English
Transformational
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Preface

When we speak of studying transformational grammar, we refer to a framework within which a number of questions about human intellectual capacity, questions concerning the knowledge involved in "speaking" a language, have been answered and currently are being answered. This framework is a set of principles, called linguistic universals, which allow us to describe what we, as native speakers of English, know about our language intuitively. Without such guiding principles, it would be very difficult, if not impossible, to obtain a correct description of English. Before we can describe what we know, we must know *how* to describe it; we must know, in other words, how to classify the facts which we observe.

These linguistic facts cannot be classified by any random method; they must be classified so they represent all that we know about our language and only that information. After investigating some of these facts in the chapters of this book, you will be able to appreciate that it is no simple matter to discover a classification scheme which meets this requirement. If such a classification scheme, in the form of a set of principles, existed right now, the description of our language would not be the enormously difficult task that it is at present. Unfortunately, only the barest outline of this set of principles is visible. This means that we can acquire at the moment only the most general understanding of our own competence to speak and comprehend the sentences of English. Not only will our understanding necessarily be incomplete; it will often, when we overextend our speculations and make unjustified assumptions about how to organize the facts, be incorrect. There are a great many observations to be made about English which the following chapters completely ignore. In part, this neglect is the result of simply not understanding how these various observations are related and how

they should be classified.   Under such circumstances it is possible to do no more than state the data, the raw facts, which are scarcely of interest in themselves.   Furthermore, the text proposes a number of descriptions, for example those of aspect and the auxiliary, which have not been universally accepted and which compete with alternative descriptions proposed by other grammarians studying these topics.   Thus, exclusive correctness for these analyses cannot be claimed.   We must be satisfied, at present, that such analyses are, at the very least, consistent with the more or less established linguistic principles and are, furthermore, adequate with respect to the facts they purport to describe.   The crux of these matters is that not enough is known about how linguistic facts are to be organized correctly.

These seemingly bleak observations about the current state of scientific knowledge of linguistic phenomena are not intended either as a disparaging evaluation or as a gloomy prognosis.   Quite the contrary, these remarks constitute a challenge to the inquiring intellect.   More has been learned in the past fifteen years about the organization of human linguistic knowledge than at any time since the seventeenth century, when similar questions were addressed by French philosophers and grammarians under the intellectual leadership of Descartes.   Furthermore, during the same fifteen-year period, the scientific understanding of the grammar of English, the set of defining rules which represents linguistic knowledge, has grown enormously.   The meaning of these developments is clear and impressive.   Linguistic research has produced, and is currently producing, results which constitute something of a breakthrough in the study of the operations and behavior of the human mind.

Since linguistic universals determine the form of a complete and accurate representation of what human beings know when they know a language (or would, in any case, if we knew them all), these concepts tell us exactly what makes human intelligence so human, what makes it unique.   They tell us of the innate propensities of the human organism to acquire behavioral and intellectual characteristics which set it apart from other animal organisms.   Taken together with a complete and accurate description of a particular language, constructed in accordance with them, these universals would provide the information necessary to answer questions about the strategy by means of which human beings acquire a language in the first place.

As you can see, the search for linguistic universals and the construction of a correct description of a speaker's linguistic knowledge must go hand in hand.   Without justifiable universals, it is impossible to know whether a proposed description is correct.   Without grammatical descrip-

tions which make empirical claims about the speaker's knowledge, it is impossible to test the correctness of the proposed universals. The consequence of this is that it is not particularly illuminating to speak in the abstract of either the grammatical description of a language or the universals which constitute a theory of grammars. Each must be discussed in the context of the other. To a certain extent these two dimensions have been integrated in this book. The discussion of the existence of deep and surface structures, of transformational rules composed of elementary transformational processes (substitution, deletion, and adjunction), of the fact that transformations are partially ordered, of the recursive character of the phrase structure rules allowing the embedding of sentences within sentences, and so forth, is a treatment of linguistic universals, of properties which all human languages will share. On the other hand, other parts of the presentation deal with the particular deep structures and transformations contained in English—in other words, with the general topic of how English as a system of knowledge makes use of the kinds of constructs given by the linguistic universals.

To speak, then, of transformational grammar is to speak of a point of view concerning what questions about human language are important to ask and to answer. These questions invariably center upon the nature of the abilities displayed by human beings in acquiring and using a language. Partial answers to a number of questions of this sort have already been provided; certain of these are implicit in the analyses of the various syntactic constructions proposed in the chapters which follow. Others, because of their complexity, are not presented. Despite the progress made so far, attempts to develop a comprehensive theory of grammars and precise descriptions of actual human languages in terms of such a theory are in their preliminary stages. The theoretical proposals set forth in this volume are already being questioned and modified. Correspondingly, the syntactic descriptions currently ascribed to most of the constructions in English studied in the early days of transformational research are, wherever possible, being revamped so as to accord with newer and more insightful formulations of linguistic universals. In this way, the science of transformational grammar progresses, rarely in an atmosphere of certainty and security, always in an atmosphere of challenge and curiosity.

