

**READINGS**

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# **The Psychology of Language, Thought, and Instruction**

**JOHN P. DE CECCO**



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Language,  
Thought,  
and Instruction*

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## Preface

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We need a book on how to teach language and thought. This book does *not* satisfy that need. Nor does any book. Inspection of the available research literature reveals this sobering state of affairs: we have little basic knowledge in the three areas, language, thought, and teaching, and even less knowledge of their interrelations. If the student wants to pursue the madness of asking how we should conduct instruction in conceptual thought and linguistic behavior, he soon finds himself perusing the basic research even though his chief interests are more practical than theoretical.

Yet, more than ever before, we need to know. American education has renewed its pledge to teach the children of the poor and the rich all the basic skills and subject matter. In a highly verbal culture there are obvious advantages for all children to speak, read, and write well. In a scientific culture all children must learn the type of conceptual thinking we associate with science and mathematics. What were once educational objectives reserved only for the “gifted” or the middle and upper classes are now serious commitments for all American children. Teaching methodology now enjoys popular discussion because we are discovering that we have too little knowledge of how to teach language and thought, especially to the children of the poor.

In addressing himself to the problem of instruction in language and thought, the editor found it necessary to cross many disciplines and attend to their interrelations. He has borrowed theory and fact from linguistics, psycholinguistics, the psychology of cognition and verbal learning, developmental psychology, anthropology, sociology, and education. In this collection none of these areas can stand alone. The risk that an interdisciplinary book must take is the profound disappointment it causes the disciplinary scholar, who feels that his field is somehow misrepresented. The purpose of the book, however, is not to represent each discipline separately but only within the framework of the general objective—greater knowledge and understanding of instruction in language and thought.

The fulfillment of this objective, as we have stated, required excursions into many disciplines. One of these disciplines is linguistics. In maturity of technique and theory and wealth of data the science of linguistics rivals the science of psychology. Linguistics describes the state or nature of the language. It is the study of messages once they are “on the air” [Chapter 1]. Descriptive linguistics includes the study of phonology, morphology, and syntax. Linguistics assumes that languages are

codes that can be described without reference to meaning and that the spoken language has primacy over the written language. Beyond descriptive linguistics is generative or transformational grammar, which tries to explain why the native speaker is able to understand and produce an infinity of novel sentences.

Psycholinguistics, itself an interdisciplinary field with which this anthology is seriously concerned, explores the relation between messages and the encoding and decoding processes of the human beings who select and interpret them [Chapter 1]. Therefore, although the linguist studies messages, the psycholinguist studies communicators. The psycholinguist uses language to study thought. Psycholinguistic research has found Chomsky's transformational grammar a fruitful theoretical base because transformations are a combined product of linguistic structure and psychological processes within the speaker. The relation between language mastery and various intellectual processes is explored in articles in Chapter 1.

There is also the interdisciplinary field of anthropological linguistics—sometimes called linguistic relativity and ethnolinguistics [Chapter 2]. This field is the study of the relation of language and thought to culture. While education embraces the children of divergent cultural backgrounds we must build anthropological variables into our educational research. Franz Boas, and Edward Sapir [Chapter 2], both of whom helped to establish the primacy of the phoneme, are the “fathers” of anthropological linguistics.

The current lively interest in the relation of language and thought to social class differences is a direct reflection of our present concern for the education of the “culturally disadvantaged.” In Chapter 3 we see that a major disadvantage of the underprivileged is their verbal and cognitive underdevelopment. Unfortunately, in education and psychology we sometimes substitute a limp compassion, sentimentality, and romanticism of lower-class values for the serious business of teaching underprivileged children what they need to know. We are not demeaning the poor when we study their linguistic and cognitive deficiencies. It is also patently absurd to masquerade these deficiencies as cultural “differences.” Knowledge of the linguistic and cognitive habits of the underprivileged will enable us to devise appropriate instruction. The articles in Chapter 3 attempt to identify social class differences in linguistic and cognitive behavior.

