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STRENGTH RELATIONS IN SYLLABLE STRUCTURE IN ENGLISH

The theory of consonantal strength formulated by Vennemann and Hooper¹ is based on the assumption that: "... there are weak and strong positions in the syllable, and consistently weak positions are occupied by the weaker sounds, while the strong positions are occupied by the strong consonants". The syllable is treated as the articulatory unit of primary importance to the phonological structure of a language. The theory claims that it is possible to establish the universal strength hierarchy and to allot different strength values to particular classes of consonants, depending on their function in the syllable structure.

Every syllable consists of a nucleus and outer margins; the nuclear position is occupied by the most vowel-like sound in the syllable, while the least vowel-like sounds are placed in the margins. The relation between the consonant strength and the syllable structure may be illustrated in the following way:

MARGIN	NUCLEUS	MARGIN
obstruents liquids	liquids obstruents	
nasals glides	vowels glides	nasals
MARGIN : STRONG	NUCLEUS : WEAK	WEAK : MARGIN

These relations constitute the basis for the following strength scale which is believed to be universal:

glides liquids nasals	voiced voiceless cont.	voiceless stops
cont. voiced stops		
1 2 3 4 5		6

¹ J. Hooper, *An Introduction to Natural Generative Phonology*, New York 1976, Academic Press.

As the scale is very general, Hooper's claim concerning its universal appeal does not seem too strong, especially when the scale is compared to the sonority hierarchy proposed by Jespersen²:

1. voiceless consonants: stops and fricatives.
2. voiced stops.
3. voiced fricatives.
4. nasals and laterals.
5. trills and flaps.
6. close vowels.
7. mid vowels.
8. open vowels.

According to Jespersen the most sonorous segment in the syllable constitutes the nucleus, and the farther from the nucleus, the less sonorous segments appear. The description of the syllable structure by means of the strength relations is based on the same principle, except for choosing the opposite feature as the starting point for the analysis. However, the use of the cover feature strength seems to offer more precision in capturing the consonantal relations without referring to the acoustic phenomena.

The universal model of strength relations has been applied to the description of the syllable structure of Spanish and Icelandic³; the aim of this article is to examine its applicability to English. The tentative scale of strength relations in English syllable structure proposed in this article is basically true to the universal model, but it contains a number of language - specific inconsistencies and modifications. The most important one is the introduction of an extra - strong syllable - initial position, and consistently the claim that the sound which may fill it has the highest strength value.

The scale is as follows:

				3	∫				
			m	ə	θ		b	p	
y	r	l	n	v	f		d	t	
w			ŋ	zdʒ	s htʃ		g	k	S
1	2	3	4	5	6	7	8	9	

where S is the extra - strong sound.

² Hooper, *op. cit.*

³ *Ibidem.*

The above scale is basic for the formulation of the syllable structure conditions:

$$\$ (C_{ex})(C_m)(C_n) v (C_q)(C_r) \$$$

where C_{ex} is the extra - strong position.

if $ex \neq 0$ then $m = 8$

$m > n$

if $n > 1$ then $m \geq 6$

$n \leq 3$

$r > q$

I. Syllable - Initial Margin: Onset.

Syllable - initial position may be occupied either by a single consonant or a clusters of consonants. There are no constraints on single consonants in syllable - initial position in English, with the exception of $[\eta]$; the fact that this sound fails to appear in the onset of the syllable adds to the doubts concerning its phonemic status, as the only source of this sound is the nasal assimilation rule.

The clusters of consonants follow the syllable structure conditions and are generally true to the universal model. However, in order to account for three - member consonant clusters it is necessary to introduce the extra-strong initial position, which may be occupied by one sound only, i. e. $[S]$. Hence I claim that there are two functional variants of the voiceless alveolar fricative in English: medium-strong $[s]$ and $[S]$, which is the strongest sound in English.

English allows only one consonant, i. e. $[S]$, to precede voiceless stops, universally the strongest consonants, in syllable - initial position. Under the influence of this extra - strong sound voiceless stops lose some of their strength, which is manifested by the lack of aspiration. $[S]$ is also the only consonant which may appear as the first member of three - member initial clusters, as in:

$[\text{skri:n}]$, $[\text{split}]$, $[\text{spred}]$, $[\text{straik}]$, etc.

The above clusters are formed by adding the extra - strong sound at the beginning of a regular type of voiceless stop + liquid or glide clusters.

Three - member clusters and the problem of the initial sound have been accounted for in many ways; the fact that only one

sound can occupy the initial position seems very significant. Jassem⁴ speaks about the syllabic function of [s], Fujimura and Lovins⁵ treat the clusters containing [s] + tense stops as integral units. Although the latter interpretation is very plausible, it fails to account for the weakening of a stop in these clusters, and the regularity in the use of [s] both in syllable - initial and syllable - final position. The use of the cover feature strength and the distinction between two functional variants of the voiceless alveolar fricative: medium-strong [s] and extra-strong [S] offer more precision and simplicity in the description of the syllable structure in English.

Syllable structure conditions restrict the last member of syllable - initial clusters to the strength value lower or equal 3. The condition stating that if C_n position is occupied the preceding consonant must be stronger or equal 6 limits the number of consonants which may cluster with liquids and glides to the ones with considerably high strength value. Thus it is possible to assume that there must be some distance between clustering consonants on the scale: at least three points in case of the initial clusters.

The above assumption is valid for all clusters, especially when the strength value of liquids and glides is examined more closely. In a detailed analysis it would be necessary to place glides several points below liquids on the scale, and to note the difference between lateral and non - lateral liquids, the nonlateral liquids being still much weaker or vowel - like than the lateral ones. Glides are very close to vowels in their strength value, and their weakness enables them to cluster even with usually non - clustering sounds, such as [v], e.g. [vi:l] but also [vju:].

Syllable - initial position is the strongest one in the syllable, and such phenomena as aspiration, initial partial devoicing or the direction of assimilation seem to prove its special function in the syllable structure. Aspiration is the strongest syllable initially and under stress; if an aspirated sound is

⁴ W. J a s s e m, *The Phonology of Modern English*, Warszawa 1983.

⁵ O. F u j i m u r a, J. L o v i n s. *Syllables as Concatenative Units: Preliminary Version Prepared for Symposium on Segment Organisation and the Syllable*, Colorado 1977, University of Colorado.

followed by a clustering consonant (a liquid or a glide) aspiration is manifested by its devoicing. Partial devoicing takes also place syllable initially after a pause and is the process of consonantal strengthening due to the assumption about greater strength of voiceless consonants. The process of assimilation of syllable - final consonants to the syllable - initial ones following them is another example of the strength of syllable - initial position. Let us consider the following:

[kʌt] in cut, but [kʌpbʌk] in cut - back

[ten] in ten, but [tempɪ:pl] in ten people

II. Syllable - Final Margin: Coda

Syllable - final position is considerably weaker than the initial one, but the main principle of strength relations in syllable - final clusters is the same: the farther from the nucleus, the stronger sounds appear. Nevertheless, the structure of these clusters is considerably complicated, especially when word - final clusters are concerned and all suffixes and inflectional endings are taken into account.

Let us consider final clusters in the following words:

[kʌts] : [kʌst], [tʌks] : [tʌsk], [eitθ], [glimst], [traɪəmfɪt].

The complexity of these clusters is decreased by the observation that in case of obstruent clusters all but the first are apical, and all obstruents agree with the first one in voicing, except for the final clusters containing [θ], as in [eitθ].

Fujimura and Lovins⁶ account for all irregularities in the syllable - final clusters by introducing the concept of *syllable affixes*. They analyse the internal structure of English syllables in terms of the core of the syllable, from which phonetic affixes are separated. All the affixes are understood to be suffixal and to have no implications of morphological significance. Everything that precedes the affixes in a syllable is referred to as syllable core.

The concept of *phonetic affixes* reduces the complexity of final clusters due to the assumption that the hierarchy holds within the core of the syllable only. Thus all the final clusters in the words mentioned above are regular and congruent with the vowel affinity principle as well as sonority and strength

⁶ *Ibidem*.

hierarchy. However, the separation of all the suffixes from the syllable structure seems to miss certain generalizations about the system of sounds and their function.

According to the theory presented so far, strength relations should be essential to the organization of speech, regardless of its morphological structure. The processes of elision and assimilation in rapid speech prove that there is an overall tendency towards *optimal syllable* structure CV. It is only in isolation that English words may end in complex obstruent clusters, the direction of simplification of these clusters being always congruent with strength hierarchy.

Final consonant clusters in [kæts] : [kæst] and [tæks] : [tæsk] seem to violate the strength scale because of two different positions of [s] in relation to the voiceless stop. However, it is possible to account for this irregularity without referring to *syllable affixes*; instead it is easy to explain these clusters by means of the distinction between two functional variants of *s* in English: [s] and [S]. The medium strong variant is used in [kæst], whereas the extra - strong one appears in [kæts].

The use of the extra - strong variant of "s" enables us to capture the regularity of its distribution: it is the only sound occurring initially in three - member consonant initial clusters and moreover, it is the most frequent and most productive inflectional ending in English, always followed by the word boundary. The past tense endings [t], [d] belong to the strongest sounds, whereas the only possible explanation of final cluster in [eitθ], [depθ], etc. lies in low frequency of occurrence of ending [θ].

What I have been trying to prove is that the strength hierarchy helps to analyse the consonant clusters in English in a simple and explicit way. It allows to capture the tendencies and to predict processes taking place in the syllable structure without limiting the discussion to the stems or syllable core only.

The applicability of the theory of consonantal strength to the syllable structure in English seems to be another proof of its universal appeal. It should be born in mind, however, that the consonant clusters in the English language are rather simple when compared to the heavy consonant clusters in Polish. There-

fore my next article will be an attempt at analyzing the syllable structure in Polish by use of the consonantal strength theory.

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ZALEŻNOŚCI MOCY W STRUKTURZE SYLABY W JĘZYKU ANGIELSKIM

Artykuł ten jest próbą omówienia struktury sylaby w języku angielskim w oparciu o teorię zależności mocy dźwięków. Teoria ta została zaproponowana przez Joan Hooper, jako uniwersalistyczna metoda opisu sylaby, w artykule zastosowano ją zaś do języka angielskiego (Hooper przedstawiła zastosowanie swojej teorii do opisu sylaby w języku hiszpańskim). Przedstawiono wykres mocy dźwięków dla języka angielskiego oraz zaproponowano wprowadzenie dwóch wariantów funkcjonalnych dźwięków [s]: średnio mocnego [s] i najmocniejszego z dźwięków [S], który występuje w najmocniejszej pozycji w sylabie.