

THE SYLLABIC STRUCTURES OF ENGLISH AND POLISH

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0.0. The syllable is one of the central problems in linguistics. In diachronic as well as in synchronic studies the researcher is forced to take this notion into consideration. Certain linguistic changes, like the umlaut, involve the syllable; the analysis of the distribution of phonemes should be also performed in terms of the syllable-initial and syllable-final positions (Cf. Haugen 1956). Different syllable structures of various languages are a source of great difficulties for students of foreign languages. To help the student to overcome them, the linguist must be aware of the differences in the structure of the syllable of the native language and of the foreign language in question in order to provide the learner with selected drills.

0.1. The notion of the syllable has a very long history, beginning with the Indian grammarians. The syllable has been approached both from the phonetic and the phonemic point of view and defined in various ways (Cf. Awedyk 1971). In our opinion the syllable is a phonetic unit and the opening of the vocal tract is the basis of syllable formation. The structure of the syllable may be presented symbolically as $\#/X/O/Y/\#$ where O stands for the most open sound of the syllable, i.e., the syllabic, X for a less open sound (or a sequence of less open sounds) which may precede the syllabic, and Y for a less open sound (or a sequence of less open sounds) which may follow the syllabic. The syllable has various manifestations in different languages, i.e., the structure of a particular language determines what phonemes can appear in the positions O, X, and Y.

1.0. When we want to describe the syllabic structure in a given language, our first step is the phonemic analysis. Recently, the notion of the phoneme and the phonemic analysis has been rejected (Chomsky and Halle 1968).

The discussion of this problem is outside the scope of our paper, let us only consider a very simple example. In the utterance *The train is due at ten three* different t-sounds appear. According to Chomsky and Halle the system of phonological rules assigns a phonetic interpretation to each surface structure (Chomsky and Halle 1968 : 14). In this case the system of rules must specify the [t] in *train* as a retroflex sound, which is quite different from the [t] in *ten* and *at*. Yet these sounds are grouped into one unit. And this is nothing else but the phonemic analysis.

1.1. Our approach is based on Zabrocki's phoneme theory (Zabrocki 1962). In his opinion the phoneme is first of all a syntagmatic unit and the syntagmatic analysis is primary to paradigmatic.

The input of the analysis is the text. Texts are first divided into words; words in turn are divided into segments on the basis of extreme acoustic contrasts of articulation : close : open. The degree of the opening of the vocal is the primary differentiating principle. Thus all sounds are divided into two classes: open and close. Within each class, sounds are further subdivided on the basis of oppositions like voiced : voiceless, short : long, and so on. For example, in the word *cut* [k] is distinguished from [ʌ] because the former is a close sound and the latter is an open sound: the feature "close" is then relevant for [k]. On the other hand, in the sequence [tl], [t] is distinguished from [l] because [t] is voiceless and [l] is voiced: the feature "voiceless" is then relevant for [t]. Not all features can be specified in direct contact; indirect contact must be also taken into consideration. In the word *public* the following features become primary, e.g., [p] : [b] equal voiceless : voiced, [ʌ] : [i] equal low : high, etc. The features that are primary in direct and in indirect contacts form a unit called the phone. The difference between a phone and a sound consists in this: a phone is always constant, while a sound may be pronounced in different ways depending on the context. Thus in *keep*, *cool*, *cap* three different k-sounds occur, but one phone [k]. The phone consists of diffusive and confusive features. The former are those which distinguish one phone from another, the latter are those common to two or more phones. The examination of the distribution of phones in words brings us to a unit called the phoneme: "Ein Phon mit der entsprechenden Verteilungsfunktion im Wort nennen wir Phonem. Phoneme sind somit verteilungsfunktionsgeladene Phone" (Zabrocki 1962 : 66). A phone belongs to a phoneme when it can occur in all positions in a word, but, practically, full distribution is rare. This condition is fulfilled in various ways; phones are realized as plus phones (Cf. Grucza 1967), neutral phones, minus phones, and allophones. A plus phone has all the diffusive and confusive features e.g., Polish /d/ in word initial position is realized as [d]. A neutral phone has only confusive features, e.g. Polish /d/ in word final position occurs as [t]. A minus phone has neither diffusive nor confusive features, e.g., English /ŋ/ in word initial position. When two phones hold certain confusive features in

common and the ' do not occur in the same context, those two phones belong to the same phoneme. One of them will be given a label the "plusphone", the other an allophone. For example, in Polish [ŋ] occurs only before [k, g]/, where [n] does not appear. Thus [ŋ] and [n] constitute one phoneme /n/; [n] is the plusphone and [ŋ] is the allophone. It also happens that two phones never occur in the same position, yet they do not belong to the same phoneme, e.g., [h] and [ŋ] in English. The possibility of assigning these two phones to one phoneme is ruled out because they have no confusive features.

