

Speech Sounds and the Work of Professor Ján Sabol

Renáta Gregová, Pavol Jozef Šafárik University in Košice, Slovakia

The paper summarizes the scientific work of Dr. h. c. prof. PhDr. Ján Sabol, DrSc., professor emeritus at Pavol Jozef Šafárik University in Košice, Slovakia. Professor Ján Sabol is especially well-known as the author of the synthetic phonological theory published in 1989. This theory provided a new view of sounds and various sound phenomena in the Slovak language with possible application to other (not only Slavic) languages. The substance of the theory is the analysis of every sound element from three different levels of abstraction – the level of the phone, the level of the phoneme and the level of the morphophoneme – as delimited on the ground of the mutual relationship between the individual and the universal in language.

The substantial part of Professor Sabol's research was and still is represented by the analysis of the syllable, its structure and its function in the process of communication. He offers several syllabification criteria that help syllabify huge consonant clusters occurring word-medially. Distinctive features of phonemes, the relationship between segments and suprasegments, and the stylistic possibilities of sound elements also create an intrinsic part of Professor Sabol's work. The results of his extensive research have applications not only in phonetics and phonology but also in general linguistics, mathematical linguistics, versology, language culture and stylistics.

Keywords: *synthetic phonological theory, the individual, the universal, syllable, segment, suprasegment*

1 Who is Professor Ján Sabol?

Dr. h. c. prof. PhDr. Ján Sabol, DrSc., was born on 25 January 1939 in the small village of Sokol', northwest of Košice, Slovakia. From 1956 to 1959, he studied at the Faculty of Arts of the High Pedagogical School in Prešov. Then, from 1956 to 1960, he continued his education at the Faculty of Arts of Pavol Jozef Šafárik University, Košice, studying Slovak and Russian language and literature.

Ján Sabol received his PhDr. degree (doctor of philosophy) in 1969 and his CSc. degree (candidate of sciences) in 1980. In 1985, after a successful habilitation, he received the scientific-pedagogical title of docent (doc.). In 1991, he was awarded the scientific degree DrSc. (doctor scientiarum), and in 1992, he reached the rank of professor (Jazykovedný ústav Ľudovíta Štúra SAV, n.d.). In 2010, Professor Sabol was given the honorary title Dr. h. c. (doctor honoris causa).

Since 2017, Ján Sabol has been professor emeritus at Pavol Jozef Šafárik University. His research interests are predominantly in the fields of phonetics, phonology, morphophonology and the morphology of standard Slovak, as well as in stylistics, versology, general linguistics, and mathematical linguistics (Jazykovedný ústav Ľudovíta Štúra SAV, n.d.).

2 When did it all start?

As a university student, Professor Sabol was a member of the research team of Professor Štefan Tóbiš. His task was to record and analyze East Slovak dialects and to compare them to standard Slovak. Later, as a young scientist, he concentrated on the opportunities the general theory of information offers to linguistic research.

3 How did it continue?

Gradually, Ján Sabol focused his research activities on the detailed description of the sound level of standard Slovak. He analyzed combinations of phonemes, the prosodic structure of Slovak words, the cooperation of segments and suprasegments, phonological oppositions, neutralizations, alternations, etc. His research interest was enriched, as indicated above, by general and mathematical linguistics. Professor Sabol's extensive scientific research has been distilled into robust publication activities over several decades. According to Britishpedia, he is the author or co-author of 18 monographs, 12 university textbooks and more than 350 scientific works (<https://britishpedia.com/sk>). The basic research method of Professor Sabol has always been a complex sound analysis of phonic units from different levels of abstraction, which was fully developed in his famous synthetic phonological theory¹.

