Using Face-to-face Dialogue as a Standard for Other Communication Systems

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Abstract: Because face-to-face dialogue is our first and most common form of communication, we can use it as a prototype to evaluate other forms of communication. Three features are fully present only in face-to-face dialogue: unrestricted *verbal* expression, meaningful *nonverbal* acts such as gestures and facial displays, and instantaneous *collaboration* between speaker and listener. In this paper, we explicate these three dimensions and then use them to measure other communication systems: written text, television, and electronic mail. Users of these other systems often spontaneously accommodate to their limitations by inventing dialogue-like features. Finally, we propose that the design of new communication systems could benefit by using face-to-face dialogue as both a standard and a source of solutions.

Résumé: Notre principal outil pour communiquer, le plus universel, consiste en rapports verbaux directs: on peut donc s'en servir comme étalon afin de jauger d'autres moyens de communication. Cette analyse démontre que trois traits se retrouvent dans leur intégralité uniquement dans les rapports verbaux directs: a) une *expression orale* sans contraintes; b) un *paralangage* expressif significatif (gestuel, mimique); c) une *interaction* immédiate entre le sujet émetteur et le sujet récepteur. Dans ce travail, nous examinons en détail ces trois caractéristiques pour les utiliser ensuite dans l'appréciation d'autres moyens de communiquer: l'écrit, la télévision et le courrier électronique. Les personnes se servant de ces médias suppléent souvent aux lacunes de ces derniers en recréant instinctivement les particularités de la conversation. Pour terminer, nous voudrions dire que les rapports verbaux directs—utilisés comme norme, comme clé de problèmes—pourraient être utiles à la conception de nouveaux systèmes de communication.

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Some communication and language scholars have proposed a special status for ordinary, everyday conversation. Levinson (1983, p. 284) described conversation as "the prototypic speech act"; Clark & Wilkes-Gibbs (1986, p. 1) described it as "the fundamental site of language use." Linell (1982) emphasized that spoken dialogue (rather than written text) is the language of primary socialization and of everyday life. In other words, it is our first language developmentally and continues to be the language of our daily interactions. Most everyday conversation takes place in *face-to-face dialogue* with friends, family, co-workers, neighbours, salesclerks, strangers, and so forth.

It is therefore odd that communication theories tend to be based on more formal prototypes, such as written language (the linguistic tradition), public speaking (the rhetorical tradition), or electronically mediated communication (the information transmission tradition). One consequence of using any of these prototypes as an implicit or explicit standard of communication is to obscure the unique features of face-to-face dialogue or even to see it as a poorer form of communication (cf. Goodwin, 1981).

In this paper, we take the opposite approach and propose that face-to-face dialogue is an appropriate standard against which to measure other forms of human communication (e.g., written text, television, e-mail, formal lectures). First, we will explicate three dimensions on which face-to-face dialogue has advantages over other communication systems: Face-to-face dialogue is fully *verbal, non-verbal,* and *collaborative.* Then, we will assemble these three dimensions to propose a model of communication by which we can assess the other systems. Specifically, what do they lack, in comparison to face-to-face dialogue? What might be the consequences of losing capacities that we are accustomed to using in everyday communication? How do people spontaneously accommodate, and how can we design systems to make up for those deficiencies?

Our unit of analysis will always be the whole communication system rather than separate individual components (Watzlawick, Beavin Bavelas, & Jackson, 1967, chap. 4); that is, when assessing the capacity of a system, we will examine what can be done within the system as a whole. For example, a television commentator has considerable one-way influence on his or her audience, but the members of the viewing audience have very little capacity to respond. Therefore, the whole communication system, which includes both commentator and audience, has virtually no capacity for collaboration. The limitations of a system might be technological, as with television, or social—for example, the conventions of a formal lecture also limit collaboration. For any given kind of system, there are of course exceptions (for example, some TV programs broadcast viewers' comments). As explained in a later section, we think these exceptions reveal the ways in which people modify a format to make it simulate features of face-to-face dialogue. For example, if the participants cannot
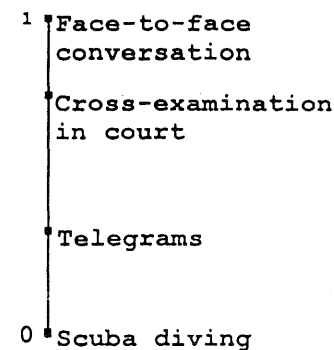
collaborate, they can at least draw on their common ground to maximize the likelihood of mutual understanding.

The verbal dimension

Words are ubiquitous in human communication, but there are differences in the degree to which full verbal capacity (whether spoken, written, or signed) is available. That is, while we use words in most communication settings, we cannot always use our full potential range of verbal expressiveness. Full capacity on the verbal dimension would mean that the people involved could speak freely, as is often the case in face-to-face dialogue. In formal communication formats, this is often not the case. For example, written academic text uses a limited vocabulary and proscribes slang and informal grammatical forms. We can talk informally in person about our ideas much more freely than we can write about them.