Three people were of fundamental importance to the creation of this book (although, it goes without saying, they are in no way responsible for the correctness of the linguistic formulations). The first is John Ross of M.I.T., who spent many hours dissecting the original manuscript on linguistic and stylistic grounds and supplying the authors with invaluable comments. The second person is Cay Dietrich of IBM, Thomas J.

Watson Research Center, who gave the authors extensive editorial assistance. If this presentation is comprehensible, it is largely the result of Miss Dietrich's ability to detect and express the essential components of complex ideas. The third person is Noam Chomsky of M.I.T., who was kind enough to review the manuscript in detail, after the final draft had been prepared. Professor Chomsky offered a great many helpful suggestions which, wherever feasible, were incorporated into the copy-edited manuscript. To these three people the authors offer their thanks.

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P.S.R.

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The Study of Language

Language as a Scientific Subject Matter

The most puzzling scientific mysteries are often uncovered when scientists investigate natural phenomena that are taken for granted. Until this century the color change of metal during heating was known to every blacksmith, but was not explainable by classical physics. Max Planck, the German physicist, studied this phenomenon and derived a rule that became the basis of modern quantum physics. The primary purpose of this book is to call attention to the mysteries of a natural phenomenon common to the experience of every normal human being —the knowledge and use of language—and to present some partial explanations of these mysteries. Most of the major discoveries in this field have yet to be made.

The mysteries about language that will be discussed here seem trivial and obvious at first sight. For example: Every normal human being is capable of distinguishing the sentences of his language from all other objects in the universe. Yet, how can this fact be explained? A sentence is a *string* of words, but not every string of words is a sentence. The following strings are English sentences:

1. the trains are most crowded during the holidays
2. aren't you thinking of a perambulator?
3. wash that car before breakfast!

Suppose the word order of these strings was reversed:

4. * holidays the during crowded most are trains the
5. * perambulator a of thinking you aren't
6. * breakfast before car that wash.

3

Every speaker of English knows, without a moment's hesitation, that these strings are not English sentences, even though they contain English words. (An asterisk is always placed before a string which is syntactically or semantically deviant.) What is it that you know when you distinguish between strings of words which are sentences of your language and strings which are not sentences of your language? And where did you get this knowledge?

One possible answer to the latter question is that you memorized the possible sentences of your language while learning it in your infancy, much as you memorized the faces or names of classmates and friends. But this is not the way a human being learns his language. It is impossible to memorize *all* sentences possible in your language, and you frequently utter or hear sentences that do not duplicate any of your past experience. (In fact, the sentence you are reading now has probably not occurred previously in your experience.) Nonetheless, you have been able to distinguish between the grammatical strings and those strings made ungrammatical by reversal of word order. Obviously, you have not learned your language by memorizing its sentences. This, then, is one important human ability that needs to be investigated: How is a normal human being capable of deciding whether a string of words is a sentence in his language, and how is he able to do this for any of a potentially infinite number of strings he has never seen nor heard before?

But this is far from all that needs to be explained. For example, a speaker of a language can almost always tell whether a string is peculiar because of its meaning (i.e., its semantic interpretation) or because of its form (its "syntax"). In his first book on transformational grammar, Noam Chomsky pointed out that the following string is grammatical:[1]

*colorless green ideas sleep furiously.

However, it is nonsensical. It could be described as well-formed grammatically but ill-formed semantically.

Finally, the meaning of a string may be quite clear, but the string may be ungrammatical:

* John and I jumps over wall and we shoots he
* you don't can putting your feet on the table in here
* is reading your father this book.

Thus we are often able to understand foreigners and others who do not correctly use the rules of English.

Furthermore, what is left unsaid may also be very important in a normal sentence of English. You would not be able to explain the full

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[1] *Syntactic Structures* (Gravenhage, 1957), p. 15.

meaning of the following ungrammatical string:

* so was Norbert Wiener

but you would understand and be able to explain this string if it appeared as part of a grammatical string:

Yehudi Menuhin was a child prodigy and so was Norbert Wiener.