4 Sabol's synthetic phonological theory

4.1 *The philosophical background*

Inspired by the theories of the Prague School of Linguistics and the Moscow Phonological School, Ján Sabol, in his synthetic phonological theory (SPT), emphasizes a phonological, functional approach to sound elements while being aware of the mutual interconnection between the phonetic and phonological levels of language's sound subsystems (Sabol 1989: 5–6). His goal was “to avoid mistakes that accompany some phonological conceptions: a ‘forced’ adherence to ‘their’ level of abstraction when defining sound elements, [and] an inability to look at sounds in complexity and thus to have their own ‘partial’ truth” (Sabol 1989: 6).

The philosophical starting point of the SPT is the existence of different levels in the relationship between the fundamental gnoseological categories – the individual and the universal, that is, the concrete and the abstract – in the basic sound units of the given language. The correlation between the universal (the abstract) and the individual (the concrete) manifests itself in various language oppositions, for example, langue–parole, language–speech, paradigm–syntagma, and sociolect–idiolect, as well as in the relationship between such language units as phone–phoneme, sentence–utterance, and connotation–denotation (Sabol 1989: 14–15). All language units can move in both directions, that is, from the individual to the universal (for example, the phonologization of sound elements or the extension of the word meaning) or from the universal to the individual (for example, the dephonologization of sound

¹ Details about the synthetic phonological theory and its application to the sound system of Slovak and English can be found in Gregová 2016, 2019, 2021, 2022. The aim of this paper is to outline the theory and its basic rules, principles and possible applications to an English-speaking audience who cannot read the theory in its original language (Slovak).

units or the narrowing of the word meaning) (Sabol 1989: 14–15). Of course, at each level of abstraction, there is “a dialectic link between the universal and the individual; only their mutual rearrangement changes” (Sabol 1989: 17).

Based on the existence of miscellaneous levels of abstraction in language elements, Sabol defines three key sound units characterized by the different degrees of the individual and the universal in the given unit:

1) phone (Ph) – a sound, a speech segment, the unit with the lowest degree of abstraction;

2) phoneme (Phm) – a sound unit materialized as a bundle of distinctive features, a sound element able to distinguish the meaning of words and word forms; and

3) morphophoneme (MPhm) – the sound determined in the morpheme as the smallest bearer of the elementary or complex meaning (Sabol 1989: 18–19).

Taking the distinctive features of phonemes into account, “the phone is identical to the phoneme or differs from it by the phonologically irrelevant feature (features), [while] the phoneme is identical to the morphophoneme or differs from it by the phonologically relevant feature (features)” (Sabol 1989: 22).

The following parts of the paper offer a brief interpretation of the crucial phonological units, processes and phenomena involved in the SPT.

4.2 The synthetic phonological theory and the syllable

The SPT defines the syllable as

the basic syntagmatic-paradigmatic and phonic-rhythmical unit with one peak of sonority in which the contrastiveness and distinctive features of phonic elements are manifested and which is the bearer of all suprasegmental phenomena (prosodemes) of a given language (Sabol 1994: 217).

The syllable is evidently understood as a complex sound unit that interconnects the basic phonic units (the phone, the phoneme and the morphophoneme) with the higher-level sound elements (units of rhythm and their groups) as well as with the semantic elements (morpheme, word). As for the syllable’s function, it intersects with all three parts of the process of communication: the articulatory part (the basic syllable structure CV(C) reflects the physiology of the creation of speech sounds: closing–opening–(closing)), the acoustic part (acoustically, the syllable represents the passage from silence to sound) and the perceptual part (the better the beginning of the syllable (its onset phase) is created phonetically, the better we perceive the whole syllable) (Sabol 1994: 217–218).

