# Cohesion and Reference in English Chatroom Discourse

Carlos M Nash
*University of California at Santa Barbara*
*cmnash@umail.ucsb.edu*

## Abstract

*This paper examines the textual structure of English chatroom discourse focusing on the cohesive elements which are utilised by the participants in order to create a semantically coherent structure. Due to multiple conversations simultaneously occurring and the linearity imposed by the chat software, conversations become intertwined with each other, and adjacent turns often appear to be semantically unrelated. Schönfeldt and Golato [19] demonstrate that participants in a German chatgroup cope with the lack of adjacency by evoking the name of the recipient whom they are addressing. Unfortunately, every chatroom does not adopt such conventions. Based on a preliminary analysis of a Yahoo! chatgroup, this study will show that cohesive devices (e.g., referential forms) are aiding the participants. Cohesive devices such as lexical relationships and direct address are very frequent in chatroom discourse. Furthermore, certain cohesive elements that are common in spoken discourse (e.g., ellipsis) are used less often in chatrooms because they have a greater potential of leading to ambiguity and misinterpretations.*

## 1. Introduction

It is without a doubt that the Internet has dramatically changed many facets of our lives. E-commerce allows us to easily purchase just about anything from anywhere around the world. Many institutional websites allow us to manage our own business and affairs without the need of face-to-face interaction. With e-mail, sharing important research information with colleagues or keeping in contact with family and friends is no longer limited to 'snail mail' and telephone calls. In addition, the Internet has changed the way we meet and interact with other people. Meeting new people is no longer constrained by our location (normally one meets people only in a face-to-face interaction). With a larger network of people available, it becomes easier to find and communicate with others who share similar interests and hobbies as ours. One method of communicating with a group of people on the Internet is through chatrooms.

Defined in Crystal [6] a chatroom is a multi-party electronic discourse. The conversations in chatrooms are in near real-time, continuous or on-going, and are usually focused on one particular subject matter. As the name of the channel suggests, users of chatrooms think of them as being very similar to real-life chat; as a matter of fact, chat participants have general expectations that the language of chatrooms should have the features of real-life chat [6].

Although chatrooms seem to be similar to face-to-face chat or speech, it cannot be ignored that chatroom discourse is text-based. Thus, it follows that chatroom discourse will possess features in common to both written and spoken discourse. This mixture of features from spoken and written discourse leads to two interesting characteristics of chatroom discourse: (1) an imposed linear structure, and (2) a new system of turn-taking. From these two properties, both of which are artefacts of the software used to create and host chatrooms, a new linguistic phenomenon emerges: Conversations and topics are intertwined.

It is possible, and usually the norm in chatrooms, that multiple conversations occur simultaneously. As a consequence, tracking sequential exchanges can become rather difficult for some users [11]. However chaotic chatroom discourse may appear, users are able to create coherency and communicate with each other. This raises the question as to exactly how do chatroom users track topics and create coherency from the intertwining turns. The answer lies in the use of cohesive elements, specifically the use of cohesive elements that provide sufficient, and often overly sufficient, information in a given context. Chatroom members rely heavily on the use of elements that carry more information (e.g., full lexical noun phrases) in order to avoid ambiguity.

This study will analyse the use of cohesive elements and reference in chatroom discourse. Section 2 begins the analysis by demonstrating the characteristics that make chatroom discourse different from spoken and written discourse. Section 3 defines six types of cohesive elements found in text, which also appear in chatroom discourse. Sections 4 and 5 briefly describe the data source and methodology used to code the data. Section 6 marks the first part of the analysis and examines the frequency and scope of the six types of cohesive elements. The general claim will be made that elements that are much more explicit and make fewer assumptions about what information is activated for the recipients will be used more frequently than less explicit cohesive elements. The study continues with an analysis of a subset of cohesive elements (i.e., pronominal reference, nominal

ellipsis, and lexical repetitions) having to do with referential choice. This section will show an overwhelming use of lexical repetition which is considered, according to Givón [9], the 'more-marked' (i.e., information laden) form. The primary conclusion of this study is that the users' ability to track and follow topics is directly related to the selection of such 'more-marked' cohesive elements.

## 2. Imposed linearity, a new system of turn-taking, and intertwined messages

An underlying principle of Internet chat is that it is supposed to mimic the real-time nature of face-to-face conversation. Therefore, chat software is developed on the notion of a time-line; that is, one utterance strictly follows another. When chatting, a chatroom member types a statement, which is then followed up by the same or any other member. To further the notion of time-line, some chat software (e.g., AOL Instant Messenger) allow users to time stamp each contribution, thus indicating the time at which each contribution was received by the chat server. These time stamps are only visible to those who enable the feature. The notion of the time-line is perfectly valid in chat discourse since each contribution can be analysed as a discrete event occurring at a particular point in time. However, the linearity imposed by this time-line does not allow for the possibility of simultaneity and overlap. Contributions, or turns, must be sequential. This is where chatroom discourse quickly departs from face-to-face conversation. (For a more in-depth description of and the complexities behind chatroom interactions, see [6], [11]).

