

# Text Chat In Action

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## ABSTRACT

Synchronous text communication is becoming recognized as a valuable workplace communication medium yet some studies of group text chat indicate that its properties can lead to interactional incoherence. We consider this issue through a detailed analytic examination of text chat transcripts by showing how participants manage their interactions through considering multiple threads, turn taking and topic change. We reveal the routine practices that participants employ to create and manage coherent interaction. These practices arise from the turn taking system in operation, which facilitates straightforward repair of misunderstandings. We conclude by considering the implications of this for design and for the organisation and management of interactions of various forms.

## Keywords

Conversation analysis (CA), ethnomethodology, text-chat, computer supported cooperative work (CSCW).

## 1. INTRODUCTION

Of the different online communication mediums, text communication is undoubtedly the most successful in the workplace. Text communication channels used in the workplace include asynchronous channels such as email and discussion boards and quasi-synchronous channels, such as instant messaging (IM) [20] [15] and text chat [3] [4] [10]. The term quasi-synchronous was coined for Internet Relay Chat (IRC) by Garcia & Jacobs [7], but could equally be applied to other channels such as IM and text chat. It refers to the fact that although the posted messages are available synchronously to all participants, the production of those messages is not available to all participants, only to the typist. Thus unlike face-to-face communication, message transmission is not synchronous with message production.

Isaacs et al [15] described the importance of text as a communication means for supporting informal communication in the workplace, compared to other channels, such as audio and video. These channels have so far failed to make such an impact for reasons including cost, privacy, implementation difficulties

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and lack of support for core user tasks. A number of recent studies have outlined the use of IM in the workplace [20] [5] [15]. Many of the studies describe how IM is often used to check availability for interactions through other means and how users tended to prefer audio when matters became complex [20] [5]. However, Isaacs et al [15] found that IM was often used for interactions about the work itself, including complex ones, that checking availability was a use, but not the major one and that there was little evidence for users exchanging IM for other channels when interactions became complex.

Whereas IM applications tend to primarily support messaging between two participants, text chat applications can support multiple participants. There is evidence that chat rooms, MUDs, etc. might support work groups in carrying out their work. For example, Churchill and Bly [4] described how a mature and established text-based MUD was used in a workplace for interactions. They describe how users choose whichever communication medium is appropriate for their current needs, using the MUD alongside other mediums. Like Isaacs et al [15] they report the value of text communication in the workplace, concluding that *'there is a greater potential than is being realized for low bandwidth tools to fill a niche in conversational gaps between people who are not always collocated.'* (p47). Handel & Herbsleb [10] also described the use of a group text chat tool in the workplace. Using a quantitative analysis of recorded chat data they found that the chat rooms were used both synchronously, with a tendency towards bursts of synchronous activity, but also asynchronously, with follow ups occurring much later.

However some past studies of text chat tools have suggested that the interactional features of text chat, such as the ability to have many different threads of chat running simultaneously, can lead to problems for participants in managing their interactions. Although a review of the literature suggested that claims of interactional incoherence were exaggerated [14], many studies, in particular technical design studies, focus on addressing the assumed problem of multiple threads [22] [23].

If such text chat tools are to become more widely adopted in the workplace then it would be beneficial to understand the interactional characteristics of group text chat more fully. This understanding can be used to inform decisions on both where text chat might best be used in the workplace and on whether the interactional qualities of interfaces need be re-designed to best support it. This paper provides a detailed analysis of text chat, paying particular attention to issues such as how participants are seen to manage threads, take turns, etc. It examines the mechanics of *how* participants interact using text chat through an analytical examination of transcripts of text chat. This approach has proven beneficial before in understanding the properties of different

communication channels and their related patterns of use, for example, in the study of media spaces [11] and the study of Collaborative Virtual Environments [1].

We are interested in the form and structure of the naturally occurring interaction in the events. The issues examined in this paper such as how participants are shown to cooperatively manage the text chat, carry out repair, etc. are not assessments of participants 'feelings' or 'concerns'. Rather, they are examples of how people, in-and-through their interaction, co-construct a coherent conversation. In other words, in this study we are interested in the work that participants do to make the interaction work rather than examining psychological, gender or inter-cultural issues (which are examined elsewhere, see for example, Ess [6]). Consequently we focus on the detail of the interaction as it can be seen in the records of the text chat and through our observation of participants. The aim of this research is to provide an understanding of the 'mechanics' of the interaction. We then use this understanding to suggest where text chat might best be employed, how text chatting might be organised to support different forms of activity, and how systems to support these activities might be designed.

This research differs from prior studies of the interactional features of text chat, which, on the whole, examine gross interactional features and in doing so have produced contradictory results. The prior work most related to this study is that of Garcia and Jacobs [7] who carried out a detailed examination of the turn taking system in text chat. This paper expands on their work by highlighting the unproblematic nature of repair and how topic changes are managed within the context of multiple threads. We find that participants draw on a number of resources, going beyond their understanding of the turn taking system in speech, to make sense of the interaction. All of this leads to some new insights for design and for text-chat 'event' organisation. This will be illustrated below.

Existing research into the interactional features of text chat is briefly described below, including a review of Garcia and Jacobs study. This is followed by the method and a discussion of the findings of this study. In the final section the implications for the use of text chat and the design of text chat tools will be outlined.