You understand the last four words to mean that Norbert Wiener was a child prodigy, although this is not stated in so many words. A speaker of a particular human language can often understand the full meaning of a sentence in his language without explicit statements in the words of the sentence. Such sentences are characterized by a very important kind of grammatical rule which will be presented later. Compare the following sentences:

1. Dr. Johnson asked someone to behave himself
2. Dr. Johnson promised someone to behave himself.

When you read the first of these superficially similar sentences, you understood the person who was to behave to be "someone." But when you read the second sentence, you understood the person who was to behave to be "Dr. Johnson." In these two sentences, the items which you understood to refer to the person who was to behave were in different positions, although the sentences were identical on the surface except for one word. What is it that you know about English that enables you to understand the sentences correctly? How is it that you understand

finding the revolver in that drawer worried us

as meaning that *we* are the ones who found the revolver in that drawer? Your knowledge of your language includes the ability to reconstruct the full meaning of a sentence from a string of words which may not contain all the words necessary for an accurate interpretation if you were, say, a Thai learning English.

Frequently, a native speaker of English will understand a sentence as having more than one meaning, as being *ambiguous*. Sometimes just one word is ambiguous, as the word "bank" in

the police station was right by the bank.

Here "bank" could be either the bank where money may be deposited or the bank of a river. Sometimes, however, the ambiguity has to do with the grammatical structure of the sentence:

the lamb is too hot to eat.

This sentence means either that the lamb is so hot that it cannot eat anything or that the lamb is so hot that no one can eat it. Can you see the ambiguity in the following sentence:

visiting relatives can be a nuisance.

Sentences may be multiply ambiguous. Six possible interpretations of the following sentence are given below:

the seniors were told to stop demonstrating on campus.

1. The seniors were demonstrating on campus and were asked to desist.
2. The seniors were demonstrating and were asked, on campus, to desist.
3. The seniors were demonstrating and were asked to desist on campus (although they could demonstrate elsewhere).
4. People were demonstrating on campus, and seniors were asked to stop them.
5. People were demonstrating and seniors were asked, on campus, to stop them.
6. People were demonstrating and seniors were asked to stop them from doing this on the campus (although they could do it elsewhere).

This ability that you have to extract more than one meaning from some sentences of your language is matched by one other skill. You can usually tell when two or more sentences have the same meaning—when they are *synonymous*. Sometimes this synonymity arises from the existence of more than one word for a meaning, as in the joke translation of "Twinkle, twinkle, little star," which begins:

Scintillate, scintillate, diminutive asteroid,
How I speculate as to your identity.

Frequently the synonymy is a result of the way the sentences are structured, as demonstrated by the following sentences:

1. six out of seven salesmen agree that walruses have buckteeth
2. that walruses have buckteeth is agreed by six out of seven salesmen
3. it is agreed by six out of seven salesmen that walruses have buckteeth.

You have never seen nor heard these sentences before; yet you need little or no conscious thought to decide that all three of them have a common meaning—a meaning distinct from that of

six out of seven walruses believe that salesmen have buckteeth.

The simplest type of synonymy is word synonymy. As you saw in the alternative version of "Twinkle, twinkle, little star," different words may have the same meaning, though sometimes some alternatives may carry slightly differing connotations. Word synonymy is obviously responsible for the synonymy of the following pair of sentences:

> oculists are expected to be well trained
> eye doctors are expected to be well trained.

Anyone who speaks English as his native language understands these sentences to be synonymous because he has memorized the meanings of "oculist" and "eye doctor." Since these meanings are the same, he knows that the otherwise identical sentences must have the same meaning.

It is not as simple, however, to explain the native speaker's ability to detect synonymy in such sentences as:

1. the chicken crossed the expressway
   the expressway was crossed by the chicken
2. it is believed that the framers of the Constitution met in Philadelphia
   the framers of the Constitution are believed to have met in Philadelphia
3. economists claim that a recession is not inevitable, and economists are not noted for optimism
   economists, who are not noted for optimism, claim that a recession is not inevitable.

SUMMARY

When you use skills such as the four discussed in this chapter:

1. the ability to distinguish between the grammatical and ungrammatical strings of a potentially infinite set of utterances,
2. the ability to interpret certain grammatical strings even though elements of the interpretation may not be physically present in the string,
3. the ability to perceive ambiguity in a grammatical string,
4. the ability to perceive when two or more strings are synonymous,

you are making use of a kind of knowledge that can best be described as knowledge of the grammar of your language. This provides you with the grammatical information you need to understand and produce (or generate) the sentences of English. Although these four skills seem

too obvious to bother with, they have never been satisfactorily explained. As remarked earlier, science often progresses by trying to explain well-known, everyday phenomena.   Planck's investigation of the color change in heated metal revealed unexpected complexities, and you will see that the same is true in the case of these four skills.

