

# Using Conversational Analysis to ascertain whether commercially available synchronous messengers can support real world ad hoc interactions.

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## **ABSTRACT**

Conversational analysis was used to ascertain that two student project meetings conducted using CuSeeme chat and video, contained sufficient discussion to progress the projects. The findings were that conversational "rules" were followed and chains of discussion occurred. These findings support the literature reviewed that shows remote groups need effective communication channels for planned and ad hoc meetings.

Research in progress will use conversational analysis to analyse the interactions occurring during Instant messenger (IM) encounters, and evaluate the usefulness of IM for promoting more ad hoc lecturer-student and student-student encounters over the next academic year.

## **Keywords**

ad hoc, instant messenger, computer mediated work, computer mediated learning

## **INTRODUCTION**

For some years now, team or group working has been seen by many organisations as the only way to progress complex work activities in a structured and logical manner. Information workers in particular are finding that no one person can deal with every aspect of a task, and organisational security experts recommend that some tasks are split, to ensure fraud and theft are less easy to perpetrate.

However, many of these information workers also work remotely some (telecommuting), or all (teleworking) of the

time, and distance learning is growing increasingly popular as delivery methods improve.

Although technology is available that facilitates computer mediated work, many attempts at long term remote working fail due to lack of opportunities to communicate with fellow workers, resulting in feelings of isolation ([1], [7], [11], [12], [21]). The literature reviewed below shows that strongly tied groups are more satisfied and more productive than less cohesive groups and that ad hoc encounters improve teamwork and on the job learning. Although face to face ad hoc meetings occur at common points in offices such as photocopiers, vending machines and toilets, there has been less opportunity for remote ad hoc encounters, till now.

Commercially available computer mediated communication software such as Netmeeting, CuSeeme, Instant Messengers, and ICQ all provide the communications channels needed. Netmeeting is used for formal meetings and the others are often perceived as social media, with little to offer the business community. It therefore seemed appropriate to use conversational analysis, an ethnographic research tool, to evaluate the content of real-life meetings, to ascertain whether an example of this software facilitated task focused conversations that led to productive outcomes. The work described demonstrates that CuSeeme was a usable and satisfying way to conduct student project meetings and that ongoing research is under way using a commercially available Instant Messenger application.

## **LITERATURE**

Short, Williams, et al. 1976 [23] discuss the difference between formal and informal communications which may take place horizontally to peers or vertically to higher and lower authorities. Although these distinctions appear sensible in a bureaucratic organisational structure they are less easily defined in day to day communication. For

example, is communication between a shop assistant and customer formal or informal, horizontal or vertical? At the time of their research they may have said it was formal and vertical with the customer having higher status, but nearly 30 years later both formality and deference to customers has changed considerably. This is true in the workplace and learning situation too, where both the formality and the hierarchical status is disappearing. Although meetings retain some of their formality, many day to day conversations are purely on an ad hoc basis.

Until recently this was not possible for those working remotely as conversations by phone and face to face needed to be booked in order to ensure that they could take place synchronously. However, the last 10 years has seen a huge growth in computer mediated communications, both synchronous and asynchronous.

### **Groups**

Society and work are kept functioning through people communicating with each other to achieve group aims and goals. Theories of group formation and development abound and it is not the intention here to examine these in depth. However it is worth mentioning some that may influence communication outside of laboratory experiments. Losh, 2001[19] defines a group through their interdependence, saying "Interdependence means that people cannot achieve goals individually, but must do so as group members". This provides a useful perspective for computer supported co-operative work where people often work remotely from each other, but cannot complete tasks without co operation from others, within and outside the organization. Group cohesion is the sense of community that individuals feel when they belong to a group. Groups become more cohesive as they go through the stages and shared experiences of group formation, but cohesiveness has both positive and negative outcomes [19]. When group norms are aligned with those of an organisation, cohesiveness can produce positive productivity enhancements, whereas productivity may fall if the commitment to the organisation is low. "Groupthink" is a term coined by Janis 1972 [15] who described this as a problem that occurred when people ignored alternative points of view in order to show their unanimity as a group.