Several chapters represent the discipline of psychology. In Chapter 4 we raise the thorny question of the meaning of meaning and how meaning is acquired. We see how semantic theory must supplement grammatical theory to explain the ability of native speakers to interpret sentences. About four of the chapters deal with various aspects of the relation of language and cognition. Chapter 6 discusses how thought is studied. Chapter 7 concerns the development of language and thought. Chapter 8 discusses how language is acquired. Finally, Chapter 9 considers the relation of language and problem solving. An underlying issue in these four chapters is the differences in the theoretical models, terminology, and, to some lesser extent, the research techniques of the behavioral and cognitive theorists. In the tradition of S-R learning theory and methodology, the behaviorists use horizontal models that relate antecedent stimulus conditions to consequent response events [Chapter 6]. The cognitive theorists use vertical hierarchies in which lower-level operations, patterns, meaning, strategies, and so on, are subsumed under higher-level functions. On

the surface it appears that no two conceptualizations of thought or behavior could be more divergent. It all looks like an exciting controversy made venerable by the tradition that opposed Gestalt and behaviorist psychology. However, the coalescing of the two points of view, which in substance may chiefly reflect the personal preferences of researchers for various models and terminology, may be even more exciting and fruitful. In any event, the neo-behaviorists are developing and using more intervening variables, such as response hierarchies and verbal mediators; and the cognitive theorists, such as Piaget, are paying more attention than ever before to the specification and control of independent stimulus and dependent response variables. As Kendler observes, however [Chapter 6], we may discover that as the stimulus-response unit shifts from the nonsense syllable and single word to the phrase or sentence we may be in for more theoretical surprises than we now anticipate. The editor joins Kendler in the hope that there can be a greater rapprochement between learning and developmental psychologists in their investigations of the acquisition of language and thought.

Two chapters are directly concerned with instruction in language and thought. Chapter 5 concerns instruction in reading, for which there is a vast polemical and empirical literature. The research is frequently basic, as in the study of grapheme-phoneme correspondence (Gibson and associates [Chapter 5]), or it is applied, as in comparing the use of i.t.a. and traditional orthography. Chapter 10 largely concerns research on instruction in conceptual thinking. The issue that this research must resolve is the relative merits of deductive and inductive teaching for various levels of student aptitude and subject matter and for available classroom time. Inductive instructional models are now the most popular in the research literature (but not necessarily in the schools), but there is little published research that can help teachers decide under what conditions an inductive approach is preferable to a deductive approach. Chapter 10 also deals with research on the teaching of English and foreign languages. Linguistics has made "audio-lingual" approaches popular in the teaching of grammar and in the language laboratories, but it is hard to see what additional *direct* contributions to instructional methodology linguistics can make at this time. The editor believes that modern linguistics will make its chief contributions to psycholinguistics in the study of human encoding and decoding processes. The findings of psycholinguistics, in turn, may become a fruitful base for research on teaching.

Only recently, in fact, has research on teaching seriously undertaken the development of models and theory. In discussing research on the teaching of reading, language, mathematics, and so on, we often forget that we have little or no basic research on teaching methodology. Under federal grants at several major universities this research is now seriously under way. Until we know a little more about teaching in general it will be difficult if not impossible to discover much of consequence in teaching various subject matter and intellectual skills.

To avoid a book of unmanageable length it has been necessary to exclude many excellent articles that deal with specialized aspects of topics (for example, intra-dimensional shifts as an aspect of the study of reversal and nonreversal shifts) or with different but related topics (such as perception and language). We have not included articles on the neurological aspects of language and thought, although we

list and discuss a few of the important references [Chapters 2 and 7]. With the exception of the Whorf thesis we have excluded articles that specifically explore the relation of perception and language, particularly as this study is reflected in the work of Roger Brown, Harry Helson, Eric Lenneberg, Leo Postman, and Mark Rosenzweig. We should have liked to include some of the studies of cognitive style, as exemplified in the research of Jerome Kagan and H. A. Moss. The work of Allen Newell, Earl Hunt, and their associates on the computer simulation of thought or problem-solving processes deserves more note than we have given to it. Experimental tests of Piaget's theories and hypotheses by British and American psychologists required more space than we could provide. And there is a growing field of experimental anthropology which may considerably add to our understanding of language and thought.

