
Language and Speech [and Discussion]

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Language and speech

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This paper is intended to serve as an introduction both to the first session and to the Discussion Meeting as a whole. I begin by distinguishing natural human languages, in relation to their apparent species-specificity, from non-natural languages and from non-human languages. I then explain the technical terms ‘language system’, ‘grammar’, ‘lexicon’, ‘competence’ and ‘performance’. Languages, as we know them, are manifest in two mediums: in the phonic medium when spoken; in the graphic medium when written. Although there are good reasons for saying that speech is primary in relation to writing, in any discussion of the psychological mechanisms of language, it is important to maintain a distinction between language and medium, as follows. (1) It is possible that the integration of syntax and phonology, though based on a species-specific biological endowment for the acquisition of language and for vocalization, is a product of the normal environmental conditions in which languages are acquired and should not be ascribed to what Chomsky identifies as universal grammar. (2) Spoken utterances have a linear, time-related, structure. Sentences, as medium-independent units, do not. What, then, are the factors that determine the linearization of sentences so that, in particular contexts of utterance, one order of words and phrases, rather than another, is adopted? Are the same factors responsible for the fixation of word-order in those languages in which the order of words and phrases has a grammatical function? More generally, do such psychological factors, including the requirements of on-line processing, have an influence upon the historical development of language systems? (3) Is the language system, including the lexicon, stored in the brain in a medium-independent format, so that it can be accessed equally well in both speech and writing and without either of them influencing the other?

My role in this Discussion Meeting differs somewhat from that of the others who are delivering papers. The topic that I have chosen and the way that I shall handle it reflect this difference. I shall not be addressing myself to some identifiable narrower or more technical aspect of the general theme. Instead, I shall be establishing a number of conceptual distinctions that will be relevant to many of the technical issues coming up for discussion in the papers given by the speakers who follow me in this and subsequent sessions. My paper is intended to serve as an introduction both to the first session and to the Meeting as a whole. It was the expressed wish of the Officers of the Royal Society and the British Academy that there should be some such introductory paper at the beginning of the Meeting, for the benefit of those attending who have no specialized background in philosophy, linguistics or psychology.

With that explanatory preamble, let me now turn to the substance of my paper. I shall begin by making two or three points relating to language without saying anything about speech. I shall then go on to consider language and speech in the context of the general theme of the Meeting and some of the specific issues that other speakers will be dealing with.

The theme of the Meeting is ‘The psychological mechanisms of language’. What we are concerned with can be described more fully as natural human language. Arguably, this fuller

[1]

14-2

description is redundant in respect of either or both of the two adjectives, 'natural' and 'human'. Indeed, this is the view that most linguists and many philosophers of language would take. But it is worth making the point explicit and concentrating for a moment upon the implications of both of the two qualifying adjectives, without prejudice to the question of whether there is any language, properly so called, that is non-natural or non-human.

Without dwelling upon the details, let us say that a natural language is one that has not been specially constructed, whether for general or specific purposes, and is acquired by its users without special instruction as a normal part of the process of maturation and socialization. In terms of this rough and ready operational definition, there are some thousands of distinct natural human languages used in the world today, including English, Quechua, Dyirbal, Yoruba and Malayalam – to list just a few, each of which is representative, in various ways, of hundreds or thousands of others. But Esperanto, on the one hand, and first-order predicate calculus or computer languages like ALGOL, FORTRAN and BASIC, on the other, are non-natural. Many non-natural languages are parasitic, to a greater or less extent, upon pre-existing natural languages. This being so, though non-natural, they are not necessarily unnatural; they may be comparable, structurally and perhaps also functionally, with the natural languages from which they derive and upon which, arguably, they are parasitic. I say 'arguably', not only because the point, as I have put it, is debatable, but also by putting it in this way I am hinting at a deeper and theoretically more interesting sense of 'natural', and of its contrary 'unnatural', than my operational definition of 'natural language' requires.