In face-to-face interaction, listeners have the ability to backchannel as the speaker is talking, hence creating overlapping speech. Furthermore, simultaneous speech, e.g., interruptions and collaborative finishes, is quite common [17]. Unlike face-to-face interactions, in chatroom discourse other members cannot see the message as the writer is typing. The only time a message is visible to the other members of the chatgroup is when the writer presses the 'enter' or 'return' key. There is no way for the other members to react to the contribution as it is being created, only after it has been sent to and distributed by the central server. Therefore, simultaneous speech cannot occur [6], [11].

The second key difference between chatroom discourse and spoken communication is that the notion of turn-taking is redefined. According to Sacks, Schegloff, and Jefferson [17] and Fox [8], in spoken discourse, turns are constructed from units, which may be lexical items, phrases, clauses, or sentences, called turn-constructional units (TCU). At the end of a TCU, another speaker is allowed to take a turn and continue the conversation. This transition point is called a transition-relevance point (TRP). There are basic rules of turn-taking which were described by and summarised by Levinson [12] and Fox [8]. Rule 1 is given below.

> Rule 1 – applies initially at the first TRP of any turn:
> (a) If the current speaker selects a next speaker in current turn, then current speaker must stop speaking, and that next speaker must speak next.
> (b) If current speaker does not select next speaker, then any other part may self-select, first speaker gaining right to the next turn
> (c) If the current speaker does not select next speaker, and no other party self-selects, then current speaker may, but need not, continue.

However, the rule for turn-taking in chatroom discourse is much more straight-forward. A turn is defined as a message followed by a carriage return – that is, a string of text followed by the press of the 'enter' or 'return' key. The turn is usually complete due to the lack of interruptions and overlaps. After a writer has sent a message to the server, any member of the chatroom, including the server which automatically announces when a member enters or exits the chatroom, has the right to send a message. Below is a sample of chat data showing three consecutive turns.

*Example 1.*

| | | |
|---|---|---|
| 159 | **12_toney:** | I'm like to point out that Elisa does not condone the use of illegal drugs. |
| 160 | **shdquaver:** | toney, my grammar is catching! |
| 161 | **Elisa:** | you are ignored again, you retard |

The forced linearity and redefined notion of turn-taking contribute to perhaps the most interesting linguistic phenomenon found in chatroom discourse: intertwined conversations. Since strict linearity is imposed on the output, turn-taking is not highly restrictive, and numerous conversations can develop among smaller groups within the chatroom, discussions and topics can be intertwined with other discussions and topics. The terms *twining* and *intertwining* have been chosen to describe the phenomenon, in hopes of capturing the notion of many conversational strands being twisted together to form one unit (S. Cumming pers. comm.). The example below shows three discussions intertwined with each other. In one conversation, chopin01e, Dilbert, brideshead, and streichquartett01 are debating about the current state of the chatroom. In the second conversation, chopin01e and brideshead are discussing about piano. In the third conversation is Dilbert and brideshead conclude their conversation on musical theatre which preceded Example 2.

*Example 2.*

| | | |
|---|---|---|
| 823 | **chopin01e:** | IT'S BORING THIS CHAT ROOM |
| 824 | **Dilbert:** | im not bored |
| 825 | **brideshead:** | no it isn't |

826 **chopin01e:** LOL
827 **12_toney:** don't let the door hit your ass on the way out
828 **Dilbert:** lol
829 **chopin01e:** LOL
830 **streichquartett01:** hee hee hee
831 **chopin01e:** ANY PIANIST?
832 **brideshead:** me
833 **Dilbert:** alrighty im gonna head out....nice chatten with ya brideshead!
834 **Dilbert:** bye
835 **chopin01e:** WHAT ARE YOU STUDING NOW?
836 **Dilbert:** : )
837 **brideshead:** cheerio
838 **streichquartett01:** there's a cover charge for entertainment
839 **brideshead:** i don't

Presented below is the same data from the previous example; however, the turns are now separated into their appropriate conversations.