The editor's introductions to each chapter are designed for two purposes: (1) to point up questions and issues that the relevant research has raised or answered and (2) to provide a theoretical background for the various articles in the chapters. The introductions include the discussion of more articles than appear in this collection. The references following the introductions list articles discussed but not included in this book. Students who wish to read more extensively in the current literature will find these lists useful.

At one point the editor considered the inclusion of a glossary. However, because meanings of technical terms vary over time and from author to author, it was decided to index the various definitions rather than favor one definition over another or define a term so generally that it means very little. The index will indicate pages in the text that define technical terms.

The editor gratefully acknowledges the authors and publishers who have generously consented either to the reprinting or original publication of their articles. He is deeply indebted to those who reviewed the various drafts of the prospectus, suggested inclusion and deletion of various articles, and commented on the drafts of his introductory materials: Professors Roger Brown and John Carroll of Harvard University, Professor Dale Harris of the Pennsylvania State University, Professor Arthur Jensen of the University of California at Berkeley, Professor William Kesson of Yale University, and Professor Jerome Podell of San Francisco State College. The editor wishes to thank his colleagues in the Department of Psychology and the Center for Interdisciplinary Studies in Education at San Francisco State College for their help and encouragement. He also wishes to thank Professor Eric Hamp of The University of Chicago for the revision of his paper on linguistics.

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J. P. DE C.

*San Francisco*  
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# *The Study of Language: In the Beginning Was the Sound*

## 1

### INTRODUCTION

Language has been with us a long time and, like other familiar phenomena, to single it out for special attention always appears somewhat artificial. In education we pay due respect to its importance even if we do not always understand its nature. In psychology, beginning with Ebbinghaus, the study of verbal learning and verbal behavior has a long tradition and a promising future. The fear of “verbalism” in both education and psychotherapy, the use of words without meaning for the user, has occasionally prompted the educator and the therapist to decry the use of language and, perhaps more whimsically than seriously, to entertain the possibility of carrying on treatment and instruction without the use of words. Also, some educators speak about “verbal intelligence” and almost suggest that it is an idiosyncrasy of the middle class which the education of underprivileged children should disavow. Even in psychology the study of language as the most distinctive aspect of human, as opposed to animal, behavior has received modest attention [Miller, Chapters 1, 8].<sup>1</sup> In textbooks on general and educational psychology, language, as a topic, receives cursory attention, considered either as an extension of animal learning or an aspect of social psychology and communication.

In both education and psychology there are strong indications of renewed interest in language as a subject matter in its own right and as an important domain of human behavior. Beyond the application of linguistics to the teaching of grammar, reading, and foreign language, there are investigations of language and thought in European, American, and Soviet psychology and education that may considerably improve our

<sup>1</sup>References in brackets are to passages in this anthology; those in parentheses are to the lists at the ends of the introductions and selections.

knowledge of how language is acquired and how it relates to thought. For example, although operant conditioning enjoys considerable favor in American psychology, the cognitive theorists with their interest in brain function and central processes are enjoying equal if not greater favor. Even the behaviorists find invisible mediating processes fruitful explanations of stimulus-response relations [Kendler, Chapter 9]. Some are even attempting to provide a neo-behavioristic framework for investigating the relation of motivation to thinking (Berlyne, 1965). We should like to prophesy that the empiricism of the cognitive theorist, as indicated by his interest in brain function and the computer, and the mediational processes of the behaviorist may herald a belated rapprochement, but investigators of both schools still find their differences much more important than their similarities [Skinner, Miller, Chapter 8].