It has been argued, notably by Chomsky, that languages that meet my operational, and intuitively applicable, definition of 'natural' do so, not simply as a matter of historical contingency, but by virtue of biological necessity: that natural human languages are structurally adapted to the psychological nature of man; and that if they were not so adapted, they could not be acquired, as I have said they are, without special instruction as an integral and normal part of the process of maturation and socialization. The question of whether natural human languages as we know them are also natural in this deeper sense is perhaps the central issue in this first session. But it is of importance throughout, since the psychological make-up of man is presumably a matter of biological endowment.

Granted that it is appropriate to use the term 'language' to refer to a wide range of communicative and symbolic systems employed by animals and machines, we can define a human language quite simply as one that is used by human beings, and a non-human language as one that is used by any non-human entity. Once again, however, the distinction can be given a deeper and theoretically more interesting interpretation: in terms of species-specificity. It can be argued that human languages share a number of structural properties, or design characteristics, that set them off as a class from the languages of other species, so that it is legitimate to talk not only of human languages, but also of human language in the singular.

Coupling the two predicates 'natural' and 'human' and giving to each its deeper sense, we arrive of course at the characteristically Chomskyan thesis of innatism, which Chomsky himself will be developing in a particular direction, and which Cohen and Kenny will be criticizing, in later papers. As Chomsky (1976, p. 4) put it in his *Reflections on language*: 'A human language is a system of remarkable complexity. To come to know a human language would be an extraordinary intellectual achievement for a creature not specifically designed to accomplish this task. A normal child acquires this knowledge on relatively slight exposure and without specific training.'

The next point that I want to take up has to do with the specialized use by linguists and psychologists of such terms as ‘language system’ (or alternatively of ‘language’ in the sense of ‘language system’); ‘grammar’ and ‘lexicon’; ‘competence’ and ‘performance’.

It is an obvious, but none the less important, fact that one cannot possess or use language (henceforth I shall restrict the term ‘language’ to natural human language) without possessing or using some particular language – English, Quechua, Dyirbal, Yoruba, Malayalam, or whatever. Each of these differs systematically from the others, so that, due allowance being made for the well known problems of drawing a sharp distinction between languages and dialects, styles or registers, we can readily determine that someone is using one language rather than another on particular occasions. We do this, whether as investigating linguists or as participating interlocutors, by observing and analysing, not the language behaviour itself, but the products of that behaviour – strings of words and phrases inscribed in some appropriate physical medium. But the language, for the linguist at least, is neither the behaviour nor the products of that behaviour, both of which are subsumed under the ambiguous English word ‘utterance’. What the linguist is interested in is the language system: the underlying, abstract, system of entities and rules by virtue of which particular language inscriptions can be identified as tokens of the same type or distinguished as tokens of different types; can be parsed (to use the traditional term) or (in modern terminology) assigned an appropriate structural description; and can be interpreted in terms of the meaning of the constituent expressions, of the grammatical structure of the sentences that have been uttered, and of the relevant contextual factors.

We may distinguish the language system, then, on the one hand from language behaviour of a particular kind and on the other from language inscriptions. The latter, together with native speakers’ intuitions of grammaticality and acceptability, of sameness and difference of meaning, and so on, constitute the linguist’s data; but they are not the object of linguistic theory or linguistic description. The linguist, I repeat, is interested in language systems.

And when he comes to describe them, whether he subscribes to the aims of generative grammar or not, he does so by drawing a distinction between phonology and syntax and by making reference, in the description of both, as also in the account that he gives of the meaning of sentences, to the information that is stored in the lexicon, or dictionary. The term ‘grammar’ is commonly used nowadays to cover the rules of phonology, syntax and semantics, but not the lexicon. Taking ‘grammar’ in this sense, we can say that a language system comprises both a grammar and a lexicon, and that each presupposes the other. The lexicon is a list of expressions, every one of which has one or more forms, belongs to a particular syntactic category, and has one or more meanings; the rules of the grammar cannot operate otherwise than upon the expressions supplied by the lexicon and the phonological, syntactic and semantic information associated with them in individual lexical entries. Under a rather broader interpretation of ‘grammar’, the term may be held to cover, not only the phonological, syntactic and semantic rules of a language system, but also the lexicon. This is the sense in which Chomsky and perhaps some of the other speakers will be employing the term. Nothing of consequence hangs upon this particular point of terminology. I mention it only to forestall misunderstanding and confusion.