Figure 1 illustrates the full range of this dimension, starting with face-to-face dialogue. (In this and all subsequent figures, the implied quantities are relative and metaphorical, intended only to indicate "more" and "less" of our abstract dimensions.) Next on the verbal dimension are formal settings such as the courtroom, in which the attorney can only ask certain questions and the witness can only respond in certain terms. For example, the attorney cannot ask "leading questions," and the witness can only answer in ways the court deems appropriate (e.g., limiting the testimony to what he or she has witnessed directly). Thus, their verbal exchanges are much more limited than the dialogue they might have had about the same events in casual conversation. Before the era of faxes, the constraints imposed by telegrams were even more restrictive, because each word incurred a cost. Finally, there are settings such as scuba diving where words are not available.

Figure 1
The Verbal Dimension

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1  ┬ Face-to-face
   │ conversation
   │
   ┤ Cross-examination
   │ in court
   │
   │
   │
   ┤ Telegrams
   │
   │
   │
0  ┴ Scuba diving
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Other contrasts on this dimension include the limited vocabulary appropriate to formal letters or memos versus the freer, more informal vocabulary of some e-mail. A multiple-choice test restricts the student's verbal options in a way that essay tests do not. Even in face-to-face dialogue, there may be social restrictions, such as the difference in appropriate vocabulary at a formal diplomatic dinner compared to an evening at home with friends.

The non-verbal dimension

An obvious feature of face-to-face dialogue is the availability of non-verbal communication. Although the full scope of non-verbal communication potentially includes any act other than words, here we will focus only on those non-verbal acts that are directly connected to the words. In particular, we include facial expressions (e.g., Chovil, 1991/1992), gestures (e.g., McNeill, 1985), eye contact (Kendon, 1967), and paralinguistic features of the spoken voice (e.g., Scherer, 1982). These are the non-verbal components usually used in conjunction with words to create a message in face-to-face dialogue. In this paper, we are not concerned with other non-verbal information such as posture, clothing, or smell.

The terms "conversation" and "dialogue" tend to imply verbal exchanges. When people refer to what is said, they often mean the words uttered, implicitly ignoring or downplaying the non-verbal complements. To realize the importance of non-verbal information, try having a conversation with a friend in which you suppress all non-verbal features: both of you are straight-faced, speaking in monotone, and not moving your bodies at all. Or, recall how little you get out of a lecture when the speaker just reads from a text.

In face-to-face dialogue, we have access to all of the non-verbal elements available in human communication (see Figure 2). The participants' faces and voices are constantly expressive, and their hands gesture freely. These non-verbal acts provide not only useful redundancy but also supplementation and nuance, and they often permit the depiction of meanings that are difficult or impossible to convey in words.

Figure 2
The Non-verbal Dimension
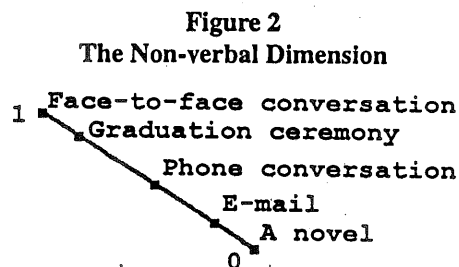
In other situations, only part of the complete array of non-verbal elements may be available. In a formal setting, such as a graduation or wedding ceremony, the participants are not allowed the full range of non-verbal behaviours. For example, it would be inappropriate to belly-laugh, stick out your tongue, or cross your eyes.

Technological communication often restricts the availability of non-verbal aspects of communication. For example, on the telephone, we do not have access to any visible non-verbal cues such as facial or hand gestures. There are, however, audible non-verbal features, such as the nuances of vocal inflection, tone of voice, and pauses—all of which can convey significant information.

Electronic mail has become a common mode of communication for many people. Here we have access to neither audible nor visible non-verbal information. In spite of the verbal informality of e-mail, we cannot see a smile, a concerned face, or a gesture; we cannot hear a hesitant, enthusiastic, humorous, or sarcastic tone of voice. An interesting adaptation to this deficiency is the invention of "emoticons," which are typewritten symbols that imitate facial expressions. For example, :) is a smile on its side, :(is a sad face, and ;) is a wink. Because of these symbols, we have placed e-mail a bit higher on the non-verbal dimension than other forms of written text.

An ordinary novel is an example of the lowest position on the non-verbal dimension. One could argue that some kinds of punctuation convey non-verbal information, but the information carried by even the most expressive punctuation gives less information than a facial expression or tone of voice. A phrase punctuated with an exclamation mark is still missing tone of voice; for example, "Yes!" could have been uttered in anger, jest, or happiness.

The collaborative dimension

One of the most often overlooked aspects of face-to-face dialogue is that it is *social interaction*, that is, it is two-way rather than one-way. Moreover, dialogue is not simply alternating monologues, in which a mute and inexpressive listener waits for the speaker to finish his or her monologue. Speakers overlap, build sentences together, and even speak and gesture simultaneously. In addition, listeners frequently insert brief responses such as "Yeah," "Mhm," and nodding (which Yngve [1970] called "back-channel" responses). Even when they are not inserting these discrete responses, listeners provide constant facial feedback by their attentive, confused, or bored expressions.