*Example 3.*

823 **chopin01e:** IT'S BORING THIS CHAT ROOM
824 **Dilbert:** im not bored
825 **brideshead:** no it isn't
826 **chopin01e:** LOL
827 **12_toney:** don't let the door hit your ass on the way out
828 **Dilbert:** lol
829 **chopin01e:** LOL
830 **streichquartett01:** hee hee hee
838 **streichquartett01:** there's a cover charge for entertainment

831 **chopin01e:** ANY PIANIST?
832 **brideshead:** me
835 **chopin01e:** WHAT ARE YOU STUDING NOW?
839 **brideshead:** i don't

833 **Dilbert:** alrighty im gonna head out….nice chatten with ya brideshead!
834 **Dilbert:** bye
836 **Dilbert:** : )
837 **brideshead:** cheerio

Suffice to say, it is much more difficult to read chat transcript in which different conversations are intertwined since adjacent utterances appear to be semantically unrelated. As a matter of fact, the notion of adjacency pairs [18] seems to have been destroyed. For example, in a question/answer pair, it is expected that a question will have an answer immediately following it. However, in the chat example above, there are three intervening turns between the question presented in turn 835 and the answer in turn 839. Yet, we see that it is possible to separate the individual threads. The fact that the threads are separable poses the question 'how do chatroom members keep track of individual conversations?' Consequently, we can ask: when constructing his or her turn what choices does the writer make in order to help others keep track of which conversation his or her turn is a part of? Despite the interactive limitations of Internet chatrooms, users are still able to communicate effectively with each other. To do so, they must be employing tactics to offset the problems caused by non-adjacent turns and potential ambiguity [11]. The former question will be addressed in the following section on cohesion.

## 3. Cohesion

Halliday and Hasan's 1976 book *Cohesion in English* (*CE*) is a comprehensive analysis of the linguistic elements that are used in discourse to unify a group of sentences into a cohesive whole. The unit of language consisting of more than one sentence which is recognised as a unified whole is referred to as *text*. The text may be spoken or written; therefore, their findings should be applicable to spoken, written, and Internet discourse. *Texture* is the property of text being a whole unit; hence, only those groups of sentences that possess texture are considered to be text. However, what is it that allows a string of sentences to have texture?

To present the notion of texture, Halliday and Hasan begin with a rather straight-forward example. *Wash and core six cooking apples. Put them into a fireproof dish.* The pronoun *them* in the second sentence refers back to (or is anaphoric to) the six cooking apples in the first sentence. The anaphoric function of *them* ties the second sentence to the first. In order for one to understand the meaning of *them*, there must be presupposed information, which is, in this case, the six cooking apples. The interpretation of a certain element of discourse (the presupposing) which is dependent on the existence of another element (the presupposed) is referred to as *cohesion*. Although a presupposed and a presupposing element can occur within the same sentence, Halliday and Hasan focus on cohesion across sentences. They identified five types of cohesive relations which are used to help form texture: reference, substitution, ellipsis, conjunction, and lexical relationships. With definitions adapted from Halliday and Hasan, Sections 3.1–3.4 present the cohesive elements that involve reference. Section 3.5 defines conjunctions, a cohesive device that does not function as reference. Section 3.6 defines direct address, a strategy used to create coherent adjacent turns in chatroom discourse.

### 3.1. Co-reference

According to Halliday and Hasan, co-reference pertains to the property by which an element is not being interpreted semantically in its own right–it is interpreted by making reference to something else. There are three subcategories of references: personal, demonstratives, and comparatives.

Personal co-reference, i.e. a reference by means of person, includes personal pronouns (e.g., *I, you, he, she, it, we, me, him, us*), possessive determiners (e.g., *my, your, his, her*), and possessive pronouns (e.g., *mine, yours, his, hers*). However, it should be noted that first and second person pronouns and determiners do not play a significant role in inter-sentential cohesion; instead, they make reference to the roles of listener and speaker, which are outside the text. References made outside the text are exophoric, while reference made within the text are endophoric. This holds for chatroom discourse, with the exception that user nicknames identify writers. Below is an example showing a personal pronoun making reference to the writer within the text.

*Example 4.*

723 **Dilbert:** I also like to listen to foreign cast recordings

The pronoun *I* is making a reference to the speech role, the speaker, but chat users have information available within the text, the username, to which the pronoun refers. Therefore, although speech roles are typically exophoric in spoken discourse, they can be considered endophoric in chatroom discourse.

Demonstrative co-reference is made on the basis of proximity. The referent is located on a scale of proximity, near (e.g., *this, these, here*) and far (e.g., *that, those, there*). Like personal references, demonstrative references typically are exophoric. When used in spoken discourse, demonstrative references tend to be accompanied with gestures to clarify the referent, hence they are deictic. According to Crystal [5],[6], deictic uses are typically avoided in chatroom situations because of the high potential of ambiguity.

Comparative co-reference is an indirect reference made by means of similarity or quantity and quality. General comparison expresses the likeness between two things and uses words such as *same, similar,* or *different*. Particular comparison expresses the comparability between two entities with respect to quantity or quality and uses such words as *more* or *less*, and comparative and superlative bound morphemes.