## 2. TEXT CHAT

As introduced above, studies of text chat have tended to focus on the interactional problems caused by the properties of text chat, such as interactional incoherence caused by multiple parallel threads (e.g. [19] [9]). For example, Smith, Cadiz and Burkhalter [22] found that one of the significant features of text chat was the *lack of control over turn positioning*. That is, since turns can be sent simultaneously by a number of participants, then there is no guarantee that a next-turn, for example a response to a question, will appear directly after the question. Instead other turns may appear between the question and the response. In spoken conversation a turn's meaning is partially derived from its location in the conversation. Smith, Cadiz and Burkhalter [22] found that this was problematic in text chat, causing confusion over threads (that is, which turn relates to which previous turns) and that it resulted in a preference for short turns (so that the response might be closer to the question, if sent quickly). They, like other designers, attempted to address these problems by **redesigning chat interfaces**. In this case so the chat was

*threaded*, by allowing participants to place new entries so they appeared after the last entry in the thread they referred to. However, this new design resulted in new problems. For example, participants had no specific point of focus as new entries could appear anywhere in the chat space, rather than at the end as with the original format. Although multiple, intertwined threading can cause problems to the reader in conventional systems, the temporal dimension is fairly clear as the entries read from top to bottom in the order they were posted. Many of the studies of text chat tended to examine tools for social or personal chatting. A study by McDaniel, Olson & Magee [18] examined *threading* in CMC and face-to-face conversations between atmospheric physicists at work and found little thread confusion arose.

There are, therefore, contradictory findings on the ability of text chat to support interaction well. Herring [14] reviewed the literature on computer-mediated communication and found that although CMC might be described as interactionally incoherent because of the loose inter-turn connectedness and overlapping exchanges, these features also produced benefits. Such as, the ability to engage in multiple simultaneous exchanges within a single discussion, compared to the limits on multiple simultaneous interaction in face-to-face events. The persistence of the chat plays an important role in interactions, that is, participants can participate in multiple threads without too much confusion because of their availability on screen.

Garcia and Jacobs [7] compared the turn-taking system in text chat to that in face-to-face conversation. They video-recorded participants, enabling them to examine turn production (which is only available on each users screen) as well as the actual turns posted. They found that the turn taking system in text chat is different to that in face-to-face chat. Since the turn is not available to participants other than the poster until it is posted, participants in text chat can not use within-turn components, such as continuers and simultaneous talk<sup>1</sup>, to manage their turns and interruptions can not occur. Simultaneous posting means that the exact sequential placement of turns cannot be controlled since other participants may post theirs first.

In spoken conversation, the current speaker can select the next speaker or if not, the next speaker can self-select (the 'floor' is open) [21]. This is done through verbal and non-verbal cues intertwined with the turn at talk. In addition, much of the understanding of turns comes from their sequential and serial location in that conversation. Turns which are *serially adjacent* are ones in which one turn comes directly after another. A next comment must clearly follow a previous comment or it becomes 'marked out'<sup>2</sup> as breaking conversational norms. If some explanation of why it does not follow is not given (phrases such as 'by the way' or 'to change the subject' can be used to indicate a new unrelated topic) this may produce comments or rebukes from fellow participants. The *sequential ordering* of turns refers to the describable ways in which turns are linked together into definite sequences. An example of such a sequence is an adjacency pair,

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<sup>1</sup> In spoken conversation, for example, if a speaker takes in breath during an utterance this serves as a continuer, 'holding the floor' for them to continue speaking. And if two participants speak at once, if one previously 'held the floor' they maintain this right.

<sup>2</sup> Noticeable, and therefore possible to be *remarked* upon.

where the second pair part is conditionally relevant to the first pair part. For example, ‘question-answer’ is an adjacency pair and if an answer does not directly follow a question (unless the following turn is part of an insertion sequence, such as a clarifying question) then it is *noticeably absent*. That is, participants may comment on it, ask the question again, etc. (see [16] for a more detailed introduction to the analysis of spoken conversation)

Garcia and Jacobs suggest that the fact that a next turn in text chat does not necessarily relate to the prior turn (that is, there are multiple threads running through the chat) results in difficulties interpreting messages in their sequential context. The sequential organisation that results is frequently not the order participants intended and participants do not share the same information about the relation of posted messages to each other. That is, other participants do not know when the sender started typing, i.e. what it was that the sender was responding to.

Since other posts may come between the two parts of, for example a question and answer adjacency pair, this may lead to *phantom adjacency pairs* where the two adjacent comments may appear to be related but in fact are not. Also even though the response of a next speaker who has been selected may not appear until after intervening turns, this delay in response is not treated as noticeably absent. It does not become marked out in the way it would in spoken conversation. They propose that, rather than current speaker selects next speaker which occurs in spoken conversation, in text chat *current poster selects future poster*. Garcia and Jacobs [7] found that posters may wish to be next to increase referent/message coherency and thus may reply rapidly, using short messages and split long messages<sup>3</sup>. Furthermore, some participants orient to the potential that their message may not be adjacent to the one to which it relates and design their messages to be understood even if there are intervening turns. For example, by using the name of the participant to whose message they refer or by referring to elements of (or repeating parts of) the posting in question. Interestingly, and presumably related to this, participants rarely used one turn to answer two previous turns. Thus Garcia & Jacobs conclude that this turn-taking system results in a different form of interaction to oral conversation, but that this does not mean that it is impaired, as some authors have argued, just *different*.

Text-chat doesn’t involve any spoken talk but instead is machine-mediated written talk so we might think about it as a specialized form of “speech exchange system<sup>4</sup>”. Different speech exchange systems are said to be “likely variants on the turn-taking system” described by the Sacks and colleagues [21]. For example, in debates the amount of time and order of speakers may both be pre-specified, which is clearly not the case in everyday conversation. Garcia and Jacobs [7] demonstrated that text chat can be seen as a variant of the turn-taking system described by

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<sup>3</sup> In the case of split long messages the initial posting can be seen as a positional ‘marker’ to establish the relevance of upcoming messages to the previous posting.

<sup>4</sup> Although perhaps the concept of “speech exchange system” should be re-specified to include the text communication systems which have been developed since Sack’s (1974) original specification.