Clark and his colleagues (e.g., Clark, 1992, 1996; Clark & Schaefer, 1987; Clark & Wilkes-Gibbs, 1986) have identified processes of *collaboration* in conversation, by which they mean that the participants can work together to confirm that *what is being said is also being understood*. For example, when Kathy says to Daniel, "Now hit the return key," Daniel can respond, "Is that

the one that has the arrow and says enter?" This possibility of achieving immediate clarification is a unique feature of face-to-face dialogue. In no other form of communication does collaboration on mutual understanding occur as rapidly and freely.

The participants have many different conversational resources for collaboration. The speaker can actively seek evidence of understanding from the listener in a variety of ways. Some are verbal ("Do you understand?" "Am I going too slow?"). Some combine verbal and non-verbal elements (e.g., "Y'know?"; cf. Bernstein, 1962). Some are entirely non-verbal, such as a pause with an inquiring look or the speaker's highly specialized gestures for eliciting feedback from the listener (Bavelas, Chovil, Coates, & Roe, 1995).

Listeners, too, have both verbal and non-verbal resources for collaboration. The most subtle example is facial: the listener can indicate understanding by simply continuing to attend to the speaker; on the other hand, a distracted or confused look will often lead to expansion or rephrasing by the speaker. The listener also regularly responds by back-channel, such as a nod of the head or "mmhm"; again, their absence would quickly bring a response from the speaker.

Another example of implicit evidence of understanding is when the listener takes up the speaking turn and continues in a relevant manner:

Sam: Hey, I got the role!

Susan: And you thought you blew the audition!

But if Susan replied, "We'll need more than one for dinner," Sam would know she had misunderstood the homonym "roll."

More explicit collaboration is evident when the listener asks a question to clarify his or her understanding:

Lisa: Pass me the screwdriver.

Bruce: Do you want the Robertson or the Phillips?

As Clark & Wilkes-Gibbs (1986) and Schober & Clark (1989) have shown, speakers and listeners often collaborate to create unique verbal references:

Lisa: Pass me the Robertson screwdriver.

Bruce: Is that the one with the square tip?

Lisa: Yeah, pass me the square-tip.

In the above, we have emphasized the microprocesses by which listeners and speakers monitor and co-ordinate their mutual understanding. Obviously, in most conversations, listeners do a great deal more than indicate understanding; they frequently become speakers and contribute substantively as well. This permits speech events, such as irony, that are often misunderstood in

other formats. Coates (1996) has shown that spontaneous ironic humour in face-to-face dialogue is accomplished collaboratively. The speaker must first establish that a common viewpoint exists (e.g., that they both disliked the movie) and can then make an ironic comment (e.g., "Let's buy the video as soon as it comes out!"). The listener confirms the correct understanding (e.g., by laughing or "I can't wait!"). They must also collaborate to return to normal, non-ironic speech (e.g., by ceasing to smile or moving to a new topic). (The frequent failure of irony in written correspondence is usually attributed to the lack of non-verbal signals. We propose that it is equally due to the lack of on-line collaboration. That is, the sender cannot or does not confirm the common viewpoint or monitor the listener's understanding.)

Figure 3 illustrates the third dimension of our model, degree of collaboration. As described above, face-to-face dialogue provides moment-by-moment collaboration, so that understanding can be constantly monitored.

Figure 3
The Collaborative Dimension

As shown in Figure 3, in an educational setting where a teacher is lecturing to a large class, less collaboration can occur. Some students may collaborate with their instructor by asking questions throughout the lecture. In addition, the students can provide evidence of understanding to an alert teacher by their facial expressions. For example, students can convey that they have not comprehended what the lecturer has said by displaying puzzlement on their faces; they can convey their boredom by directing their gaze away from the teacher. On a more positive note, students can show their eagerness or interest by looking attentive.

An example of even less collaborative potential is using the national postal service ("snail mail"). The process of corresponding in this format precludes simultaneous or even very quick responses. It may be several weeks before the writer finds out that the recipient misunderstood him or her.

A communication system that entails no collaboration would be characterized by a zero on the collaborative axis. Watching television or listening to the radio are examples of communicative systems where there is effectively no collaboration because there is nothing the recipient can do to indicate that he or she has not understood. If any information is not clear, it cannot easily be put right.

Assembling the cube

When all three dimensions are put together, they create a cube (Figure 4) that metaphorically contains the full capacity which face-to-face dialogue provides. The participants have the potential for unrestrained verbal expression, a complete non-verbal repertoire, and constant collaboration in achieving mutual understanding. In this section, we will use this cube to assess other communication formats. As above, the implied quantities are also metaphorical and are intended to indicate only relative capacities, that is, to illustrate what is missing when we communicate in any format other than face-to-face dialogue.

