

Making Sense of Computer-Mediated Communication (CMC): Conversations as Genres, CMC Systems as Genre Ecologies

Thomas Erickson

IBM T. J. Watson Research Center

[*snowfall@acm.org*](mailto:snowfall@acm.org)

Abstract

In this paper I examine mixed synchronous and asynchronous text-based conversations that have been carried on in the context of a computer-mediated communication (CMC) system called "Babble", which has been in use by a group of nineteen people for nearly two years. The primary goal is to explore principled ways of analyzing and characterizing conversational activity in such systems using genre theory. After discussing genre theory, and some of the issues that come to the fore when apply genre theory to CMC, the paper analyzes five conversations. It argues that the conversations constitute separate genres, and develops the concept of participatory structure to capture some of their differences. Next, the paper examines the CMC system as a whole: it argues that the CMC system may be viewed as an ecology of conversational genres, and discusses three properties - global pull, topical pull, and conversational impetus - which may be used to characterize the behavior of the ecology.

1. Introduction

For over two years the research group I work in has been involved in the design, implementation and use of a novel computer-mediated communication (CMC) system called "Babble" [10]. We have used the system as part of our daily work practice for nearly two years, and, more recently, have deployed the system to nine other groups which have used it in a variety of ways. In all of these cases we have collected logs of activity and conversation, observed use of the deployments, and, in some cases, conducted interviews and surveys of participants (see [6]).

While we have learned a great deal from these studies, we have had considerable difficulty in trying to characterize the conversational activity in Babble, both for individual conversations and for the system as a whole. As long time users we have intuitions about the conversational activity which are difficult to capture crisply. For instance, some conversations seem, in some sense, to have a life of their own: they have their own rhythms, a particular core of participants, and specific types of content; and, as implementers who have a vested interest in seeing the system continue to be used, we find that we feel confident that these conversations will continue. Other conversations, however, seem fragile, or unhealthy, and we worry that

they will falter and cease. An analogous example occurs at the level of the CMC system: some deployments seem to catch on and develop their own life, momentum, or rhythm; other deployments seem fragile or unhealthy, never quite catching on, and, in spite of frequent initial use, gradually lose users and die of attrition.

The goal of this paper is to explore whether such intuitions can be made crisper through the use of genre theory. I will try to establish two things: First, that the individual conversations which take place within Babble may be seen as instances of genres, and, in some cases, genres that differ quite distinctly from one another. Second, that the use of the system as a whole depends on a complex interplay of different conversation genres which may, extending the notions of genre repertoires [15] and genre systems [2], be viewed as a genre ecology.

We'll pursue this goal in the following manner: First, we'll lay some theoretical groundwork, describing the flavor of genre theory that forms the basis for this work, and discussing some of the new issues which arise as genre theory is applied to the digital medium in general, and conversation in particular. Because genre theory involves understanding the relationship between the situation in which genres are enacted, we'll next describe the technical and social context within which the conversations are being produced: we'll describe "Babble," the CMC system we've designed, and the social and institutional context of the group that is carrying on the conversations. Having laid out the theoretical, technical, and social background, we will turn to the conversations themselves and analyze five examples of conversations in terms of genre theory, the aim being to show that they differ quite significantly from one another in form, content and participatory structure. Finally we'll turn to the functioning of the system as a whole, and, discussing the dynamics of conversations and the ebb and flow of participation, we'll develop the concept of genre ecologies.

2. Genre Theory

2.1. Situated Genre Theory

Traditionally genres were used as taxonomic categories, with genres being defined in terms of communicative purpose, and regularities of form and content. In the last two decades, however, a number of scholars have developed a view of genre that I will call situated genre theory. Situated genre theory (sometimes known as North American genre theory) is most often traced to Miller's 1984 paper [14], and has been elaborated by other scholars including Bazerman [3], Swales [18], and Berkenkotter and Huckin [4]. Situated genre theory has been brought to the attention of the technical community primarily through the work of Yates and Orlikowski (e.g., [19]).

What distinguishes this flavor of genre theory from previous conceptions is its emphasis on the ways in which genres arise out of a recurring communicative situation. That is, the regularities of form and content which characterize a genre are not viewed as arbitrary conventions, but instead arise out of a confluence of technical, social and institutional forces which comprise the communicative situation, and out of the attempts of the genre's 'users'-the "discourse community"-to achieve their communicative purposes in that situation.

To make this less abstract, let's look at a well known document type-the résumé-through the lens of genre theory. The communicative purpose of a résumé is to provide a summary of information relevant to employment in a particular field. The résumé's communicative purpose is (from the author's point of view) to enable its author to get a job. Résumés follow many conventions of form and content: they tend to be short, highly structured, and they contain job-related and contact information. These conventions are not arbitrary, but rather are responses to the situation in which it is used:

Its content is shaped by what is seen as appropriate for employment in a particular field; similarly, assumptions about how the organization will choose to communicate with the author determine the choice of contact methods (e.g., email; phone; address) to be provided.

Its highly structured form enables it to be quickly scanned by managers reading stacks of résumés, and to serve as an on-the-fly reference during interviews.

Its form is also influenced by technical factors—for example, desktop publishing has probably increased the use of bold and italic text, and decreased underlining and uppercase (stylistic tools available on typewriters).

Thus the conventions of the résumé genre are response to a combination of technical, social, and institutional forces. Finally, the "discourse community" for the résumé genre consists of those who produce, circulate, and consume résumés, as well as the business segments devoted to assisting those seeking jobs or employees.