Language is a specifically human characteristic.   Descartes noted in Part V of his *Discourse on Method:*

> It is a very remarkable fact that there are none so depraved and stupid, without even excepting idiots, that they cannot arrange different words together forming of them a statement by which they make known their thoughts; while, on the other hand, there is no other animal, however perfect and fortunately circumstanced it may be, which can do the same.[2]

The particular skills that human beings use when they speak and understand their own language are quite remarkable, especially when you realize that a language is basically an infinite set of sentences.

In a very real sense, then, the study of what a grammar must be like if it is to account for the sentences of our language is more than the study of the structure of English sentences and the processes which operate on these structures.   The various linguistic skills reflect aspects of the intellectual abilities we possess by virtue of being human.   When we attempt to explain these skills, we are really seeking to explain an important part of what makes us human.

EXERCISE ONE

1. Using these statements as starting-off points, explain the different uses to which the word "grammar" is put:

   a. His grammar is excellent.   He rarely makes errors either in speech or writing.
   b. His grammar is excellent.   It reveals very interesting insights into the structure of English.
   c. Human beings possess a grammar which makes it possible for them to use, produce, and understand a human language.

2. In your grammar classes in high school, you probably learned to divide a sentence into two parts.   Thus you would probably divide the following sentence

   A grammar specifies a speaker's intuitive knowledge.

   in this way:

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[2] Quoted in N. Chomsky, *Cartesian Linguistics* (New York, 1966), p. 4.

a. A grammar <u>specifies</u> a speaker's intuitive knowledge.

How could you justify dividing the sentence as it is done above rather than as it is done in *b* below?

b. A grammar <u>specifies</u> a speaker's intuitive knowledge.

3. Discuss the difference in the relationship between the italicized words in *a*, those in *b*, and those in *c* with respect to the phrase "to paint in Paris."

   a. *Whistler* persuaded *his mother* to paint in Paris.
   b. *Whistler* promised *his mother* to paint in Paris.
   c. *Whistler* left *his mother* to paint in Paris.

   Note the ambiguity of *c*.

4. Explain the ambiguity in the sentences below:

   a. Eating apples can be enjoyable.
   b. She told me to leave at five o'clock.
   c. Could this be the invisible man's hair tonic?
   d. The old matron fed her dog biscuits.
   e. Every citizen may vote.

5. Describe the difference in the relationship of "Eberhart" to "please" in *a* and *b*:

   a. Eberhart is eager to please.
   b. Eberhart is easy to please.

6. What does Descartes have to say about the relationship of human intelligence to human linguistic ability?

7. Show how the sentence below may be reorganized so that the new version

   a. is synonymous with the original version.
   b. has a different meaning from that of the original sentence:

   <center>The cheese was purchased by Aunt Tillie.</center>

8. Certain material has been deleted from the sentences below. Show what this deleted material must have been:

   a. She adopted forty-two cats simply because she wanted to.
   b. John likes Mary, Bill, and Sally.
   c. Oaks are taller than maples.
   d. Discovering the truth pleases scientists.
   e. Ladies wearing high heels are not welcome on tennis courts.

9. The following pairs of sentences are synonymous, but in a different way. Can you describe and explain the differences?

   a. My attorney specializes in copyright law.
      My lawyer specializes in copyright law.
   b. A proposal was made which bothered me.
      A proposal which bothered me was made.

Constituent Structure

If you are to explain the speaker's knowledge of the sentences in his language, you must start by asking a question about something that is seemingly obvious. *What exactly is a sentence?* In a certain sense, everyone who speaks English knows what a sentence is; but if you try to give a definition of a sentence which is not circular, you will find that the task is not so easy. Traditionally, sentences are spoken of as expressing complete thoughts. This answer does nothing more than raise a second question: *What exactly is a complete thought?* Clearly, if this question is answered by saying "a sentence," nothing has been achieved. So, the problem is clear. Speakers know the sentences of their language. But what exactly are these objects, these sentences, that speakers know? This chapter begins to sketch an answer to this question.

At first glance, you would naturally consider a sentence to be a string of words. When sentences are written, they are written as strings of words; when sentences are read, they are read as strings of words. Sentences are, indeed, strings of words, but strings with very unusual properties. For example, a consideration of the two strings below reveals the most characteristic property of sentences. *Sentences are structured strings of words.*

1. This human language reveals a systematic property.

2.　　4　1　3　7　6　5　2

This structure is not apparent in the string itself; it is invisible. But it is there nonetheless, and speakers of English can readily demonstrate this structure. The words in sentences fall into groups or clusters, and speakers of English have little difficulty recognizing these clusters. Suppose someone asked you to divide string 1 into two parts, the two parts which seemed most natural to you. What would your answer be: