

12. Syllable Structure

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1. Introduction

The size of the sets of consonants and vowels which form the segment inventories of languages have been discussed in chapters 1 and 2. In addition to the number of segments that languages use, it is also important to consider the ways that the segments are allowed to combine with each other in making longer structures, such as words and syllables. Some languages allow very free combination of segments, while in others the combinations are strongly restricted. In this chapter the complexity of sequencing of segments within syllables will be discussed as a means of examining one important aspect of how the combination of individual sounds is governed across the sampled set of languages.

The **syllable** is a well-recognized unit in linguistic analysis which explains quite well the number of rhythmic units that will be perceived in a word or longer utterance. This number is usually equal to the number of vowels in the utterance. Although it is usually easy to get agreement on the number of syllables present in a word, intuitions sometimes differ over where the boundaries between one syllable and another should be placed. Despite such hesitation, the syllable has proven to be a very useful concept in discussing the general rules for distribution of sounds in languages. Where listeners differ in syllabifying particular words, it is generally the case that both possible syllabifications can be shown to be permitted ones since unambiguous cases of each type can be found. For example, an English word such as *pastry* might be syllabified by different speakers as *past.ry* or as *pas.try* (where the dot represents a division between syllables). Since both *paste* and *tree* are perfectly acceptable monosyllabic words of English, either

division will agree with a broader rule concerning possible syllables of English. The broadest rules of this kind for any given language describe what is called the canonical syllable pattern of the language. This is the pattern which essentially characterizes how many consonants may occur before the vowel in a syllable, and how many after the vowel.

2. Defining the values

Canonical syllable patterns are most often represented as a string of C and V symbols, where C stands for a Consonant and V for a Vowel sound (including any complex vowel elements such as diphthongs which might occur in the language). The one kind of syllable which seems to occur in every language is CV, that is, a syllable consisting of just one consonant preceding a vowel. In a relatively small number of languages this is the only type of syllable permitted. Such languages include Hawaiian and Mba (Adamawa–Ubangian, Niger–Congo; Democratic Republic of Congo). It is more frequent to find languages in which it is permitted not to have an initial consonant, as for example in Fijian, Igbo (Niger–Congo; Nigeria), and Yareba (Yareban; Papua New Guinea). For these languages the canonical syllable can be represented as (C)V, the parentheses indicating that an initial consonant is an optional element. If a language only allows syllables which fit this template, the language will be said to have **simple syllable structure**.

A slightly more elaborate syllable structure would add another consonant, either in the final position of the syllable or at its beginning, giving the structures CVC and CCV; these are both modest expansions of the simple CV syllable type. But it is worthwhile to make a distinction between two types of two-consonant strings. In a very large number of languages, although two consonants are allowed in the onset position of a syllable, there are strict limits on what kinds of combinations are permitted. The second of two consonants is commonly limited

to being one of a small set belonging to either the class of "liquids" or the class of "glides". The liquids are the sounds commonly represented by the letters *r* and *l*, while glides are vowel-like consonants such as those at the beginning of the English words *wet* and *yet*. Liquids and glides have in common that they are produced with a configuration of the speech organs which permits a relatively unobstructed flow of air out of the mouth. Languages which permit a single consonant after the vowel and/or allow two consonants to occur before the vowel, but adhere to a limitation to only the common two-consonant patterns described above, are counted as having **moderately complex syllable structure**. An example is Darai (Indo-Aryan; Nepal). Here the most elaborate syllable permitted is CCVC, as in /bwak/ '(his) father', but the only possible second consonant in a sequence of two is /w/.

Languages which permit freer combinations of two consonants in the position before a vowel, or which allow three or more consonants in this onset position, and/or two or more consonants in the position after the vowel, are classified as having **complex syllable structure**. An obvious example of complex structure is English, whose canonical syllable pattern is often cited as (C)(C)(C)V(C)(C)(C)(C). The full expansion of the pattern only occurs in a few words such as *strengths*, when pronounced /stɹɛŋkθs/, but it is relatively easy to find syllables beginning with three consonants or ending with four, as in *split* and *texts* (/tɛksts/).

The classification of languages into three categories of syllabic complexity, simple, moderate and complex, naturally overlooks many other questions of segment distribution (for example, whether the syllables at the beginnings and ends of words have the same or different restrictions from those which are internal to words), and has to gloss over some important differences with respect to how rarely or frequently the more complex syllable types occur in a given language. In reaching decisions regarding how to classify a given language, a certain

common-sense flexibility has been employed. For example, if some kinds of consonant sequences have only recently been introduced into a language as a result of borrowing international words (such as *sport* or *golf*) the language will be classed on the basis of what occurs in more established vocabulary. Despite its summary nature the three-way classification provides a useful grouping with interesting geographical characteristics.

@	1. Simple syllable structure	61
@	2. Moderately complex syllable structure	274
@	3. Complex syllable structure	150
	total	485

3. Geographical distribution

By far the most common type are languages which permit moderately complex syllable structure, accounting for about 56.5% of the sample. This type is of course widespread, but it is particularly frequent in Africa, the more easterly part of Asia and much of Australia. Only 61 (about 12.5%) of the languages in the sample limit themselves to nothing more complicated than the universal syllable type, CV. 150 languages (about 30.9% of the total) permit complex syllables of one or more types. The languages with simple syllable structures tend to be distributed somewhere near the equator, in Africa, New Guinea and South America. Note that this distribution has a considerable overlap with that found for languages with smaller consonant inventories, with the fit being least good in Africa. Languages with complex syllable structures are predominantly found in the northern two-thirds of the northern hemisphere, that is, in northern North America and northern Eurasia, where this type actually dominates over the others. Here there is a degree of overlap with the areas in which large consonant inventories tend to be more frequent, most especially in the more northerly parts

of the North American continent. A smaller cluster of languages with complex syllable structure is found in northern Australia.

4. Correlations

The areal overlaps noted above between small consonant inventories and simple syllable structure, and large consonant inventories and complex syllable structures, provide an interesting example of how complexity in different areas of phonological structure may work together as mutual reinforcement rather than being mutually offsetting. Across the set of 484 languages for which both consonant inventory size and syllable structure data are included, there is a significant though not strong correlation between these two measures of complexity (the correlation coefficient is .203 and the statistical significance level is very high, $p < .0001$). The languages with simple canonical syllable structure have an average of 19.1 consonants in their inventory, languages with moderately complex syllable structure have an average of 22.0 consonants, and those with complex syllable structures have an average of 25.8 consonants. As discussed in chapter 13, syllable structure complexity does not show a similar pattern of positive correlation with tone system complexity.

It should be noted that the patterns of association between syllable structure and consonant inventory size established here are assuredly, at least in part, a reflection of the overlapping geographical distributions of properties noted in §3, and these overlaps might be due to fortuitous distribution of genealogically-shared or areally-spread features. Analysis of the patterns within and between different linguistic areas and language families would be required to decide whether the association should be attributed to accidents of survival and spread of particular languages, or can be proposed as reflecting a design feature of language viewed as a whole.