

Quantity in Slovak and in British English

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This paper provides a comparative (or contrastive) analysis of vowel length in standard Slovak and in British English based on phonetic analysis of materials derived from recordings of broadcast news. The selection of the sound recordings to be analysed was based on the assumption that sound realisation in the reporting genres using journalistic style is prosodically neutral. The analysis focuses on the comparative realisation of quantity in the structure of Slovak and British English syllables and illuminates similar and differing aspects of phonology connected with the length of vowels in both languages.

Keywords: vocalic quantity, vocalic quality, standard Slovak, British English

1. Introduction

This paper presents a comparative/contrastive analysis of quantity (syllabic length) behaviour in standard Slovak and in British English with concentration on the phonic materialization and phonological application of this sound phenomenon in English.

The quantity or length of sonants is universal and is manifested in every syllable (Sabol 2004: 183). The syllable as the basic phonetic unit of continuous speech, and as the intersection between the segmental and suprasegmental language levels, is one of the central phenomena of the sound language system (Sabol 1994: 214, 216).

The range of prosodic, suprasegmental features that are perceived within a syllable offers opportunities both for special observation of the creation and configuration of phonic elements in the mass media communication style used in radio and television as this is a type of communication based on the acoustic-auditory principle and for examination of the use of the given knowledge in theoretical reasoning and its practical application.

This research involves a number of givens concerning the phonetic status of syllables in each: the specific articulatory bases in Slovak and in British English; the specific structuring of syllable segments created by differing historical development despite a common Indo-European basis; the differentiated language background for standard variety codification; and the substantial differences in using other languages as foreign elements.

General comprehensibility and impartiality are the basic conditions for the creation of news texts. Facts, along with the manner of presentation, should be announced and not commented on. News texts of journalistic style are classified as objective (Mistrík 1982).

In radio and television, unlike newspapers, texts are written in a way to be realized in sound form with minimal articulatory effort or problems connected with phonemes or their combinations; however, not all radio utterances have the primary written form. Some genres are generated directly in the process of radio communication.

In radio communication sound, i.e. spoken utterances, music, noises, is the main means of expression (Mistrík 1997: 463). Thus, the quality (clarity and comprehensibility) of the spoken word in a delimited timeframe becomes the basic condition for successful communication when perceiving radio broadcast information.

Radio utterances have all the peculiarities of spoken utterances: they disappear in time and space, and the speech is perceived at the moment of its creation. The particularity of radio communication is a certain communicative distance between the speaker and the hearer: the speaker cannot slow his utterance down and the addressee has no opportunity to tell the speaker that he cannot understand him (Mistik 1997: 462-465).

As a result, the basic condition for successful radio communication is perfect pronunciation, the faultless production of segmental sound elements and of those suprasegmentals with phonologically relevant function (Sabol 2003: 34).

Thus, the journalistic style offers the most suitable material for the comparative analysis of language sound systems.

The material starting point for phonetic analysis is the recordings of news broadcasting from radio stations whose pronunciation styles can be considered standard in both languages. The recordings in standard Slovak are those of the *Rádio Východ* local radio broadcasting station. Those in English are from the BBC because of its use of Received Pronunciation (RP English). With regard to the fact that not all varieties of English have the same number of phonemes and that there are not the same pronunciation rules in all varieties of English, it is the RP that serves as the basis for description of the sound level of British English in most works on phonetics and phonology (cf. e. g. Abercrombie 1967; Jones 1969; Gimson 1970; Ward 1972; Roach 2000).

The selection of the sound material for analysis was based on the assumption that the sound realisation of those reporting genres of journalistic style that have fixed objective word order is prosodically neutral in Slovak and in English.

2. Phonetic and phonological characteristics of the Slovak and the British English syllable

Although linguists agree on the fact that native language users usually can intuitively count the number of syllables in a word, linguistic definitions of the substance, origin, structure and function of this unit are not uniformly subscribed to (cf. e.g. Abercrombie 1967: 34, Romportl 1986: 107, Roach 2000: 70).

