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This paper reports on some of the components of person to person communication mediated by computer conferencing systems. Transcripts from two systems were analysed: the Electronic Information and Exchange System (EIES), based at the New Jersey Institute of Technology; and Planet, based at Infomedia Inc. in Palo Alto, California. The research focused upon the ways in which expressive communication is encoded by users of the medium<sup>1</sup>.

1. INTRODUCTION

The term paralanguage is used broadly in this report. It includes those vocal features outlined by Trager (1964) as well as the prosodic system of Crystal (1969). Both are concerned with the investigation of linguistic phenomena which generally fall outside the boundaries of phonology, morphology and lexical analysis. These phenomena are the voice qualities and tones which communicate expressive feelings, indicate the age, health and sex of a speaker, modify the meanings of words, and help to regulate interaction between speakers.

Paralanguage becomes an issue in print communication when individuals attempt to transcribe (and analyse) an oral presentation, or write a script which is to be delivered orally. In addition, paralinguistic analysis can be directed towards forms of print which mimic or contain elements of oral communication. These include comic strips, novels, graffiti, and computer conferencing (see Crystal and Davy 1969).

The research reported here is not concerned with a direct comparison between face-to-face and computer mediated communication. Such a comparison is useful, e.g. it can help us to understand how one form borrows elements from the other (see section 5.), or aid in the selection of the medium which is more appropriate for a given task. However, the intent here is simpler: to isolate some of the paralinguistic features which are present in computer mediated communication and to begin to map the patterning of those features.

2. THE FRAME

Computer conferencing may be described as a frame of social activity in Goffman's terms (1974). The computer conferencing frame is characterized by an exchange of print communication between or among individuals. That is, it may involve person to person or person to group communication. The information is typed on a computer terminal, transmitted via a telephone line to a central computer where it is processed and stored until the intended receiver (also using a computer terminal and a telephone line) enters the system. The received information is either printed on paper or displayed on a television screen. The exchange can be in real time, if the users are on the system simultaneously and linked together in a common notepad. More typically, the exchange is asynchronous with several hours or a few days lapse between sending and receiving.

In all of the transcripts examined for this study, the composer of the message typed it into the system. Further, the systems were used for many purposes:

simple message sending (electronic mail), task related conferencing, and fun (e.g. jokes and conferences on popular topics). Bills for usage were paid by the organizations involved, not the individuals themselves. These elements within the frame may affect the style of interaction.

One concern in frame analysis is to understand differences in a situation which make a difference. Clearly, there is a need to investigate conditions not included in this study in order to gain a broader understanding of paralinguistic usage. Among the conditions which might make a difference are: the presence of a secretary in the flow of information; usage based upon narrow task communications only; and situations where there is a direct cost to the user.

3. FEATURES

The following elements have been isolated within the transcripts and given a preliminary designation as paralinguistic features.

3.1. VOCAL SPELLING

These features include non standard spellings of words which bring attention to sound qualities. The spelling may serve to mark a regional accent or an idiosyncratic manner of speech. Often, the misspelling involves repetition of a vowel (drawl) or a final consonant (released or held consonant, with final stress). In addition, there are many examples of non standard contractions. A single contraction in a message appears to bring attention (stress) to the word. A series of contractions in a single message appears to serve as a tempo marker, indicating a quick pace in composing the message.

/biznis/

/weeeeeell/

/breakkk/

/y'all/

/Miami Dade Cmty Coll Life Lab Pgm/

Figure 1. Examples of Vocal Spelling

Some of the spellings shown above can occur through a glitch in the system or an unintended error by the composer of the message. Typically, the full context helps the reader to discern if the spelling was intentional.

3.2. LEXICAL SURROGATES

Often, people use words to describe their "tone of voice" in the message. This may be inserted as a parenthetical comment within a sentence, in which case it is likely to mark that sentence alone. Alternatively, it may be located at the beginning or end of a message. In these instances, it often provides a tone for the entire message.

In addition, vocal segregates (e.g. uh huh, humm, yuk yuk) are written commonly within the body of texts.

1. The research was supported by DHEW Grant No. 54-P-71362/2/2-01

/What was decided? I like the idea, but then again, it was mine (she said blushing)./

/Boo, boo Horror of horrors! ti65 DOESN'T seem to cure all the problems involved in transmitting files./

Figure 2. Examples of Lexical Surrogates

### 3.3. SPATIAL ARRAYS

Perhaps the most striking feature of computer conferencing is the spatial arrangement of words. While some users borrow a standard letter format, others treat the page space as a canvass on which they paint with words and letters, or an advertisement layout in which they are free to leave space between words, skip lines, and paragraph each new sentence.

Some spatial arrays are actual graphics: arrangements of letters to create a picture. Hiltz and Turoff (1978) note the heavy use of graphics at Christmas time, when people send greeting cards through the conferencing system. In day to day messaging, users often leave space between words (indicating pause, or setting off a word or phrase), run words together (quickening of tempo, onomatopoeic effect), skip lines within a paragraph (to setoff a word, phrase or sentence), and create paragraphs to lend visual support to the entire message or items within it. In addition, many messages contain headlines, as in newspaper writing.