Sacks et al. [21]. Our task here is to expand that research and show its relevance for the design and use of text chat systems. Crucially, our examples illustrate just how the speech exchange system of text-chat systematically varies with that of spoken conversation according to features of the technology. Furthermore, participants show their understanding of this in the way in which they orient to one another conversationally. This leads to *routine* phenomena which have the potential for creating *routine* forms of misunderstandings and that these are repaired in *routine* familiar ways.

### 3. METHOD

The data was analysed using techniques from conversation analysis (CA). CA is a method for analysing spoken conversation but here the data here consisted of records of text chat. However, techniques derived from CA have proved useful for analysing text chat [7]. This is because CA, through examining detailed transcriptions, analyses how, in spoken conversation, coherence is produced through the sequencing of utterances. This approach can readily be applied to sequences of text chat, when we consider how it is temporally produced and shared (seen on the screen by all participants). Methods of analysis such as CA and (the highly related) ethnomethodological ethnography have proved useful on many occasions for understanding the detailed use of technology, applications, computer tools (see [11] for an introduction and [17] for an edited collection of studies). CA deals with transcriptions of conversation only, while ethnomethodology has a wider brief, dealing with action, interaction, reasoning and the organisation of activities as they are produced and observed. Both share a concern for explicating the form and organisation of everyday action and interaction as-it-happens, in situ. Such an understanding can then be used to aid design and redesign.

Through revealing the social nature of activities and human-computer interaction (HCI), by looking at moment-to-moment action and interaction, we provide a resource to aid in the design (or re-design) of technologies to better support these activities. Hence, by understanding the properties of group text chat, its appropriateness and effectiveness as a work tool in various situations can be evaluated. Ideas can then be created for how new applications to support communication at work (and thus the work itself) might be designed across a variety of activities, with different group size, purpose etc.

The text chat analysed here was recorded during a series of online business seminars to a small audience (total participants involved in the chat range from 6 to 11) who were not collocated (in fact the audience attended from their desk tops in locations such as the UK, Russia and Canada). The audience consisted in the main of business people, with some academic staff also attending. The attendees were a mixture of acquainted and unacquainted persons, with a range of technical abilities. The seminars consisted of presentation and discussion sessions which lasted 60-90 minutes. The primary examples given here come from three seminars held using the presentation system PlaceWare™, supplemented by data from two other seminars held with different technologies: Firetalk™ plus Net2gether™ and WebEx™. In some of the presentations text chat was the only means of communication (within the presentation system) available to the participants, in other presentations they had access to an audio channel when the presentation itself was not being given. However, the audio channel was used, almost exclusively, for the ‘official’ business of

the presentation: checking the audio was working, giving the presentation, asking and answering questions. Thus even in systems with an audio channel available for the participants, text chat was their primary communication channel.

For most participants, it was the first time using these specific technologies and, as is the way with such technologies, the seminars were not without technical problems. Thus the technology itself often formed the topic of the discussion, however this does not negate the findings, since this discussion was carried out using text chat. As with conversation analysis, the topics that people discuss can be seen as orthogonal to the mechanics and structure of the talk, and it is this structure, the systematics of text chat, that is elaborated (and important) here.<sup>5</sup>

#### 4. THE FEATURES OF TEXT CHAT

In this section some of the interactional features of the recorded chat are discussed. These centre around three aspects of the chat: threading, turn taking and topic change, plus the use of alternative communication channels. In the final section, this research will be compared to other studies and some conclusions about the use of text chat in the workplace and the design of text chat systems will be drawn.

##### 4.1 Multiple threads

As described above many papers have suggested that a major problem of text chat is that multiple threads running simultaneously can make understanding difficult. In this research there was little evidence of multiple threads leading to confusion, participants managed to hold coherent discussions with multiple threads running through them. Participants were, however, aware of the potential for misunderstandings because of multiple threads and used this potential to spark humour. Examples of the techniques participants use to manage turns and threads, producing a coherent body of chat, are provided below.

Multiple threads can consist of parallel chats with different participants in each thread or participants may be involved in two threads simultaneously. At some points during the event, where there is rapid conversation, threads can become quite out of sync. In Extract 1 there are three different intertwined threads of chat and one thread initiator which is not taken up. The excerpt begins with Janet's question to Dr. Ahmed. This comes as part of an ongoing thread assessing the event, which Janet initiated and then Alec, Hasan and Dr. Ahmed all contributed to. Here Janet continues it by addressing a question on sound to Dr Ahmed (105-6, Ex 1). This thread continues without interruption from intervening threads up to line 113. The next two comments are thread initiators, by Janet (114) and Alec (115-6). Then Dr Ahmed appears to either expand his comment of line 109 (117-8) or contribute to the discussion of the understanding of the presenter/presentation<sup>6</sup>. This unproblematically initiates a

<sup>5</sup> Of course we are not saying topic is unimportant, just not for our purposes here.

<sup>6</sup> This represents an interesting case for analysis. The 'however' (in 117) could be seen to link to Dr. Ahmed's previous entry (109). But, due to the change of topic, from comparisons of the sound quality of PlaceWare and Centra to the presentation itself it may well represent a subtle topic shift (from being able to comprehend the audio quality to being able to understand the

breakaway strand with the presenter, Danielm, (122-4) and they continue their discussion beyond this extract. Before Danielm responds to Dr Ahmed though he adds a comment to the previous thread on sound quality (119-20). Janet then responds to Alec's thread initiator (121). Finally, Alec makes a comment about the effect of the activity on the chat window (125-6). Despite this being a period of rapid comment entry with several intertwined threads, participants manage the threads with apparent ease.