Abercrombie's (1967) 'chest-pulse' theory explains this phonic unit in terms of the pulmonic air-stream mechanism. The syllable is defined as the movement of the speech organs (Abercrombie 1967: 34-35). The prominence theory of Jones (1969a), based on the auditive principle, defines the syllable as the sequence of sounds with one peak of prominence, where prominence of the sound is given by its inherent sonority, length, stress, intonation or combination of these (ibid.: 55). Hála (1956: 46) offers a complex phonetic definition assuming that the syllable is the transition of speech organs from stricture to aperture while the pure laryngeal sound forms.

Roach (1983) combines Abercrombie's and Jones's phonetic definitions with the phonological (functional) aspect of the syllable and its segments and defines the syllable as a centre having no or little obstruction to the air flow; before and after this centre, at the beginning and at the end of the syllable, there is greater obstruction to the air flow and less loud sound (Roach 1983: 67).

Pauliny (1979: 101-104) rejects phonetic delimitation of the syllable and describes this unit in terms of linguistic, phonological criteria as the unit whose aim is to form contrastive

combinations of phonemes, thus enabling their understanding as units with distinctive features.

This brief survey of syllable theories can be concluded by Sabol's definition, based on the synthetic phonological theory (Sabol 1989: 217):

the syllable is 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.

In general, it can be said that the syllable, as the smallest unit of a continuous speech, has three phases: initial (stricture, onset), central (nucleus, peak) and final (restricture, coda). The nucleus or the peak formed by a vowel or by syllabic consonants is the main phase. Sounds with the ability to form the syllable are called sonants. The other two phases of the syllable are filled with non-sonants (consonants).

The peak of the syllable, its nucleus or centre – it can be a vowel or a syllabic consonant¹ – is the bearer of all suprasegmental phenomena, quantity included.

3. Brief characteristics of syllabic nuclei

3.1 *The Slovak vocalic subsystem*

The inventory of the vocalic phonemes in Slovak is relatively limited. It is created by five or six short monophthongs: *i, e, a, o, u, ä* (vowel *ä* is pronounced only in the so-called B norm of standard pronunciation; its occurrence is restricted to the higher pronunciation style; it does not appear in the neutral pronunciation style); five long monophthongs: *í, é, á, ó, ú*; and four diphthongs: *ia, ie, iu, ô*.

All Slovak monophthongs and diphthongs are oral with the soft palate closing the entrance into the nasal cavity. Vowels *o, ó, u, ú, iu* and *ô* are labialized – the lips are active during their articulation. The five long monophthongs and the four diphthongs are approximately twice as long as the short (Kráľ and Sabol 1989: 200-201).

The sound form of Slovak monophthongs and diphthongs is relatively stable; they are not reduced, but are fully pronounced in every syllable (ibid.).

From the aspect of the close/open quality of vowels, the Slovak vocalic sounds are 'neutral'. The vowel pairs in Slovak do not have a different quality; they differ only in their quantity (vowels are either short or long).

Slovak vowels can be categorized into the following vocalic types (timbres): i-type (*i, í*), e-type (*e, é, ie*), a-type (*a, á, ia*), o-type (*o, ó, ô*) and u-type (*u, ú, iu*).

3.2 *The English vocalic subsystem*

The inventory of vocalic phonemes in RP is richer than the inventory of vocalic phonemes in Slovak. RP contains seven relatively short vowels [ɪ, e, ʌ, ɒ, ʊ, ə, æ], five relatively long vowels [i:, ɜ:, ɑ:, ɔ:, u:], eight diphthongs [eɪ, aɪ, ɔɪ, ɪə, eə, ʊə, əʊ, aʊ] and five triphthongs [eɪə, aɪə, ɔɪə, əʊə, aʊə] (Roach 2000: ix).²

The basic differential criterion of the English monophthongs is their quality, given by a different position of the tongue and lips during the articulation of each. Vocalic quantity is in English – unlike Slovak – only relative.

Similarly to Slovak ones, the English vowels can be classified into vocalic types (timbres): i-type [ɪ, i:, ɪə], e-type [e, ə, æ, ɜ:, eɪ, eə, əʊ, eɪə, əʊə], a-type [ʌ, ɑ:, aɪ, aʊ, aɪə, aʊə], o-type [ɒ, ɔ:, ɔɪ, ɔə] and u-type [ʊ, u:, uə] (cf. Skaličková 1982: 68).