1.2. The procedure described above leads to the establishment of the phoneme inventory in a given language. Below we present the phoneme inventories of English (British) and Polish.

English: /i: i e æ ʌ a: a ɔ: v u: ɜ: ə ei ai oi ov av iə w j h r l m n ŋ θ ð v f z s ʒ f tʃ dʒ d t b p g k/ (Gimson 1970).

Polish: /a ɔ̃ ɔ ɛ̃ ɛ i u i w j x r l n ɲ m v f z s ʒ f z ɛ dʒ ts dʒ tʃ dʒ tɕ d t b p g k/ (Wierzechowska 1965, Jassem 1964).

2.0. Having established the phoneme inventory of a given language, we determine the syllabic phonemes. We investigate the phoneme occurrences in words since the word is the most convenient unit for a great number of languages and syllables usually do not bridge words. We have the right to make an assumption that the most open phonemes, the vocalic phonemes, are syllabic. Then we have to determine whether other phonemes can perform this function. In English, for example, the consonantal resonants /r l n m/ are syllabic when they occur between two consonants, or between a consonant and open transition or vice versa, or between two open transitions (Cf. Francis 1965). The syllabic phoneme forms the nucleus of the syllable which may be either simple or complex, i.e., it may consist of one or more segments. The nucleus is an irreducible constituent of the syllable.

2.1. The lists of syllabic phonemes in English and Polish are as follows:

English: vocalic nucleus

a) simple /i: i e æ ʌ a: a ɔ: v u: ɜ: ə/

b) complex /ei ai oi ov av iə/

consonantal nucleus /r l n m/

Polish: vocalic nucleus /a ɔ̃ ɔ ɛ̃ ɛ i u i/.

3.0. Next we establish the sequences of phonemes which may precede (onset) and follow (coda) the syllabic. The onset is the sequence of phonemes which appears between the beginning of the word and the first syllabic; the coda is the sequence which is between the last syllabic and the end of the word. Then we determine the number of positions and the membership of each position (Cf. Hoekett 1955, Haugen 1956). The onset and the coda are syllable margins.

3.1. A limited size of this paper does not allow us to present the lists of English (Fisiak 1968, Trnka 1968) and Polish (Bargielówna 1950) onsets and codas the number of which, especially in Polish, is very large. We shall discuss only the number of positions and the membership of each position. English onsets include from zero, e.g., *all*, to three positions, e.g., /spr-/ *spring*. Polish onsets include from zero, e.g., *on* 'he', to four positions, e.g., /pstr-/ *pstry* 'many-coloured'. English codas include from zero, e.g., *mother*, to four positions, e.g., /-ksts/ *texts*. Polish codas include from zero, e.g., *lato* 'summer', to four positions, e.g., /-mstf/ *klamstw* Gen. Pl. of *klamstwo* 'lie'.

The membership of onset and coda positions is presented in the table.

4.0. The lists of onsets and codas serve as the basis for the division of inter-syllabic sequences (interludes), i.e., the sequences which occur between two consecutive syllables in a word. English interludes include from zero e.g., *coeducation*, to four positions, e.g., /-nstr-/ *monstrous*. Polish interludes include from zero, e.g., *aorta* 'aorta', to five positions, e.g., /-zvzgl-/ *bezwzględny* 'absolute'.

On the basis of the onset-coda dictionary the Polish interlude /-lxn-/ *pulchny* 'plump' will be divided /-lx+n-/ since /-lx/ is an admissible coda in Polish. The divisions before /l/ and after /n/ are impossible because neither /lxn-/ nor /-lxn/ occur in Polish. Similarly, in English the division of the interlude /-nf-/ *confidence* is /-n+f-/ since neither /-nf/ nor /nf-/ are permitted in English.

