
REDEFINING LANGUAGE.

Nonverbal Linguistic Acts
In Face-to-face Dialogue

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I was touched to be asked to give this particular lecture for two reasons: First, obviously, Professor Fisher's and my own work have a great deal in common; we shared some important assumptions. Second, when I should have been old enough to know better, I thought life went on forever, and "sometime soon" I would corner Aubrey at a meeting and talk about these common interests. That time never came, but tonight I can at least have that talk, symbolically, here.

Let me start by asking you to visualize three scenes: First, "flash-back" to 150,000 years ago (plus or minus 50,000 years), when early humans were developing language. We can never know very much about how that happened, but one thing we know for sure: They were not writing memos to each other. Now to ontology, to your own early childhood, when you were learning your first language. You knew all the essential aspects before you learned to read and write. Your "first language" was spoken, not written. And, finally, back to the present: Depending on how you measure it, between 35 and 70% of the world's population is not literate. In spite of this, they live, love, conduct business and social life, create art and inventions, and discuss the meaning of life. They have full use of language; it is simply not a written one.

Yet linguists from de Saussure to Chomsky have defined language as purely verbal and preferably written, consisting of words and their ar-

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rangements in idealized, perfect sentences. My main point tonight is that some of us (for example, psychologists, communication researchers, and psycholinguists) may be more interested in people's use of language than in language as an abstracted result, our definition of language may appropriately differ from that of linguists, for whom written text is the ideal prototype.

Nicole Chovil and I are developing an alternative definition, for the form of language that occurs in face-to-face dialogue—arguably the most common setting for language use. Tonight I am going to summarize one part of our theory, which is an argument for the inclusion of features other than transcribable words, that is, for the inclusion of some nonverbal acts in this redefinition of language. (If there is time at the end, I will sketch out the second part: adding the social aspects of language—because language in conversation is dialogue, not monologue as is written text.)

Our emphasis on the inclusion of only some nonverbal acts is so impor-

tant that I must start by emphasizing that these are strictly limited to symbolic acts closely connected to the immediate talk-in-progress. We are explicitly not talking about all of the behaviours that have at some time or other been called "nonverbal communication." That is, we exclude from this subset such nonverbal behaviours as the following:

- behaviours that occur when the subject is alone, or believes that he or she is alone;
- hand signals (often called "emblems"; e.g., [do "thumb's up"]. These are stereotypic gestures that occur in nonspeaking contexts;
- involuntary or reflexive acts (such as breathing or sneezing), even when they occur in the presence of another;
- voluntary acts that accomplish other-than-communicative functions (such as lifting a coffee cup or turning a page); and, finally,
- static postures, such as resting positions of the arms or legs.

Indeed, one of the defining characteristics of the acts we are including is that they are typically of the same brief duration as the words and phrases with which they are tightly synchronized—often one second or less.

Even with these exclusions set aside, a significant subset remains: When we talk spontaneously in per-

son, we cannot help using intonation and stress as well as illustrative gestures and facial displays. So Nicole and I are proposing that language in face-to-face dialogue consists of integrated audible and visible elements: the audible elements are words and how they are said, the visible components are illustrative gestures and facial displays.

Let me give a couple of very simple examples so that you can start visualizing these actions:

(i) One young man is asking the other what year he is in University, by saying "second? third? or ...?" [Do gesture] That is, when he had no immediate reply to "second" or "third," he rocked his hand back and forth several times, which meant "or somewhere in between second and third years," which the other man understood and confirmed to be the case.

(ii) I walked into a sports store and asked whether they had Merco squash balls. The clerk said, "No, we have Dunlops." I responded with [DO]; that is, I wrinkled my nose, laughed, and said, "No thanks," and he laughed and said "OK." The nose-wrinkle in this context meant (and was understood to mean) "It is AS IF Dunlop squash balls are disgusting to me." It used the metaphor of physical disgust to convey dislike for something not at all rotten or smelly.

The nonverbal acts we are calling linguistic are symbolic acts closely connected to the immediate talk-in-progress. They have three key characteristics, which I will summarize here and discuss in detail in the rest of my talk: First, they are sensitive to a sender-receiver relationship (i.e., they show audience effects). Second, they are analogically encoded symbols that can be explicated in their immediate linguistic context. Third, they are completely integrated with simultaneous verbal and nonverbal symbolic acts.