4. Quantity in Slovak: significant theories

Quantity – the prosodic phenomenon signalled by the duration of the articulatory air stream – is realised on sonantic phones/phonemes. Sonants are vowels or syllabic consonants. There are syllabic and moraic languages. In syllabic languages, quantity is the property of the syllable as a segment. In moraic languages, mora is the basic quantitative unit; its length corresponds to the length of one short syllable, and there are two moras in one long syllable (Horecký 1978: 149).

The Slovak language belongs to the moraic languages, although the thesis about the moraic character of standard Slovak is weakened by the results of earlier experimental phonetic research of quantity which showed that the proportion 1: 2 of the short and long sonant is only partly valid (Sabol 1984: 514). The actual proportion of the short and long sonantic phone pronunciation is approximately 1: 1.6 (Sabol 1989: 112).

In standard Slovak the rule is that two successive syllables cannot ‘exceed’ the duration of three moras. It is the so-called rhythmical law exhibiting the neutralization of the phonological opposition quantitiveness:non-quantitiveness. It is a progressive type of neutralization: the long phoneme (morphophoneme) influences the following long sonant within a word and causes its shortening (Sabol 1989: 141-146). This phenomenon regulates the function of quantity that has a phonological-distinctive function in standard Slovak, it differentiates the meaning of words and word forms (ibid.: 141-142).

Quantity – the suprasegmental feature given by the continuation of the articulatory air stream – is perceived on sonantic phones/phonemes. The quantitative measurements of segments (phones) pronounced in continuous sentences have shown that the individually realised lengths of sounds (phones) depend on the actual speed of the utterance, its pace (Palková 1994: 178).

The experimental research on quantity realisation in standard Slovak has shown that the sound materialization of this suprasegmental phenomenon is influenced also by other factors.

First, the speed of the utterance (tempo, pace) is connected with the semantic ‘saturation’ of the text which is significantly differentiated according to the style of speech. Thus, if the relation between quantity and tempo is included, the *language style* (1) to which the analysed text belongs must be taken into consideration.

Next, the duration of a sound is influenced by *the placement of the long syllable in a given word* (2). The closer the proximity of the syllable containing a long syllabicity bearer to the beginning of a word, the more accurate the realisation of the long sonant is.

Additionally, the results of experimental research have also shown that sonant duration depends on *the vocalic type of the phone on which the long chrona is realised* (3), *on the sound environment*, i. e. on the sound character of the preceding and the following

consonant (4), *on the type of morpheme with the long sonant* (5), and on the stressed/unstressed character of the given syllable [*co-operation of quantity and stress* (6)] (Sabol 1984: 515-517).

5. Quantity in English: significant theories

The English language prefers the terms 'length' or 'duration' to the term 'quantity' when dealing with phonetic/phonological language issues.

According to Abercrombie (1967) the length of segments – their duration – is irrelevant from the phonetic point of view: it is important only in phonology when creating a syllable. The author explains this theory of monosyllabic words in the following way:

The duration of all monosyllabic words in English is approximately the same when having approximately the same conditions. The difference lies in the way of creating the total length of the word given by the sum of the lengths of its individual segments (ibid.: 80-82).

Jones (1969a) distinguishes two or better three degrees of a segment's (sound's) duration: long and short; long, half-long and short; and he notes that the basic principles of the vocalic segments' duration in RP-English are only approximate, since, as the author adds, "It is not difficult to distinguish five or six degrees of duration if we wish and experiments with apparatus reveal many more than these" (ibid.: 140).

Since the absolute length of the English long vowels is highly variable, Jones uses the term *chroneme* for vowels traditionally called 'long' and 'short'. Every *chroneme*, both short and long, includes several variations, several *allochrones* (Jones 1969b: 233).

Variations in the duration of the English vocalic segments are mentioned also by Gimson (1970). He assumes that the vowel's length, or better the length of its acoustic correlate, does not necessarily have to correspond with our linguistic judgement of quantity. The difference between 'the measurable duration' and the 'linguistic length' is only an example of the way our linguistic sense 'withdraws' what is significant from the sound material and only two length degrees are linguistically significant or important: vowels are either long or short, and all other absolute durations are interpreted with respect to this relation (Gimson 1970: 24-25).