4.2.1 The criteria for the syllabification of words

The synthetic (or complex) approach is also applied when looking for the syllable boundary, which may cause difficulties, especially when the consonant clusters occur in an inter-sonantic (word-medial) position. Sabol suggests the application of the following criteria for the syllabification of words with consonant clusters:

(1a) the universal typological model of the syllable CV, that is, the structure structure (closing) + aperture (opening);

(1b) the specification of the syllable model from (1a) into the model “eye” and the model “fish”, which divides languages into two groups²;

(2) the relationship between form and content (meaning) in a language, that is, the delimitation of the syllable boundary on the basis of the morpheme boundary;

(3a) “Kuryłowicz’s rule”: the beginning of the word is at the same time the beginning of the first syllable of the word and the end of the word is at the same time the end of the last syllable in a given language (Kuryłowicz 1948; Sabol 2010: 19–20; Sabol & Zimmermann 2014: 63);

(3b) the completion of the criterion (3a) with information about the frequency of the occurrence of the possible word-initial and word-final consonant clusters in a given language;

(4) the degree of stricture: this criterion is based on Hála’s (1956) claim that sounds with a higher degree of stricture in their articulation are the most suitable for creating the onset of the syllable;

(5) the transgressive nature of consonants and the inherence of vowels: certain consonants are transgressive because some of their acoustic features have their reflection on the formant fields of the following vowels that are then inherent (Romportl 1985), the result of which is a kind of acoustic ‘symbiosis’ of the neighbouring speech sounds;

(6) the coarticulation that represents the articulatory ‘version’ of the acoustic symbiosis of the neighbouring sounds explained in (5);

(7) the power of syllable ‘welds’ depends on the contrast between phonemes in syllables (see Paulíny 1979), and the degree of contrast depends on distinctive features: the more different features there are between neighbouring phonemes, the stronger the contrast between them is, and the syllable boundary is to be at the place of the lowest contrast;

(8) the syllabification of words from the first syllable ‘cut’ to the last syllable ‘cut’;

(9) the understanding of the syllable as the tightest possible articulatory-acoustic connection of sound elements; and

(10) the cooperation of segments and suprasegments.

As Sabol further explains, these criteria are mutually interconnected, and their role in syllabification is not equal (Sabol 1994: 219–221; Sabol 2010: 20).

4.2.1.1 *The criteria in detail*

The language universal criterion (1a) that says the basic syllable structure is CV enables us to syllabify disyllabic word-medial consonant clusters VCCV as VC.CV³ or V.CCV. Three-consonant word-medial clusters may have three different syllabifications: VCC.CV, VC.CCV or V.CCCV. Analogically, four-consonant clusters in an intervocalic position may be syllabified in four different ways, and so on. Which of the possible syllabifications is the most suitable for the correct demarcation of the syllable depends on the given language’s phonotactic constraints and rules (criteria (3a) and (3b)) that at the same time classify the language in line with two basic syllable models (see note 2). The ‘correct’ placement of the syllable boundaries also depends on the articulatory and acoustic properties of the individual consonants (criteria (4), (5), (6) and (9)). The distinctive features of phonemes in a consonant cluster are also crucial (criterion (7)), as is the relationship between the syllable and morpheme(s) in the syllabified word (criterion (2)). If the words to be parsed into syllables are part of larger language units,

² The syllable model “eye” is typical of languages in which there is no sonorant preceding the obstruent in the syllable onset, as, for, example in Slovak. The syllable model “fish” occurs in languages that allow the combination sonorant + obstruent at the beginning of the syllable, as, for example, in Czech.

³ . implies the syllable boundary.

criteria (8) and (10) have to be taken into account (for details, see Gregová 2016, 2019). The practical utilization of these criteria will be illustrated in the following subsection.

4.2.1.2 Syllabification in the model

Considering the English word *extra* /ekstrə/, Roach indicates five possible syllabifications of the English four-consonant cluster /kstr/ occurring word-medially, adding: “How can we decide in the division? No single rule will tell us what to do without bringing up problems” (2002: 77):

- a. e.kstrə
- b. ek.strə
- c. eks.trə
- d. ekst.rə
- e. ekstr.ə

Let us analyze the word in accordance with Sabol’s criteria. Criterion (1a) offers four possible syllabifications: *ekst.rə*, *eks.trə*, *ek.strə* and *e.kstrə*. The syllabification *ekstr.ə* is ruled out immediately, because it is not in accordance with the basic syllable model CV. The syllabification *e.kstrə* is also ruled out as it violates the phonotactic rules of the English language that allow a maximum of three consonants in syllable onset (Roach 2002: 76) and thus is not acceptable.