The feature of group cohesiveness that is of interest in this paper is that of co-operation, as many computer applications fall under the umbrella of CSCW (computer supported *co-operative* work). Zajonc, R (1965) discusses social facilitation where the presence of others improves performance. This is an interesting area of research as audience effect and co-action effect are not the result of co-operation or shared work, but improved performance is facilitated by the arousal effect of having others present.

Jettmar, 2000 [16] extended earlier work on social facilitation to compare situations where people believed they were being monitored by computers or humans. She found that participants preferred to be monitored and having work adapted by computer, but performed better when this was done by a human.

These findings have implications for remote work and learning as telepresence is likely to bring different social facilitation effects to those of physical presence. Certainly, Kling, 1994 [18] makes the point that monitoring by face to face managers can create solidarity in work groups by combining supervision with personal conversation, while managers simply using technical monitoring tools, such as keystroke and transaction loggers, tend to build "commitment through fear". However, 21<sup>st</sup> century work and learning practices often mean that people work in different groups at different times. Bjorkman [3] discusses how project-based work forces job rotation, even within the same company, and Derald et al. 1998 [6] and Nelson, 1997 [20] describe contingent workforces under pressure to produce coordinated teamwork despite not having previous contact or communication. Thus groups do not get the opportunity to become cohesive, but those working in different teams, or attending the same tutorials, often do get the opportunity to know each other and therefore have some ties, although they could not be called a cohesive group.

### **Effects of Tie Strength**

Bernard et al [2] deal with social networks and how people have friends and acquaintances, and a category of people they "know" but do not necessarily like or dislike, merely that they see on a daily basis. This is a growing category in large universities and organisations, particularly those with contingent work forces. We may easily be grouped by others with these people we "know" without ever realising that this has happened. Storey, 1991[25] suggests that groups with a common history and values are more likely to attempt to reach agreement. Shah and Jehn, 1993 [22] agreed with this saying that critical evaluation and questioning enhanced decision making and that friend groups provided a supportive environment for critical evaluation without negative repercussions. Gruenfeld et al. 1996[10] also show that familiar group members are less prone to conformity and more comfortable disagreeing with one another. The personal information that they have about each other allows them to disagree without challenging others' closely held beliefs. They go further to say that group members are more likely to treat unique evidence seriously if it comes from a trusted source than an outsider where it might simply be regarded as aberrant.

Wellman, 1997[28] found that strong ties tend to provide more social support than weak ties, but that weak ties do

have value in linking people to other social worlds. He goes on to suggest that the asynchronicity and limited social presence of CMC merely slow down the development of strong ties. Constant et al. [5] surveyed the usefulness of weak ties in eliciting technical help. Their findings showed that people tried to help others despite being weakly tied, though according to Gruenfeld, above, the receiver of the help may fail to trust the information, as it is from an unknown source. Haythornthwaite, 2001 [12] found that strongly tied communicators will adapt their use of media to support their needs, as opposed to weakly tied communicators who have less motivation to make the effort to find alternative communication channels should one fail. She posits that dependence on a single widely used medium makes a weak tie network vulnerable to dissolution if there are changes or breakdowns within the medium. These ideas have serious implications for organisations and universities that promote the use of email or computer conferencing to facilitate group work amongst weakly tied members. In summary it may take longer than a group's lifespan for ties to strengthen sufficiently to call them strong. The weakly tied group may not trust the information it receives from other members, and if the communication medium undergoes an upgrade or crashes, the result may be that members never come back online.

### ***Organisational Communication Needs***

Isaacs et al. 1997[14] look to the future and the value of impromptu conversation. They show evidence that remote teamwork suffers when opportunities for ad hoc communication are reduced. Work becomes more difficult to manage despite longer and more task focussed meetings. They stress the importance of mundane office conversations that help workers learn, understand, adapt, and apply formal procedures and processes. They also look briefly at the evidence for strong and weak ties in supporting organisational communication, stating that strong ties are a function of frequency of contact, reciprocation, emotional intensity and intimacy.

Haythornthwaite, 1998 [13] comments on the sense of community amongst distance learners, and suggests that early allocation to small sub groups may restrict their exposure to different information and viewpoints. She suggests that on-campus students will not suffer from this as much because they are meeting each other in ad hoc situations around the campus, while the remote learners are not. This author believes these suggestions have implications for remote workers in organisations, who could suffer from similar restrictions. As more and more information workers are teleworking or telecommuting, isolation may grow exponentially unless an easy synchronous means of conducting ad hoc conversations is officially adopted by organisations promoting remote working.