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There are nonverbal acts that are sensitive to a sender-receiver relationship

The first requirement for establishing that some nonverbal acts are linguistic is that they occur primarily in dialogue and are affected by the visual or auditory availability of a receiver. It is not necessary to show that these acts never occur without a receiver, or else the fact that we sometimes talk to ourselves would eliminate words as well! However, the act should be substantially reduced or modified when no receiver is available.

The empirical paradigm was first developed by Cohen and Harrison (1973) for hand gestures. They established that hand gestures were significantly more frequent when people were giving directions in person than over an intercom. Cohen (1977) used three groups (face-to-face, intercom, and practicing alone) and again found a significantly higher rate of gestures in the face-to-face condition.

Several studies have demonstrated that facial displays, particularly smiles, are also sensitive to whether they will be received by another. Kraut and Johnston (1979) conducted four field studies demonstrating that people were more likely to smile when they were with or facing other people than when alone or facing away. Smiling was relatively independent of whether a good or bad event had occurred; for example, bowlers tended to smile depending on whether they were facing their companions and not on whether they had thrown a good ball.

Other types of facial displays have also been shown to be affected by social variables. Brightman, Segal, Werther, and Steiner (1975) found that subjects' faces portrayed their re-

actions to sweet or salty sandwiches only when they ate them in the visual presence of other subjects, that is, in a group setting where they could see each other. There was no change in facial display when the subjects ate alone—even for the highest levels of tastants (110% salt or 136% sugar).

In our studies of motor mimicry, we varied the precise moment of visual availability during a carefully rehearsed 4-second interval (Bavelas, Black, Lemery, & Mullett, 1986). The subjects were significantly more likely to produce and to hold mimetic facial displays in response to another's apparent injury when that other person made eye contact than when he did not. In another study (Bavelas, Black, Chovil, Lemery, & Mullett, 1988), we found that even third parties observing mimetic body movements were affected by whether the observer and victim were in eye contact.

Using face-to-face, partition, telephone, and answering-machine conditions, Chovil (1991) found that facial displays in response to hearing about a "close call" event were most frequent when they would be seen by the story teller and decreased in frequency as the communicative situation became more removed from a full face-to-face interaction.

The last line of evidence is the well-established tendency for listeners to gaze at speakers in dialogue, although speakers often look away. We would argue that this listener gaze occurs because what the speaker is "saying" is not just auditory but also visual. Listeners need to see speakers' hands and faces as well as hearing their words.

Two conclusions are apparent even in this brief review of the literature. First, it is methodologically possible to test for the sensitivity of nonverbal acts to the visual availability of a receiver. The wide variety of methods used in previous studies suggests that the techniques for further such tests are well developed and encourages us to hope that more will be

done. Second, the results so far reveal a clear and growing set of nonverbal acts that show such sensitivity. These are candidates for our class of nonverbal linguistic acts; they have met a necessary but not sufficient criterion. As will be seen, they must go on to show other properties as well.

There are nonverbal acts that are symbolic

The single most important property of the class of nonverbal acts we are discussing is that they are not only physical actions but are symbolic acts whose function is to convey meaning. While head-nodding can be described physically (just as written words can be described as physical patterns on a page), it is more appropriately described in terms of the meaning it conveys (e.g., agreement). These acts do not merely reveal information; they represent meaning. Weiner, Devoe, Rubinow, and Geller (1972) drew our attention to the confusion between informative and communicative nonverbal acts (a confusion that Pragmatics unfortunately contributed to; see Bavelas, 1990a). When a doctor hears someone coughing, the doctor can infer that the patient might be ill; in this case, coughing is an informative nonverbal behavior. In contrast, a stylized cough used to interrupt discreetly is a communicative nonverbal act. These are not the "same" behavior; one is purely physical, whereas the other is also symbolic.

The symbolic nature of such acts is often overlooked because their encoding is analogic (also called iconic or natural), whereas encoding into words is arbitrary (also called digital or conventional). However, although the act is like what it represents, it is still not equal to what it represents. For example, when I depict the size of the fish I caught as a kid [DO], the space between my hands is only like the length of the fish; it does not contain the fish, which existed at another time, in another place.

David McNeill (1985, pp. 351-

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353) at the University of Chicago has proposed explicitly that gestures are referential symbols. They encompass the two sides of a symbol—its form (e.g., hand rising with finger pointed upwards) and the concept it represents (upward movement). Clark and Gerrig (1990) called these "demonstrations" but stated clearly that they have referents, whether generic or specific.