The syllabification *ekst.rə* breaks criterion (4) about the degree of stricture. This leaves two syllabifications: *eks.trə* and *ek.strə*. From the viewpoint of the power of syllable welds (criterion (7)), the syllable boundary should be between /s/ and /t/, that is, *eks.trə*. This also seems to be in accordance with criterion (2) about the syllable–morpheme relationship. However, in the word *extra*, *ex-* is not a separate morpheme, though, as some authors say, it is a morpheme-like sound (Roach 2002, 77).

Criteria (3a) – Kuryłowicz’s rule – and (3b) – the frequency of the occurrence of consonant clusters – prefer the syllabification *eks.trə*, which accords with criterion (7) regarding the contrasts between phonemes. The acoustic symbiosis between sounds and coarticulation (criteria (5), (6) and (9)) syllabify the word as *eks.trə*. The degree of stricture (criterion (4)) results in two syllabifications: *ek.strə* and *eks.trə*.

Taking into account the phonetic and phonemic nature of the individual criteria, as well as the relationship between form and meaning in language (*ex-* can be classified as a morpheme-like sound), the syllabification *eks.trə* seems to be the most convenient (for details and an analysis of more English and Slovak words, see Gregová 2016, 2019).

4.2.2 The syllable and different levels of abstraction

The SPT provides another view of the syllable and its structure: the analysis of the syllable structure through the levels of the phone, the phoneme and the morphophoneme, as defined above (4.1).

According to the SPT, each sound unit has a ‘vertical’ structure (the view of the given unit from different levels of abstraction, that is, different levels of the relationship between the individual and the universal) and the horizontal dimension of the relation Ph–Phm–MPhm within the given morpheme. These are the results of neutralization (see below) and alternation (see below) processes in the morpheme.

The levels of Ph, Phm and MPhm are fully reflected in the phonic structure of

morphemes and create their corresponding phonic layers: the Ph–morpheme layer or level that shows the sound structure of the morpheme at the level of the phone, the Phm–morpheme level that displays the sound structure of the morpheme at the level of the phoneme, and the MPhm–morpheme level that shows the sound structure of the morpheme at the level of the morphophoneme (for details, see Sabol 1989: 132–133). Analogically, an identical procedure can be applied to analyses of the phonic structure of the syllable.

The complex analysis of the structure of the syllable through the Ph, Phm and MPhm levels results in the layers of Ph–syllable (the syllable structure at the level of the phone), Phm–syllable (the syllable structure at the level of the phoneme) and MPhm–syllable (the syllable structure at the level of the morphophoneme). The level of the phone captures the phonetic structure of lexical units influenced by the orthophony of the given language, neutralizations and alternations and is noted in phonetic symbols in square brackets []. The level of the phoneme reflects the phonemic structure of lexical units influenced by neutralization and alternation and is transcribed in phonemic symbols between forward slashes //. The level of the morphophoneme shows the morphophonemic structure of the given lexical unit that is affected only by alternations and is written in capitals. The morphophoneme is marked out in the morpheme as the smallest bearer of the elementarily or complex meaning on account of the position of the maximum phonological differentiation. It is the place where both members of the given opposition can occur (Sabol 1989: 105; see also section 4.4 below).