While there is no universally accepted definition of genre, the following is a reasonable synthesis: *A genre is a patterning of communication created by a combination of the individual, social and technical forces implicit in a recurring communicative situation. A genre structures communication by creating shared expectations about the form and content of the interaction, thus easing the burden of production and interpretation.*

2.2. Digital Genres

Situated genre theory has been developed primarily as a way of analyzing text-based discourse in institutional or disciplinary contexts. Recently researchers have applied situated genre theory to forms of CMC such as email [5; 19], discussion databases [16; 20], virtual communities [9; 10], and publishing on the web [7; 8; 13].

The application of situated genre theory to the digital medium raises new issues for genre theory. One new issue is that the digital medium is far more malleable than speech or paper, the two principal media for conventional genres. Consider some consequences of this fluidity:

- A digital document is far more malleable than a paper document: it can be changed without a trace, and reproduced and distributed for virtually no cost. Yates and Sumner [21] argue that this fluidity shifts the 'burden of fixity' from the technical to the institutional realm.
- The malleability of the underlying medium is not just an issue for individual documents, but for genres as wholes. A number of investigators have raised the possibility that the fluidity of the digital medium, and the potential for tighter coupling between a genre and its discourse community will greatly speed the evolution of genres (e.g., [9; 10; 17]).

2.3. Conversations as Genres

Another issue that comes to the fore in looking at digital genres is the status of conversation. Can conversations be regarded as being instances of genres? Is it useful to do so? Many of those employing situated genre theory seem to prefer reserving the rubric of genre for relatively extensive, well-structured modes of discourse, particularly those embodied in documents. In this regard, conversation is perhaps too brief and too protean for comfort (though see Bakhtin [1] for a contrasting view). Yet, things have changed: in the digital medium analogs of what was once ephemeral conversation take on varying degrees of

persistence in applications like chat, MOOs, bulletin board systems and mailing lists. With this new persistence, conversation takes on many new properties (e.g., [11]).

Still, various parties have taken different stands with respect to the genericity of digital conversation. Bergquist and Ljungberg [5], for example, have argued that conversations do not have all the characteristics of genre, and that instead they are a sort of symbolic ether in which true genres are embedded (and discussed and negotiated). While they make an interesting argument for the case they examine, I am not convinced that all forms of digital conversation should be excluded from consideration as genres. In particular, an example of a conversation involving group limerick-making I previously studied [10] seems to be a clear counter-example. The question to be examined here is to what extent more ordinary, work-based conversations may take on the characteristics of genres.

3. The Communicative Situation

Now we'll turn to the case to be studied: conversations within a chat-like CMC system called "Babble." Because a key element of situated genre theory is understanding the situation within which genres are enacted, the next section lays out the technical and social forces at play. After describing this context, we move on to the two final sections where we look at individual conversations, and the functioning of the system as a whole.

3.1. The Technical Context: Babble

Babble is a CMC system that supports multiple text-based, persistent conversations (i.e., they may be carried out synchronously or asynchronously). Babble differs most notably from other systems in its use of a minimalist visual representation of the participants to provide cues about their presence and activities. Here we will give a very brief description of Babble, focusing primarily on the features that are of importance to our subsequent analyses; see [12] for a more complete description.