The problems here are two-fold. Although systems like Netmeeting and Instant messengers offer easy access and good usability, even for the less computer literate, many corporations restrict use of these for security and productivity reasons. Secondly, where access is relatively free, such as on a university campus, many lecturers are reluctant to allow students IM access, in case they are swamped with messages. In a survey conducted by Woodford and Dingley (unpublished 2001), 62% of a computing departments lecturers had not ever used an Instant messenger, although 100% had used email to arrange meetings. None had used an instant messenger to arrange meetings or for the meetings themselves.

Although sufficient applications exist to support ad hoc meetings it is pointless holding them simply to justify the existence of the technology. Real meetings solve real problems, whether ad hoc or formal, and large amounts of research time is given to inventing new CSCW technology that may only work under experimental conditions. The author therefore decided to use conversation analysis to look at the content of meetings conducted using the text and video facility of CuSeeme.

### ***Conversation analysis***

Ordinary social conversation, group discussions and often, team meetings, do not have a formal structure, although members still need to take turns to speak and offer ideas. Following the progress of such conversations allows the analyst to draw conclusions about the intentions and motivations of the group, and ground these in new or existing paradigms. This approach differs from an experiment where the theory is proposed via an hypothesis, and tests are carried out to establish the validity and reliability of the theory. Experimental studies require strict controls to ensure that any variations that occur are accounted for only by the planned change of condition.

Garcia and Jacobs, 1999[9] examine the nature of a conversation that occurs using computer mediated communication (CMC) in a naturalistic environment, where the participants need to interact to complete a college task. The students were observed, their "conversations" recorded, and the results were analysed in accordance with the general requirements of conversation analysis, i.e. turn-taking, sequential organisation, repair organisation and turn construction design. Although they found differences from oral conversations, they found conversation analysis to be a good tool for studying CMC.

### ***Conversational Turns***

Titscher, 2000 [27] suggests that the core idea of conversational analysis, is the organised activity of turn taking. Ten Have, 1999 [26] agrees the importance of turn

taking, and provides a number of “rules” that conversationalists adopt to ensure the promotion of the conversation. While the rules are not salient to this paper, the taking of turns is vital, as a discourse by a single speaker is merely a monologue, and a cacophony of speakers does not allow information to be exchanged. Computer mediated conversations do not have the advantage of gaze and body language to assist in the exchange of turns, and even video mediated conversations suffer from time lag that prevents the “handing over of turn” body language that often occurs in face to face conversations.

It was therefore important to find out whether real conversations could occur and whether these could lead to useful outcomes, rather than the monologue or cacophony suggested above. Real conversations with useful outcomes result from topics being sufficiently explored before they are changed. Ten Have, 1999 [26] describes this as chaining, and it results from one or more speakers following up the first question and its answer, with statements and further, but topic related questions. It was this author’s belief that chaining needed to take place for the project meetings to be successful in progressing the state of the project.

Using conversation analysis is not novel, Cheepen, 1996 [4] used conversation analysis to design automated dialogue systems for computers. She has not used conversation analysis to analyse dialogue, but to structure machine-human dialogues, based on the principles of conversation. Solomon, 1997 [24] uses conversation analysis to look at fragments of information-seeking conversation within a library context. He noted few breakdowns and only 1 lengthy silence, but the context was formal and each interaction was brief. Frohlich et al. 1993 [8] used conversation analysis to examine repair fragments of human-machine dialogues that constitute communication breakdown and repair. However, it should be noted that in these examples, and those used by Ten Have, 1999[26] and Kemp, 1982 [17] conversations are naturally short or are reduced to fragments for analysis purposes.

## **RESEARCH**

### ***Rationale and Outcomes***

University students often have to work singly and in groups on computing projects. Computing students often develop very useful software applications for their projects, and many of these could be useful to small businesses without the time or expertise to develop their own solutions. While some students develop software for nearby small enterprises, many are often a long way from home, and their contacts are in home area businesses. These students often end up designing a project from a list of department suggestions, of no real use and without any sense of

ownership by the students. CSCW would provide the ability for students and project managers to meet regularly to review progress without incurring extra expense, and giving students the impetus and ownership they so often need to motivate them on a long project.

