the lag between messages that users experience in synchronous CMC could count as one of the motives behind this phenomenon. They argued that it is inevitable for participants in online discussions to develop strategies that are specific to their environment for the purpose of maintaining coherence. Three strategies were proposed in the study: *addressing, sequential organization*, and *message compression*. Addressing refers to the acts of naming the recipient of a message and fully or partially quoting some previous message to which the participant is responding. Sequential organization is used to develop a point-by-point response to prior discussion so that the response and prior discussion are structurally parallel. The message compression strategy is used specifically in synchronous discussion; it involves splitting long messages into shorter sequences and rapidly contributing them to the conversation. This strategy enables the participant to keep the floor through a rapidly delivered series of brief comments.

Moran (1991) cited the research of Sacks et al. (1974) to identify the differences between spoken conversation and asynchronous online discussion. According to Sacks et al. (1974), in spoken conversation, it is unlikely to find more than one person speaking at a time. When two people do find themselves speaking

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at the same time, one of them stops abruptly to repair the situation. There is nothing similar to this in asynchronous discussion. Also, in face-to-face conversation, one must listen and pay attention to how the topic is being developed in order to get an opportunity to speak. However, in asynchronous discussion, there is nothing that obliges the participant to read the contributions of others. As a consequence, online discussions tend to be divergent rather than convergent.

Wilkins (1991) studies 377 entries in a publicly accessible 'topic', which is an asynchronous computer messaging system similar to a newsgroup but with an added capability for synchronous conversations. Thus, her data are a mixture of synchronous and asynchronous material. She addresses the question of whether or not CMC would inherit its conventions from the written or spoken discourse.

She finds that the turn-taking mechanisms associated with oral conversation were not applied in her data. Instead, the means for signaling a response to a previous topic and the person it is addressed to are "taken from the conventions of written language in informal letters and memos." (Wilkins, 1991: 63). Examples of these means are the abbreviation re:, the identification of the addressee by full name, and the number of the message which is being responded to.

Next, Wilkins discusses the means participants employ for topic maintenance. She states that she "had little difficulty following, reading and

correctly interpreting a log of computer conversation in which [she] did not participate." (Wilkins, 1991: 64) She explains this as partially the result of frequent lexical repetition which participants rely on for creating textual cohesion. In contrast, oral discourse relies more heavily on pronouns to create textual cohesion.

Wilkins reports the presence of several other features typically associated with spoken discourse in her corpus. For example, in 11% of the entries participants explicitly stated paralinguistic features. The features were expressed as statements of physical actions such as grinning or ducking, and put in brackets like stage directions. The following is one of the examples given by Wilkins to illustrate this point: "we consider trying to make Unison a church for tax advantages but (sighs) we did'nt think the IRS would buy it" (Wilkins, 1991: 66).

Furthermore, Wilkins' corpus shows a high degree of involvement which is said to be characteristic of oral texts. The high incidence of first person pronouns in 63% of the entries in the corpus is explained as a representation of ego involvement. Involvement with the audience is expressed by the use of second person pronouns or names in 56% and the occurrence of questions in 21% of the entries. Markers of interest such as exaggeration and exclamation were also present in Wilkins' corpus.

Finally, Wilkins discusses two more features associated with oral discourse that occur in her data: disfluencies and innovative use of language. Disfluencies

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refer to phenomena such as hesitations, false starts, and the adding of afterthoughts. The examples provided by Wilkins to illustrate these phenomena also happen to display the innovative ways in which participants try to mimic prosodic features such as the use of capitalization and punctuation. She also cites a play on words in her corpus as an example of innovation in language.

Wilkins concludes that her samples share more characteristic features with traditional, spoken, unplanned, involved discourse than with written, edited, and informational texts. She hypothesizes that the oral character of CMC contributes to the strong feeling of community that the participants in her study reported.

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Chapter 3

Methods

3.1 Data Collection and Analysis

This study is based on the analysis of an IRC corpus which was compiled at irregular intervals over the course of two months. The corpus consists of log files of public group interaction on the IRC channel #ubuntu. This popular chat channel is dedicated to providing technical support to users of the Ubuntu software which is a widely used operating system.

The examples discussed in the study are taken from this particular channel because the researcher assumes that its participants are more likely to be experienced users of IRC who use it regularly to communicate with each other. This assumption is based on the observation that the Ubuntu software is mostly used by techies in comparison to Windows which is considered as mainstream software. Another factor behind choosing the #ubuntu channel is the fact that the interaction in this channel is task-focused since users are helping each other to resolve technical issues and problems by exchanging tips and experiences. The focus in this study is on *task-oriented* group chat as opposed to recreational chat.

It is important to note that the log files retrieved for the purposes of this study reflect the specific structure adopted by the IRC client (i.e. software used for

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accessing the IRC system) used, namely mIRC. Therefore, they may contain different structural information from what could be retrieved from another IRC client. Figure 1 illustrates the structure of the log files that were used.

```
[09:50] <brez> sacarlson: thank you -- would you recommend any other type of DLNA software I could use? I basically have a Ubuntu box with 1TB HDD, 4 GB RAM dual core processor with it's primary use being for streaming movies/music to my 60" LED in my lounge room.
[09:51] * Dragnslcr (~scott@c-76-118-7-184.hsd1.ma.comcast.net) Quit (Read error: Connection reset by peer)
[09:51] <mogaj> My cd rom not ejecting … my os ubuntu 11.10
[09:51] <sacarlson> brez: might take a peak at ppa if they have added any changes
[09:51] * redscare (~lenskiy@BAKER-SEVEN-THIRTY.MIT.EDU) has left #ubuntu
[09:51] * vector (~vector@host-155-81-2-96.midco.net) has joined #ubuntu
[09:51] * karthick87 (~karthick@shellium/member/karthick87) has joined #ubuntu
[09:51] * eights (~eights@unaffiliated/eights) Quit (Ping timeout: 246 seconds)
[09:52] * scientes_ (~scientes@unaffiliated/scientes) Quit (Remote host closed the connection)
[09:52] * free_loader (~aswin@106.51.73.100) has joined #ubuntu
[09:52] * txdv (~quassel@dslb-094-220-206-156.pools.arcor-ip.net) Quit (Ping timeout: 245 seconds)
[09:52] * flamen (~flamen@62.83.22.30.dyn.user.ono.com) has joined #ubuntu
```

Figure 1. Log file from mIRC

The excerpt in Figure 1 is from mIRC, which is the IRC client used in this study. The interaction was automatically logged by the client and saved in a specific folder. The log files contain three major types of information: the time the message was sent, the participant's self-chosen nickname, and the message posted by the participant. System messages informing participants about the arrival and departure of other members are also included in the log files. These log files were transferred into an Excel file so that they can be analyzed more conveniently.

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3.1.1 The Tool

Internet Relay Chat (IRC) is a popular mode of synchronous CMC. It was the first Internet protocol to allow real-time text-based interaction between large numbers of people at different physical locations. It was first introduced in 1988 and rapidly grew in popularity. Because IRC facilitates synchronous group interaction, it has been incorporated and embedded into several other CMC modes that support multiparty interaction such as Internet forums and multi-participant online games. Based on the topic of discussion, the IRC system is divided into several virtual spaces known as channels. The user needs to join a channel before s/he can partake in its discussions. Also, users can join several channels simultaneously.

IRC has three major features that set it apart from other CMC environments. It is multi-participant, synchronous and text-based. Message transmission in IRC is 1-way rather than 2-way. This means that the interlocutors do not know that a message is being typed to them until it is completed and sent. This particular feature of IRC has been considered problematic because it precludes the possibility for simultaneous feedback.

Another problematic aspect of IRC is the way it organizes and displays messages. IRC servers display messages in the order in which they are received,

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i.e. in a chronological order, with no regard for what they are responding to. This mechanism results in the overlapping of multiple conversational threads and is, therefore, a major cause of disrupted turn adjacency (Baron, 2010). Logically-related messages become separated as messages from other simultaneously ongoing conversations intervene between them.

Users' conversations are further interrupted by system messages which are automatically inserted to announce the arrival and departure of participants. These messages are similar to users' messages except that they are preceded by an asterisk. The IRC software keeps recent messages displayed on the screen until newer messages cause them to scroll up and eventually off the screen. Even after being pushed off the screen, the user can still review previous messages by scrolling up. For this reason, IRC conversation is considered to be persistent. This affordance of IRC makes it possible for users to engage in multiple conversations simultaneously as it reduces the cognitive load on them by providing persistent transcripts of the conversations.