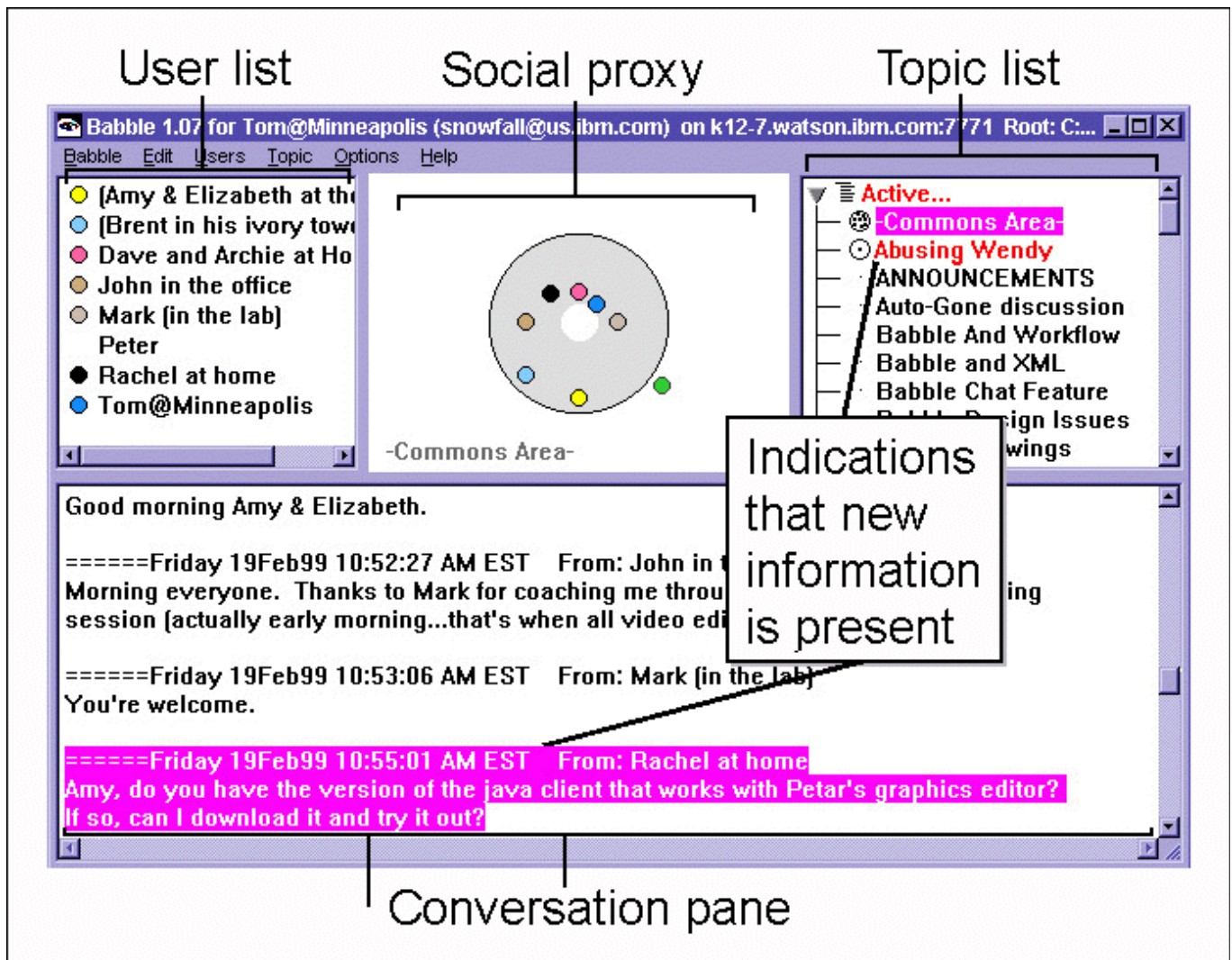


Figure 1: The Babble Interface. Call-outs show interface elements that indicate presence of users or new information.

Figure 1 shows a screenshot of the Babble user interface. The elements of the screen are, clockwise from the upper left:

- 1) a list of all users logged onto Babble;
- 2) a minimalist representation called the social proxy which shows who is present and active in the current conversation;
- 3) the list of all conversations (also known as "topics"); and
- 4) the conversation window which contains the text of the current conversation ("current" being from the point of view of a particular user).

Participants choose a conversation by clicking on its name in the topic list; they contribute by typing into an entry window. Each new comment is appended to the end of the conversation; because comments persist across sessions users do not need to be co-present to participate.

For our purposes we will focus on two features of the interface: how Babble indicates the presence and activity of users; and how Babble indicates the presence of new information. Babble provides cues about users' presence and activity through the social proxy, which portrays the conversation as a large circle, and the participants as colored dots (referred to, hereafter, as marbles). Marbles within the circle are involved in

the conversation being viewed; marbles outside the circle represent those who are logged on but are in other conversations. The marbles of those who are active in the current conversation, either contributing (i.e. typing) or 'listening' (i.e., interacting with the conversation window via mouse clicks and movements) are shown near the circle's center; with inactivity marbles drift out to the periphery. (In the example shown, seven of eight users are in the COMMONS AREA conversation; of those, five are relatively active and two are idle.) When people leave the current conversation their marbles move outside the circle; when they enter the conversation, their marbles move into the circle. All marble movements are shown with animation, thus making arrivals, movements, and departures visually salient. Although simple, the social proxy gives a sense of the size of the audience, the degree to which the audience is actively listening or contributing, as well as indicating whether people are gathering or dispersing, and who it is that is coming and going. Babble indicates the presence of new information in two ways. When a conversation has new material added to it (relative to a particular user), its title in the topic list pane is shown in red (e.g., the second topic in figure 1). And when a user enters the conversation, the text of the new comments are highlighted. These two types of cues - for presence and new information - are directed at different audiences: presence cues are only useful to those who are simultaneously logged on; new information cues are useful to all users because they provide information about what has happened in a user's absence. These two types of cues will be relevant towards the end of the paper, where we discuss how Babble operates as an ecology of genres.

3.2. The Social Context

The group whose conversation is analyzed in this study has used Babble for nearly two years. The group is centered around the software development group (AKA "the lab") that designed and implemented the system, and includes a mix of computer scientists and social scientists (including the author). Over the period of time examined in this study, the Babble group ranged in number from nine to nineteen users. This growth is primarily due to members of the lab inviting "associates" - colleagues with whom they had strong social or professional ties to join Babble. At its peak population, eleven of the users were full time lab members, two were summer interns, and the other six were the associates just mentioned.

Geographically, the group of Babble users is about half co-located in New York, and half distributed. Most of the lab members are located in the same building, although offices tend to be distributed around the building - so actual adjacency is rare. Two members of the lab are telecommuters, and spend the majority of their time tens to hundreds of miles away; other members of the lab frequently work at home. Four of the six associated colleagues (i.e. those not officially members of the lab, but users of Babble) are remotely located: three in the Boston area, and one in Austin.

Socially, the lab is a cohesive group, with considerable camaraderie. In addition to work-based collaboration, the lab members occasionally socialize, although usually within business hours (e.g., going out to lunch) The associates vary in the strength and number of their ties to the lab members, some known to almost all lab members, and others known only to one or two lab members with whom they have shared interests. Conversation in the Babble system moves fluidly between work and social talk; it is always civil, frequently informal, and joking, teasing, and other ludic behavior is not unusual.

3.3. How Babble is Actually Used

Overall, the Babble system as used by this group can be characterized as a core of relatively synchronous activity surrounded by a constellation of asynchronous conversations. At the center of activity is the COMMONS AREA, a place where collocated and remote members share news, engage in banter, get help,

and 'hang out.'

Uses of Babble can be grouped into three general categories: social/ludic; group awareness; and instrumental. Social/ludic activities are those engaged in for social and entertainment purposes such as a custom of exchanging morning greetings, and a topic devoted to jokes. Group awareness activities have to do with actions on the system that are addressed to the group as a whole, or to no one in particular, and generally are done without expectation of a reply or responsive action. These activities include posting announcements and other news believed to be of general interest, commenting on project activity, and keeping on-line notebooks or offices. The third type of activity is instrumental, that is, activities engaged in with a particular end in mind. These include starting or participating in focused discussions, posting bug reports, holding on-line meetings, and asking questions. These activities are often, though not always, addressed to a particular participant or group of participants.