Figure 4
The Assembled Dimensions
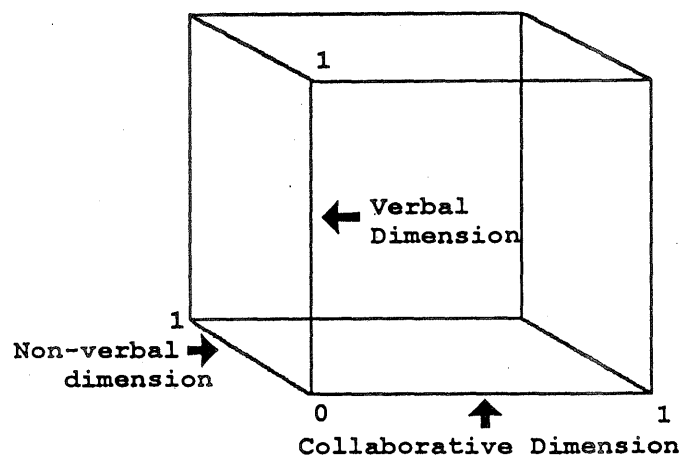
For example, written text (Figure 5) is only complete on the verbal dimension and has a very a small non-verbal component (namely, punctuation). Collaboration is effectively zero; if the reader does not understand something, he or she cannot ask the author, and the author cannot explain further. Note that using face-to-face dialogue (i.e., the full cube) as a standard draws attention to the significant deficiencies of written text, which is usually considered the highest form of communication. As Linell (1982) has pointed out, the absence of non-verbal and social aspects requires that written text be more explicit, more autonomous (context-free), more constrained by formal rules, and less varied than spoken language. In this sense, writing is not a natural activity. It is, as Linell (1982) states, a product of secondary socialization.

Television (Figure 6) has the potential for all verbal and non-verbal possibilities; performers can speak, gesture, and so forth as if in face-to-face dialogue. However, as mentioned above, there is no possibility of collaboration.

In our model, it is a non-social or monologic medium. Ordinary radio broadcasts (Figure 7) are even more limited because of the absence of visible non-verbal features. Only words and voice qualities are available. However, it is relatively inexpensive to create collaboration through a call-in format, in which the radio broadcaster and listeners can have a dialogue.

Figure 5
**Possibilities in a System of Written Text: Full Verbal,
Minimal Non-verbal, and No Collaboration**
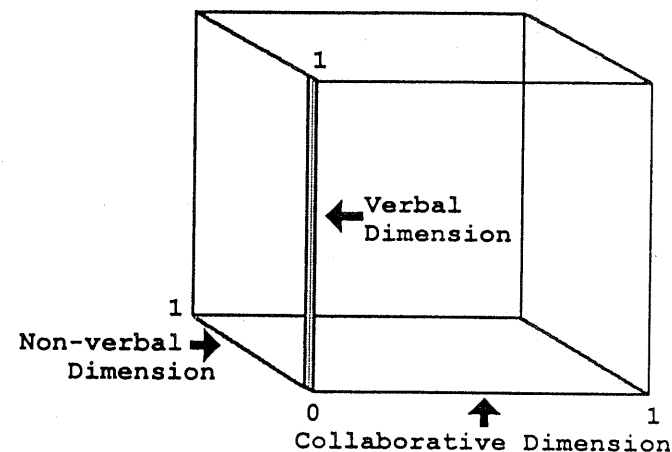
Figure 6
**Possibilities in a Television System: Full Verbal,
Full Non-verbal, but No Collaboration**
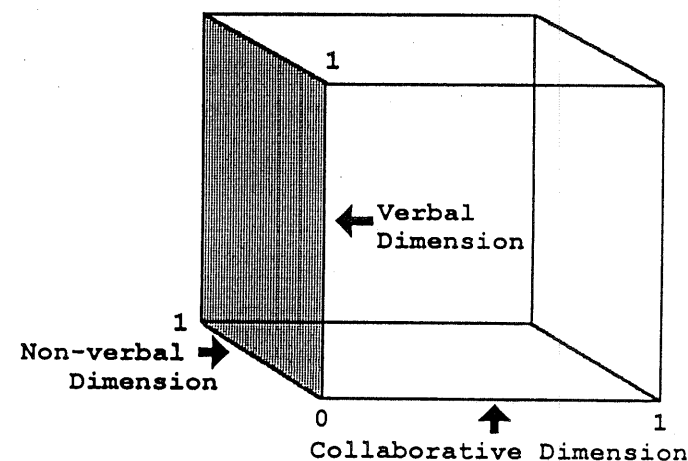
Figure 7
Possibilities in a Radio System: Full Verbal, Only the Paralinguistic
Features of Non-verbal, and No Collaboration
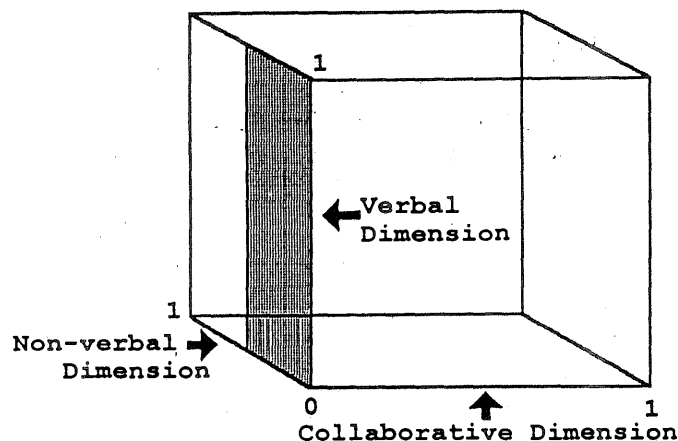
Both regular mail (Figure 8) and electronic mail (Figure 9) are fully verbal but have little non-verbal capacity. Moreover, collaboration is greatly limited by speed of reply. As can be seen, e-mail has a greater collaborative potential because the participants can create a more rapid exchange if both are logged on. With the exception to be discussed below, instantaneous feedback is not available.