The scientific study of language is called linguistics. More properly, linguistics is the study of messages once they are "on the air" (Osgood and Sebeok, 1965, page 3). The linguist determines the *code* of the message, the characteristics that distinguish one message from another. Psycholinguistics, an area of research with which this anthology is concerned, concerns the relation between messages and the characteristics of the persons who select and interpret them. The psycholinguist studies the *encoding* and *decoding* processes of human individuals. In summary, just as the linguist studies messages, the psycholinguist studies communicators. The study of communicators, moreover, combines the study of language and thought.

Eric Hamp, in an article in this chapter, describes the two basic assumptions of linguistics: (1) that language as a set of signs or as a code can be described quite apart from meaning or what the signs or codes refer to in the objective, personal, or social world; and (2) that the spoken language (the sounds of the language) precedes and is more fundamental in the description of the language than are the peculiar characteristics of the written language. Hamp's discussion introduces key linguistic terms. There is the *phoneme*, which describes the range of sound a native speaker distinguishes or fails to distinguish. The native speaker, of course, distinguishes an infinitely small number of all possible vocal sounds. Although he contrasts a few sounds, the phonemes of his language, he conveniently lumps all other vocal sounds into relatively few pigeonholes. There are about forty-five phonemes in the English language. *Morphemes* are considerably more difficult to define and identify. Hamp develops the idea of morphemes in connection with meaning, although some modern linguists prefer to avoid the subject of meaning just as many psychologists of learning prefer to avoid the discussion of motivation and perception. Morphemes at least refer to form. Any form that cannot be divided into two or more forms is a morpheme (Carroll, 1964). Take the words "light-house," "redbook," and "unreconstructed." The morphemes are as follows: *light*, *house*, *red*, *book*, *un-*, *re-*, *construct*, and *-ed*. Note that *con*

could be a morpheme except that *struct* cannot stand alone as an independent form. Morphemes are almost words, but Hamp points out how "word" is an ill-defined concept. He also distinguishes between different types of morphemes—free forms and bound forms.

The notion that people speak ungrammatically does not make good linguistic sense. They are more likely to write ungrammatically if their writing somehow is divorced from their speech practices. Certain modes of speaking may have particular snob or esthetic value, but they do not have greater linguistic justification. Since the linguists have been asserting with ideological conviction the primacy of speech, there have been sharp debates of what is good English, with the "purists" insisting on resisting change and the erosion of traditional standards, and the linguistic "liberals" sometimes espousing that "anything you hear is right." Most teachers of English must define for themselves and their students a position between these extremes. In the meantime most writers will at least occasionally split an infinitive.

Hamp also discusses how different languages cause their native speakers to "slice their universe" in different ways and to express or fail to express and to have knowledge of some objects and experiences. The dozen genders of the Bantu languages, as compared with the two genders in French, give gender in these languages considerably more refinement. This assumption is based on the Whorf thesis, which is discussed in Chapter 2.

Beyond descriptive linguistics, the description of the language code, there is the generative or transformational grammar of Chomsky and his followers (Chomsky, 1957). Transformational grammar is the attempt to explain why the native speaker is able to understand and produce sentences that may have never been written or spoken before. Its basic assumption is that language is a system of rules which can be variously arranged to form and understand new sentences. Knowledge of a language is based on intuitive mastery of the rules. There are two important concepts in transformational grammar, the *kernel sentences* and *transforms*. Kernel sentences are the basic stuff of language. Chomsky describes them as the underlying structures which express all the syntactical relations and functions that appear in any sentence (Chomsky, 1964, page xiii). The article by Henry Gleason demonstrates how these transformations are made. Gleason also uses "noun phrase" and "verb phrase." In the sentence, "The boy hit the ball," the noun phrase is "the boy," and "hit the ball" is the verb phrase. In many kernel sentences the noun phrase can be more familiarly identified as the subject and the verb phrase as the predicate. However, in the transforms the relation between these phrases may be quite different from the one described by the subject-predicate relation. Recently Postal has used the concept of *phrase makers* to describe underlying linguistic structure (Postal, 1964). Phrase makers describe the parts of this structure, how these parts are grouped together into significant sequences, and what type of grouping each is.