##### Extract 1 : Event 3 PlaceWare text chat

105 *janet* : Dr Ahmed how did it sound to you  
106 *janet* : sound?  
107 *Dr. Ahmed* : well  
108 *janet* : how does it compare to Centra  
109 *Dr. Ahmed* : it is good to a certain level  
110 *Tom* : Some echoes initially. Occasional breaking up that got  
111 worse towards the end. I found Dan quite readily  
112 understandable, but then I am familiar with his accent.  
113 *janet* : yes indeed you are Tom!!!  
114 *janet* : who has turned themselves pink?  
115 *Alec Hunter-Moore* : It would be interesting to use a  
116 speech-to-text system to feed into this chat window  
117 *Dr. Ahmed* : however, I hope the presenter be more specific  
about  
118 project history and background  
119 *danielm* : The sound quality is just so crucial - that as long as it  
120 holds the event can work  
121 *janet* : yes - it seems strange now typing after talking I think  
122 *danielm* : Dr Ahmed - what would you like to know about  
project  
123 history  
124 *Dr. Ahmed* : I.e. is it part of your Ph D  
125 *Alec Hunter-Moore* : Now several people are typing at once the  
126 scrolling in the chat window has gone mad!

Participants are able to manage multiple threads because of the quasi-synchronous nature of text chat. That is, unlike face-to-face conversations where comments follow one another with minimal or no pauses, in text chat *only the completed comment is entered*, thus there are gaps while participants type. In addition, rather than listening, which is a continuous process, the *typed comments are persistent* and so can be read relatively at will. In reality, because of the size of the chat box and the difficulties of scrolling, comments are only *easily* readable for a period of time which depends on the amount of chat being entered. However this period does mean that comments do not need to be read as soon as they are entered and scrolling, although it can be difficult, is possible. Participants' entries during these events show that they do use this feature (for example, in Event 6 one participant answered an much earlier query to him well after it would have been visible without scrolling). In addition, most chat entries are easily associated with the thread to which they contribute because of the *observable contextual relations*. That is, the contributions in a thread are sequentially related to one another in an *accountable*

topic of the presentation). Thus it may refer more readily to Tom's comments in lines 110-112. As we can easily see from this example the chat can have quite a complex structure but apparently cause little difficulty for participants.

way (i.e. the relations are *observable* and *reportable* [8]), even where their serial relations have been disrupted by intervening comments from different threads. For example Danielm's contribution to the previous thread on sound quality is clearly related to that thread despite there being three intervening entries, because it is *observably* on the same topic. We can see if we compare this to the discussion of Dr. Ahmed's 'however', cases arise where conflicting, reasonable, sensible connections can be made between utterances and parts of utterances. Sometimes this causes confusion, sometimes this is seen to be unproblematic, sometimes this phenomena itself becomes a topic of humour. It is something participants are aware of and crucially the turn taking system (as in spoken conversation) provides for misunderstandings to be repaired in the next turn.

Participants also have methods such as *naming* available to them to indicate the intended recipient, see for example lines 105, 113 and 122 (Extract 1). It is often, but not exclusively, found at the beginning of a new thread or where there were several lines of intervening text. Given that conversation works on a basis of *economy* (see [13]) we can see the use of names as a failsafe to ensure more conversational effort is not required in order to identify the desired recipient. However, in these events although naming was used by participants, overall few threads were explicitly addressed to an individual. This in turn reinforces a view that multiple thread management in these events works fairly well. One would expect that as it became more difficult to implicitly continue and differentiate threads, the use of explicit devices (e.g. names or the repetition of questions beside answers in a subsequent turn) would markedly increase<sup>7</sup>.

Misunderstandings *did* occur through the interplay of multiple threads, however this was rare in these events. Two examples of how threads can get entangled occurred in the discussion session of Event 3. In the first example the confusion arises from two threads ongoing at the same time. The first thread is a discussion about Alec's area of interest, the second about the audio capabilities of PlaceWare. In the first thread Alec explains his area of interest (144-6, Extract 2). In the second thread which begins immediately after Alec's comment, Hasan asks about the audio for PlaceWare (147). Janet's next comment could be a response to either Hasan or Alec (148). Although her following comment, being a directed response to Hasan (149) might suggest the initial response was to Alec. Janet then elaborates on her response to Hasan (150-1). Hasan makes a comment, which like Janet's earlier response is ambiguous in terms of which thread it belongs to (152). Danielm makes an unrelated comment (153-4)<sup>8</sup>. Then Alec indicates some problems understanding the threads (155-6). So the cause of the confusion here seems to be the two rather ambiguous comments about Dr. Ahmed and his 'field' or 'area'. That is, what Dr Ahmed's field is, whether 'e-commerce'

<sup>7</sup> In free-flowing face to face conversation turn-taking and structure are managed economically and implicitly, the use of more explicit devices indicates more effort is required to manage these.

<sup>8</sup> Although, this is interesting from an etiquette perspective; although it is fine to have multiple and even interrelated conversations going at the same time (i.e. in the same text chat space), it is still possible to butt into someone else's conversation.

or 'the audio capabilities of PlaceWare', is not clear to Alec. The problems that arise here stem from an unclear referent since the referent in question, that is Dr. Ahmed's field or area, could reasonably apply to either thread. However, although the presence of multiple threads might be said to produce this problem, the turn taking system provides for Alec to request clarification. The persistence of the chat, presented in its temporal unfolding means that Alec's request for clarification can be tied to the ambiguity over whether the mention of Dr Ahmed is the second part of an adjacency pair of which his initial comment is the first part. This projects a future turn to clear this matter up and this was done in the continuing chat (unseen) where Janet re-iterated that 'e-learning' was indeed Dr Ahmed's area.