Figure 8
Possibilities in Regular Mail: Full Verbal, Little Non-verbal,
and Some Collaboration
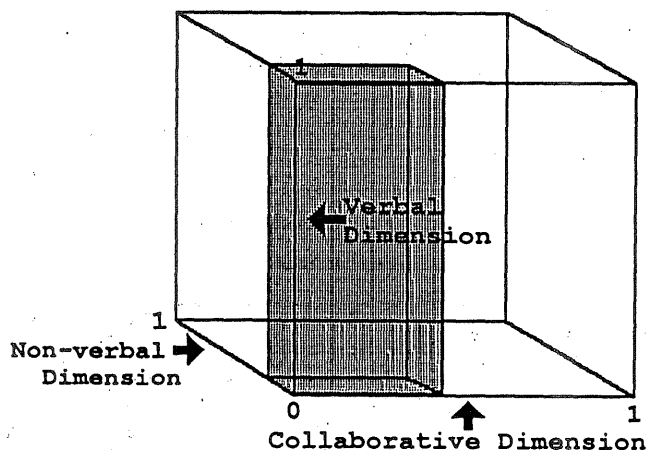
Figure 9
Possibilities in E-mail: Full Verbal, Little Non-verbal,
and Some Collaboration
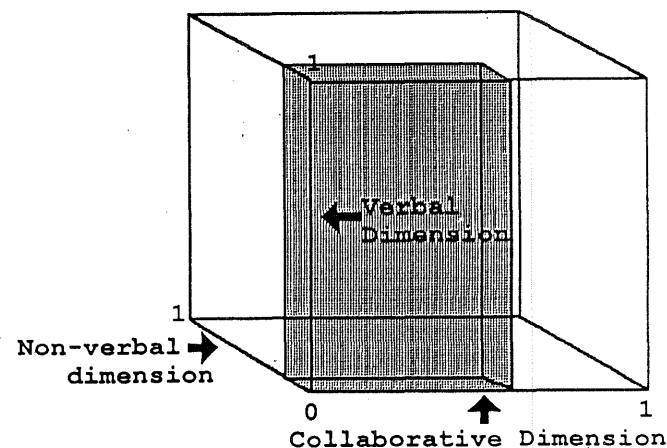
Finally, Figure 10 illustrates why classroom lectures are not like one-on-one tutoring. Again, the collaborative dimension is limited because no single student has unique status as listener. If one student indicates lack of understanding, the lecturer must decide between boring the rest of the class or leaving that one person behind.

Figure 10
Possibilities in a Large Classroom Lecture Situation: Full Verbal,
Full Non-verbal, but Minimal Collaboration

Accommodation in other formats

So far, our emphasis has been on the often-unrecognized advantages that face-to-face dialogue has over other communication systems—on what conversation has that other formats lack. There is another, less obvious implication of the model, based on our assumption that face-to-face dialogue is the most natural, practiced, and preferred form of human communication. If this is so, we should be able to recognize instances where users spontaneously (and often ingeniously) accommodate to create analogues or substitutes for the missing aspects. That is, when people use other forms of communication, they should prefer and frequently find ways to make them more conversation-like.

Even in written text, which in our model is the most limited form of communication, writers and readers find ways to overcome the limits. As noted above, writers use a more formal and explicit dialect, rather than the brief but perfectly clear phrasings that are possible in dialogue because of non-verbal enhancement and collaboration. Moreover, while a speaker will know immediately whether he or she was understood, the writer can take no such chances, which is another reason to be more redundant verbally. Good writers anticipate the level of the reader's understanding by, for example, regularly paraphrasing difficult concepts and giving examples. The reader can help his or her own understanding by going back over previous passages, inventing his or her own examples or paraphrases, and especially by discussing the text with someone else in person. Note that the latter substitutes collaboration with a person other than the author for direct collaboration with the author.

In some forms of written text, such as newspapers, there are sections entirely devoted to readers' comments. The "Letters to the Editor" section may even include occasional responses and clarifications by the editor—an example of collaboration spread over several days.

