The Role of Speech in Language: Introduction to the Conference*

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Our topic—the role of speech in language—is not an established one: no one has made it the direct and primary object of his research. It is the more appropriate, therefore, that one of the chairmen of this conference describe what we had in mind as we made our plans.

Our point of departure was a question: do we increase our understanding of language when we take into account that it is spoken? Obviously, we chairmen would answer in the affirmative; we hope that you will want to answer similarly. If so, the aim of our conference will be to consider, not whether our understanding of language is increased, but how; you will want to count the ways. It is not my place, however, to answer for you, or to try to bias the direction your discussion will take. I should only say why we think the question is a reasonable one and likely to trigger a productive discussion.

Our belief in an organic connection between speech and language comes, improbably, from some loose assumptions about grammar and the fit of grammatical form to grammatical function. We find nothing wrong with the linguists' assertion that the function of grammar is to connect sound to meaning, except that it does not take us as far as we want to go. Why is the grammar complex, and what purpose, if any, is served by the forms these complications take? What gain might have served, in evolution, to select for the physiological processes that underlie man's use of these peculiarly complex grammatical codes?

It may be useful, first, to replace the words "sound" and "meaning" with the structures to which they are presumably related. Sound is no problem for us; it is produced by the vocal tract and received by the ear. These structures, the vocal tract and the ear, are one terminal of the connection that grammar makes. Let us call it, for want of a better term, the transmission terminal. What, then, is the other terminal? What structure serves similarly for meaning, and what shall we call it? Mincing no words, we shall suppose that the other terminal is a nonlinguistic intellect, the place where our cognitive apparatus is housed. We need not speculate about the nature of that intellect or its associated machinery, except to emphasize that, as we have already said, it is not linguistic, and that communication within it is carried out, not in linguistic terms, nor indeed in


terms of such other special processes as vision or audition, but in some amodal code. Fodor, Bever, and Garrett (1974), whose view of this whole process is similar to the one presented here, have called this code "mentalese." In any case, we have at the one end a source—the intellect—from which linguistic messages originate and to which they are delivered, and at the other end a transmission terminal—the vocal tract for producing sounds and the ear for receiving them. Grammar is the code that connects the source to the transmitter, and we are back once again to the question: what is the function of a complex grammatical connection?

To see the function of a grammatical connection, it is helpful to consider what communication would be like without it. In such agrammatic communication each message would be represented straightforwardly by a signal. The rule governing the flow of information would describe a one-to-one relation between a list of all possible messages and a corresponding list of signals. Moving back and forth between source and transmitter, the information would be converted—for example, from a neural representation to an acoustic one—but not in any way restructured. Now from a logical point of view, there is nothing wrong with that kind of communication; such a simple cipher can, in principle, do everything that complexly encoded language does. But from a biological point of view it works well only if there is reasonable agreement in number between the potential messages and the distinctively different signals that can be efficiently produced and perceived. And there is the rub. Though we don't know exactly how many uniquely different sounds we can cope with, the number is surely quite small. It is even harder, of course, to estimate the number of potential messages; if it is to include all that our stored experience and cognitive machinery can generate, however, it must be enormously large. It follows, then, that if we are to communicate with an agrammatic system, the terminal transmission apparatus—the vocal tract and the ear—will set the limit on what we can say, and a very low limit it will be.

To say, as we do, that the number of messages is vastly greater than the number of useable signals is to suggest that the intellect and the transmission terminal are not well matched to each other. But there is no reason to suppose that they should be. These structures developed in evolution long before the appearance of language and in connection with biological functions—thinking and remembering, in the one case, and eating, breathing, and hearing, in the other—that had nothing to do with language or, to any considerable extent, with each other. So long as vocal communication was agrammatic, the number of messages that a presumably rich intellect could send was severely limited by the number of distinctively different signals that a poor transmission system could cope with. We see then that a function of grammatical codes is to restructure information to make it differentially appropriate for processing and long-term storage in an intellect, on the one hand, and for transmission through a vocal tract and an ear, on the other. If so, then, as Mattingly (1972) has suggested, grammatical processes may have evolved as a kind of interface, matching the potentialities of an intellect to the limitations of our devices for producing and perceiving sounds, and thus increasing vastly the efficiency with which we can communicate ideas.