Chomsky's transformational grammar is of major importance in the study of the relation of language and thought, or psycholinguistics. The transformations to which he refers are a combined product of linguistic structure and psychological processes within the speaker. For example, attempts have been made to study the relation of grammatical transformations to the recall of English sentences (Mehler, 1963). Miller, in an article in this chapter, is interested in studying human encoding and decoding processes, which he describes as the "combinatorial power" to arrange grammatical rules to form new and useful sentences. As a psychologist, Miller is concerned less with explaining language structure than with the human intellectual processes that underlie language mastery. Miller uses the notion of syntactic categories (roughly equivalent to parts of speech) to raise some interesting questions: (1) what is the relation to our memory of words and syntactic categories? and (2) what is the relation of these categories to our understanding of a sentence? The research he describes suggests how at least certain aspects of transformational processes may be investigated. In effect, Miller is using modern linguistic theory to study the functions of the human mind. As he indicates, "mind" is a four-letter word that American psychologists need no longer avoid.

Vygotsky, in the following article, proposes a functional interrelation of language and thought. Vygotsky criticizes atomistic and behavioristic studies of verbal learning that essentially separate thought and word, sound and meaning. He suggests that a more fruitful way to pursue the study of language and thought is to use a "unit of analysis" comparable to the molecule in the physical sciences and to the cell in biology. This unit, he proposes, is *word meaning*.

It is far too early to predict how useful linguistic theory and the linguistic description of language will be for the study of human thought. We can report only that the use of language to study thought processes has produced some interesting experimentation and that the results of this research could make important contributions to the theory and practice of instruction. One psychologist has suggested several possible relations between linguistics and education (Carroll, 1953).

## REFERENCES

- Berlyne, D. E. *Structure and direction in thinking*. New York: Wiley, 1965.
- Carroll, J. B. *Language and thought*. Englewood Cliffs, N.J.: Prentice-Hall, 1964.
- . *The study of language: A survey of linguistics and related disciplines in America*. New York: Cambridge, 1953.
- Chomsky, N. *Syntactic structures*. 's-Gavenhage, Holland: Mouton, 1957.
- . Introduction. In P. Roberts, *English syntax: Alternate edition*. New York: Harcourt, 1964.
- Mehler, J. Some effects of grammatical transformations on the recall of English sentences, *J. verb. Learn. verb. Behav.*, 1963, 2, 346-351.

- Osgood, C. E., and T. E. Sebeok. *Psycholinguistics: A survey of theory and research problems*. This includes A. R. Diebold, Jr., *A survey of psycholinguistic research 1954-1964*. Bloomington: Indiana University Press, 1965.
- Postal, P. M. Underlying and superficial linguistic structure, *Harvard Educ. Rev.*, 1964, 34, No. 2, 246-266.
- Saporta, S. (Ed.) *Psycholinguistics: A book of readings*. New York: Holt, Rinehart and Winston, 1961.

## ***Language in a Few Words: With Notes on a Rereading, 1966***

ERIC P. HAMP

The fundamental aim of scholarship is to advance knowledge. For this purpose it is necessary for the specialist to make use of terms and methods some of which are technically very complex. But the fruits of scholarship will be barren indeed, if from time to time they are not made intelligible to educated men at large in such a form that the nonspecialist may increase his understanding without being expected to retrace all the steps laboriously trodden in the first place by the specialist.