The three-level analysis of the morpheme structure and the syllable structure will be illustrated here by a simple Slovak example. The Slovak word *navždy* ‘forever’ has the morpheme structure *navždy* (one morpheme) and is syllabified as *na.vždy*. The complex sound structure of the morpheme is as follows:

Ph-morpheme	[nawždi]
Phm-morpheme	/navždi/
MPhm-morpheme	NAVŽDI

The phonic structure of the syllables delimited in the given word at different levels of abstraction is as follows:

Ph-syllable	[na.wždi] ⁴
Phm-syllable	/na.vždi/
MPhm-syllable	NA.VŽDI ⁵

4.3 *The synthetic phonological theory and distinctive features of phonemes*

In line with the complex, synthetic approach to speech sounds, the SPT defines distinctive features of phonemes based on the articulatory, acoustic and perceptual characteristics of their speech segment correlates. Contrary to the fundamental work of Jakobson and Halle (1956), Sabol does not specify identical distinctive features for all categories of phonemes. However, there are separate sets of distinctive features for vocalic phonemes (monophthongs and diphthongs) and consonant phonemes (sonorants and obstruents) (Sabol 1989: 78). In the

⁴ [w] is a labiodental fricative voiced oral sound; it is a combinatory variant of the phoneme /v/ occurring before voiced obstruents (Kráľ 2005: 60).

⁵ This is only a hypothetical sound structure of the syllables at the level of the morphophoneme since the neutralizations of distinctive features have to be taken into account (for details, see Sabol 1989: 105–133).

following lines, I will briefly summarize Sabol’s distinctive features theory (for a full presentation, see Sabol 1989: 78–104)⁶.

In the first step, it is necessary to divide all phonemes in a language into two functionally different categories of sounds: vowels and consonants. This is possible via the application of two phonological oppositions resulting from two distinctive features: consonantal (C)–non-consonantal (C⁰) and vocalic (V)–non-vocalic (V⁰). These two pairs of features determine four classes of phonemes: sonorants (CV), obstruents (CV⁰), vowels (C⁰V), and glides (C⁰V⁰). In standard Slovak, there are no glides.

In the next step, Sabol (1989) introduces a set of distinctive features for vocalic phonemes (4.3.1) and a set of features for consonant phonemes (4.3.2).

4.3.1 Vowel features

The acoustic characteristics of vowels are crucial to these sounds’ distinctive features because “acoustic characteristics of phonic elements encompass information about their articulatory structure and vice versa” (Sabol 1989: 79).

As stated above, all vowels are (1) vocalic (V) and (2) non-consonantal (C⁰). Vowels’ other features are as follows:

- (3) diffuse (D)–non-diffuse (D⁰), compact: the criterion for this opposition is the difference between the values of the first and second formants (F₂–F₁). Vowels with a high degree of difference – /i, e, e:, i:, æ, ie/ – are diffuse; perceptually, all those sounds are characterized as high-pitched;
- (4) concentrated (Cc)–non-concentrated (Cc⁰): this feature results from the proportion of the second formant to the first (F₂:F₁). The feature Cc is typical of the sounds /a, o, u, æ, a:, o:, u:, ia, iu, uo/, while the vowels /i, e, i:, e:, ie/ are Cc⁰;
- (5) narrow (Nr)–non-narrow (Nr⁰): vowels with a low first formant – /i, u, i:, u:, iu/ – are characterized by narrowness;
- (6) labial (Lb)–non-labial (Lb⁰): vowels (o, u, o:, u:, uo, iu) produced with rounded lips are labialized, which is reflected in a low spectral focus (calculated according to the formula (F₁ + F₂) : 2); perceptually, labial sounds are low-pitched;
- (7) quantitative (Lg)–non-quantitative (Lg⁰): long monophthongs and diphthongs are quantitative (Lg); and
- (8) glide (G)–non-glide (G⁰): the glide characterizes diphthongs (ia, ie, iu, uo) (Sabol 1989: 79–82).

Table 1 illustrates a matrix of the distinctive features of Slovak vowel phonemes.

Table 1: Matrix of distinctive features of Slovak vowel phonemes (Sabol 1989: 83)

	i	i:	e	e:	ie	æ	a	a:	ia	o	o:	uo	u	u:	iu
V	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D	+	+	+	+	+	+	-	-	+	-	-	-	-	-	-
Cc	-	-	-	-	-	+	+	+	+	+	+	+	+	+	+
Nr	+	+	-	-	-	-	-	-	-	-	-	-	+	+	+
Lb	-	-	-	-	-	-	-	-	-	+	+	+	+	+	+
Lg	-	+	-	+	+	-	-	+	+	-	+	+	-	+	+
G	-	-	-	-	+	-	-	-	+	-	-	+	-	-	+

⁶ This theory was developed on the basis of the description of Slovak phonemes. To make Slovak phonemes familiar to those who cannot speak Slovak, IPA symbols are used for their notation in this paper.