Facial displays can also be symbolic. We (Bavelas et al., 1986, 1988) found evidence that motor mimicry (such as wincing at another person's pain or leaning with another's effort) is not a vicarious emotional reaction but rather conveys to the other person "It is as if I am you, having your reaction." Chovil (1991/92) found that, when asked to tell about a past interaction, people often used their facial displays (as well as words) to describe both themselves and the other person (e.g., "He was SO mad" [do face]). In the latter case, their faces portrayed a reaction of another person, at a different time, and in a different place than the present dialogue. In all of these examples, faces and hands are portraying objects and events that do not necessarily exist at the moment—the essential characteristic of human symbolic activity.

Moreover, nonverbal symbolic acts are not limited to the portrayal of concrete objects and actions. McNeill and Levy (1982) identified three degrees of abstract symbolization in gestures. In iconix/1, the hands portray hands in relation to an object that is not present (e.g., my hand turns an imaginary key in the lock). In iconix/2, the hands portray, not hands, but another object or action (e.g., my hand becomes a kangaroo jumping). In metaphorix, the hands depict abstract intangibles by metaphor (e.g., portraying time as a line on which

past, present, and future can be located, or balancing cupped palms to "weigh" two alternative possibilities).

I will speculate here that facial displays are also both iconic and metaphorical. Iconic facial displays portray or enact people's literal reactions (e.g., disgust in response to something inedible). Portraying one's own facial reaction (whether currently, in the past or future, or hypothetically) would be iconix/1. Portraying someone else's reaction, as in motor mimicry, would be iconix/2. The difference is that in iconix/1, the face is still one's own face, whereas in iconix/2 it has become someone else's face. Facial metaphorix convert the literal meaning of a facial reaction to an abstract one by using it in a metaphor. Recall my earlier reaction to Dunlop squash ball:

Customer: "Do you have any Merco squash balls?"

Clerk: "No, we have Dunlops."

Customer: (while wrinkling her nose and laughing) "No thanks."

Clerk: (laughs) "Okay!"

The nose wrinkle in this context used the metaphor of physical disgust to convey dislike. Obviously, a squash ball cannot be literally disgusting in either appearance or smell, so the facial display was a metaphorix and was understood as such.

I think that many conversational facial displays are metaphorix with similar etymologies: Squinting suspiciously at an implausible story is a metaphor based on squinting as a means of peering more closely. When told about a social faux pas, people often react by pulling their eyebrows together in a "pained" expression, although the event was only metaphorically painful. Some facial displays have become extremely abstract; for example, eyebrow movements used as syntactic stressors (Ekman, 1979; Chovil, 1991/92) are probably a meta-

phor that draws on the startle reaction. In brief, analogic encoding is a flexible and powerful system for the symbolic representation of abstract as well as concrete meaning in conversation.

Can non-arbitrary encoding be linguistic?

Although classical linguistics includes some nonverbal acts as symbols, these acts have been excluded from language because of the manner of their abstraction, which is analogic encoding. The dictum that analogically encoded symbols are not part of language originated with de Saussure (1915/1966, pp. 67-70), who emphasized that, in the true linguistic sign (i.e., a word), the encoding is not "natural" but arbitrary, whereas nonverbal symbols are "never wholly arbitrary" (1915/1966, p. 69). Subsequently, the vast majority of linguists have used the wholly arbitrary nature of verbal encoding to relegate nonverbal to the status of mere symbols or non-linguistic signs.

It is surprising to me that the Saussurian definition of language as verbal has not been challenged before, because it has at least three logical flaws. First, no reason is given for requiring that linguistic signs be arbitrary, other than that words are arbitrary signs. But to use arbitrariness as a criterion by which all but words are excluded from language is logically circular: It is the same as saying "non-words are not part of language because they do not have the same properties as words." Per Linell (a Swedish linguist and communication scholar) has suggested that the real reasons probably lie in the historical origins of linguistics as the study of written (and often dead) languages. In Linell's words,

Our conception of language is deeply influenced by a long tradition of analyzing only written language, [and] modern linguistic theory, including psycholinguistics and sociolinguistics, approaches the structures and mechanisms of

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spoken language with a conceptual apparatus, which—upon closer scrutiny—turns out to be more apt for written language in surprisingly many fundamental aspects. I will refer to this situation as *the written language bias* in linguistics. (1982, p. 1; italics original)

An expanding modern interest in the phenomena of living discourse (psycholinguistics, sociolinguistics, discourse analysis, and conversation analysis) has led many linguists besides Linell to attempt broader definitions of language. We propose that part of this redefinition should include questioning the validity of requiring arbitrary encoding for the kind of language we are studying.