The fact that there is no comparable understanding of the advance of knowledge of such a familiar phenomenon as language seems hard to understand. [This situation has happily changed somewhat since these words were written, though with two reservations: (1) Recent knowledge has still not really percolated to the level of the average newspaper reader. (2) Attention to linguistics in the schools has not of late been entirely happy; in its new burst of popularity it threatens often to be more modish than informed.]\* Recent, but quite fundamental, findings concerning language have scarcely emerged from the snug covers of learned journals, indigestible dissertations,

\* Material within brackets are the notes of the rereading in 1966.

and formidable monographs concerned with elusive minutiae. From time to time attempts are made to quicken the body; yet they all have failed. Think, for example, of the expert who starts with remarks to the effect that language is usually thought to be a dull subject and then get no further than promising to inspect a few of the fascinating byways of this "absorbing discipline," as he proceeds to unfurl tiresome, and often irrelevant, periphrastic expressions of the passive voice in English or Eskimo. Then there is the bombardier who opens a barrage of countless languages or the museum director who sets out to guide you through a picture gallery of languages. "Just look at all those words that resemble one another," says he. The intelligent reader, who is probably plagued every day with sufficient chaos of detail, is by now reaching for the string on the bed lamp. [To these there has been added in the last decade a new blight: the term-swapper. In this era of extravagant awe for chromium-plated scientism, authors frequently increase and impress their audiences, thinking to enrich and enhance their

Reprinted with the permission of the author and the publisher (and revised by the author) from the *Journal of General Education*, 1951, 5, No. 4, 286-302.

own scholarly precision, by parading very old and tired notions under technical-sounding names. Thus, sounds or letters become "phonemes"; parts of speech lose their old names and become numbers; old-style commas and the spaces after simple phrases get replaced by single- and double-bars with superscript numerals peppered about; and in this guise a jargonish brand of pseudo-reasoning and would-be data begin to sound as if they really meant something and led somewhere.]

Another subject concerned with language has come to the fore in recent years, an ingredient that in many ways only beclouds the issue precisely because of its validity as a province of knowledge in its own right, namely, that worrisome and sometimes popular topic, semantics. Semantics certainly has its proper place in any consideration of human communication; it is unfortunate that at present both controls and methods for observing and sifting semantic data are embarrassingly undeveloped. Just how are we to draw the lines defining how people "feel" about the connotations of linguistic expression? And to say—what seems to be a widespread notion—that when we have dealt with semantics we have explained a basic portion of the nature of language is simply not true. [Semantics is still a troubled subject. But in the past several years, with the advent of generative grammatical theory, a healthy attention has once again turned to it, and notable hypotheses, if not yet solutions, are being developed.]

Under the rubric of semantics there is also the question of the expression that logical categories and functions find in language. But, as long as discussion is restricted to these considerations of logic, the crucial question of language remains untouched. Languages are garments that clothe and enhance, or at times detract from, what we assume to be the mental processes of human beings. To use a gross simile, a tailor who restricts his study to anatomy will not learn what a good suit of clothes consists

of; the success of Christian Dior does not rest on mere measurements of the configurations shared by all women. And, like good Chinese *couture*, the waist of a Paris mode in a given year has no necessary relationship to that slender middle part of a woman's body that finds quite different expression in the terms of a physical anthropologist or of the average man with an eye for beauty. Let me illustrate this with two English sentences: *There is no democracy where there is ruthless subjection of the peace-loving masses by the few* and *There are no whelps in that pigsty*. The first statement offers certain difficulties which it would be highly desirable to define. With the aid, if necessary, of an expert in animal husbandry, the second statement offers no problems at all of the same order.