4.3.2 Consonant features

All consonants are (1) consonantal (C); at the same time, (2) sonorants are vocalic (V) and obstruents are non-vocalic (V⁰).

The place of articulation helps identify two phonological oppositions:

(3) diffuse (D)–non-diffuse (D⁰): sounds articulated in the front part of the oral cavity (i.e. bilabial, labiodental, and pre-alveolar places of articulation) are diffuse;

(4) acute (A)–non-acute (A⁰): the feature acute (A) is given by the articulation in the middle of the oral cavity (alveolar and palatal sounds).

The type of obstacle specifies the feature

(5) occlusive (O)–non-occlusive (O⁰): semi-occlusives have the feature occlusive (O) too. This feature is not important for sonorants because, in their case, occlusiveness is incorporated in the feature consonantal (C).

Lateral articulation is captured in the feature

(6) lateral (Lt)–non-lateral (Lt⁰): Lt characterizes /l/ as being opposite to /r/, which is non-lateral (Lt⁰), and /ʎ/ as being opposite to /j/. This feature is irrelevant for all other phonemes.

The auditive impression of a strong sibilant acoustic effect creates the feature

(7) strident (S)–non-strident (S⁰): the feature S is relevant for the phonemes /s, z, ʃ, ʒ, ts, dz, tʃ, dʒ/; the feature S⁰ is necessary for the phonemes /t, d, c, ɟ/.

All obstruents have the feature

(8) voice (Vc)–non-voice (Vc⁰): the phonemes /b, d, ɟ, g, dz, dʒ, z, ʒ, h, v/ are voiced (Vc), and the phonemes /p, t, c, k, ts, tʃ, s, ʃ, x, f/ are voiceless (Vc⁰).

Consonants articulated with lowered velum are described by the feature

(9) nasal (N)–non-nasal (N⁰): in standard Slovak, the feature nasal (N) is necessary only for the phonemes /m, n, ŋ/ (Sabol 1989: 94–98).

Tables 2 and 3 illustrate the feature specifications of Slovak sonorants and obstruents, respectively.

Table 2: Distinctive features of Slovak sonorants (Sabol 1989: 99)

	r	l	ʎ	m	n	ɲ	j	v
V	+	+	+	+	+	+	+	+
C	+	+	+	+	+	+	+	+
D	+	+	-	+	+	-	-	+
A	+	+	+	-	+	+	+	-
Lt	-	+	+	0 ⁷	0	0	-	+
N	-	-	-	+	+	+	-	-

Table 3: Distinctive features of Slovak obstruents (Sabol 1989: 100)

	p	b	f	v ⁸	t	d	s	z	ts	dz	ʃ	ʒ	tʃ	dʒ	c	ɟ	k	g	x	h
V	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
D	+	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-	-	-
A	-	-	-	-	+	+	-	-	+	+	+	+	+	+	+	+	-	-	-	-
O	+	+	-	-	+	+	-	-	+	+	-	-	+	+	+	+	+	+	-	-
S	0	0	0	0	-	-	+	+	+	+	+	+	+	+	-	-	0	0	0	0
Vc	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+

⁷ 0 means that the feature is irrelevant for the delimitation of the given phoneme.

⁸ In standard Slovak, the phoneme /v/ behaves as a sonorant but also as an obstruent.

4.4 The synthetic phonological theory and the difference between neutralizations and alternations

As mentioned in section 4.2.2, different levels of abstraction may be helpful when identifying neutralizations and/or alternations.