In Gimson's view, the variation in sound or syllable duration in English depends predominantly on 1) the dynamic distribution of rhythm that is characteristic for English and completely different from the rhythmic flow in other languages and 2) on the speed of the utterance (1970: 24-26).

The problem of quantity and the sound level of English was the subject of the research of Skaličková (1966) who compares the sound levels of Czech and English on the basis of extensive sound material. Her reflections on the quantity function in English are based on the thesis that "English levels the length of individual sections and accommodates them to a certain rhythmical frame" (ibid.: 17). This means that, when dealing with monosyllabic words, although the shortening and lengthening of English vowels are evidenced in polysyllabic words as well, all words with the fortis consonant have the same length as the corresponding words with the lenis consonant, since every fortis consonant in English is longer than the corresponding lenis consonant (ibid.).

Fortis (voiceless) consonants (/p, t, k, s, f, ʃ, θ, tʃ/) shorten the preceding vowel, while lenis (voiced) consonants (/b, d, g, z, v, ʒ, ð, dʒ/) prolong the preceding vowel.

The overall result of the co-operation of vowels and fortis/lenis consonants may be schematically charted as follows:

$$(1) \quad \text{vowel} + \begin{array}{l} \text{longer consonant} \\ \text{(voiceless, fortis)} \end{array} = \text{vowel} + \begin{array}{l} \text{shorter consonant} \\ \text{(voiced, lenis)} \end{array} \quad (\text{ibid.: 17})^3$$

The basic condition, then, for the equal duration of qualitatively identical vowels as for the different duration of qualitatively different vowels is the same ‘voice/tension’ category of the following consonant (ibid.: 16-18).

In regard to the diametrically different character of vocalic length in English when compared with Slovak or Czech, Skaličková proposes eliminating the classic opposition ‘short – long’ from the English vocalic subsystem and to substitute the opposition ‘longior – brevior’ for it. In Skaličková’s view these new oppositional terms represent the ‘different character’ of vocalic quantity in English more accurately (Skaličková 1966: 22 – 23).

Roach (2000: 19) characterises long vowels as vowels that have the tendency to be longer than corresponding short vowels in a similar context.

Thus, the quantity of English vowels is not absolute, as it is, for example, in Czech or in Slovak, but is relative.⁴ The duration of an English vocalic segment depends on the character of the following consonant, on its tension (voice), and on the stressed or unstressed character of the syllable in which the given vowel occurs. A vowel in a stressed syllable is always longer than a corresponding vowel in an unstressed syllable. The lengthening or shortening of English vowels is also influenced by the final position in a word or a sentence, since a stressed syllable in a word’s final position is always the longest.

The question of the length or shortness of the English vowels is relatively complicated. Vowels [i:], [ɜ:], [ɑ:], [ɔ:], [u:] are longer than all other English vowels in the identical sound environment and pronounced with the same stress. For this reason they can be indicated as ‘long’, because “they tend to be long” (Jones 1969b: 236), or at least longer than all other monophthongs in the same context that can be indicated as short. Of course one must remain aware of the considerable variation that exists in the sound realization of all of these short and long segments.

The problem of identifying quantity in the English phonic system becomes apparent even in the phonological classification of the English vocalic system and when delimiting distinctive features of the English vocalic phonemes.

Vowels /ɪ/, /e/, /ʌ/, /ɒ/, /ʊ/, /æ/, /ə/ are usually called lax and vowels /i:/, /ɜ:/, /ɑ:/, /ɔ:/, /u:/ are tense (cf. e. g. Vachek 1963). Difference in tension (Giegerich 1992, for example, mentions the binary opposition [tense/lax]) is only one of the two basic differences between the English vowels, one of quality. The second difference is that of quantity or the length of vowels (binary opposition [quantity]).

For example /i:/ in the word *beat* /bi:t/ has features [+tense], [+long] and /ɪ/ in the word *bit* /bɪt/ can be defined as [-tense], [-long]. According to Giegerich (1992: 99) both features are relevant only on the level of the phone by identifying [i:] as long and tense and [ɪ] as short and lax. On the phonological level the difference in the length of the vowel becomes

redundant, since we do not need two binary features to distinguish one phoneme from the other.