We can now move on to consider Chomsky’s distinction between competence and performance in relation to the other terminological and conceptual distinctions that we have drawn so far.

Performance can be identified, without difficulty, with what I have called language behaviour. It can thus be distinguished, in the same way, both from the products of that behaviour, language inscriptions, and from the underlying language system. But what is linguistic competence? At one level this question, too, can be answered without difficulty. One's linguistic competence is one's knowledge of a particular language system: that is to say, one's knowledge of an interdependent grammar and vocabulary.

When it comes to developing this notion of linguistic competence in greater detail and giving it empirical content, the question gets more complicated and correspondingly more interesting. Several contributors address themselves to one or other aspect of the question. Here I shall simply make the point that, although Chomsky recognizes the logical validity of the distinction between a language system and someone's knowledge of the system (whether that someone is an actual or an ideal user of the system), he has maintained, in the past at least, that the distinction can, for theoretical purposes, be ignored. He has therefore tended to use the term 'grammar' with what he calls systematic ambiguity: to refer indifferently to both the rules of the language and the ideal user's knowledge of the rules. For Chomsky, it would appear, the only kind of reality that can be ascribed to grammars and to natural human languages is psychological reality. It is for this reason that he takes the view that linguistics is a branch of cognitive psychology. But Chomsky, if I understand him correctly, differs from many others who are working towards psychologically real grammars, some of whom are taking part in this Meeting, in that he pays relatively little attention to what is otherwise known or hypothesized of psychological processes. I would suggest that we keep this point in mind throughout. He does not believe that performance shapes competence, and his notion of psychological reality is considerably more abstract than that of most psychologists.

I now wish to make explicit the distinction, which has been implicit in everything that I have said so far between a language and the medium in which that language is manifest. It is in terms of this distinction that I propose to discuss the relation between language and speech. Medium in this sense is connected, on the one hand, with the information theorist's notion of the channel of communication and, on the other, with the psychologist's notion of input and output modalities, which will be referred to in some of the later papers.

Spoken language is manifest, normally, in what I shall refer to as the phonic medium: that is to say, the products of speech are signals, actual or potential, inscribed in the physical medium of sound. More precisely, they are inscribed (in this technical sense of 'inscribe') in the range of sound produced by the human voice – hence the term 'phonic'. Written language, on the other hand, is normally inscribed in what may be referred to as a graphic medium: anything that will sustain the requisite distinctions of shape. (It is possible for spoken language to be written, and conversely for written language to be spoken. In the present context, we can safely neglect these additional complexities. It is worth mentioning, however, not only that linguists have to reckon with them in the discussion of style and register in particular languages, but also that they are interesting from a psychological point of view.)

The main reason why we have to draw the distinction between language and medium is that human languages, as we know them in modern literate societies, are very largely independent of the medium in which they are manifest. As far as their syntactic and lexical structure are concerned, they are, in principle, completely independent: any spoken language inscription can be converted – transcribed – into a corresponding written language inscription in the same

language, and vice versa. To the extent that written and spoken language inscriptions are interconvertible in this way, we can say that they have the property of medium transferability. In practice, medium-transferability is reduced in all the major languages of the world (though less in English than in many others) by virtue of the conservatism of scribal traditions, the greater standardization of the written language and its association with more formal or more official situations, and other such historically and culturally identifiable factors. Although the consequential lack of isomorphism at the syntactic and lexical levels may have important implications for the design of certain psycholinguistic experiments, I will not dwell upon this aspect of medium-transferability. There are other points to which I want to give a more particular emphasis.