To make up for the lack of non-verbal elements, academic authors use graphs, photos, and other illustrations. One particularly imaginative solution was found by McNeill (1985) who faced the problem of adequately describing hand gestures, which are three-dimensional and highly mobile, in the two-dimensional, static academic text: McNeill asked the readers to act out the gestures themselves as they read his verbal description. Fiction writers often describe scenes, people, and so forth, in some detail. In any case, their readers inevitably imagine their own equivalents, going far beyond the text to create a plausible scene.

In both regular and electronic mail, writers replace non-verbal communication with drawings such as emoticons or with verbal and punctuation substitutes ("HA HA!!" or "!?!"). Writers may even create a fictive interaction ("I can imagine your face when you see this" or "Sit down before you read this!"). Collaboration is comparatively slow by regular mail. It may be that we

use fax and couriers not just to meet deadlines, but because we wish to come closer to the rapid interchanges possible in face-to-face dialogue. Some e-mail systems simulate collaboration by replicating the original message to which the user wishes to reply and then permitting the user to interweave answers or comments at appropriate places. (This probably feels more like a natural reply to the respondent, but it is less so to the original sender. Usually, the only time people quote our exact words back to us is in a dispute.)

Viewers are quite resourceful about improving the unilateral, monologic nature of television. Alone, a viewer can let him- or herself be drawn into the program—nodding, smiling, or even arguing with the unresponsive program. Often, people watch favourite shows with friends or in groups where they can talk about them, or they call a friend after watching the latest episode. In such conversations, viewers can reinforce understanding and clarify ambiguities; while they cannot have a dialogue *with* the program, they can have a dialogue *about* the program. Such dialogues can go beyond a personal network of friends, for example, *Star Trek* conventions or the Internet discussion group about *X-Files*. If the producers attend or participate, then a more direct dialogue is possible.

Some television programs incorporate dialogic features, such as "talk-back" or "man-on-the-street" segments on news programs. The daytime talk shows (and some U.S. presidential debates) feature audience participation, in which audience members may ask the same questions that the viewer at home is burning to ask, a kind of vicarious collaboration. One interview program used a camera that "looked" back and forth from one speaker to the other, just as a viewer would do if actually present. Thus, the viewers' perspective was that of a person seated with the two participants.

As noted previously, actual dialogue can be achieved on radio by telephone call-in programs. Some of the most well known ones go beyond listener monologues and feature a highly opinionated host who engages in lively (if argumentative) dialogue with the callers. When this format is used by television producers, live phone-in from the audience requires a trade-off of non-verbal for collaborative features; that is, the absent listener cannot appear on camera.

Because Canada has a long history of a first-class radio service, we are familiar with innovations that attempt to overcome the inherent limitations of the medium. Good radio performers enhance the only non-verbal feature they have, namely, their voice. Clear articulation, rich and varied intonation, and full phrasing are essential because of the absence of redundant facial or hand gestures. (The interviewer must also remember to say "Mhm" or "Yeah" rather than nodding.) Experienced sports announcers can recreate the game for the listening audience, and CBC hosts seem to delight in attempting the impossible, such as purely auditory museum tours. It is noteworthy that the

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latter are most often accomplished through dialogue, in which an interviewer asks questions that the unseeing audience cannot. As with written text, the listener can contribute the missing non-verbal features by imaginative processes, which may be one reason why radio continues to have a loyal audience.

Many classroom lecturers also incorporate opportunities for dialogue or dialogue-like participation, such as asking the class for examples, encouraging debate, or breaking into small groups. Such innovations not only make the class more interesting to the students, they can also relieve the lecturer's anxiety by making the situation more natural. Our model would suggest that one reason for the widespread fear of public speaking is simply that it is monologue, which is not natural. As described above, dialogue provides constant and detailed feedback to the speaker; the listener has an important collaborative role in ensuring his or her own understanding. In contrast, the lecturer or public speaker, who wants equally to be understood, has very limited ways of knowing how well this is happening. Thus, classroom activities involving the students are equally valuable for the instructor.

Implications for design

Finally, both our model and these spontaneous accommodations suggest a different principle for designing new (and redesigning old) communication systems. Just as furniture can be designed ergonomically for the natural shape and actions of the human body, communication systems could be designed for the natural features of human communication. To the extent that a new system has these features, it will take advantage of natural tendencies—or, at least, will not frustrate them. In this section, we describe one technical and one non-technical example of designing more collaborative possibilities into electronic communication.

There are some e-mail systems that seek to approximate the give and take of dialogue by permitting simultaneous transmission. Both parties can type at the same time, and their messages are displayed together on the screen. However, the formats we have seen treat these messages as monologues by splitting the screen horizontally (see Figure 11). This configuration virtually dictates two monologues. To interweave their two contributions, as in real dialogue, requires each person to look up and down constantly. Perhaps more important, the temporal relation of the contributions is quickly lost. One may not notice, or fail to remember, *when* the other's message (e.g., "I don't understand") appeared on the screen and may therefore miss a crucial collaborative opening.