In order to access IRC, one is required to use a software program known as an IRC client. There is a wide array of IRC clients that one can choose from. The specific IRC client used in this study was mIRC since it is the most popular among IRC users. Figure 2 is a screen shot from mIRC showing interaction on an IRC channel.
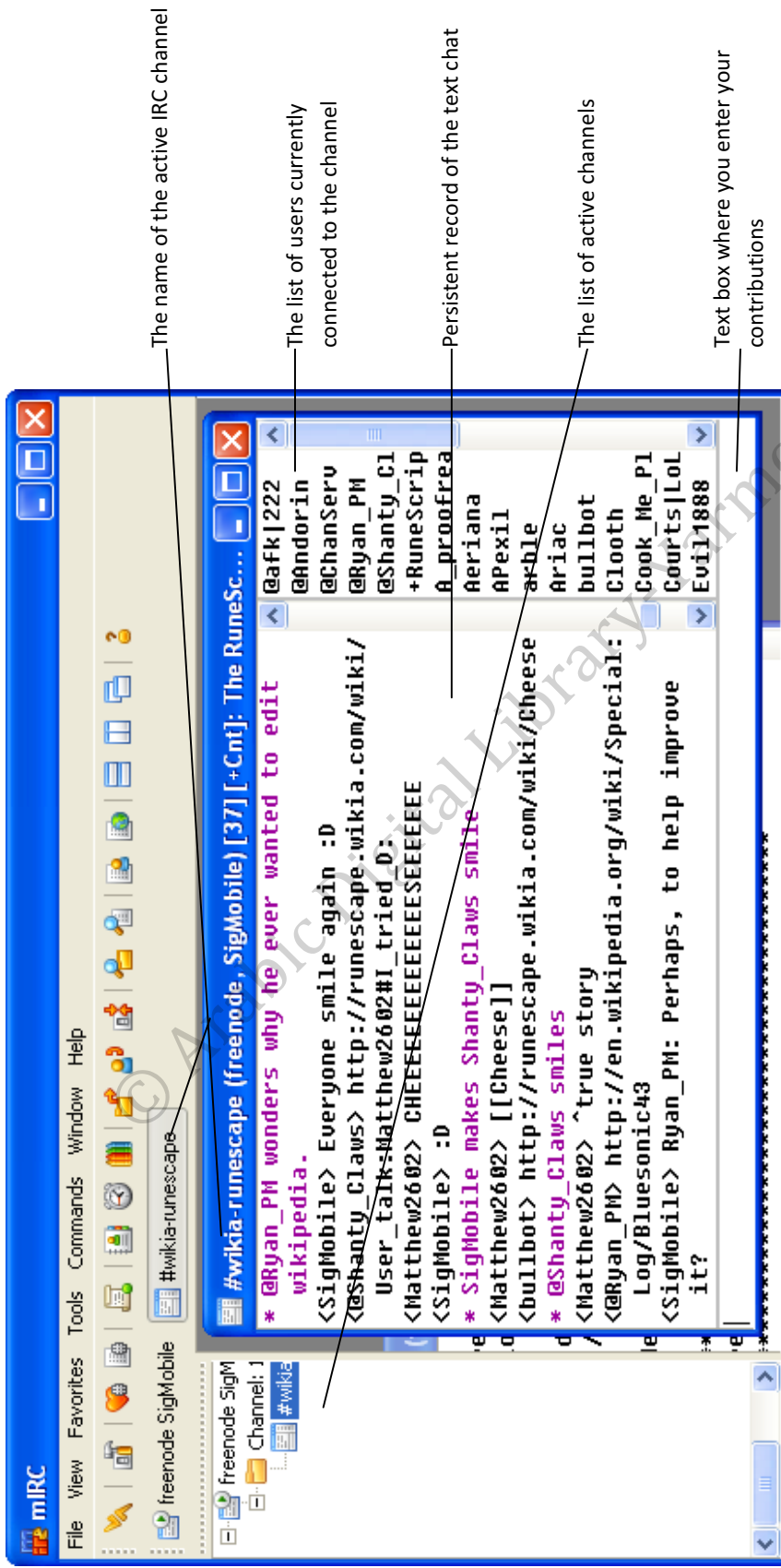
Figure 2. Screen shot from mIRC

The name of the active IRC channel

The list of users currently connected to the channel

Persistent record of the text chat

The list of active channels

Text box where you enter your contributions

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3.2 Statement of the Problem

According to Crystal (2006), CMC may favor violations of the Gricean maxims because the CP depends on extra-linguistic knowledge which is absent in many CMC situations. Ambiguity and misunderstanding are very likely to occur in text-based CMC, which is not enriched by tone of voice, facial expression, body language, or personality cues. Therefore, this studyendeavors to find out what strategies CMC users employ for the maintenance of relevance and creation of coherence.

3.3 Purpose of the Study

This study investigates the role and the observance of the Gricean maxim of relevance in computer-mediated conversations. It analyzes the discursive devices that CMC users rely on to observe this maxim and explores the ways in which these users observe or violate the maxim. In general, the study deals with the characteristics of CMC and with the applicability of the cooperative principle in the different contexts of CMC.

3.4 Questions of the Study

1. How is the maxim of relevance implemented in CMC interactions?

2. What would count as an implementation of the relevance maxim in a CMC situation and what would be read as a violation?

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3. Does disrupted turn adjacency interfere with relevance in IRC interaction?

4. What are the strategies employed by IRC users for the establishment of coherence and maintenance of relevance?

3.5 Significance of the Study

This study may give us some insight into how CMC users manage to communicate with each other efficiently and effectively despite the many constraints and limitations that are imposed by the medium of communication. It may also reveal the communicative norms that are adopted by Internet discussants and give us a glimpse of how these discussants maintain intelligibility and coherence in this specific communicative situation. The findings of the study will hopefully enable us to understand how interactants in a CMC situation evaluate the observance or violation of the conversational maxim of relevance.

Chapter 4
Findings and Discussion

4.0 Introduction

In this chapter, evidence is presented to demonstrate how sequential relevance is violated in text-based synchronous CMC. The disruption of sequential relevance is imposed by the technological constraints of the medium. Examination of the corpus compiled for this study shows that disrupted turn adjacency has become the norm rather than the exception in IRC. This situation is caused by two major features of the IRC system: interpolated system messages and overlapping conversational threads.

Although disrupted adjacency of logically-related messages is prevalent in the corpus, it does not appear to cause any serious problems with referencing and rarely results in miscommunication. To keep their messages coherent, participants employed the following strategies: adjacency pairs, lexical repetition and lexical substitution, linking expressions and addressivity. Detailed examples of these strategies are given below.

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4.1 Disruption of Sequential Relevance

4.1.1 Interpolated System Messages

In the corpus compiled for this study, there are 40127 messages. Out of these messages, 16695 are user-generated messages; the rest are messages automatically produced by the system. System messages thus constitute 58% of all messages in the corpus. Excerpts 1 and 2 illustrate this finding.

Excerpt 1

1	[15:14] <mohtadi_> iceroot: sorry i had to reboot my PC (in case you've wroten anything)
2	[15:14] * LjL (~ljl@unaffiliated/ljl) has joined #ubuntu
3	[15:15] <mohtadi_> join #ptxdist
4	[15:15] * captine (~captine@111.68.53.107) Quit (Read error: Connection timed out)
5	[15:15] <Captain_Proton> oyugik_, sure how do you know the ip or how are you trying to connect
6	[15:15] * martinphone (~richess@23.Red-81-35-215.dynamicIP.rima-tde.net) has joined #ubuntu
7	[15:15] <DannyButterman> oyugik: I can try to help. what is your printer ?
8	[15:15] * neurotech_ (~neurotech@124.168.2.84) has joined #ubuntu
9	[15:15] * altin (~altin@flossk/altin) Quit (Quit: Leaving)

Excerpt 2

1	[23:42] * jacques_ is now known as Guest68175
2	[23:43] <squid> KM0201: lol..
3	[23:43] * duckxx (~pat@rrcs-184-75-111-154.nyc.biz.rr.com) has joined #ubuntu

Lines [2], [4], [6], [8] and [9] in Excerpt 1 are messages generated by the IRC system. These messages serve as notifications of the arrival (e.g., lines [1], [6] and [8]) and departure (e.g., lines [4] and [9]) of participants. As illustrated by the first message in Excerpt 2, a notification is also displayed when a user changes his

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nick – the name by which s/he is known in the channel. System messages are always prefaced with an asterisk and displayed in a different color so that they can be easily distinguished from user contributions. They also have a fixed format that is programmed into the system.

It is striking to see that system messages outnumber intentional user contributions in the corpus just as they do in Excerpt 1. This phenomenon, however, can be attributed to the hyper-activity of the IRC channel from which the corpus was compiled. In active IRC channels where hundreds or thousands of users simultaneously engage in discussions, there will typically be many people joining or leaving the channel on a constant basis. The IRC system reports this change in channel membership by interpolating its notifications into ongoing conversations.

As a consequence, system messages end up disrupting intentional communication between participants. Logically-related conversational turns become thus separated by irrelevant messages that are constantly injected by the system into the discussion.

4.1.2 Overlapping Conversational Threads

The interleaving of multiple conversational threads is another major cause of disrupted turn adjacency in IRC. Logically-related conversational turns are frequently separated by messages from other conversations that are developing simultaneously.

In Excerpt 3, Mohtadi_'s response toIceroot in line [2] interrupts Oyugik_ and Captain_Proton's ongoing conversation. The same goes for Netiru and Rumpe1's exchange in lines [6] and [7] which interrupts Oyugik's answer in line [8] to Captain_Proton's question in line [4]. For the sake of convenience, system messages have been excluded from this excerpt and all the other following excerpts because they make the samples unnecessarily long and do not pertain to the points discussed in them.