#### Extract 2 : Event 3 PlaceWare text chat

144 *Alec Hunter-Moore* : My direct interest is an upcoming project  
 145 for delivering an e-commerce course online replacing a  
 146 paper-based distance learning method  
 147 *Hasan* : Janet, what is the audio capability with placeware?  
 148 *janet* : ah – you should talk to Dr Ahmed that is his area  
 149 *janet* : none Hasan  
 150 *janet* : you can use it with conference call on the phone or  
 151 Real Player – there is none built in  
 152 *Hasan* : Dr. Ahmed is the expert in this field...  
 153 *Danielm* : Hi everyone – its hard butting in but I'm going to do  
 154 it...  
 155 *Alec Hunter-Moore* : Whoops – we are now getting the other  
 156 common problem – which answer relates to which question

In the second example, it is not two threads intertwined but rather comments within a thread that become mixed up. In this thread Janet is directing Alec to look at a web page which she is trying to show him. He cannot see it and she requests he wait (164, Extract 3). Then Alec informs her he can see it (166), followed by Janet asking him if he can see it (167). Both participants explicitly orientate to what appears to be a miss-ordering of a question-answer adjacency pair, that is, an answer-question adjacency pair! Janet provides an explanation for it (169) and Alec making a joke about it (170-1) which is taken up by Danielm (172-3). This situation arises because of the way that turns are taken in text-chat, with only the completed entry becoming available for the other participants. It is an example of what Garcia and Jacob's (1999) call phantom adjacency pairs. Few other examples of phantom adjacency pairs were found in these events.

#### Extract 3 : Event 3 PlaceWare text chat

164 *janet* : OK – hang on a second  
 165 *Dr. Ahmed leaves section A, Row 1*  
 166 *Alec Hunter-Moore* : Now I have it  
 167 *janet* : ok do you see it now?  
 168 *Danielm* : Goodbye Dr Ahmed  
 169 *janet* : simultaneous typing!!  
 170 *Alec Hunter-Moore* : I like this system - you get the answer  
 171 before the question  
 172 *Danielm* : Yes – but sometimes it's an answer to something  
 173 completely different

Throughout the events other examples of humour arising from the potential for multiple threads to become entangled occurred. One

example occurred in Event 1, when participants were giving feedback on the event and there were a number of ongoing threads. The two threads that concern us here stem from a discussion of the experience for the participants and the presenter. They initially begin as one thread with Guest 40 and Evan evaluating the experience as needing enhancing (236-7 and 239-40, Extract 4) this splits into two threads when Evan suggests how the talk might be enhanced by a video clip (242) which leads to a light-hearted discussion of the merits of video (243-246). The presenter, Danielr, continues the other thread with a rather negative evaluation of the experience (247-9). Guest 40's next comment relates to the video thread (253). Then Janet, the facilitator, asks a question about Danielr's evaluation of the experience (254). Danielr deliberately misreads Janet's comment as referring to the video thread rather than to the evaluative thread, suggesting that Janet was referring to improving his 'sartorial splendour' rather than the experience of presenting (256). He then gives a serious answer to Janet's question (260).

#### **Extract 4 : Event 1 PlaceWare text chat**

236 *Guest 40* : I liked the voice and slide content - but felt  
 237 distanced from you as a person  
 238 *danielr* : I wasn't looking at the feedback icon!!  
 239 *Evan* : I felt like you were just reading the material. It needed  
 240 something to bring it to life.  
 241 *danielr* : my girlfriend says I have a nice voice too!!!  
 242 *Evan* : Like graphics... or a video clip or something...  
 243 *Janet* : you should see what he's wearing!!!!  
 244 *Guest 40* : could the absence of visual contact be  
 245 advantageous in some circumstances?  
 246 *Janet* : like when?  
 247 *danielr* : It felt a little flat for me too... you need a live  
 248 audience methinks to put you on your mettle and to give you  
 249 a sense of engagement  
 250 *Evan* : Janet. The opportunity for side chats doesn't seem  
 251 appropriate during a lecture-type format like this. Maybe if  
 252 you were using this for holding a meeting  
 253 *Guest 40* : When the speaker is badly dressed or VERY ugly?  
 254 *Janet* : how do you think that could be improved Dan?  
 255 *Evan* : Can you turn off the 1-1 feature, Janet?  
 256 *danielr* : what – my sartorial splendour?  
 257 *Janet* : yes you can and audience chat  
 258 *Evan* : And turn it on after the presentation  
 259 *Janet* : but my aim here is to collect your chat  
 260 *danielr* : it would be nice to see images of your audience

This humour arose from the playful use of the multiple ongoing threads. Thus rather than causing problems in these situations, the features of text chat were managed by the participants and used as a basis for humour by playing on their potential for misunderstandings. The deliberate manipulation of the properties of text chat for humour by the participants demonstrates both their mastery of the medium and their awareness of the potential problems which could arise.

#### **4.1.1 Turn taking**

As can be seen from the examples above, in text chat the serial relationship between turns can be disrupted by the propensity for multiple threads of chat, however as will be demonstrated the sequential relationship is not so disrupted. Although most

adjacency pairs in text chat are not serially adjacent because of the multiple threads running through the chat, they tend to be sequentially adjacent with any intervening chat tending to be from a different thread. That is, the second pair-part of the adjacency pair tends to be the next entry after the first pair-part *on that thread* by the responder. For example, in Extract 4 there are two entries on different threads between Janet's request for clarification (246, Extract 4) and Guest 40's response (253).

As described above in the discussion of threading, this tends to cause little trouble for participants at these events. On the whole the first and second pair parts are observably linked by their context and often use similar terms in both pair parts. Unlike spoken conversation where the next turn is related to the previous turn and serial order is very important, in text chat such a relationship of meaning between consecutive turns does not seem to be assumed. Instead participants on the whole, seem to be able to manage multiple threads and turns are expected to be sequentially related within a thread. That is, there is a looser relationship between the serial ordering of turns and the topics or threads of chat. So the sequential relationship of entries is important, with several ongoing sequences/threads occurring at one time, however participants are not seen to treat the relationship between entries as strictly as next-relates-to-former.

