

6 Syntactic structure

So, in order to describe X in (1c), we need a pattern made of further patterns, just as we do for S.

It should be fairly obvious that these syntactic categories and patterns—noun, verb, noun phrase, and so forth—can't be characterized in terms of phonological structure. For one thing, the very same sequence of sounds can serve as different parts of speech, as seen in the sentences in (3); you can doubtless multiply examples *ad libitum*.

- (3) a We're going to rock around the clock. (rock = verb)
- b We put some rock around the clock. (rock = noun)
- c Beth threw the ball. (threw = verb)
- d It went through the window. (through = preposition)

Consequently, if we (and our brains) are to be able to characterize the patterns of phrases and sentences, we need an additional layer of structure beyond that provided by phonological structure, a layer in which the basic units of analysis are parts of speech, and in which they are combined into phrases and sentences. Just as the auditory signal is factored into voice recognition, affect recognition, and speech perception, the speech analysis is factored into phonological structure and this further analysis, which we'll call *syntactic structure*.

On the other hand, syntactic structure can't be related as directly to the auditory signal as phonological structure is. In order to determine the part of speech of a word, first the word has to be identified. What word is being spoken obviously doesn't depend on who is saying it or their tone of voice—that all has to be filtered out already. But this is exactly what phonological structure does. That is, identifying the word depends not on its auditory characteristics but, rather, on its *phonological* characteristics. So our functional diagram of information flow in language is elaborated to Figure 6.1.

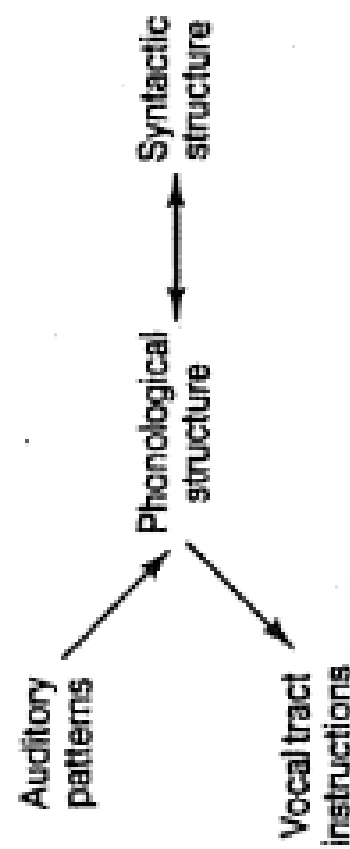


Figure 6.1 The place of syntactic structure in the information flow of language

Syntactic structure is distinct from phonological structure

Phonological structure allows us to build up speech sounds into words and string them together. But it doesn't help us to describe the kinds of patterns we discussed in Chapter 2, shown again in (1).

- (1) a An X is not a Y.
- b Since an X is not a Y, a Z is not a W.
- c X Verbs that S.

What fits into the slots marked "X," "Y," "Verb," and "S" in these patterns? We can't describe these just in terms of their sound. Rather, we need the notion, familiar from traditional grammar, of "parts of speech" such as noun, verb, adjective, and preposition—plus ways of combining them. X, Y, Z, and W in patterns (1a) and (1b) have to be filled by nouns such as "nunnery," "banana," "oboe," and so forth; Verb in pattern (1c) has to be filled by a verb such as "thinks," "believes," "expects," and so forth.

There is a further complication in pattern (1c). As we saw in Chapter 2, S has to be filled with another pattern, a sentence that can stand on its own. In the examples in Chapter 2, X was filled by a name (or proper noun) such as "Larry," "Moe," or "Curly." But it can also be filled by a larger pattern of words consisting of a common noun and a collection of modifiers—a so-called *noun phrase*. In the sentences in (2), I've underlined the noun phrase that takes the place of X in pattern (1c), and I've marked in bold the *head noun*, the noun that everything else modifies.

- (2) a The big black bear thinks that you won't shoot him.
- b A woman in the lobby with a book under her arm believes that an oboe is not an octopus.
- c The tall boy who Bill met yesterday expects that the world economy will disintegrate within a year.

Syntactic structure is distinct from meaning

School grammar defines a noun as "the name of a person, place, or thing" and a verb as "an action or state of being." According to these definitions, the units of syntactic structure are actually elements of meaning (or thought). And many people (some eminent psychologists and computer scientists included) think that syntactic analysis is nothing but a stripped-down description of meaning: if we characterize the meaning properly, there is nothing left to be said about syntactic-structure.