Returning to de Saussure, the second problem with his distinction between arbitrary and analogic encoding is that these terms are not categorical but rather form a continuum. Obviously, most words are at the arbitrary end of the continuum. However, words and nonverbal acts have overlapping distributions. Starting at the completely analogic end, I should first point out that non-symbolic acts are not even on the continuum at all. These are acts that are not encoded. For example, if there were a sudden BANG near me here, you would see the facial components of a true involuntary startle reaction; it might reveal information to you, but it would not represent meaning. However, if I then demonstrate this reaction as part of telling about a startling event, this would be an encoded act at the extreme analogic end of the continuum. Although it is still very close to the "natural" form, an important transformation has been made, from being the event to being about the event. In a further step towards stylization and arbitrariness, I could use exaggerated

raising of the eyebrows or widening of the eyes [DO] as a stylized display of surprise at unexpected (but not literally "startling") gossip. Finally, as noted above, rapid movements of the eyebrows that "underline" important words and phrases may be a highly abstracted version of that same startle reaction, a version that uses such an abbreviated form and abstraction of the original meaning that it is near the other, arbitrary end of the continuum. Similarly for gestures: it is difficult to identify the analogic origin of the shrug (meaning "I don't know"), which is therefore also closer to the arbitrary end of the continuum. So natural/arbitrary is not a dichotomy.

Our third criticism is that de Saussure (1915/1966, p. 69) admitted two significant exceptions. He explicitly included onomatopoeic words (e.g., "bow-wow" or "buzz") simply because they are words, although he conceded that these are "naturally" encoded. In our view, a sound that portrays the bark of a dog is no different than a gesture that portrays its size or movement. To include the first as a part of language, however minor, while excluding the second can only reflect a bias for auditory rather than visual portrayals. De Saussure's second exception was implicit. By including spoken as well as written languages, de Saussure and subsequent linguists were admitting at least some of the so-called "paralinguistic" (audible nonverbal) aspects of spoken words. Yet these are often analogically encoded. For example, the most clearly linguistic of these is word stress, which can change the meaning of a sentence entirely. Yet it is more analogic than arbitrary because the use of slightly increased volume to stress a word is a non-arbitrary way to make it stand out.

In summary, we propose that there are symbolic nonverbal (linguistic) acts, whose primary function is representational. These can range from concrete to abstract and also from analogic to relatively arbitrary encoding.

Our research group has conducted several projects in which we treated nonverbal acts not as physical behaviors to be counted or described literally but as symbolic acts to be explicated or "translated" in their immediate linguistic context (the surrounding words and acts). It will undoubtedly surprise you that the interjudge reliability of such an approach is as good or better than for the nonsymbolic treatment of these acts. In this work, though, context is essential. Indeed, it is in this respect that these nonverbal acts are most word-like: they are polysemic—capable of several meanings. Just as the precise meaning of a word cannot be determined out of context, the meaning of a nonverbal linguistic act depends on its immediate linguistic context. Depending on what we're talking about as well as the words I use, my facial display, and my intonation, this gesture [hand measuring size] can measure the size of the fish I caught or how much time I've allocated for a task or how close I am to losing my patience.

Verbal and nonverbal linguistic acts are integrated and may be either redundant or nonredundant

Our emphasis on the importance of the simultaneous linguistic context for understanding the meaning of nonverbal as well as verbal acts makes clear that we consider these actions to be completely integrated with each other. These acts form a single, though complex, package and can therefore be treated as a whole (cf. Bavelas, 1990b; Bavelas, Black, Chovil, & Mullett, 1990); Slama-Cazacu, 1976). Indeed, we call our theory the "integrated message model."

I will re-emphasize one last time that the subset of acts described here is limited to those that refer to the immediate talk-in-progress. We are interested in the momentary convergence of a particular combination of words, intonation, stress, gesture, and face to convey the speaker's meaning to an

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interlocutor. As will become clear, because of our dual emphasis on meaning and on momentary acts, we are referring to different phenomena than are researchers who study separate channels (e.g., for nonverbal leakage or clues to deception; Ekman & Friesen, 1969). These researchers focus on units that are more global or on nonlinguistic analysis by experts or "detection" by receivers. The two approaches are, in our view, orthogonal rather than opposed.