The ability to meet project “sponsors” remotely, either formally or on an ad hoc basis would allow students to design computer applications for small businesses in their home communities, conversely allowing the community to benefit from the student’s growing knowledge and skill.

Groups of students on a summer school course have 12 weeks to complete an honours project including planning and implementation. They usually consist of members who have worked together before and have chosen to work together again. Motivation to complete, and do well is very high, although students are disadvantaged by being away from their home country and first language, which is Greek. They knew the supervisor, having already had face to face meetings. Although the supervisor was there to offer advice and give help, he/she was not part of the project team who were free to follow any direction they choose.

Students in the 4<sup>th</sup> week of researching their final year projects were selected because of the cohesive nature of their groups. Two groups consisted of 4 students each, neither having a formal leader. Each group had a normal project meeting during which the supervisor strongly advised that they complete a task for the following week. The completion of the task would allow the supervisor to check that the students had understood at least this aspect of the meeting. The students were also asked for their feelings about the meetings in a brief questionnaire.

### ***Equipment and environment***

A single multimedia PC was used by the groups of students, in a private office within the Milton campus. The workstation was connected to the university LAN. They were assisted with the set-up and technical help was on hand but was not needed. CuSeeme was running on the desktop using the “chat” interface, and a conferencing camera revealed group movements. The conferencing camera supported the video channel, despite the lack of gaze information. A previous pilot study had shown that one to many remote interactions were difficult for the single participant when the group took part in verbal intra-group discussion, as conversational “silences” went unexplained. The video channel showed the group members in verbal discussion, and reassured the single participant also, that the technology had not failed. Unlike most modern Instant Messengers, CuSeeme “chat” does not indicate that other parties are currently typing messages, so the video channel added this dimension. Although instant gaze information was lacking, social aspects such as smiles and nods were

visible by all participants. More recent innovations in instant messengers allow the sending of emoticons, but these were not available at the time of the study. A video camcorder was used to record intra-group interactions although most of the speech was in Greek and therefore inaccessible.

The supervisor was 50 miles away, connected via a modem and standard telephone line and Demon ISP. Her PC also had CuSeeme, a conferencing camera and the "chat" interface.

### Findings

The whole project meetings were analysed and are summarised as follows:

	quest	part-ques	statement	total
NBA	3	3	17	23
supervisor	9	2	20	31

	quest	part-ques	statement	total
VR	7		22	29
supervisor	10	3	29	42

It is immediately apparent from this that in each meeting, more interactions or utterances were sent by the supervisor. Conversation analysis predicts that conversations proceed in adjacency pairs where a remark from person A gets a response from person B. This means that the number of interactions should be roughly similar, but this did not occur if one compares 31 utterances from the consultant to the 23 of the students. However, when the whole conversation is examined more closely it can be seen that the supervisor sent "blocks" of chat where she split up the sentences she was sending by pressing the enter key between them.

For example

Table 1 NBA Conversation sample

26. J we will do this at the same time with building the project.
27. kate ok I have a couple of tasks for you this week dingley
28. kate d I would like you each to write up an analysis of you project to date. That is a summary of about 1 page, and it must be individual not group
29. J ok. please tell us what these tasks will be?

Once the NBA blocks of interactions are counted rather than the individual comments, both student and supervisor totals are 23. This aligns well with adjacency pair theory although the traditional analysis would not use text "blocks".

From the NBA conversation sample, phrases 26-29, it is possible to see a strange phenomenon, where the question from the student arrives after the explanation he is seeking. This happened as a result of splitting the sentences, because the students read the first part, and immediately queried what the tasks would be, while the tutor was actually explaining what they were. This occasionally happens in face to face conversation where the hearer pre-empts what the speaker is going to say and interrupts him. The result is usually part sentences, where the speaker stops talking as the listener starts, or if the speaker continues talking the listener stops his interruption. In this remote interaction the supervisor uses the deictic reference of "that", as shown below to refer to the previous statement.

The 23 conversation "blocks" between supervisor and group consisted of 3 chains. This means that despite the fact that a total of 56 interactions were recorded, only 3 topics were discussed. This means that each topic was fully explored before moving on to the next subject, and it is possible that this contributed to the perceptions of satisfaction and of a successful meeting.

The total interactions in the VR group were 71. Once again the total number of interactions does not immediately form traditional adjacency pairs, being 42 supervisor interactions to 29 student interactions. The supervisor used the "block" method quite extensively and the blocks of information do show adjacency pair structure, 27 supervisor blocks to 25 student blocks. The VR group had more topic changes, with 6 chains being apparent.

Both groups preferred the mediated meetings to face to face ones, and both completed the tasks they were asked to do, on time and with understanding. The conversations were similar to each other, but differed from the design meetings that were examined in a previous study, in that fairly extensive chaining was apparent, whereas the design meeting were simply a series of unrelated questions and their answers. The reasons for the chaining may be:-

- that project meetings are more conducive to conversation development,
- that closely tied groups are more likely to develop conversation topics
- the task encouraged in depth discussion

### Discussion

Several issues were raised as a result of these studies.

1. The project groups preferred the remote meetings to face to face ones
2. That traditional methods of conversation analysis needed to be adapted to cope with textual interactions via "chat" interfaces.

3. That newer, and now ubiquitous, groupware such as Instant Messengers would provide more extensive opportunities for both ad hoc and planned meetings.
4. That numerous social and productivity benefits such as those discussed in the literature, might now be achievable by remote users.
5. More research was required to measure the extent of benefits, particularly regarding ad hoc meetings, as opportunities for face-to-face, student-tutor ad hoc meetings were being reduced by campus security arrangements.

The fact that lengthy discussion chains were apparent, where topics were discussed at reasonable length shows that the “chat” interface is capable of facilitating academic topic exploration. Although Instant messengers were originally perceived as social communication tools, it is reasonable to assume that they will be equally robust in promoting serious discussion.

The work that is currently being undertaken encourages the students to add this author/supervisor to their instant messenger friend or buddy list. This author is using Trillian, which collates all the popular instant messengers, such as MSN, Yahoo, ICQ, into a single interface. If students logs in while she is on line, she is visible to them, and if they need help, or wish to book or change a meeting, they can do so instantly, and synchronously. Brief ad hoc meetings have already been held this way, and the author does not feel “swamped” by the volume of interruptions, although only project students have had this instant and synchronous facility to date. The survey discussed earlier, found that many lecturers feared over-use by students, while 85% of students felt that this facility would be useful or very useful.

A whole cohort of students from a computing course will be invited to use the buddy facility, and their conversations will be stored and analysed using conversation analysis, to determine their usefulness. The higher quantity of interactions should demonstrate whether the traditional methods of analysing adjacency pairs require updating for use with Instant Messenger technology. Student perceptions and utilisation will also be measured.

## Conclusion

From the literature reviewed, it is clear that cohesiveness is generally a positive force in improving productivity for organisations and increasing individual confidence. As more people work and study remotely using ICT, new techniques for improving cohesiveness are required. The work already done has shown that the “chat” interface makes a suitable medium for serious discussion, and that it was preferred by these students, over face-to-face meetings. It is now important to measure the usefulness of

ad hoc meetings to students, as well as ascertain whether Instant Messenger technology can improve the opportunities for these meetings. However, productivity is a more difficult aspect to measure, and these studies will start by measuring perceptions of productivity.

Even if the studies under way have positive outcomes there will still be barriers to be overcome. These are:-

- Reluctance to be “monitored” when on-line
- Fear of instant message overload (email and phone texting are already problematic).
- Organisational security fears
- Organisational fears that an additional communication channel will lower productivity.

Although the current studies cannot reassure in the security areas, a successful outcome should help allay some of the doubts.