## 3.2. Substitution

Substitution is the replacement of one item with a generic form. *CE* specifies three types of substitutions: nominal, verbal, and clausal.

Nominal substitution is the replacement of a noun or noun phrase with the substitutes such as *one, ones,* or *same*. Below is an example from the chat data demonstrating the substitution of the noun *dogs* with *ones.*

*Example 5.*

637 **poundpuppy99:** dogs don't get thanks usually - even big glossy ones! Wagging tail!

Verbal substitution is the replacement of a verb or verb phrase with the substitute *do* or *did*. Clausal substitution is the substitution in which the presupposed is a clause. Forms such as *so*, and *not* act as substitutes for clauses. In the following pair of sentences, *so* substitutes for a complete clause: *Are they going to the store? – I think so*; here *so* stands in for the clause *they are going to the store.*

## 3.3. Ellipsis

Ellipsis is the 'substitution by zero'. *CE* defines three forms of ellipsis: nominal, verbal, and clausal. Nominal ellipsis is the omission of a noun within a noun phrase. Halliday and Hasan provide the following as an example of nominal ellipsis: *Four other Oysters followed them, and yet another four*. The claim is that the second *four* is really *four Oysters* where Oysters is represented by a zero. However, this example appears very similar to the example of nominal substitution seen in Section 3.2 and is thus analysed here as substitution.

In this study, ellipsis will only refer to the complete absence of a phrase. Hence, nominal ellipsis is the complete absence of a noun phrase. The example below demonstrates nominal ellipsis, as defined in this study, since there is an omission of the subject, in this case, *I*.

*Example 6.*

412 **stacy015:** guess that would not be easy

Following the previous definition, verbal ellipsis is defined as the complete omission of a verb phrase. Lastly, clausal ellipsis is the ellipsis of a clause. In the following example, the_who does not reiterate the clause *(that) we know this (dental history)* after *better*.

*Example 7.*

32 **northern_soul:** do we need to know this dental history?
37 **the_who:** better, than my plans for homer northern!!!

## 3.4. Lexical Relationships

Lexical relations are cohesive relation where one lexical item refers back to another, to which it is related by having common referents. There are three types of lexical relations considered in this study: repetition, (near) synonymy, and superordinate. The most basic and obvious type of lexical relation is lexical repetition, where an item in the presupposed clause is repeated in the presupposing clause. Example 8 shows a few instances of lexical repetition.

*Example 8.*

433 **oxfordboi2004:** we're in here for the Lawnmower sale
434 mike_tv left the room.
435 **strawberry_fields_forever:** I need a good lawnmower...
436 **strawberry_fields_forever:** lol
437 **new_york_city_boi:** oh well...maybe i will check out some other rooms
438 happy_hogmanay (LPs_rock) left the room.
439 one_of_the_strausses joined the room.
440 **shostakovich_sq2:** lawnmowers - at last something I can tal about
441 magnolia_ 2003 joined the room.
442 new_york_city_boi left the room.
443 digitalpiano joined the room.
444 **introspective01:** From borodin in PM *hhhiiiiii*
445 **oxfordboi2004:** my barber needs a new lawnmower too

The word *lawnmower* links turns 433, 435, 440, and 445 by relating to a common referent.

Synonymy or near synonymy is the use of a synonym or near synonym in the presupposing clause. In Example 9, the words *show* and *stage production* are various ways of referring to musical theatre production.

*Example 9.*

766 **Dilbert:** ive never actually a seen show on broadway.....But ive seen some national tours.....Ive only been into musical theater for about 4 years
767 **brideshead:** well, there's so much to see
768 **brideshead:** some are now coming out on dvd
769 **brideshead:** sondheim has been really cool about getting his stage productions on dvd

Superordinate relations uses a hypernym, a generic or higher order term used to designate a class of specific entities, in the presupposing clause to refer to a noun in the presupposed clause. In Example 10 *teeth* and *molars* are related, because a *molar* is a type of *tooth.*

*Example 10.*

17 **oxfordboi2004:** close your jaws who...you have too many missing molars to become a diva
18 **the_who:** hi streichq!
19 **the_who:** I have 2 teeth missing & NO gaps

### 3.5. Conjunction

Conjunctions, as cohesive elements, are a way of relating linguistic elements that occur in succession, but are not related by other structural means. There are four types of conjunctive relations: additive, adversative, causal, and temporal. Additive conjunctions (e.g., *and, also, or)* link the presupposing clause to a semantically similar presupposed clause. Adversative conjunctions (e.g., *yet, but, however*) link the presupposing clause that is contrary to the expectation set by the presupposed clause. Causal conjunctions (e.g., *so, consequently, for this reason, as a result, for this purpose*) link the presupposing clause which results from some other action in the presupposed clause. Finally, temporal conjunctions (e.g., *then, next, previously, finally*) link the presupposing to the presupposed simply as a matter of sequence in time.