Now if the equivalent of the first statement were found in *Pravda*, it might be alleged that the form of "subjection" has a different coverage in the realm of ideas from that usually found, for example, in the *New York Times*. But that does not prevent the *Pravda* version from occurring in English in the *Daily Worker*. An analysis of this discrepancy does not necessarily tell us anything about the difference between the Russian *language* and English. On the other hand, among the various *linguistic* differences which we should find in the two versions would be the absence of any feature in the Russian to express our English form *the*. This does not mean that a Russian is unaware of such a distinction; in a given instance we can know nothing about such an alleged awareness, since we cannot crawl into his mind to find out. The important *linguistic* fact is that Russian simply puts a speaker under no compulsion to express this distinction at every turn, just as we do not have to change the form of a noun after a negative verb (a Russian does). [This discussion ignores the fact that there are also equally *linguistic*, but semantic, differences which could now be more fruitfully tackled in light of recent theoretical developments: e.g., *no* (contrasted with the Russian equiv-

alent in such a sentence, where *there* is negated), or *whelps* (which is compatible only with an interesting range of animals).]

Now let us regard these statements from the point of view of language. Both are statements in English, and both have essentially the same structure. That is to say, both make use of a great many of the same fundamental building blocks and also put them together in similar patterns. To point out a few characteristic English features, we notice that there are certain units of sound which occur in these statements: voiced *th* in *there*, voiceless *th* in *ruthless*; a voiceless rush of breath through the lips (if you speak one of certain forms of Standard English other than my own) for the *wh* of *whelps*. Unless you grew up speaking a language other than English, you can detect an audible rush of breath immediately after the *p* in *peace*; this does not occur after *p* in *whelps*. We find combinations of sounds such as *thl* (*ruthless*), *bj* (*subjection*), *lps* (*whelps*), *gst* (*pigsty*); we shall never find these at the beginning of an English word, as we may with *fy* in *few* (contrast *feud* and *food*). [Current theory now lays stress on the occurrence and non-occurrence of sound sequences such as these; but they are, of course, still features of the language, even if rather superficial ones.]

I have picked out a few striking phonological features of English. Among European languages, phonological systems that use two *th*-sounds are found only in Welsh, Greek, Icelandic, and Albanian; Castilian Spanish has the voiceless *th* (I am, of course, referring throughout to *sounds*, and not spelling, which is merely an imperfect and often, as in the case of English, a grossly inadequate symbolism). [Linguistic theory has taken in recent years a much more active concern with graphic representations of language in their own right and their accounting within an adequate framework.] The *wh* is a *significant contrast* (note, for example, *which* beside *witch*) is shared by no other standard European language.

Now when we say “significant contrast,”

we have struck at the heart of sound-systems in language. Certain other linguistic groups can be heard to pronounce our *wh*, but for them it may be simply a nonsignificant variation of one of their sound units. Manx, the language of the Isle of Man and now practically extinct, [It is now extinct.] employed the voiced *th* sound in the middle of a word between vowels. This was, however, not a distinctive sound, since it varied from time to time and from person to person with *z* in the selfsame forms. In other words, it made no difference to a Manxman which of these two sounds he produced in that position. If we say the word *peace* immediately after we have taken a drink of water (opening our vocal chords with a snap), we are likely to produce what a phonetician would call a “glottalized” *p*. That will not bother us at all (so long as the water went down the right way), since this is not a significant distinction in our language. Tzeltal speakers in southern Mexico might be misunderstood in a similar circumstance. *Their* sound-pattern is such that they distinguish glottalized consonants clearly and significantly from the nonglottalized variety. To us some consonants merely sound “funny.” This sort of inattention to sounds which are not significant in the language of the observer is one of the principal inadequacies of the earlier grammars written by Europeans of so-called “primitive” languages.

It is probable that no speaker produces precisely the same acoustical sound twice in succession. As yet, no absolute phonetic criteria have been established on an acoustic basis.

All the illustrations which we have just noticed have the point in common that in a given position one sound unit of a language may occur indiscriminately with varying qualities, as measured either in terms of physiological production or of the acoustic result which the observer hears; *within a limited range*, no matter what sound occurs, the result is still perfectly intelligible to a native speaker. Not only is it quite intelli-