Two simple changes would greatly facilitate dialogue. First, change the format to a vertical split and, second, link all statements permanently in time (see Figure 12). This format captures some essential features of dialogue by creating a visually clear relationship between statements and permits the natural evolution of turn-taking and non-interruptive back-channels.

Figure 11
An Existing E-mail Dialogue System

```
Hi there, how's it going? I have a question—oh, just
fine, thanks. I have a question for you, I hope you
can help me out. For my communication class, I need
to know the difference between GROUNDING and COMMON
GROUND. I don't understand. I don't understand the
difference; I know they're both from Clark. You mean
like being from the same culture. I see. Oh, it's a
process.
```

```
Hi, pretty good. How about you? What's the ques-
sure, glad to, what's the problem? Do you mean, as
in Herb Clark? You don't understand the difference
or you don't understand about Clark? OK, COMMON
GROUND is what people can bring to a conversation,
the things they know in common. Yes, culture is one
example, just being friends is another. Anyway, it
exists before the conversation even begins. GROUND-
ING happens in the conversation. When people collab-
orate to make sure they understand each other, they
also create new common ground. Yeah. So at the end
of the conversation, they have more in common to
draw on.
```
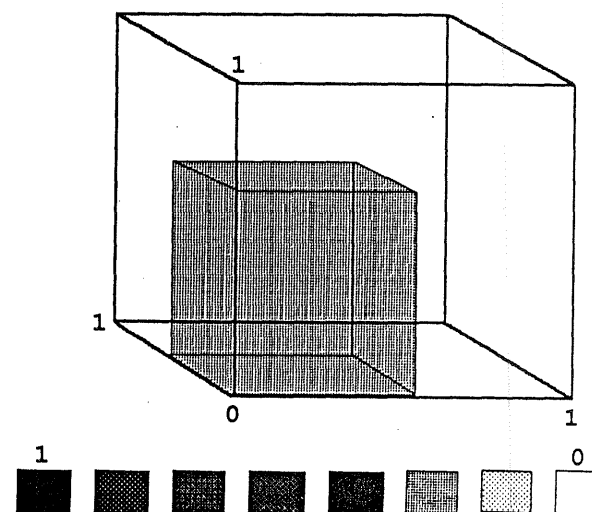
Figure 12
The Same E-mail Dialogue in a Modified Format

```
Hi there, how's it going?
                                 Hi,   pretty   good.   How
                                 about you?
Just fine. I have a ques-
tion for you, I hope you
can help me out.

                                 Sure, glad to, what's the
                                 problem?
For    my    communication
class, I need to know the
difference          between
GROUNDING    and    COMMON
GROUND.  I  don't  under-
stand.
```

Do you mean, as in Herb Clark?

Yeah.

OK, COMMON GROUND is what people can bring to a conversation, the things they know in common.

You mean like being from the same culture?

Yes, culture is one example, just being friends is another.

I see.

Anyway, it exists before the conversation even begins. GROUNDING happens in the conversation. When people collaborate to make sure they understand each other, they also create new common ground.

Oh, it's a process.

Yeah. So at the end of the conversation, they have more common ground to draw on.

Changing the screen format, as above, would be a technical way of permitting better collaboration. A non-technical means would use a principle closely related to conversational collaboration, namely, recognizing and assuring the participants' *common ground*. According to Clark & Marshall (1981) and Clark & Carlson (1982), common ground consists of the mutual knowledge, beliefs, and assumptions that people already share when they start to communicate. In a conversation, people frequently draw on their common ground. If Heather and Glen know each other, what they say to each other will be interpreted in terms of the common ground that they share. When Heather tells Glen "It's here," she intends Glen to identify what she is referring to by consulting their common ground. Its source may be an earlier conversation (Glen told Heather that he has ordered a pizza); their shared perceptual surroundings and experiences (both are waiting at the bus stop for their regular bus to arrive); previous joint experiences (the mail usually arrives at this time of day); information universally known or believed in one of the cultural communities to which Heather and Glen know they both belong ("It's here" would unambiguously mean the New Year at a New Year's Eve party when a clock starts chiming at midnight); or some combination of these.

As noted, common ground is closely related to the third dimension of our model, collaboration. When individuals share a lot of common ground, they have a head start on collaboration. Often they will not even need to confirm that they understand each other (e.g., two carpenters do not need to collaborate to identify a Robertson screwdriver), and they can draw on their common ground to aid in new mutual understanding (e.g., by describing the new item as similar to something already in their common ground).

Figure 13
Common Ground Represented by Shading

Any particular communication setting may have more or less common ground. Our metaphor for amount of common ground brought to the interaction is the degree of shading in the cube (see Figure 13). A cube that appears empty or without shading would be representative of interlocutors who have no common ground. People who come from different cultures and have different languages may have almost no common ground. Mere acquaintances will have somewhat more common ground when they share the same language and culture. Their acquaintance relationship would be represented metaphorically on the common ground dimension of our model with slight shading or darkening of the cube. Even more common ground, and consequently a greater degree of darkening of the cube, is shared by members of a group, such as members of a hockey team, a Boy Scout or Girl Guide troop, or a university department.