### 3.6 Direct Address

A few innovative practices that help facilitate turn-taking, thus producing more coherent adjacent turns, have been observed in different chatrooms [4], [11]. Some chatroom users have agreed to use special symbols to indicate that they are not ready to yield the floor. Others rely on special commands which are interpreted by a moderator as 'raising one's hand' who then allocates the floor to the recognised speaker [2], [11].

However, a more common strategy is to have the current speaker self-select the next speaker [11], [16], [22]. Direct addressing occurs when a chat member inserts the username of another member whom he or she is addressing. On the one hand, this can simply be dismissed as not a form of cohesive element because addressing someone does not necessarily need a presupposed element. Although direct address has not been treated as a cohesive element in discourse, it does involve presupposed information in that chatroom members do seem to keep track of those with whom they are interacting. Direct address is a means of keeping those participants active within the conversation, thus perpetuating the topic of a thread. In an analysis of a Thai chatroom, self-selecting the next speaker by directly addressing the recipient produced a high level of successful initiations [16]. Secondly, direct addressing provides conversational coherence and constitutes a tool for separating conversational strands [19].

## 4. Data

The data for this study were collected from Classical Music Chatroom No. 1, a subsection of Yahoo! Chat (http://chat.yahoo.com/). The number of participants typically ranges from twenty to thirty. Some members are regulars of this group; however, the majority are simply visitors.

Approximately three hours of chat data were saved. For this study, only the first hour was analysed. This included 1099 turns, a majority of which were in English. It should be mentioned that great attention has been paid to the preservation of the format of the data. This was done to enable future studies on the usefulness of fonts, faces, sizes, and colours, as tool for recognition and tracking. However, the examples presented in this paper have been reformatted.

## 5. Methodology

Each turn was assigned a turn number; the turns were then separated and placed into threads. This was done in

three passes. Each thread was assigned a thread number. There are a few instances in which a turn was ambiguous and appeared to be a member of multiple threads; therefore, such turns were assigned multiple thread numbers.

For this study, each turn was analysed for the cohesive elements defined in Sections 3.1–3.6. If a turn contained multiple cohesive elements, another instance of the turn was created and each instance was coded individually. Fore each cohesive element, the distance (i.e., the number of intervening turns) separating it from the presupposed element was also recorded with each cohesive element. It should be noted that the measurement of intervening turns is a measure of time, which is a type of interference. This is important to understand, because there are other potential interferes, for example the number entities being tracked by the writer and recipients, which influences the choice of form used in referencing.

## 6. Overall Findings

Below in Table 1 is a summary of the frequencies and percentages of the cohesive elements found in the data.

**Table 1. Frequency of cohesive elements**

| Cohesive Element | Frequency | Percentage |
|---|---|---|
| Lexical Relations | 156 | 50.81% |
| Direct Address | 85 | 27.69% |
| Co-reference | 46 | 14.98% |
| Conjunction | 9 | 2.93% |
| Ellipsis | 9 | 2.93% |
| Substitution | 2 | 0.65% |

The occurrences of elements seem to be few for one hour's worth of discourse. However, it should be noted that nearly one-third (32.30%) of the turns are generated by the chat server. It is striking that nearly half of the cohesive elements used were lexical relations, while at the far end, substitution was used only five times. When the cohesive elements are ordered by frequency, two major groupings emerge: (1) lexical relation, direct addressing, and co-reference, which are used frequently, and (2) conjunction, ellipsis, and substitution, which are used less frequently.

Another interesting pattern is the number of intervening turns that may occur between the cohesive element and the element with which it coheres. Table 2 presents the mode (the most frequent occurrence) and the range (minimum and maximum) of the number of intervening turns for each cohesive element.

**Table 2. Mode and range of cohesive elements**

| Cohesive Element | Mode (Freq.) | Range |
|---|---|---|
| Lexical Relations | 2 (24) | 0–128 |
| Direct Address | 1 (11) | 0–117 |
| Co-reference | 1 (10) | 0–13 |
| Conjunction | 1,2,3 (2) | 0–9 |
| Ellipsis | 0, 1, 3 (2) | 0–6 |
| Substitution | 1 (2) | 0–8 |

Again, the results for lexical relations are striking with its wide range, whereas conjunction, ellipsis, and substitution are much more restricted in scope. Examples and explanations of these results are presented below, with heavier emphasis on the three most frequently used cohesive elements.