What may be the best evidence of the precise integration of verbal and nonverbal linguistic acts is easily demonstrated: gestures follow verbal syntax. McNeill (1985) observed that "gestures synchronize with parallel linguistic units [and] almost never cross clause boundaries" (pp. 160-161). I might say,

My dog Ben has a HUGE head [DO]

and (at the point underlined) gesture to show the size of a Newfoundland dog's head (about the size of a basketball). Notice, first, that the gesture specifies the adjective "huge" as being at the outer limit of the potential range for dogs. Second, when I say this spontaneously, my hands reach the peak of the gesture precisely with the adjective "huge," which the gesture specifies. It takes deliberate effort to shift the gesture to an earlier, irrelevant word (e.g., "my" [DO]) or to withhold it until the sentence has been completed [DO]. In either case, the result is so bizarre as to be humorous—even though the difference in timing is less than a second. Similarly, dubbed films usually render gestures meaningless, because they change the (spoken) order of parts of speech: A gesture describing the object of a verb will appear before the verb in French (both verbally and gesturally), but this synchrony disap-

pears when the English translation puts the object after the verb.

As Sanders (1987) pointed out, receivers integrate even apparent contradictions between verbal and nonverbal components of a message, and they do so at the level of overall meaning (rather than at the level of components or physical source). For example, Sanders reanalyzed the incongruity studies of Bugental, Kaswan, and Love (1970) and found that positive verbal statements ("I like you") paired with a negative facial expressions and vocal qualities (e.g., sneering) were judged by respondents to be sarcastic. Negative verbal statements ("I hate you") paired with positive nonverbal displays (e.g., smiling) were judged to be joking:

Thus, these inconsistent pairs of utterances and nonverbal displays received *a single unitary interpretation distinct from the interpretation of either constituent*, not a preference for one rather than the other of two discrete messages. (Sanders, 1987, p. 142; italics added)

We (Bavelas et al., 1990, Ch. 7) tested this hypothesis (that senders and receivers integrate verbal and nonverbal information) using complex, real messages that were either true, false, or equivocal. Each message, originally delivered in face-to-face interaction, was converted into several different versions: an edited written version, with disfluencies and paralinguistic features removed; an unedited written transcription; two audiotaped versions; and two videotaped versions, one of which was the original. Naive decoders, randomly assigned to only one version, rated the meaning of each message (for example, what the message said about the condition of a car or the quality of a class presentation) on a continuum from very good to very poor. Agreement among raters was very high, and there was no significant effect of version on decoded meaning. Even for equivocal and deceptive messages, the written, audiotaped, and vide-

otaped versions all conveyed the same meaning to independent groups of decoders. When people lied or equivocated, they did so nonverbally as well as verbally.

Redundancy and non-redundancy

Even if the verbal and nonverbal acts that make up a message are completely integrated, one question that still arises is the extent to which the information conveyed through one act simply overlaps with or repeats information conveyed through other acts. Some nonverbal acts are redundant with the accompanying words and phrases while others convey their own specialized information. Before considering evidence for both redundancy and nonredundancy, though, we need to clarify the meaning and function of redundancy in language.

The term redundant (as in "merely redundant") is often taken to mean "over and above what is needed"; in other words, the redundant information "unnecessarily" duplicates what is already there. However, the term was given a new technical meaning by Shannon and Weaver (1949), namely, to describe signs or behaviors that serve to reduce the ambiguity of a message. In information theory, redundant acts are no longer viewed as unnecessary but rather as serving to increase the likelihood of correct decoding of meaning. Colin Cherry (1957) pointed out the implications for spoken versus written language:

When we speak to a friend, we carefully construct our words and phrases, building in redundancy, as we judge necessary for him to understand; with speech this is a running affair, because we are watching and listening to his reactions, and redundancy may be put in, in a changing manner, moment by moment.... Writing must make up for the lack of gesture or stress, if it is to combat ambiguity, by introducing redundancy through a wider

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vocabulary and closer adherence to grammatical structure. (p. 120)

Thus, the transcript of a face-to-face dialogue often seems disfluent and inarticulate, because the speaker was using nonverbal rather than verbal redundancies, and these are lost in transcription.