The first is that the medium-transferability of language is far from complete, even in principle, in respect of what is handled for spoken language by phonology. Some writing systems, of course, are based on the ideographic or logographic principle, so that for them the question of isomorphism does not even arise at this level. The very existence of such written languages, of which Chinese is the most notable example, demonstrates that language systems can be isomorphic in syntax and semantics, and yet be quite different as far as their segmental phonological structure is concerned. (By segmental phonology is meant, roughly speaking, that part of phonology that deals with the distribution of vowels and consonants in particular languages.) It demonstrates, therefore, that segmental phonology and syntax are independent of one another, in a way that syntax and semantics are not. Of greater importance for the moment, however, is the fact that there is more to the phonological structure of spoken language inscriptions than the strings of consonants and vowels of which their constituent word forms are constructed. My earlier characterization of utterance inscriptions as strings of forms inscribed in some physical medium was incomplete for spoken language. Superimposed upon the string of word forms there will be an intonation pattern, which will usually be integrated with the syntactic structure of the language inscription and will also be relevant to its semantic interpretation. None of the world's writing systems preserves the suprasegmental intonation contour, in the transcription of speech from the phonic to the graphic medium.

Also, there is more to speech than is covered by either segmental or non-segmental phonology; and therefore, according to standard assumptions, by the grammar of the language that one is speaking. In addition to the suprasegmental intonation contour of any spoken utterance inscription, there will be a variety of other suprasegmental features commonly described as paralinguistic – such features as significant variations of loudness, rhythm and tempo. The speaker therefore has to superimpose upon the verbal component of his utterance inscription two analytically distinguishable non-segmental components, one of which, by common consent, is linguistic and the other of which is not.

Where has all this been taking us? My main purpose, as I explained at the outset, is simply to introduce a number of conceptual distinctions that are relevant to issues to be discussed, at a rather more technical level, in subsequent papers. I shall now apply the distinction between language and medium very briefly to three such issues.

The first has to do with the putative naturalness of the association between language and speech. Now, there is a clear sense in which language is indeed naturally associated with speech. Spoken languages satisfy the operational definition of naturalness that I gave earlier: they are acquired without special instruction as a normal part of the process of maturation and

socialization. This is not true of written languages. But is speech natural to man in the deeper sense that we also identified earlier? Well, there is evidence to suggest that children are biologically equipped, not merely to vocalize, in the sense in which this term is customarily employed, but to produce and recognize particular classes of speech sounds (see Mehler, this symposium). If we also grant, for the sake of the argument, that the syntactic and semantic structure of human languages is narrowly constrained by a species-specific, innate, language faculty, as Chomsky will be arguing, we might seem to be justified in concluding that it is spoken language as such, if not the whole of speech, that is innately determined by the principles of universal grammar.

On present evidence, this would be a hasty conclusion to draw. In my view, it is quite possible that the language faculty and the predisposition to vocalize are biologically independent and only contingently associated in speech. The graphic medium, though non-natural, is clearly not unnatural with respect to the medium-transferable verbal component. Having learned to read and write we do so without difficulty and, apparently, without needing to transcribe to or from the phonic medium at the time of reading or writing. Furthermore, there are various reasons for saying that the medium-transferable part of language inscriptions is more characteristically linguistic than the non-verbal, suprasegmental, part (see Lyons 1977, pp. 70–94). It is in any case quite clear that the process of speaking, in so far as it involves the integration of the verbal and the non-verbal components of language utterances, makes use of rather different psychological mechanisms. It has also been suggested – and this point may be relevant to some of the neuropsychological work that will be reported later in this Meeting – that the control of what I have called the more linguistic, medium-transferable, part of speech and of the less linguistic part, which is not so readily transcribed from one medium to another, is localized in different parts of the brain. It would be interesting to discuss some of the recent research into the sign language of the deaf from this point of view; and I hope that this Meeting will give us the opportunity of doing so (see Marshall 1980; Siple 1978).

This brings me to the second issue: that of linearization. The structure of spoken utterance-inscriptions is partly linear and partly nonlinear. It is nonlinear, as we have just seen, with regard to their non-verbal component. It is linear, however, as far as their verbal component is concerned: the words must be in one sequential order rather than another. Is this linearity a property of language or of speech? Levelt will address this question in his paper. Here I would simply point out, in preparation for his paper and for the other papers concerned with the construction and comprehension of speech, that languages vary considerably in the grammatical and stylistic use that they make of word order. This cannot but be of relevance to the construction of models for on-line speech processing. And it is arguable that the factors that determine the linearization of spoken language utterances have operated, historically, to fix the word order of sentences in some, but not all, languages. If this is so, it would be another way in which performance shapes competence, as Janet Fodor puts it in her paper.