As seen in Table 1 and Table 2, lexical relation is the most often used cohesive element and has the widest range possible between the cohesive element and the presupposed element. Although it has a range which could span across 128 utterances, 90% of the occurrences had 19 or fewer intervening turns, which is still a wide range when compared to the ranges of the other cohesive elements. Since the chat window typically displays nearly 25 lines of text (this can differ due to different font sizes used by the participants and the size of the browser window), the presupposing element can be at the very top of the screen, while the cohesive element is located at, or near, the bottom. Therefore, it is to be expected that the distance between the cohesive element and its presupposition is less than 25 turns.

When lexical relations are analysed even further, it is becomes apparent that lexical repetition is primarily responsible for their high frequency (see Table 3).

**Table 3. Instances of lexical relations**

| | Repetition | Synonymy | Superordinate |
|---|---|---|---|
| **Frequency** | 137 | 15 | 4 |

A possible explanation for the high frequency of repetition is that it is like a game of matching [10]. When tracking a referent, the chatroom users are simply searching for the nearest previous occurrence of the lexical item. The cognitive processing that is needed to determine if a lexical item is a synonym or superordinate of the referent is not needed when the lexical item in question is simply a repetition of the referent. This plausibly explains why lexical repetition is the most often used form of lexical relations.

Direct address shows a similar range to that of lexical cohesion. Nearly 90% of its occurrences have 11 or fewer intervening utterances. Therefore, it appears that direct addressing has strong effects as indicated in Schönfeldt and Golato [19]. It is perhaps that one easily recognises

one's name, which is quite simply demonstrated by the 'cocktail party' phenomenon. Although a person may have his or her attention focused on the conversation at hand, it can easily be attracted when someone else mentions his or her name well across the room. This demonstrates that people are quick to respond when they hear their name, even when their attention is focused on another activity. Hence, direct address is a useful tool for separating and tracking conversational strands.

Co-reference is the last of the cohesive elements which is found in significant quantity. Eighty-five percent of co-referencing occurs with six or fewer intervening utterances. The flexibility in range may have to do with the nature of reference; they are grammatical. Personal pronouns must match in person, number, and gender (if third person singular) with its presupposition. However, as observed from many instances of miscommunication, it is easy to encounter ambiguity when using personal pronouns. Whenever there are more than one entity being discussed that share the same person, number, and gender, personal pronouns have no way of resolving to which entity it refers. Example 11 shows a case where pronoun use functions perfectly .

*Example 11.*

| | | |
|---|---|---|
| 37 | **the_who:** | better, than my plans for homer nothern!!! |
| 38 | **northern_soul:** | hmmm |
| 39 | | hiclasslady (hiclass_lady1999) left the room. |
| 40 | | hiclasslady (hiclass_lady1999) joined the room. |
| 41 | **northern_soul:** | what are they? |
| 42 | **salome01:** | i dont |
| 43 | **oxfordboi2004:** | what do you TEAC....university-reader?....typing?...or something as useful to the room as that |
| 44 | **sarah_brightman:** | if you want email latter goodnight |
| 45 | **salome01:** | no one like raul d'blasio? |
| 46 | | roll_beethoven joined the room. |
| 47 | | maurice_ravel left the room. |
| 48 | **northern_soul:** | who is he? |
| 49 | **salome01:** | ??????????] |
| 50 | **the_who:** | they involve a knife northern |

In turn 41, *they* can only refer to a 3rd person plural entity. The only noun or pronoun that is 3rd person plural and that precedes *they* is *plans* in turn 37. Likewise, for the pronoun *he* which is found in turn 48. The nearest 3rd person singular masculine entity preceding turn 48 is *Raul d'Blasio* in turn 45. Lastly, we have *they*, again, in turn 50 which can only refer to the previous instance of *they* in turn 41.

Ellipsis, a common cohesive device in spoken discourse, is rare in chatroom discourse. If the sender of a message chooses to use ellipsis, it is assumed by the sender that the recipient is able to recover the omitted information. However, the information that needs to be recovered must be activated within the consciousness of the recipient; hence, the sender is making assumptions about the recipient's knowledge. There are too many factors that prevent the sender from making any assumption of the recipient's knowledge (e.g., what the recipient has chosen to read or pay attention to, or how far away from the referent will the sender's turn appear). Therefore, this form of reference is generally avoided in chatrooms.

Conjunctions make up less than three percent of occurrences of cohesive elements. Nearly 80% of conjunctions used as a cohesive element were separated from their presuppositions by fewer than four utterances. Its relatively low usage is possibly due to an inherent property of conjunctions observed by Halliday and Hasan: conjunctions are used to specify that the following is systematically connected to a previous utterance, whereas other cohesive elements are more similar to search and match tasks. Again, given that chat activity is very rapid and the forced linearity imposed on the output, the task of searching for a presupposition that marks the clause following the conjunction as connected and relevant becomes extremely difficult. Therefore when there exists no method for the speaker to maintain the floor in a chatroom, the turns are usually complete units.