Neutralization is a phonological process in which one phoneme influences another, that is, it is a change of one phoneme into another triggered by the sound environment (Sabol 1989: 134). Alternation is a phonological (morphological) phenomenon characterized by a change of a phoneme within a morpheme into another phoneme induced by another morpheme, that is, by the semantic environment (Sabol 1989: 168).

Although the basic delimitation of these two processes is quite clear, in a given language, there are various changes whose interpretation can cause difficulties. Compare, for example, the Slovak word *vran-a* ‘a crow’ and (1) its form in the dative singular *vrane* /vraɲe/ ‘to a crow’ with (2) its diminutive form *vráň-a* /vra:ɲa/ ‘a little crow’:

- (1) nominative *vran-a* ‘a crow’ > dative *vran-e* /vraɲ-e/ ‘to a crow’
 (2) *vran-a* ‘a crow’ > DIM *vráň-a* /vra:ɲ-a/ ‘a little crow’

In both cases, the alveolar /n/ changes into the alveo-palatal /ɲ/. However, in one case, this change is the outcome of neutralization, and in the other, the pronunciation of the alveo-palatal /ɲ/ is the result of alternation. In example (1), the change of the alveolar /n/ into the alveo-palatal /ɲ/ when inflecting the noun *vran-a* ‘a crow’ is triggered by /e/ as a phoneme. This is neutralization⁹. In example (2), the change of the alveolar /n/ into the alveo-palatal /ɲ/ when creating the diminutive form of the noun *vran-a* ‘a crow’ is caused by /a/ as a diminutive morpheme. This is alternation. The same diminutive morpheme in example (2) is also responsible for the alternation of the short vowel /a/ in *vran-a* ‘a crow’ to the long vowel /a:/ in the diminutive form *vráň-a* /vra:ɲa/ ‘a little crow’.

Let us analyze both word forms at different levels of abstraction. As explained in section 4.2.2, the level of the phone (Ph) captures the phones in given morphemes, the level of the phoneme (Phm) shows the phonemic structure of morphemes, and the level of the morphophoneme (MPhm) shows the sound structure before any sound changes happen, that is, the underlying form. Considering the opposition /n-ɲ/ (see note 9), the place of maximum phonological differentiation is before any vowel except /e/ and /i/ (for details, see Sabol 1989: 158–159). The result is that N occurs at the level of the morphophoneme in the word form *vrane* /vraɲe/ ‘to a crow’:

Ph	[vraɲ-e]	[vra:ɲ-a]
Phm	/vraɲ-e/	/vra:ɲ-a/
MPhm	VRAN-E	VRA:ɲ-A

⁹ In standard Slovak, the alveolar sounds /t, d, n, l/ are pronounced as the alveo-palatal sounds /c, ɟ, ɲ, ʎ/, respectively, when occurring before the vowels /i, e, ia, ie, iu/. Phonologically speaking, this phenomenon is known as the neutralization of the phonological opposition diffuse–non-diffuse, since the only difference between /t, d, n, l/ and their palatalized counterparts /c, ɟ, ɲ, ʎ/ is the feature diffuse (see Table 3).

5 The relationship between segments and suprasegments

The sound level of language encompasses two subsets: segments and suprasegments. The medium interconnecting both is the syllable. The following phenomena exemplify the coaction and countermovement of segments and suprasegments:

- (1) *Articulation* and *modulation*: segments are the result of articulation, while suprasegments result from the modulation of the articulatory air stream.
- (2) *Succesivity* and *simultaneity*: segments are created successively or linearly, that is, each segment has its ‘own’ time, while suprasegments are formed at one time, that is, simultaneously.
- (3) *Phonotactic differentiation* and *phonotactic affinity*: segments are characterized by a tendency towards phonotactic differentiation, while phonotactic affinity is typical of suprasegments.
- (4) *Distinctive function* and *stylistic function*: segments have a distinctive phonological function, while most suprasegments fulfil a stylistic function (Sabol & Zimmermann 2014: 69–70).