Another example of how the sequential relationship between turns within a thread was maintained in the chat at these events is through the use of multiple turns. Multiple turns are often used to produce a single response, as was also noted in Isaacs et al's [15] study of IM and Garcia and Jacob's [7] study of text chat. For example, see Janet's response to Hasan's question (149-50, Extract 2). In addition, multiple turns are used to answer multiple threads (e.g. Janet's two turns, lines 148 and 149, Extract 2). In this study no participant answered two threads with one turn. Thus it seems that participants are preserving the sequential ordering of the threads of chat by using each turn to refer to a different thread and thus helping to preserve the meaning of their entries.

#### **4.1.2 Topic Instantiation And Change**

Another interesting feature of the text conversations in these events is the handling of topic instantiation and change. In face to face conversations changes of topic are often managed by the use of devices like 'by the way' or 'and another thing'. In this way the speaker acknowledges the change of subject while still maintaining the relevance of the utterance to the previous turn or turns. Another manner in which topic change can be achieved is through transforming a previously non-central element of the prior utterance and proposing it as a new topic. For example, if you are telling me something about what the weather was like when you walked your dog, I might continue on the topic of weather or I could use this as an opportunity to change the topic to your dog. In such situations changes of topic are achieved through making a previously mentioned but incidental element of the previous topic central to the proposed one.

In the text chat discussed here, participants begin new topics (threads) fairly much at will in a manner that would not happen in a *formal* face-to-face group discussion. Participants may try to hold the floor on a given thread by firing off a quick comment to act as a marker that they want to speak on the topic of a previous turn (e.g. see Janet, Extract 2, 149-150), but with multiple threads

going on they cannot hold the floor on all. If we seek a comparison between this situation and a similar face-to-face one we are drawn away from thinking about a formal group discussion and instead towards the type of conversation that a group of friends have, say in a bar. Sometimes the group orients as a whole to a single topic, other times two or three members break off as a subgroup onto another topic, and, in general, group members may flit between groups and topics fairly fluidly.

We may consider a number of reasons why the text chat shown here exhibits these features, for example, due to the possibility of multiple simultaneous postings, or because the text chat is persistent and recoverable, or simply because the practice is deemed acceptable. Although the 'rules' of topic instantiation and change could be said to be more 'relaxed' in this situation we can see cases where some rules of spoken communication are preserved. For example, when Danielr (Extract 2, 153) states "...its hard butting in but I'm going to do it" he shows an orientation to others having ownership of the conversation (thread) and that he may be breaking with etiquette in joining in. In the second example, of Dr. Ahmed in Extract 1 (and his comment on background project information, line 117) we can see that he utilises Tom's usage of 'understandable', which refers to audio quality, to institute a subtle topic shift to discuss whether the material of the presentation was understandable. This can be read as producing a new thread out of taking and linguistically transforming (whether by mistake or deliberately) part of a previous unrelated thread. This works in the same way as the weather to dog topic shift example of earlier. It is in ways like this that the 'rules' for topic ownership and management are 'relaxed' but still oriented to.

#### 4.1.3 Summary

One of the most striking aspects of the chat described here is its coherence for the participants. They engaged in group discussions of problems, and evaluated the system and the experience, with little noticeable interactional trouble and indeed often with humour. Furthermore, participants were observed to play with the possibilities of the medium itself, with intertwined threads being used to misunderstand meaning to humorous effect. This ability to chat coherently comes from the recoverable nature of text chat, that is, it is persistent so can be referred back to. Also participants can use devices such as naming, use of similar terms or utterance repetition to direct a comment. Although the serial constraints are relaxed (as shown where participants demonstrably recover previous comments and reconstruct the ongoing threads), the sequential relationship remains very important. Participants orient to this and seek to maintain this as can be seen by the use of different entries to respond to different threads.

## 4.2 Using Alternative Channels

In some of the events participants had access to a group audio channel, at least for the pre- and post-presentation phases of the events. Interaction with group audio, however, often appeared problematic, with very long pauses between turns, false starts where two or more participants began speaking at once, then both stopped, followed by a long pause (and by long here we mean pauses up to 20 or 30 seconds, an extremely long time considering pauses in face-to-face and telephone conversation are counted, in CA, in tenths of a second). At no point was free flowing group

chat around a number of topics found with the group audio. This is perhaps partly due to the occasion, the audio channel tended to be used to carry out equipment checks or for questions at the end. However, Bowers, Pycock, & O'Brien [1] found similar problems with managing group audio in collaborative virtual environments, because the fine cues used to manage turn taking in face-to-face group situations are not available when remote.