Lastly, substitution is the least used cohesive element. The major problem with substitution is that it leads very quickly to ambiguity, much more so than reference. Nominal substitution like *one*/*ones*, only match the noun or noun phrase it substitutes in number, whereas in third person pronominal reference there is the additional information on gender. Likewise verbal substitution *do*/*did* can substitute any verb or verb phrase from a preceding clause so as long they match in tense

In Clancy's [3] study of English and Japanese narrative discourse, she analysed the basis of referential choice (i.e., the factors influencing a speaker's decision in whether to refer to a particularly entity with a full noun phrase or some less explicit form of reference, such as a pronoun, and ellipsis). A similar analysis can be performed here. In her paper, Clancy limited the analysis to third person human referents and considered references which included noun phrases, personal pronouns, and ellipted subjects. The references to be considered in this study will be lexical repetition, pronominal co-reference, and nominal ellipsis. The reason for excluding superordinates and synonyms is two-fold: (1) as seen above in Table 3, lexical repetition makes up nearly 90% of the occurrences of lexical relations, thus it is very successful strategy used by chatroom members and warrants closer examination and (2) there is a higher degree of subjectivity and abstractness involved with superordinate and synonyms,. The researcher must then begin to make 'judgement calls' about whether two lexical items actually refer to the same referent, which the reader may find highly debateable.

Below in Table 4 is a summary of the frequencies and percentages of the referential forms found in the data.

**Table 4. Frequency of referential forms.**

| | Frequency | Percentage |
|---|---|---|
| Lexical Repetition | 137 | 73.26% |
| Pronominal Co-reference | 42 | 22.46% |
| Nominal Ellipsis | 4 | 4.28% |

As assumed in an earlier stage of this study, ellipsis was used rarely due to the high potential of ambiguity [14]. In order to minimise ambiguity, chat members favoured using full noun phrases (i.e. lexical repetitions) to make their turns as explicit as possible. Hence, there are significant differences in the frequency of forms used in co-referencing within chat room discourse and that used in spoken discourse (cf. Clancy's findings of 15.7% noun phrase and 20.5% ellipsis in English [3]). Perhaps this difference is caused by the different types of discourse analysed in the two studies. In Clancy's study, the speaker is generally focussing on one particular topic which allows itself to undergo ellipsis. When a topic change occurs, an explicit lexical item or noun phrase is used to indicate the topic shift. The findings here, show a higher degree of lexical repetitions because of the numerous topics that are occurring simultaneously. This corroborates with Givón's finding that the over-use of discourse machinery, via repetition, may actually have a useful function: when the channel of communication is noisy, or when the communicative system is relatively frail, over-use may be a necessary strategy to insure the hearer knows what the speaker is talking about [9]. In the case of chatroom discourse, it is not safe for the speaker to assume any knowledge that the hearer may have about the discourse for the reason of tracking problems caused by the lack of turn adjacency. Therefore, it is much more beneficial to use strategies that provide as much information as possible to the recipient.

Table 5 presents the mode (the most frequent occurrence) and the range (minimum and maximum) of the number of intervening turns for each cohesive element.

**Table 5. The minimum and maximum number of intervening turns.**

| | Range |
|---|---|
| Lexical Repetitions | 2–127 |
| Pronominal Reference | 0–12 |
| Nominal Ellipsis | 0–1 |

The results for lexical repetitions are striking with its wide range, whereas reference and ellipsis are much more restricted. Since ellipsis is highly susceptible to ambiguity, and references to a lesser degree, they have narrower ranges. Table 6 and Figure 1 show the distributions of available referential choices with respect to the number of intervening turns.

**Table 6. Distribution of referential forms.**

| Intervening Turns | 0 | 1 | 2–4 | 5–10 | 11+ |
|---|---|---|---|---|---|
| Lexical Repetition | 13 | 14 | 37 | 40 | 33 |
| Pronominal Co-reference | 5 | 10 | 14 | 8 | 4 |
| Nominal Ellipsis | 2 | 2 | 0 | 0 | 0 |