4. The Conversations

In this section we characterize five Babble conversations. We tried to select conversations that had, based on our knowledge of the environment, a broad range of communicative purposes and characteristics, such as breadth of participation, degree of synchrony of interaction, and frequency of utterance. (Recall that our goal here is not to characterize the activity in the environment as a whole, but rather to explore the question of whether individual conversations may be seen as instances of genres.)

4.1. The Analyses

Before looking at the individual conversations, we should first say a few words about particulars of the analyses we carried out. The Babble system keeps a persistent log of the conversation (available to all users in the normal course of usage), and also keeps a log of many user actions. The analyses reported here draw on the conversation logs only, unless otherwise reported. We combine quantitative measures of conversational activity with a qualitative assessment of the nature and type of on-going conversation.

For the purpose of our analyses, we selected conversations which had most of the following characteristics:

- They were relatively long lasting (months to years)
- They had lots of content (900 lines of text or more)
- They were active at the time of the analyses

In general, we tried to analyze contiguous segments of conversation. The exception to this rule is the COMMONS AREA conversation, the first case we examine. Because of the volume of conversation (an order of magnitude greater than that in the other topics), we analyzed two, month-long segments of it separated by a year.

A few notes about particularities of the analysis:

- As Babble is almost never used on weekends, we compute various time-based averages based on work weeks (typically five days, except for holiday periods) and work months (number of workdays per month, typically around 20).
- In a few cases (less than 2%) it was difficult to determine the speaker of an utterance. This was primarily due to two factors: the presence of a publicly accessible client in a shared laboratory that a few participants sometimes used to make remarks, and the occasional use of nicknames that could not be easily traced to the speakers. Such anonymous utterances were not included in the quantitative

analyses.

- In most cases we have altered the names of participants, except where permission to do otherwise was received. In the graphs which follow, individuals are indicated by numbers, and the same numbers do not indicate the same individuals across graphs.

4.2. The Conversations

Now we will turn to the individual conversations. For each conversation we will describe its origin and purpose, its regularities of content and form, and its participatory structure (i.e. how many participate, what roles they fill, the rhythm of the conversation, and the degree of responsiveness).

4.2.1. The COMMONS AREA

Origin and Purpose. The COMMONS AREA is the center of activity in Babble: it is the place where most 'inhabitants' of Babble tend to 'hang out' while they are logged on Babble. The COMMONS was created at the beginning of Babble, and served as the default place to enter Babble; it is also, by virtue of its centrality, the place where most people choose to post general questions, comments, or announcements.

Content and Form. The content of conversational activity in the COMMONS ranges from purely social talk (such as the custom of saying "good morning"), to the posing of general questions, to reminding people of an impending meeting of general interest, to more technical discussions about work projects. (In theory, more topic oriented discussion is 'supposed' to take place in specific topics; in practice, work talk often grows out of social discussions, and the recognition that a substantive conversation that 'belongs somewhere else' is taking place is often not recognized until after the fact.)

In terms of form, COMMONS AREA comments tend to be short and informal, with relaxed syntax and punctuation, use of paralinguistic expressions ("ummm"), onomatopoeia, emoticons, and playful tropes (for example, the 'tossing of cookies' to 'a dog' who usually 'accompanies' one of the participants [all done via text, of course]). In addition to the standard forms that the Babble system imposes on its communication, Babble also treats the COMMONS AREA specially. This special treatment is motivated by the centrality of the COMMONS, and also reinforces it:

- The system automatically archives the COMMONS AREA conversation every two weeks to keep it from becoming too lengthy (since conversations are stored only on a server, long conversations may take several seconds to download over low bandwidth connections).
- The COMMONS is automatically named ("-Commons Area-"), the leading hyphen allowing it to appear first in the alphabetically-ordered list of topics, thus being most visible. (Although users *could* create topics with names that show up before "-Commons Area-" in the Topics list, they don't.)
- The system automatically inserts day and week dividers to facilitate parsing and navigating the conversation; such dividers are superfluous in other topics where the conversation is much more asynchronous.

Participatory Structure. The COMMONS is an order of magnitude more active than other Babble topics in both number of individual utterances and in amount (total number of lines) of talk. Utterances tend to be short (an average of four lines) and ten to thirty times more frequent than the next most active topic. The COMMONS also has the widest range of participation, and the talk there is very responsive (i.e., utterances often respond or refer to previous utterances); it has many episodes of synchronous or near synchronous conversation (a rare event in other topics). While conversation in the COMMONS was initially dominated by the creator of Babble ('domination' is arbitrarily defined as a user who posts 50% more than the next

most frequent poster), by the time a year had elapsed the distribution of participation was broader and less dominated by an individual than any other topic.

4.2.2. BABBLE PROBLEMS

Origin and Purpose. BABBLE PROBLEMS was one of the first topics created in Babble, and, as its name suggests, is a place to report problems with the system.

Content and Form. The conversation consists of problems reported by users, with the two principal programmers responding to most problem reports - either acknowledging the problem, asking for more detail so it can be identified, or asking how the problem should be addressed. Posts in BABBLE PROBLEMS are relatively short, with a mean length of 5 lines; discussion is mostly focused on 'work', though not without its share of joking.

Participatory Structure. BABBLE PROBLEMS has about 20 postings per month; it is characterized by flurries of activity (often triggered by releases of new versions of Babble) with long periods of silence in between. Participation here was primarily confined to lab members: nine of the ten people who participated in it were lab members, with only one of the associates making two comments. As one might expect, participation is dominated by the two programmers, who respond to problem reports.

4.2.3. BAD JOKES

Origin and Purpose. The BAD JOKES topic is a place for posting jokes.

Content and Form. There were about eight posts per month, relatively evenly distributed, and the posts tended to be long (an average of 26 lines). The posts are mostly jokes (78), with a few responses or comments thrown in (10). The writing was mostly literary in style, with formatting, punctuation, and relatively few oral characteristics. This length and formality of the content is probably a reflection of the fact that the jokes were copied from other sources (principally, "the internet"); only five of the 78 jokes appeared to personal inventions.

Participatory Structure. For the year examined, it had 11 participants, one of them being the dominant poster, with fifty percent more postings than the next most frequent poster. Unlike any of the other conversations examined, this topic had a low degree of responsiveness: of the 88 postings over the year, 78 were jokes (usually unrelated to one another); there were only 10 postings which applauded, commented on, or otherwise responded to a previous joke. This low responsiveness may have been partly due to the fact that many of the jokes were copied from other media such as email (often retaining the angle-bracket quoting that signifies this origin), attributed to other people (email signatures were often retained), or attributed to other places (e.g. "a bumper sticker").

4.2.4. TOM'S OFFICE

Origin and Purpose. TOM'S OFFICE was started as a combination of an on-line office and personal notebook. It opened with the following note:

"Welcome! I intend this to be a combination of an on-line office and notebook. You're welcome to leave me message [sic], or to comment on things I put here."

It was followed by a relatively long essay (20 lines). This was the first topic of its type, and it attracted attention, receiving 7 visitors in its first couple of days. Over the next couple of months, five other 'offices' or 'notebooks' were created.

Content and Form. The content of the topic consisted of fairly long postings by Tom, observations and remarks typically in the form of short essays, interspersed with responses and dialog between Tom and other participants. In terms of form the essays were quite literary, with formal punctuation, syntax, titles, and layout; the comments tended to be more 'oral' in nature, (i.e. brief and informal). Most of the activity was work oriented, though there were occasional episodes of social or ludic behavior.

Participatory Structure. Over time, the topic developed an interaction pattern in which Tom would post a longish essay or note, and others would make generally brief comments to which Tom would reply. In the distribution of interaction over time and participants, this topic resembled BABBLE PROBLEMS (as well as the next and last topic to be discussed: ABUSING WENDY), with a few frequent participants, and a very 'bursty' rhythm.

4.2.5. ABUSING WENDY

Origin and Purpose. The ABUSING WENDY topic has an unusual history. It was originally created to 'encourage' (via peer pressure) a popular user of that name to return to Babble after she had stopped using it for several weeks. The joking claim was that this would lure her back on Babble to defend herself, and, when she did return and respond to the teasing, it took on a life of its own.

Content and Form. The content consisted principally of remarks directed to Wendy - either a tease or simply an ingenuous remark like 'this topic has been awfully quite lately!' - followed by retaliatory replies from Wendy, usually ripostes, mock threats, or injunctions to go away, all delivered in ALL CAPS, thus signifying shouting. There were no instances of work related activity taking place here. Besides the uppercase commentary by Wendy, most posts were very short and informal in style (with frequent departures from formal punctuation and capitalization). Unlike any other topic examined, 7 of the comments were uttered (pseudo) anonymously, using nicknames departing from the convention of including the person's actual name (e.g. "scared" and "anon") - in fact, because of the social proxy and the ability to determine the real identity of anyone synchronously present - the use of such nicknames was more in the nature of feigning anonymity than achieving it.

Participatory Structure. Over the course of about two weeks, the following pattern developed. After a period of inactivity someone would make an entry in the topic, a few other comments might follow, but very quickly Wendy would arrive and 'shout' (in uppercase) at everyone and tell them to go elsewhere. Interaction would cease, until the next provocation. This conversation very quickly took on the character of a game with three principal players: Wendy, who dominated the topic, contributing 40% of the comments, and two other users contributing 26% and 16% of the comments; the other six players each contributed less than four percent of the content.

4.3. Comparing the Conversations

	Commons Sept. 98	Babble Problems	Bad Jokes	Tom's Office	Abusing Wendy
Purpose	Work/Social	Work	Ludic	Work	Ludic
Participants	19	10	11	11	8
Dominant poster?	No	No	Yes	Yes	Yes

Posts/month	600	22.4	7.5	7.3	14.8
Lines/post	4.0	5.1	26.0	18.8	4.2
Sample duration	1 month 9/1-30	20 months 8/97-4/99	1 year 3/98-99	8 months 7/98-3/99	1 year 3/98 -99

Table 1. Comparing the conversations.

Table 1 and figure 2 compare some of the characteristics of the five conversations. Table 1 summarizes the overall characteristics of each conversation, and figure 2 shows graphs of the frequency of participation (in percent) for the possible participants in each conversation. Figure 2 is particularly interesting, in that it shows the difference in the distribution of participation across conversations. At one end of the extreme is the COMMONS AREA, with a very broad, relatively egalitarian distribution of participants; at the other extreme are TOM'S OFFICE and ABUSING WENDY, topics dominated by one or a few individuals, with a distinct second tier of participants.

What is most striking in looking over the various conversations is the sheer amount of variation between them. Since the conversations were selected to represent a wide range of types this is not entirely surprising, but on the other hand, it does support the claim that individual conversations - even though carried out by the same group of people, in the same organizational context, in the same system - can have very different structure and dynamics, and thus be aptly characterized in terms of genre.

In this regard, the notion of conversational genres as consisting, in part, of a participatory structure seems of particular importance with regard to trying to understand on-line systems of this sort. For example, conversations that are highly dominated by an individual are likely to be quite fragile: that is, if Tom or Wendy were to leave the Babble system, it seems likely that the TOM'S OFFICE and ABUSING WENDY conversations would come to an end, whereas the others would be likely to continue on.

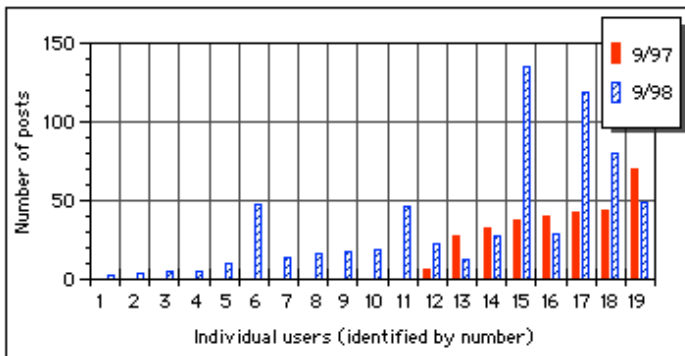


Figure 2. Differences in proportional distribution of participation across conversations. (Note: order of participants along the x-axis is not constant from one conversation to the next.)

As noted elsewhere ([6]), this puts a rather different spin on the notion of critical mass, which is usually

invoked in discussing the success or failure of CMC systems: here, the amount of mass which is critical seems to vary from conversation to conversation. To the extent that TOM'S OFFICE serves as a personal notebook, it requires only Tom's input. ABUSING WENDY requires Wendy's input, but also at least one other to serve the provocation function that the game requires. Similarly, BABBLE PROBLEMS requires at least one person to have and report problems, and another to respond and fix them, and an imperfect system to produce the problems. The COMMONS AREA, in contrast, would seem to have a higher requirement for a critical mass for participation because its activity arises solely from interaction among people, no particular person serving as the motivating force.

This last point - the role of system bugs in driving the conversation - is quite interesting: unlike the other conversations examined, BABBLE PROBLEMS is partly driven by external forces, rather than solely by the activity of participants. Elsewhere in Babble we have observed that some features of the system can actually stimulate conversation, and often contribute to the liveliness of the activity. For example, in the early days of Babble, there was no interface mechanism for determining the color of a participant's marble; instead, the color of a marble was computed by doing a hash on the user's nickname. As a consequence, the following interaction sequence often occurred: a new user would ask how to change the color of their marble; one or more experienced users would explain that it was generated from the nickname, and describe how to change that; a flurry of nickname (and color) changing would then occur, with jokes and other commentary by on-lookers. After a mechanism for picking marble color was introduced, most of this behavior vanished. It seems ironic that improving the system's usability might actually have a negative impact on the system's use.

5. The Babble System as a Whole

As mentioned in the introduction, one of the motivations for this work was to try to characterize the behavior of Babble as a whole. In our experience of reflecting on our own use of the system, as well as deploying it to a number of other groups, we observed that some deployments of Babble seemed alive and healthy, whereas others seemed weak or fragile. In this section we develop the notion of genre ecologies, the idea that a CMC system like Babble can be viewed as an ecology of conversational genres, in which the various conversational genres are interdependent and act - in a variety of ways - to support the functioning of the system as a whole.

5.1. "Babble" as a Genre Ecology

This type of analysis has some similarities to work previously done in situated genre theory. Bazerman [2] has described the concept of genre systems in his work on the document-driven discourse in the patent application and adjudication process. He notes that the process is driven by a variety of document genres, and that a particular response to one genre (e.g., the rejection of an application) will lead to the production of a particular genre of document in response. The dependencies captured in this notion are similar to those we observe in Babble, however the genre systems proposed by Bazerman are deterministic (a particular response to a particular genre leads to the generation of another specific genre), whereas what we observe is much 'softer.'

Similarly, Orlikowski, et al [15] have discussed the notion of genre repertoires in organizations, noting that organizations have a particular set of genres on which they can draw to engage in collective action. This concept seems useful, since one thing that we've observed in the course of the adoption (or not) of Babble, is that participants only gradually build up a set of ways in which they turn Babble to their personal and collective ends.

It seems useful to combine these two notions. Beginning with the idea of genre repertoires, that a community or organization can possess (and expand) a set of genres for engaging in collective activity, we add in (a softer) notion of the interdependence and triggering expressed in the concept of genre systems, which we express in terms of properties of conversational genres. This gives us what seems to be a useful conceptual framework for talking about CMC systems: genre ecologies.

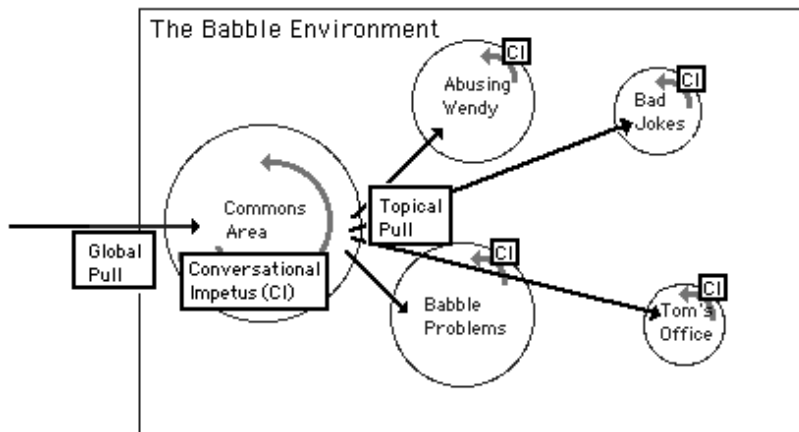


Figure 3. The forces at play in the Babble genre ecology: global pull (bringing participants into the system), topical moving (moving them around the conversation space), and conversational impetus (the degree of 'energy' a conversation has - i.e. the amount of effort required to participate in it).

The notion is that conversation genres have a number of properties which work together to drive the activity in Babble as a whole. We can look at each conversational genres in terms of three ecological properties: *global pull* which brings people onto the system; *topical pull*, which causes people to move into particular conversations; and *conversational impetus*, which has to do with how much energy a participant needs to invest to participate in a conversation, that is, to contribute to that genre. Figure 3 shows a schematic of these forces as they apply to the Babble conversations examined. Note that these are relational properties, their strengths varying depending on the relationship between a particular genre and a particular participant.

Let's look at each of these three properties in turn. *Global pull* is what induces a potential user to start up and log on to Babble, with no cues from the system (since it isn't running). *Global pull* is often initially a purely social force. For example, in the Babble deployment studied here, members of a subgroup of the lab often used the COMMONS AREA to make announcements about impromptu meetings, talks, and events. When a new member joined that subgroup, he found that, to avoid missing events, he had to regularly log on to Babble to monitor the COMMONS AREA. While conversational genres that directly support work practices can obviously create a great deal of *global pull*, it is also the case that as members become accustomed to Babble, *the global pull* may increase for less instrumental reasons such as the desire to socialize with colleagues, or read the latest jokes. In any event, the importance of *global pull* is that once users are on Babble, they are more available for participation in other conversational genres on Babble.

Related to the notion of *global pull*, is *topical pull*. That is, once on Babble, what might cause a participant to move to a different conversational genre? Babble tries to enhance *topical pull* via a number of mechanisms aimed at making activity visible. The most obvious of these is the social proxy, which makes synchronous group activity in a conversation evident by displaying a tight cluster of dots (as shown in figure 1); this visibility can alert people who are logged on to Babble, but engaged in non-Babble activity,

that something is happening, and can thus draw them into the conversation. For topics where synchronous activity is rare, mechanisms to make activity visible are available but not as prominent: when new material is posted in a conversation, its title (in the topic list in the upper right corner of figure 1) turns red. As noted earlier, the use of a hyphen to begin the name of the COMMONS AREA (i.e. "- Commons Area -") enhances its visibility by ensuring its presence at or near the top of the list of topics; the topics list also shows miniature versions of the social proxy to the right of each topic, to help users judge when there are people in topics (this works most effectively for topics near the top of the topic list (i.e. near the COMMONS AREA). All of these mechanisms simply show either that new material has been added to a topic, or that people are present in a topic; it says nothing about what has happened. If the conversational genre has a sufficiently narrow range of content (e.g., BABBLE PROBLEMS or ABUSING WENDY), the simple presence of people or activity may provide a strong indication of what is happening; in less tightly defined genre, it may mean little or nothing.

The final property is *conversational impetus*. That is, once started, some conversational genres are relatively easy to keep going. For example, BABBLE PROBLEMS is driven by bugs in the system itself, and as long as the system keeps changing, it simply requires a disgruntled user or two and someone who might respond to their complaints. Similarly, provided that a participant knows Wendy well enough to participate in teasing, ABUSING WENDY requires little work (except from Wendy) to keep the game going: often all that is required is presence in the topic. The COMMONS AREA, in contrast, appears to require a larger and more diverse critical mass, and moreover- to the extent it is socially driven (rather than driven by shared work) - requires that the participants have social ties that are strong enough to fuel the interaction. Still, over time, customs develop - saying "good morning" and "playing with Archie" - that enable the conversation to move forward. TOM'S OFFICE requires still more effort to drive: in the pattern established, Tom has to write substantive pieces to which others respond.

6. Concluding Remarks

The principal goal of the paper has been to explore ways of characterizing activity that occurs in computer mediated communication systems. We used situated genre theory to examine a set of long-running conversations that occurred among members of an extended group of users of a novel CMC environment. We have two types of results. First, we found it quite straightforward to treat CMC-based conversations as instances of genre, and were surprised at diversity of (in particular) the participatory structures of different conversations occurring among the same set of users of the same system embedded in the same work and institutional context. To us, this lends considerable support to the notion that conversations - at least the sort of long-running, persistent conversations that take place in the digital medium - may be fruitfully viewed as instances of genre, a position that is not commonly accepted among situated genre theorists. Second, we found that genre theory was helpful in thinking about the nature of activity in the system as a whole. Building on the work of others who have thought about how sets of genres (systems and repertoires) work together, we have advanced the notion of a genre ecology, a more relaxed version of a genre system which pays particular attention to how participants are recruited into different genres. In particular, we suggest that, for the purposes of discussing how genres function as part of a genre ecology, that three forces are of particular import: *global pull*, *topical pull*, and *conversational impetus*.

Much remains to be done. In terms of this analysis, we see two obvious next steps. First, we clearly need to come up with ways of measuring or estimating the ecological properties of conversation genres. Second, we would like to continue characterization of conversations by identifying conversational practices or tropes that occur as elements of some of the on-going conversations, such as the practice of saying 'good morning' or the trope of 'playing with Archie.' These are examples of what Bakhtin [1] would call speech genre, and understanding to what degree they are present in, and how they are distributed among, conversational

genres, might aid in further characterizing the different conversational genres.