Excerpt 3

1	[15:13] <oyugik_> Captain_Proton: I am having hell connecting to a network printer, any help?
2	[15:14] <mohtadi_> iceroot: sorry i had to reboot my PC (in case you've wroten anything)
3	[15:15] <mohtadi_> join #ptxdist
4	[15:15] <Captain_Proton> oyugik_, sure how do you know the ip or how are you trying to connect
5	[15:15] <DannyButterman> oyugik: I can try to help. what is your printer ?
6	[15:15] <netiru> Hi, in bash, how can I easily navigate in a long output (if I enter 'svn help' for instance)?
7	[15:17] <rumpe1> netiru, "svn help | more"
8	[15:17] <oyugik_> I am trying to connect via ipp/lpr/samba ... which is the best method to use?
9	[15:17] <ahhughes_> I really miss my task bar, it tells me what I have running :(otherwise I waste time alt_tabbing, or inadvertently starting a new instance when it is not required
10	[15:18] <oyugik_> Captain_Proton: I am trying to connect via ipp/lpr/samba ... which is the best method to use?
11	[15:18] <netiru> thanks rumpe1!
12	[15:19] <mohtadi_> hi everyone :) i'm asking again my question :) i rebooted once my ubuntu (…)
13	[15:19] <mohtadi_> my ubuntu is 10.04 LS
14	[15:20] <Captain_Proton> oyugik_, if you do just a "find network Printer" does it come up
15	[15:21] <neurotech> Does anyone use Smuxi IRC?
16	[15:22] <krababbel> I did!
17	[15:24] <oyugik_> Captain_Proton: it does, but on the section for drivers, I dont have the correct ppd file for Sharp AR 5520 printer, hence when I choose a different one it sends the data but nothing prints
18	[15:27] <caddoo> what is the best way to see if port 443 is routing through a firewall and to a ubuntu machine succesfully
19	[15:28] <fl1bbl3> https://ipaddress

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20	[15:29] <caddoo> well I'm having a disagreement with the company that manages the router/network I'm trying to get through
21	[15:29] <Stanley00> caddoo: how about run nc to listen on 443, and echo "hello" if it's connected. and then from other machine, telnet 443 ?
22	[15:29] <fl1bbl3> or nc -p 443 -l < echo BLAH BLAH BLAH
23	[15:29] <caddoo> ok
24	[15:29] <CrazyGangster> Hello ppl, there is a way to install a grid window organizer in LXDE like compiz do?
25	[15:29] <_zoom_> guys, how to establish a vpn connections at boot-time
26	[15:29] <_zoom_> ?
27	[15:30] <caddoo> fl1bbl3: echo no such file or dir
28	[15:33] <Captain_Proton> oyugik_, well I see they do not offer linux driver, so the best thing you can try is use HP Laserjet 5n driver

In the above Excerpt, four ongoing conversations and four failed attempts at initiating a conversation are intertwined. The four conversations become easier to see when the irrelevant messages are omitted from each conversation, resulting in four separate exchanges as shown in a, b, c, and d:

a)

1	[15:13] <oyugik_> Captain_Proton: I am having hell connecting to a network printer, any help?
4	[15:15] <Captain_Proton> oyugik_, sure how do you know the ip or how are you trying to connect
5	[15:15] <DannyButterman> oyugik: I can try to help. what is your printer ?
8	[15:17] <oyugik_> I am trying to connect via ipp/lpr/samba ... which is the best method to use?
10	[15:18] <oyugik_> Captain_Proton: I am trying to connect via ipp/lpr/samba ... which is the best method to use?
14	[15:20] <Captain_Proton> oyugik_, if you do just a "find network Printer" does it come up
17	[15:24] <oyugik_> Captain_Proton: it does, but on the section for drivers, I dont have the correct ppd file for Sharp AR 5520 printer, hence when I choose a different one it sends the data but nothing prints
28	[15:33] <Captain_Proton> oyugik_, well I see they do not offer linux driver, so the best thing you can try is use HP Laserjet 5n driver

b)

2	[15:14] <mohtadi_> iceroot: sorry i had to reboot my PC (in case you've wroten anything)
3	[15:15] <mohtadi_> join #ptxdist
12	[15:19] <mohtadi_> hi everyone :) i'm asking again my question :) i rebooted once my ubuntu (…)
13	[15:19] <mohtadi_> my ubuntu is 10.04 LS

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c)

6	[15:15] <netiru> Hi, in bash, how can I easily navigate in a long output (if I enter 'svn help' for instance)?
7	[15:17] <rumpe1> netiru, "svn help | more"
11	[15:18] <netiru> thanks rumpe1!

d)

18	[15:27] <caddoo> what is the best way to see if port 443 is routing through a firewall and to a ubuntu machine succesfully
19	[15:28] <fl1bbl3> https://ipaddress
20	[15:29] <caddoo> well I'm having a disagreement with the company that manages the router/network I'm trying to get through
21	[15:29] <Stanley00> caddoo: how about run nc to listen on 443, and echo "hello" if it's connected. and then from other machine, telnet 443 ?
22	[15:29] <fl1bbl3> or nc -p 443 -l < echo BLAH BLAH BLAH
23	[15:29] <caddoo> ok
27	[15:30] <caddoo> fl1bbl3: echo no such file or dir

Determining which turns relate to which is facilitated by the fact that chat users often introduce their messages with the name of the intended addressee (in this case, their IRC nickname). This practice was termed 'addressivity' by Werry (1996).

4.1.3 Redundancy

Redundancy is very common in IRC discussions. In the following Excerpt, we can observe two instances of redundancy.

Excerpt 4

1	[09:49] <tj600> hi
2	[09:49] <sacarlson> brez: as seen here https://help.ubuntu.com/community/MiniDLNA (...)
3	[09:50] <tj600> hi ihr da
4	[09:50] <brez> sacarlson: thank you -- would you recommend any other type of DLNA (…)
5	[09:51] <mogaj> My cd rom not ejecting ... my os ubuntu 11.10
6	[09:51] <sacarlson> brez: might take a peak at ppa if they have added any changes

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7	[09:52] <brez> sacarlson: it's just weird that everything picks up OK, can view it on the TV, (…)
8	[09:52] <mogaj> My cd rom not ejecting … my os ubuntu 11.10
9	[09:52] <sacarlson> mogaj: can you try umount it?

In line [1], Tj600 posts his first message which is a greeting that is addressed to all participants on the channel. No one responds to his post which is typical of IRC interaction where greeting posts rarely receive a response. In line [3], he posts his greeting message again and just like the previous one no participant bothers to reply to it.

Mogaj posts a message in line [5] reporting an issue that he is having with the software. As this first message fails to attract the attention of other participants, he posts it again in line [8]. This second attempt succeeds in getting him some assistance in the form of a suggestion given by Sacarlson.

These two instances of redundancy disrupt the flow of the conversation that was taking place between Brez and Sacarlson. The four messages posted by Tj600 and Mogaj intervene between the logically-adjacent messages of Brez and Sacarlson. Sacarlson eventually engages in another conversation with Mogaj in addition to the one he is already having with Brez. The following excerpt is similar to the one above; here too, a participant posts his question repeatedly in the hope of attracting a response.

Excerpt 5

1	[12:10] <intore> now eth1 is down	
2	[12:10] <Meta> I'm going to ask again	
3	[12:11] <intore> have to bring up it?	
4	[12:11] <Meta> How do I turn off the graphical stuff in Unity? I'm using a netbook and it's making me lag.	
5	[12:11] <intore> is the same result	

In Excerpt 5, Meta seems to have asked a question earlier in the discussion but no one bothered to reply to it. He does not give up and in line [4] he asks his question again hoping that this time someone will respond to it. This situation recurs frequently in IRC conversations. In a study of a social IRC channel named #yakyak, Herring and Nix (1997) found that 18% of messages were not responded to by other participants. In another study of three asynchronous listserv discussions, Herring (2010) found that 34% of all participants who posted messages received no response. She reported that the vast majority (88%) of participants who received no responses to their messages had posted only a single message, and the remaining 12% of participants had posted only two messages. In contrast, everyone who posted more than two messages managed to attract aresponse. For this reason, some participants get into the habit of sending multiple messages to increase their chances of hooking a response.

This practice, however, is frowned upon in most IRC channels including the #ubuntu channel. The following sequence is an example of one participant warning another that he has broken channel rules by posting redundant messages.

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Excerpt 6

1	[23:46] <guntbert> !repeat | blnk
2	[23:46] <ubottu> blnk: Don't feel ignored and repeat your question quickly; if nobody knows your answer, nobody will answer you. While you wait, try searching https://help.ubuntu.com or http://ubuntuforums.org or http://askubuntu.com/
3	[23:46] <OerHeks> Walters, there is an #Ubuntu-touch irc channel here on Freenode.
4	[23:46] <mrsuchyPL> @blink don't paste the same problem

In Excerpt 6, Guntbert triggers the 'repeat' rule in response to Blnk posting his question multiple times in quick succession. In a similar vein, MrsuchyPL in line [4] asks Blnk not to post the same problem multiple times.