A virtually blackened cube represents the maximum common ground that it is possible to share with another individual; this would sometimes be true for parents and children, best friends, or spouses. In addition, over the course of a conversation between any two people, as new common ground is created, the cube would become darker (see Figures 14a and 14b). Because collaboration in conversation creates new common ground, it is often called *grounding*.

Figure 14a
A System of Face-to-Face Conversation, at the Beginning
of a Conversation
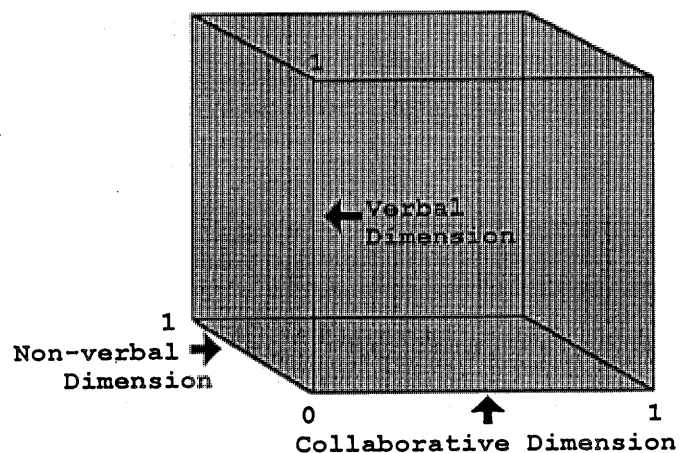
Figure 14b
Through the Conversation, the Interlocutors Have Increased
their Common Ground
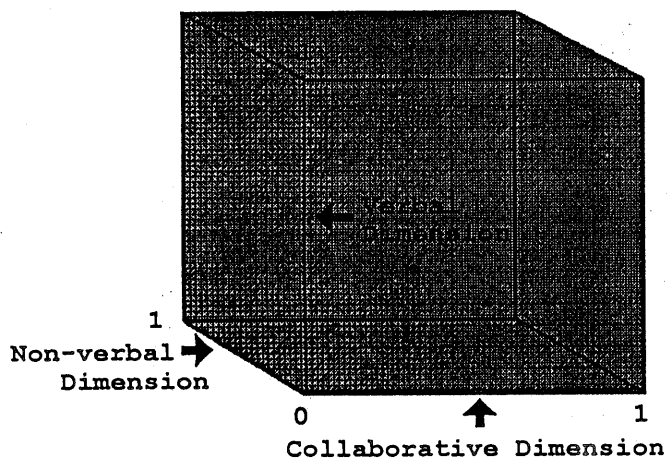
Although inadequate attention to common ground can be found in many settings, the problem is particularly acute in rapidly developing areas of electronic communication. As described in the text of Figure 12, people working together on new computer technology will constantly create *new* common ground through their collaboration. Thus, software designers, consultants, programmers, and other people immersed in the world of computers create new terms and understandings virtually every time they converse with each other. This process is a ubiquitous and powerful one in conversation. However, it is all too easy to forget that outsiders, who were not part of these dialogues, do not share the new common ground. Using insider jargon to communicate with outsiders is drawing on common ground that is simply not there. What is transparently obvious to the experts will be meaningless to newcomers. Thus, computer products and systems that are designed for non-experts could be improved substantially by careful assessment and use of common ground.

For example, both errors and learning time can be reduced by using terms that are likely to be already shared. Calling something a "ListServe" does not help a newcomer to guess its purpose or function, whereas calling it a "mailing list" or "discussion group" draws on more widely shared common ground. Similarly, terms like "stop," "exit," or "quit" are better uses of common ground than arbitrary key sequences such as "CTRL], c." In general, any symbol or action that has a similar meaning or form in our broader common ground will be more immediately accessible. This suggests an interesting line of research into our everyday common ground, looking for mutual knowledge and assumptions that can be readily incorporated into the new communication systems. In any case, it is essential to keep careful track of what is common ground for the user group by, for example, constantly testing the system on naive users and changing any terms or functions that are not part of the common ground of designer and users.

Conclusions

Both of the suggestions we have made for improving electronic communication echo the main theme of this article, namely, that the natural origins of communication are in face-to-face dialogue. Dialogue is not only our first form of communication, it remains our most common in everyday life. In this article, we have tried to show that face-to-face dialogue has features that are often missing or highly limited in other forms of communication—hence our suggestion that dialogue might serve as an appropriate standard for other communication systems.

Other forms of communication offer new possibilities, but these possibilities will be enhanced if they draw on, rather than ignore, the attributes of face-to-face dialogue. We are proposing the communicative equivalent of

ergonomic design (of furniture, equipment, displays, etc.). We need to fit not only the natural contours and motions of the body but also the natural features and dimensions of communication, as found in face-to-face dialogue.

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