It would indeed be nice if we didn't have to posit a level of syntactic analysis in between phonological structure and meaning—if the brain's analysis were maximally simple. But the facts of language don't let us off the hook so easily. Syntactic structure is closer to meaning than sound is—it's the last way-station enroute from sound to meaning—so it strongly reflects certain aspects of meaning. But, as I want to show, there are other properties of syntactic structure that don't have much to do with meaning. Rather, they have to do with organizing the elements of meaning into linear order so that they can be pronounced, and at the same time marking the relations among these elements so that they can be re-identified by the hearer.

To start with, let's ask whether each part of speech really denotes a consistent kind of meaning. Some of the most common matchings of entities of meaning with parts of speech are shown in (4).

- (4) Object = Noun (*dog, skyscraper, ocean, molecule*)
 Action = Verb (*breathe, enter, provide, interpret*)
 Property = Adjective (*hot, jealous, quiet, insubstantial*)
 Location = Preposition (or prepositional phrase) (*in the house, on the ceiling, between NY and LA*)

Now it is true that any word that names an object will be a noun. But on the other hand, not every noun names an object. "Earthquake" names, if anything, an action, as does "concert"; "redness" and "size" name properties; "place" and "location" pretty obviously name locations. In fact, for just about any kind of entity we can think of, there exist nouns that name that kind of entity. So the grammatical notion of noun can't be given a definition in terms of what kind of entity it names.

Similarly, prepositions can be used to name not only locations but also times ("after lunch," "through the night") and properties

("out of luck," "in a good mood"). So prepositions don't correspond to any fixed sort of entity either.

These examples also show that a particular kind of entity need not correspond to a single part of speech either. Actions can be named by either verbs or nouns; properties can be named by adjectives, nouns, or prepositions. In fact, the very same property can be expressed by an adjective or an adverb, depending whether it modifies a noun or a verb:

- (5) *a* a-violent-earthquake, a beautiful concert
b The earth shook violently; The orchestra played beautifully

We conclude that parts of speech, the basic units of syntactic structure, are not definable in terms of meaning.

Here's another reason why syntactic structure isn't predictable from meaning. In Chapter 4 we noticed that meaning or thought is independent of the language that is being spoken. Otherwise it makes no sense to speak of translating from one language to another, conveying the same meaning.* It follows, then, that any difference between the original and the translation isn't part of the meaning they share.

Of course, languages don't share the *phonology* that goes with the same thought. That's why we have to study vocabulary like crazy when we're learning foreign languages: what noise means the same thing in Portuguese that "umbrella" means in English? But in addition to learning phonology, we have to learn what order to put the words in, and that's a *syntactic* property of the languages in question.

For example, English adjectives normally precede the nouns they modify, but French adjectives (with some exceptions) normally follow the nouns they modify.

- (6) le chat noir = the cat black ("the black cat")

English verbs normally follow the subject and precede the object, but Japanese verbs always follow both subject and object.

- (7) Bill-ga hon-o utta = Bill book sold ("Bill sold the book")

In English, one can form a question by placing an "auxiliary verb"

* Almost the same meaning, at any rate. In Chapter 14 I'll mention some circumstances where completely accurate translation is not possible.

("do," "will," "be," etc.) in front of the subject, but in German questions, the main verb can be placed before the subject.

- (8) *Liebt Wozzeck Marie? = loves Wozzeck Marie?*
 ("Does Wozzeck love Marie?")

These patterns of word order depend on knowing the parts of speech of the words, so they have to do with syntactic structure. On the other hand, since they differ from language to language, they can't depend on the meaning. So again we see that syntactic structure has properties that are independent of meaning.

Some syntactic patterns

If parts of speech don't have to do with meaning, what *do* they have to do with? It should be evident by now that the classification of words into parts of speech determines their roles in patterns.

Let's briefly explore some syntactic patterns in English. As we go through them, it is important to bear in mind that these patterns are part of mental grammar—that we somehow have these patterns stored in our brains, and that we had to learn them.

As we saw in Chapter 5, a noun can appear with a plural ending: "dogs," "bananas," "earthquakes." A verb, on the other hand, can appear with a past tense ending: "helped," "believed," "procrastinated." Notice that our ability to use these endings is *syntactic* knowledge, and doesn't follow from the meanings of the words. In terms of meaning, it would make sense if nouns that name actions could appear with a past tense. But there are no words "earthquaked" or "concerted" which name an earthquake or a concert that occurred in the past. Likewise, in terms of meaning, it would make sense to be able to put a plural ending on a verb to mean that the action was performed more than once. But we can't say "Bill will dances" to mean he will dance several times. (The "-s" ending in "Bill dances", of course, indicates not plural, but that there is a third-person-singular subject.) In other words, the availability of past tense and plural endings correlates with the syntactic distinction between verbs and nouns, not with the distinction in meaning between objects and actions.