These failed initiations of conversation contribute to the disruption observed in multi-participant chat. Redundancy also occurs in the form of multiple participants posting an identical message or an identical response to a message. Lack of simultaneous feedbackwhich is manifested in participants' inability to see what each one of them is typing can cause them to post redundant contributions to the conversation. This type of redundancy, however, is different from the one discussed above because it is the result of system limitations and is, therefore, not user-motivated. The following excerpt illustrates how the limited capabilities of the IRC system with respect to simultaneous feedback can result in unintended redundancy.

Excerpt 7

1	[22:59] <Gnea> bs: what browser do you use?
2	[22:59] <KM0201> bs: what browser are you using?

In Excerpt 7, two participants, namely Gnea and KM0201, post messages requesting Bs to elaborate on his question. Strikingly, the two messages are almost identical in their meaning and thus redundant. Both participants were probably typing at the same time and one of them ended up posting his message fractionally quicker which is why it appears first in the sequence.

The following excerpt is an example of participants' intolerance towards redundancy:

Excerpt 8

1	[19:04] <Laika> Can someone help me with something?
2	[19:04] <wormmd> !ask | Laika
3	[19:04] <ubottu> Laika: Please don't ask to ask a question, simply ask the question (all on ONE line and in the channel, so that others can read and follow it easily). If anyone knows the answer they will most likely reply. :-) See also !patience

Here, in response to Laika's post, Wormmd triggers the channel's rule that deals with unnecessary introductions. The rule instructs participant to ask their questions directly without prefacing them with statement requesting permission for asking the question. In addition, the rule demands that participants enclose their question in a single message instead of spreading it over multiple posts. This is to prevent contributions from other users from interrupting the sequence of the question. Participants are also requested to be patient and to withhold from posting the same question repeatedly. If their question receives no response, that could be a sign that no one knows the answer. Therefore, there is no point in posting the question multiple times.

All these regulation are geared towards reducing redundancy and disrupted adjacency. If IRC users keep posting redundant messages, they will eventually interrupt the flow of ongoing conversations and increase the gap between relevant utterances. As a consequence, the coherence of interaction on the channel will be disrupted and communication between participants will become less efficient and less effective.

The following exchange demonstrates an issue that is specific to tech-oriented IRC channels. DasEi triggers the channel bot to display a block of text that instructs another participant, Harris, to refrain from posting lengthy blocks of code into the conversation:

Excerpt 9

1	[02:28:03] <Harris> sudo blkidharris@harris-HP-Pavilion-dv6000-RP296UA-ABA:~$ sudo blkid
2	[02:28:03] <Harris> [sudo] password for harris:
3	[02:28:03] <Harris> /dev/sda1: UUID="3CEA067DEA063424" TYPE="ntfs"
4	[02:28:03] <Harris> /dev/sda5: UUID="aa06274d-f8f3-47fa-afc9-f6428e628695" TYPE="ext4"
5	[02:28:03] <Harris> /dev/sda6: UUID="f185f78f-a9c2-439a-a865-09b8caad582e" TYPE="swap"
6	[02:28:06] <SetiAmon> action that didn't do anything
7	[02:28:08] <juboba> iToast, stop cying, I wrote it all with no interruption
8	[02:28:08] <DasEi> !paste
9	[02:28:09] <ubottu> For posting multi-line texts into the channel, please use http://paste.ubuntu.com	To post !screenshots use http://imagebin.org/?page=add	!pastebinit to paste directly from command line	Make sure you give us the URL for your paste - see also the channel topic.

Since the #ubuntu IRC channel is about giving technical support to the users of this software, there are many occasions where users need to post long strands of code or bulky error messages that are generated by the Ubuntu system. Posting

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these blocks of code directly into the conversation is considered inefficient since the IRC system is designed for the exchange of short messages. To deal with this limitation of the system, IRC users tend to post multiline blocks of text on some specific websites and then include the hyperlink to the webpage in their IRC messages.

In the above excerpt, one participant requests another to follow the channel guidelines and stop bulky code blocks. If all users start posting their code directly into the exchange, the IRC conversation will become very hard to follow. Besides, the code itself becomes mal-formatted when it is posted as a series of IRC messages. Therefore, posting multiline blocks of text or code on the Web is conducive to both the coherence of the conversation and the readability of the code or text.

4.1.4 Spam Posts

The proliferation of spam is a known issue that plagues all modes of CMC in varying degrees. There are a number of CMC users who join IRC channels for the sole purpose of promoting and advertising their services or products. The following exchange shows an instance of unsolicited advertisement and participants' reaction to it.

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Excerpt 10

1	[11:57] <overshift> Hi! I'm selling an account with benefit of: 500 proxies + a tip on how to pay 15$ and have unlimited proxies :). who is interestered private me
2	[11:57] <Kirk__> http://paste.ubuntu.com/921508/ [10:10] <ActionParsnip> Kirk__: also try: wget http://dl.dropbox.com/u/8850924/fixpackage; chmod +x ./fixpackage; sudo ./fixpackage
3	[11:58] <Meta> How do I turn off some of the visual BS in Unity?
4	[11:59] <Meta> I'm using a netbook and Unity makes it slow as wet week, but when I use xfce, my sound doesn't work.
5	[11:59] <oCean> overshift: don't advertise here
6	[12:00] <overshift> ok

In the above sequence, Overshift disrupts the ongoing conversation between participants by a post advertising his service in line [1]. His contribution is not in line with the discussion rules of the channel and is seen as self-promoting. In line [5], OCean posts a message requesting Overshift not to advertise in the channel. Overshift conforms to this request, as shown by his message in line [6], and stops pushing his service. In most IRC channels, promotional messages are considered a form of spam because they usually cause the conversation to drift away from its original topic and do not contribute much value to the discussion. Users who engage in such an activity are warned and eventually an IRC operator blocks them from the channel if they refuse to conform.

4.1.5 Other Problems

The disruption of sequential coherence that is caused by system messages and interleaved conversations can sometimes cause participants to lose track of the conversational thread. Excerpt 11 is an example of this.

Excerpt 11

1	[23:41] <squid> KM0201: it's very simple...just watch this short video with the instructions. http://paste.ubuntu.com/940193/
2	[23:41] <Mrokii> KM0201: Then into "plugins" I asssume?
3	[23:41] <KM0201> squid: i don't even remember what you rproblem was
4	[23:42] <KM0201> squid: lmao, that was a joke. (cuz you said you figured out how to fix a major problem with 11.10... i know how to install gnome 2.x in 11.10)
5	[23:43] <squid> KM0201: lol..
6	[23:43] <Ammar_> no I installed it using the CD
7	[23:43] <squid> just trying to help some newbies out....

In line [3], KM0201 asks Squid to remind him of the question that he was asking. KM0201 might have overlooked that question or forgotten about it as he was actively engaged in other simultaneous conversations. Then, in his next turn, KM0201 seems to remember what Squid is referring to: a mock question that KM0201 asked and intended to be ironical in response to a claim made by Squid about having solved a *major* issue that Ubuntu had. Unwittingly, Squid failed to see the irony in the question and tried earnestly to provide an answer to it. Several researchers (cf.Walther & Burgoon, 1992; Sproull & Kiesler, 1986) have addressed the problematic nature of irony in CMC situations. CMC users most often fail to detect irony and other pragmatic aspects of utterances due to the absence of social cues in most CMC environments.

The following excerpt is similar to the one above it. Here too, one participant, Jrib, fails to remember what another, Raven, was asking and requests him to restate his question. This could be the result of the user's attempt to engage

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in multiple conversations simultaneously or being involved in multitasking.

Excerpt 12

[00:21] <jrib> raven: well the alternate desktop install and the regular desktop install will leave you with basically the same system after install. What is your question?

Users' inability to manage the cognitive load imposed by the nature of interaction in IRC is manifested in their losing track of the conversational thread in which they are engaged despite having access to a persistent transcript of the conversation. The user has to choose between scrolling up to review previous parts of the conversation that he has missed or keeping track of the currently ongoing conversation.