Granted that sentences, as distinct from utterance inscriptions, may have a nonlinear structure, at what point in the production of speech are they linearized? Indeed, is it psychologically plausible to suppose that there is some stage in speech production at which medium-independent sentences are constructed, before their linearization for utterance and the superimposition upon them of an appropriate intonation pattern?

Finally, at the risk of rushing in where angels fear to tread, I must say something about language and speech in relation to the organization of the mental lexicon. As we have seen,

the language system comprises a grammar and a lexicon. To say that someone knows a language is to say that he has internalized both its grammar and its lexicon: that they are stored in long-term memory, so that they can be accessed during the production and reception of language utterances. Linguists, as we have seen, usually take the view that phonology is an integral part of the language system and that the phonological representation of a lexical item is essential to it in a way that its orthographic representation is not. It follows from this assumption that words and phrases should be more directly accessible in spoken form than they are in written form, during normal language processing and also in psycholinguistic experiments. At the very least, we should be suspicious of this interpretation of the principle of the priority of spoken language. If the argument of this paper is accepted, we should be prepared to consider the possibility that words and phrases are stored in the mental lexicon in a medium-independent form, so that they can be accessed equally well in either their phonological or their orthographic representation. Several of the papers in the final session are relevant to this possibility; and it is, of course, an empirical question – to be resolved, not by linguistics, but by psychology and neurophysiology – whether this possibility is actualized in any or all of us.

I have been concerned, in this paper, with the distinction between language and medium. It is central, in my view, to the Chomskyan distinction of competence and performance and to the varied use that he and others have made of it. It is also central to any discussion of the psychological processes of language that draws a sharp distinction, as most linguists do, between what is within the language system and what is not.

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Discussion

R. B. LE PAGE (*Department of Language, University of York, U.K.*). Professor Lyons said something to the effect that we can readily determine that an individual is using language A rather than language B. This, however, is far from being always true, and the fact that it is not always true has important implications for one's view of what constitutes a language, and therefore of theories as to what a grammar is in relation to language. If monolithic rule systems are postulated, we have the right to ask: what are they the rules of? In Guyanese, the analysis of tense and aspect at the broad vernacular level, although it uses markers such as *go* and *gone* clearly identifiable as 'English', is conceptually quite different and therefore operating according to quite different rules from those of more acrolectal varieties of Guyanese. Thus, if a Guyanese speaker identifies himself as a speaker of English his 'competence' must be described in terms of a bundle of systems embracing both Creole and English, whereas if he identifies himself as a 'Creole speaker', claiming thereby affinity with other West Indian Creole speakers, his competence embraces a bundle of systems making up this Creole language. Similar

problems can be cited from all over the world: witness the uncertain boundaries of the Punjabi–Hindi–Gujerati–Bhojpuri continuum. Focusing around a norm is the product of social interaction and personal identification, and these psychological mechanisms thus determine the nature of the ‘system’ that is identified for grammatical description. We do not seem to be discussing such matters at all in this Meeting, although all grammarians seem to assume they are describing autonomous systems.

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Sankoff, Gillian 1977 Review of *Dynamics of a Creole system*, by D. Bickerton (1975). *J. Linguistics*, pp. 292–306.

J. LYONS. I do not dispute the facts that Professor Le Page brings to our attention. Nor would I wish to minimize the importance of studying synchronic variation in language communities and such phenomena as the continuum of variation that exists between higher-class (acrolectal) and lower-class (basilectal) dialects of Guyanese Creole. I also agree with him that there are interesting psychological questions that can be raised in relation to a speaker’s competence in one or other variety in this continuum and the speaker’s own sense of linguistic identity.

However, I do not believe that the simple point that I was making in my paper is affected by the existence of phenomena of this kind. Confronted with, say, two people speaking Standard English and two people speaking Standard French, we can readily decide which of the two languages each of the four is speaking. My point is no more subtle, I am afraid, than this. But I would now take the opportunity of emphasizing, as I have done elsewhere (e.g. Lyons 1977, pp. 585–588), the fact that the linguist’s description of any language system necessarily involves a considerable measure of idealization.