4.1. The division of interludes is rarely so simple as in the above examples. Generally, more than one division is possible, i.e., the dictionary of onsets and codas allows us to divide the interlude in two or more ways. For example, in the English interlude /-st-/ *dusty* at least two divisions are possible: (1) /-s++t-/ or (2) /-st/. The first division will be, however, a preferable one since in English the syllable type /VC+CV/ is more frequent than the type /V+CCV/: the former occurs 298 times, the latter 38 times (O'Connor and Trim 1953: 121). The Polish interlude /-rstf-/ *czerstwy* 'stale' can be divided in more than two ways but a preferable division will be /-rs+tf-/ because it is statistically favoured (Bargielówna 1950: 22 - 25). Thus the statistical basis will be our second criterion for the division of interludes.

4.2. Our third criterion for the division of interludes is the distribution of phonemes. On the basis of the onset-coda dictionary the English interlude /-tr-/ in *nitrate* can be divided in two ways: (1) /nai+treit/ or (2) /nait+reit/. Here the occurrence of the retroflex allophone of /t/ which appears only in the position /# -/r/ indicates that the division is before /t/.

4.3. The occurrence of the morpheme boundary may influence the division of interludes, especially in those cases when the speakers are still conscious of it. For example, in Polish the interlude /-xstr-/ *wszechstronny* 'comprehensive' will be divided into /-x+str-/ according with the occurrence of the morpheme boundary.

Coda		C ₄	C ₃	C ₂	C ₁	20	15	5	2
		/st/	/θz sd t/	/nmθvfvz sf d ₃ t _f dtbpgk/	/lnqmθ vfvzsf d ₃ t _f dtbpgk/				
N U C L E U S									
Onset		O ₁	O ₂	O ₃	O ₄	22	16	1	NONE
		/wxrln nmvfvz sf d ₃ t _f dtbpgk/	/hlnmθv fvzsf dt bpgk/	/z s ₃ f _e ts dz dtb pgk/	/v f s z b p g/				
					E N G L I S H				
					P O L I S H				
						28	25	13	7
						28	24	12	2

4.4. The question of single intervocalic consonants presents a problem in English (in Polish they go with the following syllabic). On the basis of the principle that stressed syllables with short vowels must be checked /pætə/ *patter* is divided into /pæt+ə/ (Haugen 1956). Other scholars maintain that the /t/ in /pætə/ is ambisyllabic (Trager and Bloch 1941). According to Kuryłowicz a single intervocalic consonant goes always with the following syllable (Kuryłowicz 1948). This problem may be solved in terms of the frequency of different syllable types. Since in English the type /CV/ is more frequent than the type /VC/, /pætə/ will be divided into /pæ+tə/.

4.5. The division of interludes is one of the most difficult problems in the theory of the syllable. Except for a relatively small number of cases when the divisions can be made only on the basis of the onset-coda dictionary, the divisions are more or less arbitrary. One division will be, however, always preferable either because of a higher frequency of certain syllable types or because of the occurrence of a particular allophone or the morpheme boundary. The researcher has to accept the principle of higher and lower degree of probability (cf. Zabrocki 1961) or we will face a number of insoluble problems.

5.0. The comparison of the syllabic structures in English and Polish reveals the following differences:

a) The structure of the nucleus.

In English the nucleus may be both simple and complex while in Polish it is always simple.

In English the nucleus position may be occupied by the resonants /r l n m/. In Polish only vocalic phonemes can perform this function.

b) The structure of the onset.

English onsets may include from zero to three positions and the position O_3 may be occupied only by /s/. Polish onsets may include from zero to four positions. Out of 24 English consonantal phonemes 16 can appear in the position O_2 . Out of 28 Polish consonantal phonemes only three /j n p/ cannot occur in this position.

c) The structure of the coda.

Both Polish and English codas may include from zero to four positions, in English, however, /s t/ occur only after the morpheme boundary. Only 15 English consonantal phonemes can appear in the position O_2 . In this position 24 Polish consonantal phonemes occur.

d) The structure of the interlude.

English interludes may include from zero to four positions, Polish interludes from zero to five positions.

5.1. In sum, the differences between English and Polish syllables consist both in various structures of the nucleus and the margins, especially the structure of the onsets is strikingly different in these two languages.

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