4.2 Observance of Relevance by IRC Users

Despite the disruption that is imposed by the IRC system, users seem to be aware of the importance of the relevance maxim. This attitude is clearly reflected in the construction of their conversational turns which are most often relevant to the messages to which they are presumably responding. Examples of this abound in the corpus. Consider the following sequence:

Excerpt 13

1	[15:40] <GreekFreak> Hi all. I have a partition on my drive that I want easy access to from the terminal. At the moment I have the "cd .." a few times until I can cd into media. And THEN, the drive is labeled with a hexadecimal code. How can I make that process simpler?
2	[15:43] <Stanley00> GreekFreak: you can make that partition a label
3	[15:43] <zykotick9> Stanley00: that would only help with mounting, not cd-ing into it… GreekFreak
4	[15:44] <Stanley00> zykotick9: but next time, cd will be easier ;)

5	[15:44] <LjL> geekbri: why not just type cd /media/whatever instead of cd ..'ing repeatedly?
6	[15:44] <GreekFreak> I'm new to Ubuntu, but would a shortcut be a recommended workaround?
7	[15:44] <zykotick9> GreekFreak: what is it's full path? rather then using "cd .." could you "cd /path/to/folder"?
8	[15:45] <LjL> GreekFreak: and you can hit Tab to auto-complete the hexadecimal code, of course
9	[15:45] <Stanley00> GreekFreak: and in case you just want to cd in to that *hẽ*, you can use the <tab> key
10	(…)
11	[15:45] <GreekFreak> because it's full path is "/media/3E18014B1801041D"
12	[15:45] <zykotick9> GreekFreak: +1 on LjL TAB suggestion
13	[15:45] <LjL> GreekFreak: do type cd /me TAB 3E TAB
14	[15:45] <LjL> s/do/so/
15	[15:46] <zykotick9> GreekFreak: using Stanley00's LABEL suggestion would change the UID 3E18014B1801041D to something readable
16	[15:46] <GreekFreak> I'll into Stanley00 's label. But the TAB looks workable for now
17	[15:46] <GreekFreak> thanks guys

GreekFreak's question in line [1] initiates this IRC exchange; the question he asks concerns how to easily access a partition from the Ubuntu terminal. Stanley's response to this question in line [2] is plausibly relevant as he advises GreekFreek to turn that partition into a label. In the next turn, Zykotick comments on Stanleys's reply by pointing out that his suggestion would not work in the current situation. Stanley responds to this comment by clarifying what he actually meant in his first reply. LjL joins the conversation by proposing a new solution to GreeFreak who then states that he is not an experienced user of the software and asks if a simpler workaround such as creating a shortcut to the partition would do the trick. Zykotick requests GreekFreak to post the full path to the partition he is talking about and puts forward another solution. In line [8], LjL posts what is apparently an afterthought to the suggestion he made in line [5].

Stanley's message in line [9] informs GreekFreak about an alternate way of

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accessing the partition by simply hitting the TAB key. In response to Zykotick's question posed in line [7], in line [11] GreekFreak posts the full path to the partition that he is having issues with. After seeing the answer to his question, Zykotick recommends LjL's suggestion in line [8] which consists of hitting the TAB key to auto-complete the hexadecimal code. In lines [13] and [14], LjL elaborates on his suggestion by posting the exact code that needs to be typed probably because he recalls GreekFreak's message about being an inexperienced user of the software. In line [15], Zykotick mentions one advantage of using the solution posted by Stanley in line [2]. In the last two messages, GreekFreak concludes the discussion by stating that he will look into the two solutions proposed and by thanking the other participants for their assistance.

Excerpt 13clearly demonstrates that IRC users observe the maxim of relevance. Like in face-to-face conversation, observance of the relevance maxim appears to be the norm in CMC. This observation is not restricted to the above sequence; it is strongly attested to in all the sequences included in the IRC corpus for this study. Cross-turn relevance can be easily detected by scanning the above exchange due to the extensive use of lexical repetition. Many expressions and words recur throughout the exchange. For example, the word 'cd', which is mentioned in the first message, is also found in lines [3], [4], [5], [7], [9], and [13]. This could be an indication of how the discourse is bound together and relevance is maintained.

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The following excerpt illustrates how an IRC conversation could get derailed from its original topic. The original conversation topic is eventually restored in this particular example:

Excerpt 14

1	[23:17] <dipper> hey
2	[23:17] <dipper> hope some can help
3	[23:17] <dipper> I built my own kernel
4	[23:18] <dipper> 3.0.22
5	[23:18] <dipper> but my system is installed using WUBI
6	[23:18] <KM0201> you need to check your kernel, it's making you hit enter constantly
7	[23:18] <dipper> yeah
8	[23:18] <dipper> :)
9	[23:18] <dipper> sorry
10	[23:18] <KM0201> lmao..you built your own kernel, then used wubi?
11	[23:18] <dougl> KM0201, googling lxde
12	[23:18] <dipper> my system is installed using WUBI
13	[23:18] <KM0201> that might be the funniest thing i've ever read here.
14	[23:18] <bekks> KM0201: Thats a good one :D
15	[23:19] <grit> yes, of course KM0201 http://i42.tinypic.com/23moun7.png
16	[23:19] <Gnea> KM0201: uhm, I use wubi and I compiled my own kernel on it. what's so funny?
17	[23:19] <dipper> so the problem is that my own kernel is stuck in initramfs
18	[23:19] <dipper> I can still boot using others
19	[23:19] <Gnea> dipper: did you generate an initrd.img?
20	[23:19] <KM0201> Gnea: just strikes me as totally ridiculous.
21	[23:19] <dipper> what's the different
22	[23:19] <dipper> yeah
23	[23:19] <dipper> I did
24	[23:19] <@FloodBot1> dipper: Please don't flood; use http://paste.ubuntu.com to paste; don't use Enter as punctuation.
25	[23:19] <Gnea> KM0201: your attitude it what's rediculous. help or get out.
26	[23:20] <KM0201> Gnea: get bent,..i've been helping.. if you don't like it leave yourself
27	[23:20] <Gnea> dipper: okay, using make-kpkg? and what version of ubuntu?
28	[23:20] <Gnea> KM0201: careful now..just because you've been helping doesn't give you the right to laugh at someone elses problem.
29	[23:20] <KM0201> grit: try this
30	[23:20] <KM0201> Gnea: whatever, if you don't like it /IGNORE
31	[23:20] <Chloop> anyone recommend a modern gui util for comparing binary files? not diff based (for text files)

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32	[23:20] <Gnea> KM0201: no.
33	[23:20] <bazhang> KM0201, thats enough
34	[23:20] <grit> what should i try??
35	[23:20] <bazhang> Gnea, lets move on please

The fact that the channel is task-focused could account for why the conversation topic was so quickly restored. In recreational IRC channels where people are chatting mainly for social ends, the original topic of a conversation is rarely restored.

The conversation was going smoothly with other participants providing support to Dipper who was having an issue with his kernel. However, on line [10] the conversation starts to deviate from its topic as KM0201 makes fun of Dipper's previous statement. KM0201 continues with his remarks that make fun of Dipper on line [13]. Grit in line [15] and Gnea in line [16] respond to KM0201 by stating that there is nothing funny about what Dipper has said. Contrary to KM0201, these two participants do not see any problem with the way Dipper compiled his system.

The subsequent turns are then restored to the original topic of the conversation and they try to address the issue that Dipper was having. However, KM0201 in line [20] resumes his fun party by stating that the way Dipper mounted his system is ridiculous. Dipper then asks KM0201 about the exact issue that he is laughing at. As Dipper posts three short messages in quick succession, he triggers the @Floodbot1 which warns him against flooding the channel with his posts. Gnea addresses KM0201's mocking messages and asks him to help or leave the

channel. He also tells him that assisting in the channel does not entitle him to make fun of other channel members. In line [30], KM0201 responds to Gnea by telling him to use the /IGNORE function to ignore any messages posted by him. Finally, another member, Bazhang, steps in and requests KM0201 to stop disrupting the flow of conversation. KM0201 eventually stops posting his irrelevant messages. Bazhang, then, asks Gnea to move on with the original topic of the conversation.

4.3 Strategies for Coherence Maintenance

4.3.1 Addressivity

The important role that addressivity plays in weaving the fabric of IRC conversations can be observed in the following exchange.

Excerpt 15

1	[00:13] <jrib> Lint: pastebin the output of: ls -ld /pub /pub/Videos /pub/Videos/something.flv
2	[00:13] <IntuitiveNipple> Lint: "500" will be the numerical ID, not the user-name
3	[00:13] <Lint> I checked, the other distro has no such user or group
4	[00:14] <Lint> what do you want to see there? I could but it will take much time
5	[00:15] <jrib> !who| Lint
6	[00:15] <ubottu> Lint: As you can see, this is a large channel. If you're speaking to someone in particular, please put their nickname in what you say (use !tab), or else messages get lost and it becomes confusing :)

Since joining the conversation, Lint never adhered to the convention of addressivity. His messages were posted with no indication of who they are addressed to. The confusion that resulted from this practice led Jrib, another participant in this conversation, to explicitly request Lint to include the intended addressee's nickname in his future messages. This request was performed by typing a predefined string of text by Jrib in line [5] that triggered information

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related to the addressivity convention in line [6]. This feature of triggering specific pre-written rules of discussion where needed is peculiar to the #ubuntu IRC channel and not readily available as part of the IRC system.

In the above sequence, we can see that there are two participants interacting with Lint, namely Jrib and IntuitiveNipple. Both participants observe the addressivity rule in their messages. Ubottu should not be confused for a human participant; it is actually a bot that can be triggered by users to post reminders of channel rules of discussion or explanations of technical terms that are commonly used in the channel.

4.3.2 Lexical Repetition

Lexical repetition is a common strategy used by IRC users to establish coherence and maintain relevance. The vast majority of the messages in the corpus include lexical repetition. The following excerpt demonstrates the use of lexical repetition in an IRC exchange.