Another case: in English, a verb is preceded by its subject and followed by its object, if there is one. Both the subject and object are noun phrases. As we saw a minute ago, the verb can also be modified by an adverb. So we find sentences like (9).

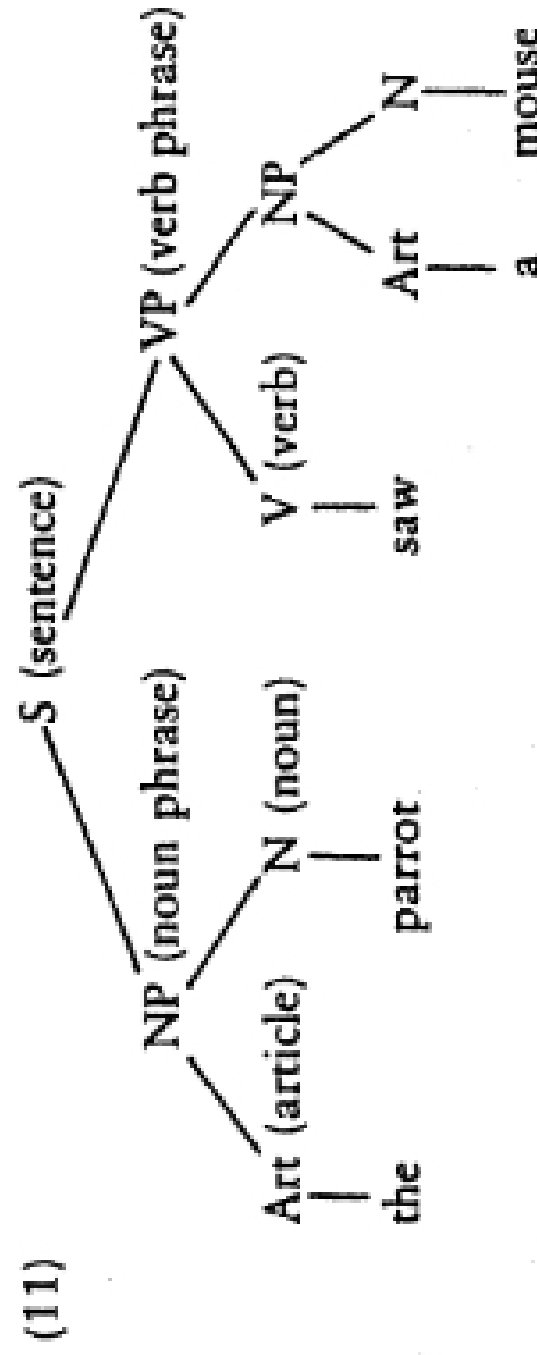
- (9) The enemy rapidly destroyed the city.
 subject noun phrase adverb verb object noun phrase

Now it so happens that there is a noun, "destruction," which describes the same action as the verb "destroy." But if we want to express something similar to (9) using this noun, the phrase comes out somewhat differently: not "the enemy rapidly destruction the city," which is gibberish, but (10).

- (10) the enemy's rapid destruction of the city.
 "subject" noun phrase possessive adjective noun preposition noun phrase
 noun phrase adjective noun preposition noun phrase

These differences can't have anything to do with meaning, since the meanings of (9) and (10) are parallel. Rather, they have to do with the syntactic patterns that go with verbs and nouns.

Let's look next at how subpatterns are put together into larger patterns. It is customary to notate the way a sentence or phrase is composed of patterns and subpatterns by drawing a "tree," like this:



This notation is similar to old-fashioned sentence diagrams in the way it breaks the sentence into parts. It is different in that it labels each part as belonging to a particular syntactic type such as N, VP, or Art. (11) says that the sentence "the parrot saw a mouse" is composed of two main parts, a noun phrase (the subject) and a verb phrase (the predicate). The noun phrase consists of two parts, the article "the" and the noun "parrot." The verb phrase also consists of two parts, the verb "saw" and the noun phrase "a mouse," which itself breaks into two parts, the article "a" and the noun "mouse."

Many variations in word order among the languages of the world become transparent when they are viewed in terms of tree structures. For example, the relative order of French adjectives and