7. Acknowledgments

The work described herein is highly collaborative, and we acknowledge the substantive contributions of our colleagues at IBM. Thanks to David N. Smith for creating the Babble prototype, Mark Laff, and Amy Katriel for implementations of the social proxy and Java versions of Babble, Cal Swart for critical assistance in the deployment of Babble, and Rachel Bellamy, Jonathan Brezin, Brent Hailpern, Charlie Hill, Amy Katriel, Wendy Kellogg, Mark Laff, Petar Makara, Peter Malkin, John Richards, David N. Smith, Cal Swart, John Thomas, and our summer interns Erin Bradner and Jason Ellis for productive, long-running conversations. Thanks to Ian Simmonds and anonymous reviewers for comments on a draft of this paper.

8. References

- [1] Bakhtin, M. M. "The Problem of Speech Genres," in *Speech Genres & Other Essays* (ed. C. Emerson and M Holquist; trans., Vern W. McGee). Austin, Texas: University of Texas Press, 1986.
- [2] Bazerman, C. "Systems of Genre and the Enactment of Social Intentions," in A. Freedman and P. Medway, eds., *Genre and the New Rhetoric*. London: Taylor & Francis Ltd., 1995, pp 79-101.
- [3] Bazerman, C. *Shaping Written Knowledge: The Genre and Activity of the Experimental Article in Science*. Madison: The University of Wisconsin Press, 1988.
- [4] Berkenkotter, C. & Huckin, T. N. *Genre Knowledge in Disciplinary Communication: Cognition/Culture /Power*. Hillsdale, NJ: Lawrence Erlbaum Associates, 1995.
- [5] Bergquist, M. & Ljungberg, J. "Genres in Action: Negotiating Genres in Practice." *Proceedings of the Thirty Second Annual Hawaii International Conference on Systems Sciences* (ed. R. Sprague), IEEE Press, 1999.
- [6] Bradner, E., Kellogg, W, & Erickson, T. *The Adoption and Use of Babble: A Field Study of Chat in the Workplace*. *Proceedings of the European Computer Supported Cooperative Work (ECSCW '99) conference*, 1999.
- [7] Crowston, K. & Williams, M. *Reproduced and Emergent Genres of Communication on the World Wide Web*. *Proceedings of the Thirtieth Annual Hawaii International Conference on Systems Sciences* (ed. R. Sprague), IEEE Press, 1997.
- [8] Crowston, K. & Williams, M. *The Effects of Linking on Genres of Web Documents*. *Proceedings of the Thirty Second Annual Hawaii International Conference on Systems Sciences* (ed. R. Sprague), IEEE Press, 1999.
- [9] Erickson, T. *Social Interaction on the Net: Virtual Community as Participatory Genre*. *Proceedings of the Thirtieth Annual Hawaii International Conference on Systems Sciences* (ed. R. Sprague), IEEE Press, 1997.
- [10] Erickson, T. "Rhyme and Punishment: The Creation and Enforcement of Conventions in an On-Line Participatory Genre." *Proceedings of the Thirty Second Annual Hawaii International Conference on Systems Sciences* (ed. R. Sprague), IEEE Press, 1999.

- [11] Erickson, T. "Persistent Conversation" Proceedings of the Thirty Second Annual Hawaii International Conference on Systems Sciences (ed. R. Sprague), IEEE Press, 1999.
- [12] Erickson, T. Smith, D. N., Kellogg, W. A., Laff, M. R., Richards, J. T., and Bradner, E. "Socially Translucent Systems: Social Proxies, Persistent Conversation, and the Design of 'Babble.'" In *Human Factors in Computing Systems: The Proceedings of CHI '99*. ACM Press, 1999.
- [13] Fortanet, I., Palmer, J.C., & Posteguillo, S. "Netvertising: content-based subgeneric variations in a digital genre." Proceedings of the Thirty First Annual Hawaii International Conference on Systems Sciences (ed. R. Sprague), IEEE Press, 1998.
- [14] Miller, C. "Genre as Social Action." *Quarterly Journal of Speech*, vol. 70, pp. 151-67. 1984. (Reprinted in *Genre and the New Rhetoric* (eds. A. Freedman & P Medway) London: Taylor and Francis, 1994.
- [15] Orlikowski, W.J. & Yates, J. "Genre Repertoire: The Structuring of Communicative Practices in Organizations," *Administrative Sciences Quarterly*, vol. 39, no. 4, 1994, pp 541-574.
- [16] Schultze, U. & Boland, R. J. Hard and Soft Information Genres: An Analysis of Two Notes Databases." Proceedings of the Thirtieth Annual Hawaii International Conference on Systems Sciences (ed. R. Sprague), IEEE Press, 1997.
- [17] Shepherd, M. & Watters, C. The Evolution of Cybergenre. Proceedings of the Thirty-First Hawaii International Conference on Systems Sciences (ed. R. Sprague), 1998.
- [18] Swales, J. *Genre Analysis*. Cambridge: Cambridge University Press, 1990.
- [19] Yates, J. and Orlikowski, W. J. "Genres of Organizational Communication: A Structural Approach to Studying Communication and Media." *Academy of Management Science Review*, Vol. 17, No. 2, 299-326, 1992.
- [20] Yates, J., Orlikowski, W. J., & Rennecker, J. "Collaborative Genres for Collaboration: Genre Systems in Digital Media." Proceedings of the Thirtieth Annual Hawaii International Conference on Systems Sciences (ed. R. Sprague), IEEE Press, 1997.
- [21] Yates, S., & Sumner, T. Digital Genres and the New Burden of Fixity. Proceedings of the Thirtieth Annual Hawaii International Conference on Systems Sciences (ed. R. Sprague), IEEE Press, 1997.