## REFERENCES

1. Armstrong-Stassen, M. (1998) Alternative work arrangements: Meeting the Challenges. **39**, 108-123.
2. Bernard, R., Johnsen, e., Killworth, P., McCarty, c., Shelley, G. and Robinson, S. (1990) Comparing four different methods for measuring social networks. *Social Networks* **12**, 179-215.
3. Bjorkman, T. (1996) The rationalisation movement in perspective and some ergonomic implications. *Applied Ergonomics* **27**, 111-117.
4. Cheepen, C. Dialogue definitions and discursal models for advanced voice dialogues. 96. 13.
5. Constant, D., Sproull, L. and Kiesler, S. (1997) The kindness of Strangers: on the usefulness of electronic weak ties for technical advice. In: Kiesler, S.E., (Ed.) *Culture of the Internet*, New Jersey: Lawrence Erlbaum Associates]
6. Derald, S., Parham, T. and Santiago, G. (1998) The changing face of work in the US: Implications for the individual, institutional and societal survival. *Culture, Diversity and mental health* **4**, 152-164.
7. Ellerman, H., Huisman, W., Schellekens, A., Zwaneveld, G. and Berns, R. (1992) an experimental network-mediated study support systems. *journal of computer assisted learning* **8**, 186-192.
8. Frohlich, D., Drew, p. and Monk, A. (1993) HPL-93-48,
9. Garcia, A.-C. and Jacobs, J.-B. (1999) The Eyes of the Beholder: Understanding the Turn-Taking System in Quasi-Synchronous Computer-Mediated

- Communication. *Research-on-Language-and-Social-Interaction*; 1999 **32**, 337-367.
10. Gruenfeld, D., Mannix, e., Williams, K. and Neale, M. (1996) Group composition and decision making: how member familiarity and information distribution affect process and performance. *Organisational behavior and Human Decision Processes* **67**, 1-15.
  11. Haddon, L. and Lewis, A. (1994) The Experience of Teleworking: an annotated view. *International Journal of Human Resource Management* **5**, 193-223.
  12. Haythornthwaite, Caroline. (2001) A social network study of the growth of community among distance learners. [http://alexia.lis.uiuc.edu/~haythorn/HICSS01\\_tiestrength.html](http://alexia.lis.uiuc.edu/~haythorn/HICSS01_tiestrength.html)
  13. Haythornthwaite, Caroline. (1998) Tie Strength and the Impact of New Media. <http://www.shef.ac.uk/~is?publications?infres/paper49.html>
  14. Isaacs, E., Whittaker, S., Frohlich, D. and O'Conaill (1997) Informal communication re examined: New functions for video in supporting opportunistic encounters. In: Finn, k., Sellen, A. and Wilbur, S., (Eds.) *Video Mediated communication*, pp. 459- New Jersey: Lawrence Erlbaum]
  15. Janis, I. ( 1972) *Victims of Groupthink*, Boston: Houghton Mifflin.
  16. Jettmar, E. Adaptive Interfaces: Effects on User Performance. 2000.
  17. Kemp, N.R.D. (1982) Cuelessness and the content and style of conversation. *British Journal of Social Psychology* **21**, 43-49.
  18. Kling, R. (1994) The Social Design of Worklife With Computers and Networks: An Open Natural Systems Perspective. *Advances in Computers* **39**, 239-293.
  19. Losh, S. C. Group processes. 2001. <http://edp5285-01.sp01.fsu.edu/Guide6.html>
  20. Nelson, B. (1997) The care of the Un-Downsized. *Training and Development* **April**, 41-43.
  21. Salaff, J; Wellman, B; Dimitrova, D (1998). Theres a time and place for telework: How social networks affect Telework. *Third International Workshop on Teleworking*
  22. Shah, p. and Jehn, K. (1993) Do friends perform better than acquaintances? The interaction of friendship, conflict and task. *Group Decision and Negotiation* **2**, 149-165.
  23. Short, J., Williams, J. and Christie, B. (1976) *The Social Psychology of Telecommunications*, London: John Wiley & Sons.
  24. Solomon, P. Conversation in Information Seeking Contexts: A Test of an Analytical Framework. 97. 13.
  25. Storey, D. (1991) history and Homogeneity: Effects of perceptions of membership groups. *Communication Research* **18**, 199-221.
  26. Ten Have, P. (1999) *Doing Conversation Analysis: A practical guide*, London: Sage.
  27. Titscher, S., Meyer, M., Wodak, R. and Vetter, E. (2000) *Methods of Text and Discourse Analysis*, London: Sage.
  28. Wellman, B. (1997) An Electronic group is virtually a social network. In: Kiesler, S., (Ed.) *Culture of the internet*, New Jersey: Lawrence Erlbaum Associates.