During the events participants were occasionally observed using communication channels outside of the channels provided by the presentation systems. In the main, these were the telephone and IM systems, ICQ and Messenger. In this study use of such alternative communication technologies tended to be between participants who already knew one another, presumably because they had access to the necessary contact details (e.g. IM or phone number). The uses of alternative technologies include;

- *Reducing the computing burden.* ICQ instant messages were sent between the two facilitators in Event 6, since they were easier to manage than the one-to-one chat supplied with PlaceWare. ICQ is a very small application and therefore less intensive to run. Other factors influencing its use might have included; (1) Their familiarity with ICQ as a means of communicating with one-another. (2) That ICQ can remain open but minimized allowing exchange of messages over a period of time. (3) That the notification mechanism indicates a new message with a sound and an icon in the task bar. And (4) that this allows the user to open the message at a convenient time (the one-to-one message box in PlaceWare opens automatically on the receivers desk and participants were often observed closing it before it had even fully loaded).
- *Alternative contact.* For example, in Event 2 when Alander was having audio problems he sent an ICQ to Evan, with whom he was acquainted, informing him of this after he had logged out of Firetalk. ICQ is a quick and easy to use message system and because of their relative locations (Russia and Canada) a more financially economical option than the phone.
- *Upgrading to audio.* Where only text was available, participants at times upgraded to audio. For example, in Event 1 Robert was having problems starting the video recorder. Janet and Robert briefly exchanged text messages but when a solution was not reached the telephone was used to solve the problem. A similar situation occurred in Event 4, where the WebEx representative suggested that he phone a participant to sort out her audio problem (this telephone call did not actually take place in the end because the representative, based in the USA could not call the participant in the UK). Thus participants indicated a preference for solving *some* problems using audio rather than text. Other problems were solved using text but these instances suggest that if a problem can not be solved easily on text, participants might *step up* the problem solving to the phone. This is similar to the findings of some studies of IM systems which suggest that audio is preferred for solving more complex problems. However, these were rare occurrences and the text chat seemed to be an adequate channel for most of the participants' discussions.

It is interesting to note, as mentioned above, that other text applications (IM) were used on some occasions, in addition to the tools provided by the applications. This is a demonstration that that participants will use whatever communication channels are available to them according to their needs. It backs up Churchill and Bly's [4] finding that *'users themselves determine which communication medium is the most appropriate for their current needs'* p45.

Such findings suggest that it would be interesting to study individuals use of communication channels in addition to studying specific communication channels to examine the circumstances surrounding peoples choice of channel (face-to-face, phone, IM, group text chat, email, etc.).

Another factor to consider is that adapting and using text chat involves learning and developing practices and etiquette. This is an on-going concern and is oriented to both implicitly and explicitly by participants. Part of the actual conversational work seen here is to do with defining and refining practices, how chat should be structured, etiquette and so forth. We can see that participants do this, and what's more some of it is explicit. In conversation, especially face-to-face we already have the apparatus and the practices in place, we can get straight to topic without wondering if we are employing the correct practice for conveying information. As we have noted the rules for topic instantiation, ownership and shifts are well established as are those for turn taking and so forth. Here we have a situation where the practices for communicating are in development. Over time participants will hone their practices for cooperatively interacting via such technologies such that they can gain a *practical* mutual comprehension even with more complex interactions. Indeed, we see this in some groups of users, for example in particular IRC rooms. Thus perhaps one factor in choosing one communication tool over another is experience of that tool, that is, knowing how to communicate certain details, topics and so on with that media. Hence experienced ICQ users will find that they can convey more complex information over it because they have developed the practices to do so.

## 5. DISCUSSION

While it still remains to discover the cross-situational and cross-cultural extensiveness of the turn-taking system in operation in text-chatting, this study following other work, most notably Garcia and Jacobs suggests that we can model its mechanics as a likely variant of the face-to-face, spoken, turn taking system revealed by Sacks and colleagues [21].

### 5.1 Speech Exchange System in Text Chat

While the turn taking system can be seen to draw most specifically on that of spoken talk, it also draws on conventions and features of writing and machine-mediated text communication and participants' understandings of these. Dealing with this 'speech exchange system' it can be seen that variations in its mechanics (when compared to spoken face-to-face interaction) arise systematically as a product of the technological features. These include: (1) the fact that the shared conversational space is a text box; (2) universal continual access allows for simultaneous postings; (3) conversation is persistent; (4) time lags between personal production and shared posting are possible. The crucial point is that participants, through their talk and its structure are

shown to orient to these features – indeed the operation of the turn-taking system orients to these features. In other words, participants are shown to actively discriminate the sequence of talk from any machine generated artefacts. Learning to text chat involves participants identifying its stable features and making the necessary adjustments to get around the artefactual effects generated by the technology. Importantly, moving on from their identification by Garcia and Jacobs [7], we have shown that these problems have the character of 'normal, natural troubles'. They are routine, arise in routine ways and the turn-taking system has routine ways of dealing with them.

### 5.2 Group Size and Conversational Schisms

Sacks and colleagues [21] detail an important phenomena related to group size and topic in relation to the turn-taking system in operation in face-to-face interaction; whole group inclusive, single topic conversation is most common in small groups of 3-4 people. In larger groups it is common for 'schisms' in topics to occur, i.e. for topics to branch and for sub-groups of participants to simultaneously converse on different threads, which may continue apart, end or re-join into a single topic. Taking this further, in 'free' (i.e. not pre-structured) conversation the greater the number of participants the more likely schisms are, and the more schisms there are, the more likely it is that threads become and remain further apart from each other in terms of topic. How free participants are to flit between threads is a matter for local negotiation. As far as we can tell from the research presented in this paper and others text-chat has very similar qualities. In our study schisms were fairly common but, more than two were rare, and we observed separate threads emerging and then coming back together. Needless to say, the self-same turn-taking system operates within threads. One difference we may conjecture is that the persistence of text-chat facilitates flitting between threads although as seen by our example earlier, entering a new thread still involves local negotiation. All of this would appear in-line with free conversation in relatively small groups (6-11 participants).

### 5.3 Session Organisation

It is not only group size and technological-situational features affect the nature of text-chat, session organization, too, is crucial. In our study the events (although, not the text-chat) had a specific, pre-defined structure, with specified joining times (where participants engaged in greetings and other getting-to-know-you chat, as well as checking of technology), a presentation followed by questions and answers and then group discussion and signing off. Also, with the presentation as a common focus, participants often discussed features of what was going on in their 'shared world'. This structure, unlike free-form IRC chat, is likely to have facilitated group coherence around specific topics. Our data strongly supports this claim and we suggest that the way an event is structured, as a workshop, a lecture, a meeting or free chat, similarly will affect topic coherence. Furthermore, just as Sacks and colleagues stipulate for spoken face-to-face conversation, the way the occasion is organized can systematically alter the operation of a turn taking system; for example, turn order, length and amount of topics could be pre-specified (for face-to-face examples, different speech exchange systems can be found in court rooms and debates, etc.).