Excerpt 16

1	[09:39] <newtothisworld> Any advice on a Free IRC client for windows.
2	[09:40] <sacarlson> newtothisworld: everything in ubuntu is free so take your pick
3	[09:41] <newtothisworld> I want a free "windows" IRC client.
4	[09:41] <sacarlson> newtothisworld: I prefer pidgin but there must be about 10 more
5	[09:41] <sacarlson> newtothisworld: yes it runs as a gui app
6	[09:42] <newtothisworld> ok I'll try Pidgin.
7	[09:42] <newtothisworld> Thanks.
8	[09:43] <sacarlson> newtothisworld: but if you asked the question in the wrong channel then you might have got the wrong answer

In the above Excerpt, Newtothisworld asks for advice about free IRC software for Windows. Sacarlson replies to his request telling him that all software in Ubuntu is free. He fails to notice that Newtothisworld is looking for *Windows* software and not Ubuntu. In his next message, Newtothisworld emphasizes Windows by enclosing it with quotation marks. Sacarlson realizes what his interlocutor is actually looking for and responds by stating his preferred Windows IRC client. But in his last turn, he justifies the misunderstanding that occurred in the first exchange by reminding Newtothisowrld that this is an Ubuntu channel not a Windows one.

The following lexical items were used repeatedly in the exchange: free, IRC client, windows, ubuntu and pidgin. The connection between the various messages in the exchange becomes easier to identify thanks to the use of lexical repetition among other things. It is not uncommon to find exchanges where several strategies of coherence creation are used simultaneously. Excerpt 17 constitutes one instance of this phenomenon.

Excerpt 17

1	[11:04] <Elijah> What method of connection does the software center use? http, https?
2	[11:04] <Seveas> http

Despite the absence of addressivity in the above excerpt, it is quite clear that the two messages are related. Three strategies are employed: lexical repetition,

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ellipsis and adjacency pair. Thanks to these strategies, even if the two messages were separated by irrelevant messages, they still could be linked together.

The use of lexical repetition can also assist in resolving ambiguous contributions to the discussion as shown in the sequence below:

Excerpt 18

1	[11:29] <intore> hi, i want boot my ubuntu 10.10 computer using the console and am trying to configure /etc/network/interfaces about the wireless connection
2	[11:29] <intore> it doesn't work
3	[11:29] <ActionParsnip> intore: sounds reasonable enough. I'd suggest using wicd-curses instead. Bit easier
4	[11:30] <intore> why it doesn't work?
5	[11:31] <auronandace> !10.10
6	[11:31] <ubottu> Ubuntu 10.10 (Maverick Meerkat) was the thirteenth release of Ubuntu. Download http://releases.ubuntu.com/10.10/ - Release Info: http://www.ubuntu.com/getubuntu/releasenotes/1010

In Excerpt 18, Auronandace's answer in line [5] to Intore's question may seem ambiguous. He simply types '!10.10'. This expression triggers the channel's bot, Ubottu, to give more details about this '10.10'. Ubottu states that this is a former release or version of Ubuntu and posts a link where more details can be found. We also notice that Intore's first message included reference to this version "i want boot my Ubuntu 10.10 computer…". We can then conclude that Auronandace's answer is linked to Intore's question through lexical repetition.

In the following excerpt, two conversational threads are intertwined. However, the connection between the turns of each thread can be easily established due to the use of lexical repetition and addressivity.

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Excerpt 19

1	[12:22] <saruji> ok, pulling my hair out, please?! does anyone know where the error log file is in ubuntu for apache?
2	[12:22] <goer> s3r4f1m: all the best...
3	[12:22] <oCean> saruji: /var/log/apache2/
4	[12:22] <s3r4f1m> the disk is still working
5	[12:22] <intore> here i am
6	[12:22] <intore> am sorry
7	[12:22] <saruji> thank you oCean
8	[12:22] <s3r4f1m> i hear him working
9	[12:22] <intore> is impossible work
10	[12:22] <intore> uff
11	[12:22] <goer> s3r4f1m: ok, use live CD then
12	[12:22] <intore> have you seen my paste?
13	[12:23] <saruji> also does anyone know how to check what version of linux I am running from command prompt?
14	[12:23] <oCean> saruji: lsb_release -a

In line [3], OCean replies to Saruji's question and in his reply he repeats two lexical items that were used by Saruji, 'log' and 'apache'. In the other conversation between S3r4f1m and two other participants, lexical repetition is clearly there. The word 'work', for instance, is mentioned first in line [4] and then reused in lines [8] and [9].

4.3.3 Lexical Substitution

Lexical substitution is another common strategy that is used for coherence maintenance. Many messages in the corpus are linked through this cohesive device. For example, numerous instances of lexical substitution can be identified in the following excerpt:

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Excerpt 20

1	[10:05] <mogaj> DropOfSerenity ; i am using laptop there is cd/dvd rom … am trying to open it to put a cd
2	[10:05] <DropsOfSerenity> mogaj, sudo eject
3	[10:05] <mogaj> DropOfSerenity: that too not working :)
4	[10:05] <mogaj> :(
5	[10:05] <DropsOfSerenity> hmmm
6	[10:06] <dr_willis> that is weird
7	[10:06] <DropsOfSerenity> might be stuck
8	[10:06] <jayar> paperclip
9	[10:06] <DropsOfSerenity> there should be a hole in the front of it, about needle sized, if you stick a paperclip in it it will open.
10	[10:06] <dr_willis> yep.. clippy to the rescue
11	[10:06] <dadanopan> best method (safiest) to erase data from an extern ssd?
12	[10:06] <dr_willis> dadanopan: just delete it.
13	[10:07] <ActionParsnip> mogaj: try: sudo eject /dev/sr0
14	[10:07] <DropsOfSerenity> dadanopan, look into dd
15	[10:07] <jayar> drag it to trash
16	[10:07] <DropsOfSerenity> you can write 0's over the entire disk, or random data
17	[10:07] <DropsOfSerenity> that's the most secure way
18	[10:07] <JermBob> hey people
19	[10:07] <dr_willis> secure deletion tools exist. but are normally overkill

Mogaj in line [3] substitutes *that* for *sudo eject* which is first used by DropsofSerenity in line [2]. Lexical substitution is also employed by Dr_willis in his reply to Dadanopan in line [12] where he substitutes *it* for *data*. The same is done by Jayar in line [15] although he does not explicitly mention Dadanopan as his addressee but this can be easily inferred from his reply. There are also a bunch of other lexical substitution instances in the above sequence such as ('delete it' in line [12], 'drag it to trash' in line [15], 'write 0's over the entire disk' in line [16], and 'deletion' in line [19] which are used synonymous substitutions of 'erase data' in line [11]).

4.3.4 Adjacency Pairs

A great number of the messages in the corpus were identified as the second pair part of an adjacency pair. Adjacency pairs constitute one coherence creation strategy that is commonly used by IRC users. Excerpt 21 shows how adjacency pairs can help in identifying the link between related messages.

Excerpt 21

1	[12:26] <travelmate> il portale italiano?
2	[12:26] <oCean> intore: again, try to keep the description (and pastebin links etc) in single line
3	[12:26] <oCean> !it | travelmate
4	[12:26] <ubottu> travelmate: Vai su #ubuntu-it se vuoi parlare in italiano, in questo canale usiamo solo l'inglese. Grazie! (per entrare, scrivi « /join #ubuntu-it » senza virgolette)

In the above sequence, four strategies are used to connect the three logically-related turns in lines [1], [3] and [4]. *Addressivity* is the first strategy used by OCean and Ubottu to identify Travelmate as the intended addressee of their messages. Their messages, however, can be identified as responses to Travelmate's question even if addressivity were not used because they both use the abbreviation 'it' as a *substitute* for the word 'italiano' which is used by Travelmate in his question. Moreover, their replies represent the second part of an *adjacency pair* as they are answers to a question. The *use of Italian* by Ubottu in line [4] explicitly links its message to Travelmate's question in line [1] which is also expressed in Italian.

In the excerpt below, we observe how adjacency pairs contribute to coherence maintenance by connecting non-adjacent logically-related turns even when the gap between these turns is quite significant.

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Excerpt 22

1	[23:25] <KM0201> Mrokii: what browser, and what version of flash?
	(…)
2	[23:29] <Mrokii> khaard: Opera, Firefox and Chrome. Flash Version is 11.2.202 I think.
3	[23:29] <Mrokii> oops wrong nick.

In Excerpt22, Mrokii responds to a previous message by KM0201. However, he prefaces his reply with the wrong nickname. Bearing in mind that there are 45 messages separating Mrokii's reply from the message replied to, one might conjecture that this mistake in the intended addressee's name will result in confusion and misunderstanding. The situation is, nonetheless, saved by lexical repetition and adjacency pair. Mrokii's answer constitutes the second part of an adjacency pair. The words 'version' and 'flash' are used in both messages which constitute lexical repetition. Lexical substitution is manifested in the use of the words "Opera, Firefox and Chrome" which are types of browsers. Mrokii, however, realizes his mistake and reports it in his subsequent message but he still does not give the correct name of his intended addressee.