/One of our units here just makes an awfulhowling noise./

/AA  
MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM  
OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO  
SSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS/

/\$  
When the next bill comes in from  
EIES/Telenet, you may also be interested/

Figure 3. Examples of Spatial Arrays

### 3.4. MANIPULATION OF GRAMMATICAL MARKERS

Grammatical markers such as capitalization, periods, commas, quotation marks, and parentheses are manipulated by users to add stress, indicate pause, modify the tone of a lexical item and signal a change of voice by the composer. For example, a user will employ three exclamation marks at the end of a sentence to lend intensity to his point. A word in the middle of a sentence (or one sentence in a message) will be capitalized and thereby receive stress. A series of dashes between syllables of a word can serve to hold the preceding syllable and indicate stress upon it or the succeeding syllable. Parentheses and quotation marks are used commonly to indicate that the words contained within them are to be heard with a different tone than the rest of the message. A series of periods are used to indicate pause, as well as to indicate internal and terminal junctures. For example, in some messages, composers do not use commas. At points where a comma is appropriate, three periods are employed. At the end of the sentence, several periods (the number can vary from 4 to more than 20) are used. This system indicates to the reader both the grammatical boundary and the length of pause between words.

The Electronic Information and Exchange System employs some of these grammatical marker manipulations in the interface between user and system. For example, they

instruct a user to respond with question marks when he does not know what to do at a command point. One question mark indicates "I don't understand what EIES wants here," and will yield a brief explanation from the system. Two question marks indicate "I am very confused" and yield a longer explanation. Three question marks indicate "I am totally lost" and put the user in direct touch with the system monitor.

/Welcome Aboard!!!/

/This background is VERY important, since it makes many people (appropriately, I think) aware about idea./

/THERE IS STILL SOME CONFUSION ON DATES FOR PHILADELPHIA. MIKE AND I ARE PERPLEXED!?!/

/At this point, I think we should include a BROAD range of ideas -- even if they look unworkable./

/Paul...three quick points.....first...the paper/

Figure 4. Manipulation of Grammatical Markers

### 3.5. MINUS FEATURES

The absence of certain features or expected work in composition may also lend a tone to the message. For example, a user may not correct spelling errors or glitches introduced by the system. Similarly, he may pay no attention to paragraphing or capitalization. The absence of such features, particularly if they are clustered together in a single message, can convey a relaxed tone of familiarity with the receiver or quickness of pacing (e.g. when the sender has a lot of work to do and must compose the message quickly).

### 4. PATTERNING OF FEATURES

It can be noted, first, that some features mark a short syllabic or polysyllabic segment (e.g. capitalization, contraction, and vocal segregates), while others mark full sentences or the entire message (e.g. a series of exclamation points, letter graphics, or an initial parenthetical comment). Second, it is revealing that many of these features have an analogic structure: in some manner, they are like the tone they represent. For example, a user may employ more or fewer periods, more or fewer question marks to indicate degrees of pause or degrees of perplexity. Paralanguage in everyday conversation is highly analogic and represents feelings, moods and states of health which do not (apparently) lend themselves to the digital structure of words.

Paralinguistic features in computer conferencing occur, often, at points of change in a message: change of pace, change of topic, change of tone. In addition, many of the features rely upon a contrastive structure to communicate meaning. That is, a message which is typed in all caps does not communicate greater intensity or stress. Capitalization must occur contrastively over one or two words in an otherwise normal sentence or over one or two sentences in a message which contains some normal capitalization.

Most paralinguistic features can have more than one meaning. Reviewed in isolation, a feature might indicate a relaxed tone, an intimate relation with the receiver, or simply sloppiness in composition. Readers must rely upon the surrounding context (both words and other paralinguistic features) to narrow the range of possible meanings.

The intended receiver of a message, as well as an outsider who attempts to analyse transcripts, must cope with the interpretation of paralinguistic features. Initially, the reader must distinguish glitches in the system and unintended typing errors from intentional use of repetition, spacing, etc. Subsequently, the reader must examine the immediate context of the feature and compare the usage with similar patterns in the same message, in other messages by the composer, and/or in other messages by the general population of users.

##### 5. DEVELOPMENT OF A CODE

The findings presented in this study are taken from a limited set of contexts. For this reason, they must be regarded as a first approximation of paralinguistic code structure in computer conferencing. Moreover, the findings do not suggest that a clear code exists for the community of users. Rather, the code appears to be in a stage of development and learning.

The study has helped to define some differences among users which appear to make a difference in the paralinguistic features they employ. In the corpus of transcripts examined, usage varied between new and experienced participants, as well as between infrequent and frequent participants. Generally, experienced and frequent participants employed more paralinguistic features. However, idiosyncratic patterns appear to be more important in determining usage. The findings serve more to define questions for subsequent study than to provide answers about user variations.

In addition, it is clear that the characteristics of the computer terminals (TI 745s, primarily), as well as system characteristics, provided many of the components or "bricks" with which paralinguistic features were constructed. For example, the repeat key on the terminal allowed users to create certain forms of graphics. Also, star keys, dollar signs, colons and other available keys were employed to communicate paralinguistic information. System terms to describe a mode of operation (e.g. notepad, scratchpad, message, conference) may also influence development of a code of usage by suggesting a more formal or informal exchange.

Finally, it may be noted that early in their usage, some participants appeared to borrow formats from other media with which they were familiar (e.g. business letters, telegrams, and telephone conversations). Over time, patterns of usage converged somewhat. However, idiosyncratic variation remained strong.

##### 6. CONCLUSION

A few conclusions can be drawn from this study. First, the presence of paralinguistic features in computer conferencing and the effort by users to communicate more information than can be carried by the words themselves, suggest that people feel it is important to be able to communicate tonal and expressive information. Second, it is not easy to communicate this information. Users must work in computer conferencing to communicate information about their feelings and state of health which naturally accompanies speech. While there does not appear to be a unified and identifiable code of paralinguistic features within conferencing systems or among users of the systems, the collective behavior of participants may be creating one.

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