It is possible, of course, that other important changes might also have occurred in the evolution of language. Thus, the nonlinguistic structures that grammar connects might themselves have been modified in the direction of reducing the mismatch. Indeed, in the case of the vocal tract, at the one end of the
system, such modifications did occur: our vocal tract differs anatomically from other primate vocal tracts, and in ways that appear to make it possible for us to produce a greater variety of sounds. If we had to speak with the vocal tract of an ape, the grammatical interface would have a larger matching job to do, and would presumably be that much more complex. As to what might have happened to the intellect, at the other end of the system, we hardly know how to ask the question; we can only speculate that our intellectual processes might in some unspecified way be better fitted to language than those of our nonhuman relatives. But such considerations, important though they may be, do not require an essential modification in our assumption about grammar and its function; we may still believe that the function of grammar is to reshape information so as to make it differentially appropriate for an intellect and a transmission system.

We come now to the basis for our assumption that speech is an organic part of language. Taking grammar as the most distinctive characteristic of language, and assuming that it evolved as a matching interface, we find it reasonable to suppose that its form would somehow reflect the characteristics of the nonlinguistic structures—intellect and transmitter—that it connects. Just how the grammar reflects those characteristics, and how the strength of the reflection varies with the distance from either of the nonlinguistic terminals, must be an empirical question. But if our view of the function of grammar and of its evolution is at all correct, then we should suppose that important aspects of language as they are because language is normally spoken and heard.

To look at grammatical processes from that functional point of view, we could begin either at the intellectual end and work downward, or at the speech end and work upward. Beginning at the intellectual end has its attractions: we are closer there to the semantic and syntactic activities that have traditionally been thought of as the essence of language. But starting at the speech end, which is what we propose to do in this conference, does not necessarily lead us away from the distinctive characteristics of language, and it has the great advantage that the processes we will be concerned with are more readily available to scientific investigation. Taking speech to comprise the part of language that extends from the phonetic (or more abstractly phonological) message to the sound, we can frame our questions quite pointedly and reasonably hope to find some interesting answers. Thus, we can ask about the shape of the phonetic message and wonder, with some hope of satisfying our curiosity, whether there is anything like it in nonhuman communication? We can ask, further, what is required of the vocal tract and the ear if the phonetic message is to be efficiently communicated? Can these requirements be met straightforwardly, given the characteristics of the vocal tract and the ear, or is there a need for grammatical interfacing—a kind of speech grammar—even at this first, lowest stage of the system? If there is such a grammatical interface, what is its form and how well does the form fit the function? In the evolution of this system, did the auditory components of the transmission system change, as the vocal tract apparently did; if so, did the changes reduce the mismatch with the requirements of phonetic communication, thus making the grammatical interface less complicated than it otherwise would have been? Are speech production and perception unique to man, and if so, what are their unique attributes? What are the conditions for the development of speech in the human infant, what is its time course, and what evidence, if any, do we find there for a species-specific, innate predisposition to language? What happens to grammar when human beings who have normal intellectual apparatus must interface, not to the vocal tract and ear, but, as in the case of deaf mutes, to visible gestures? What can we learn, in other words, about the function of
grammar by studying sign language? More generally, what can we say of the role of phonology in language? Looking at all of grammar, what evidence do we find of accommodation to the limitations of the vocal tract and the ear, and what formal resemblances, if any, do we see among syntax, phonology, and speech?

But these questions are only examples. You may or may not want to deal with some of them. At all events, we expect that you will ask better ones. Our aim has been only to illustrate a functional approach to language and grammar that we hope you will want to take as you explore the role of speech in language.

REFERENCES