4.3.5 Linking Expressions

It is very common for IRC users to break their turns into several messages. In other words, instead of expressing an idea in one single message, they break it down into multiple short messages which are posted in quick succession. There are several factors that account for this behavior. A plausible explanation is that the

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participant does not want to yield the floor until s/he expresses his/her full idea and at the same time s/he wants to do so before the conversation moves on to a different topic.

To show that their messages are related to each other, participants tend to break them at clause level or right before a linking expression. Thus, the continuation message which begins with a linking expression or contains a stranded clause shows a clear connection between it and the preceding message by the same person. Instances that include the use of this strategy abound in the corpus. The following excerpt clearly illustrates this point:

Excerpt 23

1	[10:11] <JermBob> will the name server be installed too ?
2	[10:11] <ROYAL> Hello, I will wait until JermBob is done, and then I will ask about my issue
3	[10:11] <JermBob> im done. ROYAL go for it
4	[10:11] <dr_willis> name server?
5	[10:11] <ROYAL> I have an audio issue
6	[10:11] <bkkrocks> I'm have a clean install of Ubuntu 11.10. When I do an apt-get upgrade I get a bad header line.
7	[10:12] <ROYAL> static is produced from speakers, really loudly
8	[10:12] <JermBob>nmdb ?
9	[10:12] <ROYAL> It is coming from an unused input jack
10	[10:12] <JermBob> something like that
11	[10:12] <ROYAL> but, I can only mute it in HDA-Analyzer
12	[10:12] <ROYAL> but my settings are lost after a reboot
13	[10:12] <dr_willis> bkkrocks: you did an apt-get update first?
14	[10:13] <ActionParsnip> ROYAL: what is the output of: wget -O alsa-info.sh http://www.alsa-project.org/alsa-info.sh && chmod +x ./alsa-info.sh && ./alsa-info.sh
15	[10:13] <JermBob> i did the sudo apt-get install samba and got : E: Sub-process /usr/bin/dpkg returned an error code (1)
16	[10:13] <ROYAL> did who do an apt-get update?
17	[10:13] <ROYAL> ah

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ROYAL's messages from Line [5] to line [12] can be seen as a single turn or contribution broken down into multiple short messages. His first message in line [5] is certainly incomplete as it only scratches the surface of his problem. No one would be able to help him based on the few details he has given. He goes on to elaborate on the problem in line [7] but the succession of his messages is interrupted by an irrelevant message from another participant. ROYAL prefaces two of his messages (lines [11] and [12]) with the conjunction 'but'. The use of this linking expression at the beginning of both messages serves as an explicit indication that the two messages are closely related and that each message is a continuation of the one preceding it. This same strategy is employed in the following excerpt by another participant. However, the sequence of his messages is preserved since no irrelevant turns intervene between them.

Excerpt 24

1	[12:17] <s3r4f1m> my laptop has ubuntu installed and yesterday my mother knocked him down while i was using it
2	[12:18] <s3r4f1m> and after that came with this message : "hd0, 1 read error grub rescue
3	[12:19] <s3r4f1m> was it the HDD that died?
4	[12:19] <s3r4f1m> or bad sector
5	[12:19] <goer> s3r4f1m: it's dead I think :(

In Excerpt 24, there are four successive messages posted by S3r4f1m. The subsequent messages are clear continuations of the ones preceding them. This view is further emphasized by the fact that some of these messages, lines [2] and [4], start with a linking expression. Oftentimes, messages from other users would

intervene between closely-related turns of this type. In such circumstances, the linking expressions that are used at the beginning of these messages can prove to be of great service with regard to demonstrating their interrelatedness.

The following excerpt illustrates a strategy that participants use whereby they break up their turns into separate messages at the clause level.

Excerpt 25

1	[22:58] <bs> while i'm downloading file how can i find out my speed?
2	[22:58] <zozy> bs: usually it shows up in the browser
3	[22:58] <zozy> whyile youre downloading

In the above exchange, Zozy breaks up his reply to Bs' question right before the beginning of the second clause of his sentence. Thus, his second message is introduced by the conjunction 'while'. Zozy'sdecisionto break up the sentence at this particular point could be motivated by his desire to show that it is linked to the one preceding it. His intention could also be to prevent other participants' contributions from pushing down his answer away from the question to which it is responding. His answer constitutes the second part of an adjacency pair. Question-answer adjacency pairs like the above one are frequently disrupted in IRC interaction.

Excerpt 26represents another instance of a user breaking his turn into multiple messages and using a linking expression to tie them together. The

sequence of the messages constituting the turn, however, is disrupted by contributions from two other participants.

Excerpt 26

1	[23:42] <KM0201> Mrokii: now, close any instance of a browser running
2	[23:42] <squid> KM0201: you said you wanted to change unity to gnome
3	[23:42] <Random832> hey how do you turn a set of images into a pdf
4	[23:42] <KM0201> and restart your browser

KM0201's reply to Mrokii is split between two messages; one in line [1] and the other in [4]. Two irrelevant messages intervene between KM0201's first message and its continuation. KM0201 starts his second message with the conjunction 'and' to show that it is a continuation of the one preceding it. The disruption could have been caused by KM0201 pausing before posting the second message. Another explanation would be that the other two participants were typing at the same time as KM0201 and managed to post their messages before he could post his.

Without the conjunction, KM0201's second message may prove confusing as it does not identify the intended addressee. But since it is connected to the previous message with the conjunction 'and', one can assume that the addressee is the same for both messages and KM0201 left it out to avoid redundancy.

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4.4 Discussion

4.4.1 Factors Affecting Organization of Chat Conversations

There are three major factors that can affect how chat conversations are organized. These factors are the number of participants, the affordances of the chat system, and the purpose of the talk (informational versus recreational, etc.).

The number of participants has a significant impact on the organization of a chat conversation. This impact is manifest in many aspects of the chat conversation. When there are a small number of participants in an IRC channel, there is naturally less competition for the floor. As the number of participants increases, there will be potentially more turns, which usually increases the likelihood of disrupted turn adjacency and also widens the distance between logically-related turns. Werry (1996) notes that the increased competition for the conversational floor in IRC drives participants to construct relatively short turns. He also observes that posting shorter turns more frequently and in quick bursts increases the likelihood that a given turn will be posted close to its antecedent turn, thereby potentially securing the floor for a given participant. Unlike popular public chat channels, small group chat is characterized by turns which tend to be generally long. It is also more common for turns in these groups to consist of multiple clauses or sentences (Garcia and Jacobs, 1999).

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The size of the group appears to influence the use of addressivity as well. In small groups, users do not employ addressivity as often as it is observed in large IRC chat channels.

Features or affordances of the chat environment also influence the overall organization of talk in CMC. The persistence of talk is one major advantage that text-based CMC holds over oral conversation. Thanks to it, users have access to an ongoing record of the discussion. They can easily scroll up to review previous parts of the conversation. IRC users make frequent use of this feature as it enables them to keep abreast of the discussion as it unfolds. Herring (1999) notes that the chat environment is more persistent than oral interaction because the most recent posts will be available for viewing in the chat window until newer posts cause them to scroll up and eventually off the screen. The ability to review previous sequences of the conversation at any time contributes to the creation of conversational coherence and maintenance of relevance.

In hyper-active IRC channels with numerous participants, spreading one's turn over multiple posts could be sometimes disadvantageous. However, in small group chat, this strategy can be effective for securing attention and increasing the chances of holding the floor. Multiple, successive related posts have a visual prominence that makes them stand out among individual contributions of other participants (Herring, 1999). This is one way to get around the egalitarian nature of

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computer-mediated conversation as all messages are equally 'loud' from the perspective of the interlocutor (Herring, 1999; Crystal, 2006). In face-to-face and telephone settings, the talk can easily be dominated by one participant. In contrast, the chat system allows any participant to contribute to the discussion at any time and prevents any one member from absolutely dominating the conversation. The #ubuntu IRC channel, for example, has a built-in feature known as the @floodbot that triggers a warning message to any user that sends in more than five messages successively. Users resort to manipulative techniques such as flooding in order to make their messages somewhat more prominent and thus attract more responses.

The findings of the study show that the conversational context can have a great impact on coherence. It is likely that the structure of the conversations in the exchanges presented here was influenced by the specific context of the channel which is 'giving technical support'. The participants in the channel were chatting for a purpose; they had an overall goal of helping each other with the technical problems and issues they encountered. Therefore, one can infer that the organization of interaction in task-oriented or informational chat would be different from that of recreational chat. Support for differences between these two types of chat has also been shown by Herring (2003).

4.4.2 The Maxim of Relevance in Internet Relay Chat

4.4.2.1 Sequential Relevance

Synchronous CMC is prone to the occurrence of disrupted adjacency of logically-related messages (Garcia and Jacobs, 1999; Herring, 1999). The lack of sequential relevance which is characteristic of IRC conversations is largely caused by the technological constraints of the IRC system. Disrupted adjacency, however, is not limited to multi-participant chat; it is also found in other modes of CMC such as dyadic chat (such as instant messaging) and asynchronous discussion forums (Herring, 1999). These two modes share two properties of the IRC system: sequential posting and 1-way message transmission.