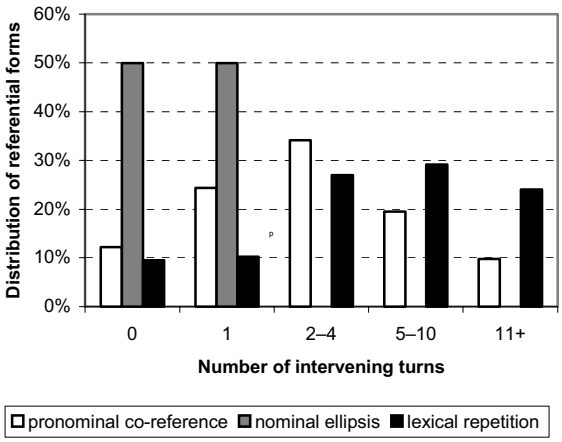


**Figure 1. Distribution of referential forms with respect to the number of intervening turns.**

Figure 1 is a representation of the data in Table 6 in percentages. It shows that of all 42 instances of pronominal co-reference, 12% (5) occurred with zero intervening turns, 24% (10) occurred with one intervening turn, 34% (14) occurred with 2 to 4 intervening turns, etc. The statistics presented in Figure 1 correspond to figures presented in Clancy [3] in two ways: (1) there is increasing use of lexical repetition (noun phrase in Clancy) as the number of intervening turns increases, and (2) ellipsis does not seem to be a useful referential form when there are more than four intervening turns.

However, an interesting difference in findings is found when comparing the two studies where there is no intervening turn between the cohesive element and the referent. In Clancy's study, only pronominal co-reference was used; however in chatroom discourse, lexical repetition is used much more often. Figure 2 shows the percentage of referential forms with respect to number of intervening turns.

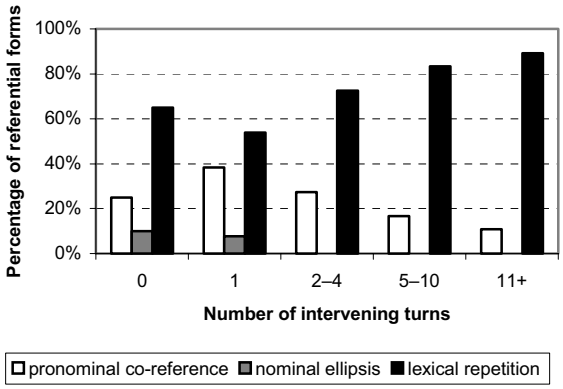


**Figure 2. Percentage of referential forms used with respect to the number of intervening turns.**

Figure 2 shows that of the three referential forms used where there is no intervening turn, 24% of the references were pronominal co-references, 14% were nominal ellipses, and 62% were lexical repetitions. Again, there is considerable resemblance to the data found in Clancy's study. There is an increased use of explicit forms, in this case lexical repetition (or noun phrases) as the number of intervening turns increases.

In summary, based on the statistics presented in Tables 1 and 2, in general, there is strong preference for cohesive elements that carry more information. Also, direct address is used frequently by chat members to initiate turns, thus create semantically coherent adjacent turns. Furthermore, as shown in Figures 1 and 2. and Table 3, the preference to use explicit forms increases when the cohesive element is located further away from its referent. Therefore due to the 'noise' inherent in chatroom discourse, chat members use explicit forms that provide redundant information to insure the hearer knows what the speaker is talking about.

## 7. Discussion

It has been argued that lexical repetition has extremely strong effects and is a useful strategy in chatroom discourse [14], [15]. The potential for ambiguity is considerable due to the rapid speed at which contributions arrive, thus causing the preceding utterances to rapidly scroll off the screen. However, lexical repetition seems to benefit greatly from 'priming'. In 1975, Rosch conducted experiments on 'priming' by first timing how long it took subjects to match identical entities. The average time between the presentation of the words or pictures and the subjects' reaction was between 0.5 to 1.0 seconds. In the second stage of the experiment, two seconds before each test, the subjects were given a category name. If the entities they had to match were good examples of the category, their reaction times for matching paired items decreased. However, if the entities were poor examples of the category, then their reaction times for matching were increased [20]. This is possibly one part of the explanation of why lexical repetition is the most often used form of cohesion as the number of turns and interferers significantly increases.

The findings in this study correlates with the findings of Clancy. Also mentioned in her paper, Wallace Chafe has discussed the choice of pronominal and nominal forms as a function of 'given' and 'new' information. Given information is the knowledge that the speaker assumes the hearer is aware of during the time of an utterance. Whereas, new information is the information the speaker assumes he or she is presently activating or re-activating in the consciousness of the hearer. If this is the case, then the findings in Rosch's study on priming is complementary. In addition, with the rapid presentation of new information in chatroom discourse, chat members can never be sure what information the recipient is aware of. Therefore, chat members must present the information in their turn as new information by using explicit reference forms.

There have been a few suggestions in the redesigning of computer-mediated communications. One consideration is to minimise incoherence (e.g., intertwined turns) by enabling simultaneous message production via two-way transmission. Another suggestion is to eliminate the imposed linear structure by linking related turns, thereby facilitating tracking [11]. However, these proposals are problematic, as Herring points out, given the current state of technology. As presented in this paper, even though there are interactional restrictions in chatrooms, chat users are able to communicate and track topics by adapting their use of language.

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