In text chat, the turn taking system could be technologically manipulated. Some examples of how this could be done include:

- **Implementing access rules.** These could alter the way the next text poster (or typist) is selected. For example the first participant to begin typing may be given rights to the floor based on the fact that they are first to begin local input. Other participants would be barred from text entry until the initial poster had posted on the shared window. This would 'ape' the feature of first new speaker takes the floor in spoken conversation and might help preserve single topic coherence. To reduce the disruption to the fluidity of the chat, if such rules were instantiated, the next poster's entry should show to all participants as he/she types it, rather than on completion.
- **Preserving serial adjacency.** As in the study of Smith et al. [22], serial adjacency may be placed back into text chats by allowing participants to place a new comment on a particular thread directly after the previous one. This will of course affect the fact that the usual design of text chat visually preserves the temporal unfolding (the sequence of posting) of the conversation.
- **Using multiple chat windows.** The availability of a single or multiple chat windows may respectively either limit or promote conversational schisms and therefore multiple topics. If multiple simultaneous topics are desired multiple windows might be used to aid their management by their visual partitioning. However, this is likely to affect the ease with which the whole chat space can be followed and managed by participants.

It should be noted that the second two suggestions above move text chat further away from the speech exchange system of conversation that we are all so familiar with. The first suggestion may move closer to the speech exchange system of conversation, however we must also consider the technically-mediated aspect of text chat. That is, aiming to mirror the speech exchange system of conversation is not necessarily appropriate, since the technical and interactional features of text chat differ from spoken conversation; typing is slower than talking, etc. Currently, as demonstrated in this paper, participants draw on existing conversational rules, adapted for this technologically mediated situation. Changing the operation of text chat will require them to develop further new practices. It is not our position here that this is impossible, or even necessarily a great user burden (since some new practices may be picked up easily). However, it does need to be considered in the design of alternative technological systems for text chat.

## 6. Conclusion: Features of text chat and design

In this paper a number of features critical to the design of text-chat technologies and the organisation of events and activities carried out with them have been developed. Firstly, we have expanded on the work of Garica and Jacobs [7] to systematically map out the turn-taking system in operation in text chat (in these studies), and it can be seen as a variant of that described by Sacks et al. [21] for spoken conversation. Secondly, this turn taking system is not inferior (as some researchers seem to have taken it to be), in need of help or repair, rather it is simply a variant due to

such features as the technology employed and the typed nature of the talk. Taken as a whole, the features of this situation, with this turn-taking system, have the potential to create routine problems, misunderstandings and so forth but the system also caters for routine repairs just as with spoken conversation.

When we think about design we can then see that this understanding serves as a baseline from which we can think about manipulating either or both of the technology used and the organization of the event to best serve our purposes. And then logically work out what the likely consequences will be. Variations in the following will affect either the amount of topics and/or the turn-taking system itself.

- **Number of participants:** more participants will likely mean more schisms and topics but make no difference to the turn taking system.
- **Number of chat windows:** more windows will encourage more schisms, separate conversations and hence more topics but again make no difference to the turn taking system.
- **Topic control:** If topics can controlled or pre-specified through formal event organisation.
- **Turn order and length control:** Turn order or turn length can be pre-specified to produce different forms of event with more formal characteristics. These alter the nature of the turn taking system seen here where these are not formally controlled.
- **Re-creating serial adjacency (as in threaded chats [22]):** this will disrupt sequential adjacency and alter the turn taking system seen here.
- **If visual unfolding reflects temporal unfolding (sequence of posting, as in this study) sequential adjacency will be preserved.**
- **Rules for posting access:** may be manipulated to prevent simultaneous postings.

In our study participants are shown to rely on the fact that the sequential ordering of text-chat conversation is maintained. Participants are shown to orient to the fact that text-chat comments are sequentially related, i.e. an answer comes after a question but not necessarily serially adjacent, the answer may come after lines of intervening text. Knowledge of this serves as the core resource for achieving conversational coherence. Misunderstandings are likely to occur when new posts get related to the wrong previous post but these can easily be repaired by, for example, a clarifying comment. For this reason manipulations that disrupt sequential ordering are likely to more seriously disrupt conversational coherence. This is not to say that this would be wrong, or that once learned might not produce another variant of the turn-taking system. However, given that the turn taking system we have outlined is already established, and apparently mastered by participants in our study and others, we might question both the need and the motivation for doing this. Why take the trouble to learn new competencies to chat with a new system when one already has them in place with other text chat systems? Manipulations that affect schisms, amounts of topics and such features as turn-order and turn length can be seen as less likely to disrupt conversational coherence, instead one can think of these as

likely to produce different varieties of interactional events and activities. It depends how free-form or pre-structured one desires the event or activity to be – is it to be a ‘cocktail party’ or a ‘formal debate’ or a ‘workplace meeting’. For example, one may want to promote simultaneous discussion on many topics or the opposite, or in a workshop situation turns of pre-specified order may be desired as part of the event. Such manipulations should be easier to manage and would crucially not disrupt sequential ordering.

Taken together these findings produce a framework for designing technologies and events to support a broad variety of conversational activities – a framework which is rooted in, and extrapolated from, a systematic understanding of how the turn-taking system in text chat works, as it has been seen to work in real-world real-time text chatting.

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