6 Sound stylistics and the stylistics of a sound

A substantial part of Professor Sabol’s research interests is dedicated to sound stylistics and the stylistics of a sound. This section summarizes the basic ideas connected with the mutual relationship between these two areas as presented by Sabol & Zimmermann (2014: 145–151).

Sound stylistics and the stylistics of a sound are not equivalent. Sound stylistics – embodied in stylistics itself – uses knowledge from orthoepy, phonetics and phonology. The stylistics of a sound as the potential ability of a sound to function as a stylistic element has its roots in language as a system.

Thinking about the functions of phonic elements (segments and suprasegments) in cognitive and communicative processes is interconnected with the relationship of symmetry and asymmetry between form and meaning in language. Symmetry has its reflection in the iconic-symbolic semiotic principle. The asymmetry between the form and meaning of a linguistic sign is reflected in an arbitrary semiotic principle. Both semiotic principles create intersecting sets of the following binary oppositions in a language system:

- (1) *associativity* (e.g., selection of thematic elements in the process of style creation) vs. *linearity* (linguistic-thematic processing of thematic elements, that is, composition), also encompassing the *metaphorical principle* (the field of associativity) and the *metonymical principle* (the field of linearity);
- (2) *motivation* (iconic-symbolic semiotic principle) vs. *non-motivation* (arbitrary semiotic principle);
- (3) *paradigmaticity* (e.g., paradigmatic relations between phonemes) vs. *syntagmaticity* (linearity, horizontality, e.g., actual realizations of phonemes in the flow of speech);
- (4) *simultaneity* (free, associative principle of elements’ connections) vs. *successivity* (linear organization of elements); and
- (5) *poetry* (dominant iconic principle) vs. *prose* (dominant arbitrary principle).

Two semiotic principles – iconic-symbolic and arbitrary – also regulate the cooperation of two universal categories:

(6) *space* (reflected in the iconic-symbolic background) vs. *time* (siding with the arbitrary semiotic structure).

The axis of associativity is connected with

(7) the *percipient* viewpoint, whereas a linear, successive structure is the domain of the *expedient*.

The final binary opposition is

(8) *reflective grammatical categories* (playing out the iconic-symbolic sign principle) vs. *classificatory grammatical categories* (governed by the arbitrary semiotic principle).

Considering particular usages of sound linguistic elements (segments and suprasegments) in stylistically different utterances means concentrating on their different shapes while keeping in mind that “sound (linguistic form) cannot apply its potential stylistic abilities in isolation, but only in cooperation with meaning, situation, text and context” (Sabol & Zimmermann 2014: 146–147), because “sound works in the name of meaning and form in the service of content, not vice versa” (Sabol & Zimmermann 2014: 150).

Phonemes’ stylistic possibilities are given predominantly by their combinations, for example, rhyme, alliteration, etc., in artistic style. The stylistic potential of most suprasegments depends on the semantics of utterances. However, any suprasegment can be used as a stylistic element when applied unexpectedly (Sabol & Zimmermann 2014: 145–151).

7 Ján Sabol and his theory: concluding remarks

As this brief survey of the work of Professor Ján Sabol implies, he has dedicated all his research activities to sounds: the sounds of human speech and sounds of the Slovak language. He has looked at these sounds from various perspectives. His research was “experimental, auditive and acoustic, always with perfectly developed general-linguistic grounding” (Ondrejovič 2019: 211). Nevertheless, Sabol’s research interests are not confined purely to phonetics and phonology, as he has also contributed to the fields of language culture, speech therapy, and the semiosis of the Bible’s text (Ondrejovič 2019: 212–213). Consequently, Professor Sabol’s theory can be useful for anyone interested in speech sounds and their theoretical description or practical application in various areas of our lives.

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Renáta Gregová
Department of British and American Studies
Faculty of Arts
Pavol Jozef Šafárik University
Moyzesova 9
040 01 Košice
Slovakia
e-mail: renata.gregova@upjs.sk

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