However, in information-focused and task-oriented chat contexts, compensatory strategies are employed to counteract the potential negative effects of disrupted turn adjacency. Those disruptive effects can be attributed directly to properties of the chat environment. Multi-participant, 1-way CMC systems are very demanding with respect to users' attention and understanding. In synchronous CMC, there are also time and typing pressures that have an adverse effect on the complexity of message production (Ko, 1996). These factors affect the type of cohesive strategies that are used to connect messages, e.g., use of simple cohesive strategies such as question and answer adjacency pairs and lexical repetition.

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Complex coherence strategies that demand the user's full attention are hard to maintain in this particular CMC environment, especially when the user is simultaneously engaged in multiple interactions. The findings of the study confirm that sequential relevance is not maintained in multiparty chat due to the prevalence of disrupted turn adjacency which is imposed by the technological features of the chat system. This finding places CMC in stark contrast to face-to-face interaction where sequential relevance is deemed crucial to the success of meaningful communication.

4.4.2.2 Coherence Maintenance

Despite the pervasive presence of disrupted adjacency in the data, there were only few cases where it led to miscommunication. This drives us to think that disrupted adjacency does not necessarily lead to miscommunication. Moreover, participants appear to take coherence into account when constructing their turns most of the time.

The use of anaphoric reference in IRC contexts imposes some potential risks. Thus, we observe that almost all problematic cases were the result of ambiguous anaphoric reference. Nevertheless, anaphoric reference was used frequently in the data despite the risks. Contextual information can be used to enhance coherence and resolve ambiguous anaphora. There are cases, however, where overt clarification is needed to resolve ambiguity.

4.4.2.3 Relevance and IRC Users

Based on the analysis of the corpus, IRC users, in general, have been found to observe the relevance maxim in their interaction despite the lack of sequential relevance that is caused by system constraints. Relevance breakdowns occur occasionally but they are quickly repaired and the original topic of discussion is restored. The context of the discussion seems to play an important role with respect to relevance maintenance. In the analyzed examples, the context was goal-oriented and informational, which accounts for the intolerance that users show towards irrelevant contributions and non-sequiturs. Furthermore, several strategies were employed to compensate for and reduce the disruptive effects that are characteristic of the IRC system.

This analysis supports the views of those theorists who consider relevance as critical to meaningful human communication (Grice, 1975; Sperber and Wilson, 1986). CMC users in the analyzed exchanges appear to be aiming to be optimally relevant. Most of their messages are intended to be cooperative.

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Chapter 5

Conclusions and Design Implications

5.1 Conclusions

This study investigated relevance maintenance and coherence creation in multiparty text-based chat. Based on the analysis of log files from the #ubuntu IRC channel, the researcher endeavored to find out whether disrupted turn adjacency interfered with relevance and if CMC users observed relevance. The analysis of the IRC corpus led to the identification of the strategies employed by users to keep their exchanges relevant and coherent.

The results confirm that disrupted turn adjacency occurs frequently in IRC conversations. They also show that disruptions of sequential relevance do not necessarily cause misunderstanding or confusion. IRC users observe the maxim of relevance in the construction of their messages. They seem to be aware of the crucial role that relevance plays in meaningful human communication. Several strategies are used by IRC participants to link their logically-adjacent messages which most often end up separated by irrelevant messages from other members' conversations and from the IRC system. Lexical repetition, lexical substitution, linking expressions,adjacency pairs and addressivity are the strategies frequently employed to stitch related turns together.

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These cohesive devices, however, are not the only means of maintaining coherence in IRC interaction. For example, the persistent and sequential nature of IRC exchanges seems to contribute to coherence creation despite the occurrence of disrupted turn adjacency. Since all interaction is dependent on mutual contributions, one may be able to establish the links between spatially separated utterances by identifying adjacency pairs. Repeated structures are also helpful for detecting related turns since some structural elements of, for example, a question are sometimes replicated in the reply structure. Like in face-to-face interaction, sequential structure is important in CMC but in a different way.

In addition to disrupted turn adjacency and intertwined conversational threads, other obstacles to coherence maintenance have been identified. Most of the issues identified had to do with participants wrongly assuming to have common ground with their interlocutors. This is also the main reason why referring across sessions can sometimes result in conversational breakdown. Multitasking also appears to contribute to some of these interactional problems.

5.2 Implications for CMC System Design

Most of the problems identified with respect to IRC interaction have to do with the design of the IRC system and IRC clients. This leads us to suggest a number of design improvements that could result in more coherent interaction.

Overlapping conversational threads are a major cause of the disruption that occurs in multiparty online chat. One way to overcome this problem is to incorporate some of the techniques that are already being used in asynchronous CMC. For instance, the threading feature which is used in Internet forums could be implemented in IRC to keep threads of conversation separate on the interface. Thus a user can choose to start a new thread when initiating a new exchange. This feature will greatly reduce the distraction and disruption caused by irrelevant intervening messages as it will physically group related messages adjacent to one another.

Quoting is another valuable feature that could be borrowed from asynchronous CMC to facilitate linking between utterances. Users will, thus, be able to quote either fully or partially the message to which they are responding. This feature will be especially useful when the time lapse between the message and the response is significant and the message is, therefore, out of the collective memory of the group. Quoting could also be used both within the same session and when referring across sessions. However, the effect of these features on synchronicity should be taken into account.

In addition, enhancements should be made to enable simultaneous feedback since insufficient feedback contributes to the occurrence of incoherence. Message transmission, which is currently one-way in IRC, should be developed to become

two-way since this is the only way to permit simultaneous feedback during message production.

Logging capabilities should be enhanced so that users can make better use of the persistent records of interaction. It might be valuable, for example, to give users the ability to assign different colors to the messages of the different participants or to increase the font size of messages posted by specific users so that they stand out in the log. Such enhancements will provide the user with visual cues that reduce the noise made by irrelevant input from the system and other participants.

One way to reduce the disruptive effects of multitasking would be to allow the participant to know whether the chat window is currently the active window on the system of the interlocutor. This will enable the participant to know if his interlocutor is ready for interaction or is involved in another activity. To avoid infringement of personal privacy, the user should have the option to allow or deny access to such information. How these design suggestions could be implemented and incorporated into the current CMC systems is a question for future research to answer.

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الملخص

عوماري، محمد. المبدأ التعاوني و التواصل من خلال الحاسوب. ماجستير لغويات. قسم اللغة الانجليزية و آدابها، جامعة اليرموك، 2012، (المشرف: الدكتور لطفي أبو الهيجاء).

تشير بعض الدراسات المتعلقة بأنظمة الدردشة النصية الجماعية الى ان بعض خصائصها، مثل خاصية تعطيل تجاور الادوار، يمكن ان تؤدي الى تفكك الاتساق التفاعلي و انعدام الترابط بين اطراف المحادثة. و بالرغم من هذه العوائق، لا يزال هذا النمط من المحادثة عبر الحاسوب يزداد شعبية يوما بعد آخر. لهذا السبب، أجريت هذه الدراسة كمحاولة لتقييم مدى التزام مستخدمي نظام الدردشة المشهور المعروف ب (IRC) بمبدأ الارتباط في محادثاتهم. تمثلت اهداف هاته الدراسة في التحقق من اذا ما كانت خاصية تعطيل تجاور الادوار تشكل عائقا للالتزام بمبدا الارتباط، كما سعت الدراسة لتحديد الاستراتيجيات اللغوية المستخدمة في الحفاظ على اتساق المحادثة. في نفس السياق تم التطرق الى بعض ميزات نظام الدردشة التي تعتبرمصدرا للمشاكل فيما يخص تفعيل الترابط و الاتساق اللغوي.

اظهرت النتائج ان هناك درجة عالية من تعطيل تجاور الادوار والتداخل بين المحادثات المختلفة في نظام دردشة IRC. و مع ذلك لم تكن هناك سوى حالات قليلة من سوء الفهم نتيجة لتعطل تجاور الادوار. يتمثل احد التفسيرات المعقولة لهذه النتيجة في قدرة المستخدمين على التكيف مع المعوقات التي تفرضها اداة التواصل. بشكل عام، وجد بأن مستخدمي نظام IRC يلتزمون بمبدأ الارتباط عند انشاء مشاركاتهم في المحادثة. كما لوحظ ان التفاعل التعاوني هو القاعدة السائدة بين المستخدمين. بالاضافة الى ادوات الاتساق تم استخدام استراتيجيات اخرى للحفاظ على ترابط المحادثات. على سبيل المثال، ساهم تسلسل المحادثة في تقوية الارتباط بين الادوار ذات الصلة على الرغم من كون هاته الادوار غير متجاورة. و كشفت الدراسة ان فرضيات المشتركين المبنية على اساس خاطيء بخصوص معلوماتهم المشتركة ساهمت في حدوث سوء الفهم بشكل كبير. اختتمت الدراسة بتقديم اقتراحات لتحسين تصميم نظام الدردشة النصية الجماعية (IRC) و البرامج المستخدمة للولوج اليه.

الكلمات المفتاحية: التواصل من خلال الحاسوب، المبدأ التعاوني، الترابط، الدردشة الالكترونية، الاتساق اللغوي.