The use of more than one act to convey an idea helps to clarify the exact meaning being conveyed. We do not typically talk in general categories about, for example, "flowers," "gardens," and "weather" but rather about specific instances, for example, "The red and orange zinnias in the large rock garden wilted in the blazing sun." Similarly, a common function of facial and gestural acts is to particularize the categories given verbally; they act as unspoken phrases modifying terms that appear in words. For example, a subject who had been asked to recall a Road Runner cartoon in detail said

and then the Coyote tries to HYPNOTIZE the Road Runner

using her face and hands to illustrate the particular kind of hypnotic action depicted in the cartoon, which was an exaggerated, "show biz" style (both hands pointed out, with wavering fingers, accompanied by a rather demented look). From the words alone, the style could have been another stereotype of hypnosis (e.g., swinging an object as a pendulum), which would not have been accurate.

Our research on the redundancy of verbal and nonverbal communicative acts includes work on both facial displays and gestures. Chovil (1991/92) coded facial displays that occurred in conversations and found that, of the 405 semantic displays by speakers, 60% were to some degree redundant with verbal content,

whereas 40% conveyed information that was not in the accompanying words. In addition, all listener displays were, by definition, nonredundant, because the listeners were not speaking. These displays permitted the listener to interject a comment without taking the floor.

We have recently (Bavelas, Chovil, Lawrie, & Wade (1992) developed a system by which to measure the degree of redundancy between a gesture and the verbal parts of the accompanying phonemic clause. The meanings conveyed by the words and by the gesture were itemized separately and then compared for overlap, with the priority given to words. That is, if the words conveyed "small-sized," then an accompanying gesture that depicted something small was rated as completely redundant. Even with this conservative bias, we found a wide range, from gestures that completely overlapped the words to gestures that provided information completely different from the words. One predictor of redundancy was our division of gestures into two functional groups: those that depicted some aspect of the overt topic of conversation and those that referred directly to the interlocutor (which we called interactive gestures). As predicted, topic gestures were, on average, fairly redundant with words, whereas gestures to the interlocutor were highly nonredundant. These interactive gestures were usually inserted without any corresponding verbal reference; they did not interrupt the verbal flow. Finally, Pickering (1991) found that speakers used topic gestures that were more independent of (nonredundant with) words when (a) they knew their gestures would be seen and (b) they were describing something for which they had a poor (verbal) vocabulary.

We speculate that words, faces, and gestures are specialized for the depiction of different kinds of meaning. Words are useful for conveying general categories (e.g., of objects, actions, and events) as well as abstract

terms or arbitrary names. For example, colors cannot be conveyed through nonverbal acts. Gestures are useful for depicting size, shape, position, or movement, whether concrete or metaphorical. For example, gestures easily depict the relationship between two objects in space or between two levels of an organization. Facial displays cannot convey any of the above information but are particularly useful for conveying information about people's reactions (past or present, self or other) and for very rapid syntactic movements, such as eyebrow markers. It is our thesis that speakers will choose spontaneously among these alternatives and that listeners will accurately decode the resulting message. Both will do so with little regard for how the information is being carried. We would prefer to start using the terms "audible and visible" to replace "verbal and nonverbal," but the participants probably do not distinguish between them at all. They send and receive integrated messages.

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Summary

Let me summarize by backing up to get the bigger picture: Traditional definitions of language fit written monologue better than they fit spoken language in face-to-face dialogue. Face-to-face dialogue requires the addition of both nonverbal and dialogical elements. Tonight I have described the first change: that some visible nonverbal acts in conversation are part of language, when they meet the following criteria: (1) they are sensitive to a sender-receiver relationship; (2) they are (analogically)

encoded symbols whose meaning can be explicated in the context of surrounding words and actions; and (3) they are redundant or nonredundant with the accompanying words, but they are always integrated with these words. In the other half of our theory, we propose that there exist uniquely dialogic processes, which cannot be reduced to the monologic processes of production and comprehension: Namely, dialogue imposes formidable time constraints; it requires coordination between interlocutors; and it provides collaboration not available in monologue. The differences between face-to-face dialogue and written text are significant enough for us to suggest that they should be called, in developmental order, language/1 (spoken language) and language/2 (written language). All aspects of language/1 (audible and visible, monologic and dialogic) are interwoven in performance, so that interlocutors produce and interpret completely integrated messages, which should therefore be analyzed by function rather than physical source or "channel."

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