Giegerich considers [tense] to be the feature for distinguishing vowels traditionally indicated as ‘long’ from vowels traditionally indicated as ‘short’.

To support his preference for the distinctive feature [tense] to the distinctive feature [quantity] in the system of phonological features of the English vocalic phonemes, he gives the following arguments:

1. In language we cannot absolutely define what is ‘long’ and what is ‘short’, while tense is an absolute term (ibid. 100)⁵.

The length of the vowel /i:/ in the sequence *bee – bead – bean – beat*, as well as the length of the vowel /ɪ/ in the sequence *bid – bin – bit* decreases from the left to the right. The author uses the fact appearing in the majority of phonetics books dealing with the question of the quantity function that the following consonant influences the duration of previous short and long vowels. The latest research, however, has not proved the influence completely (Roach 2000: 35). Giegerich agrees with the assertion that /i:/ is always longer than /ɪ/ in the same context, but he sees the biggest problem in the fact that “the shortest realisation of the ‘long’ phoneme /i:/ (in *beat*) is actually shorter than the longest realisation of the ‘short’ phoneme /ɪ/ (in *bid*)” (ibid.: 100); however, he does not support this statement with any experimental results.

2. The second argument against the insertion of feature [quantity] into the system of distinctive features of the English vocalic phonemes is the thesis that quantity is not a feature that a listener would ‘use’ for differentiation of two phonemes.

When analysing the sound subsystem, Giegerich combines three basic (the so-called standard or reference) varieties of present-day English: RP-English, General American (GA), and Standard Scottish English (SSE). Especially in Standard Scottish English, for example, the [i:] in *beat* and the [ɪ] in *bit* are perceived as equally long and the difference in the quality of these vowels seems to be decisive (ibid.).

Thus, if deciding to consider the feature [quantity] to be phonemically relevant in RP and GA, a different method would have to be applied to the phonological description of vowels in SSA (ibid.: 101).

All vowels in RP and GA are defined by the feature [+tense] on the phonological level and by the feature [+quantity] on the phonetic level and vice versa, and the feature [-tense] on the level of phoneme corresponds to the feature [-quantity] on the level of phoneme. Vowels in RP and GA have to undergo the so called Redundancy Rule that eliminates redundant phonological features:

$$(2) \quad \begin{array}{l} [+ \text{ tense}] \longrightarrow [+ \text{ quantity}] \\ [- \text{ tense}] \longrightarrow [- \text{ quantity}] \end{array} \quad (\text{ibid.}).$$

On the concrete phonic level vowels are characterised by both features [tense] and [quantity]. On the level of phoneme the feature [quantity] becomes redundant and the feature [tense] remains, which creates a homogeneous system of vocalic distinctive features for all three standard varieties of present-day English (RP, GA, SSA) with which Giegerich works.

Apparently the attempt to create a uniform phonological description of the so-called reference accents of present-day English causes some complications when characterising the

phonetic and phonological level of the individual varieties. Thus, when trying to solve as complicated a problem as the phonological description of the English vowels undoubtedly is, one would find greater convenience dealing with each of the mentioned varieties in isolation.

This paper deals with the sound level and especially with the function of quantity in RP-English. Roach (1983) tried to delimit distinctive features of English vocalic phonemes in this reference variety as well. In his analysis he uses the feature *short*, which distinguishes short vowels from long vowels and diphthongs (Roach 1983).

6. Experiment

6.1 Method

The analysed sound material of standard Slovak, recorded from Rádio Východ, contains 2579 syllables, 2139 short and 440 long. 2549 English syllables, recorded from the BBC, when measured for quantity, exhibited 1737 short and 812 long.

The time duration of the sonantic nucleus was measured with the assistance of the computer programme Multi Speech. The first step was the transformation of the recorded analogue sound into digital form and afterwards oscillograph⁶ curves were displayed on the computer screen. The graphic representation of continuous speech was segmented into individual words, and then the sonantic nuclei in these words were cut off.

The beginning and the end of the segmented sonantic nucleus was defined perceptually. In the case of any uncertainties (transgression and inherence of sounds, transients), the information about the shape of the individual phones' oscillograph curves (Zimmermann 2002) was used. Finally, the data about the time duration of segmented sonantic nuclei in milliseconds were read from the screen (Fig. 1).

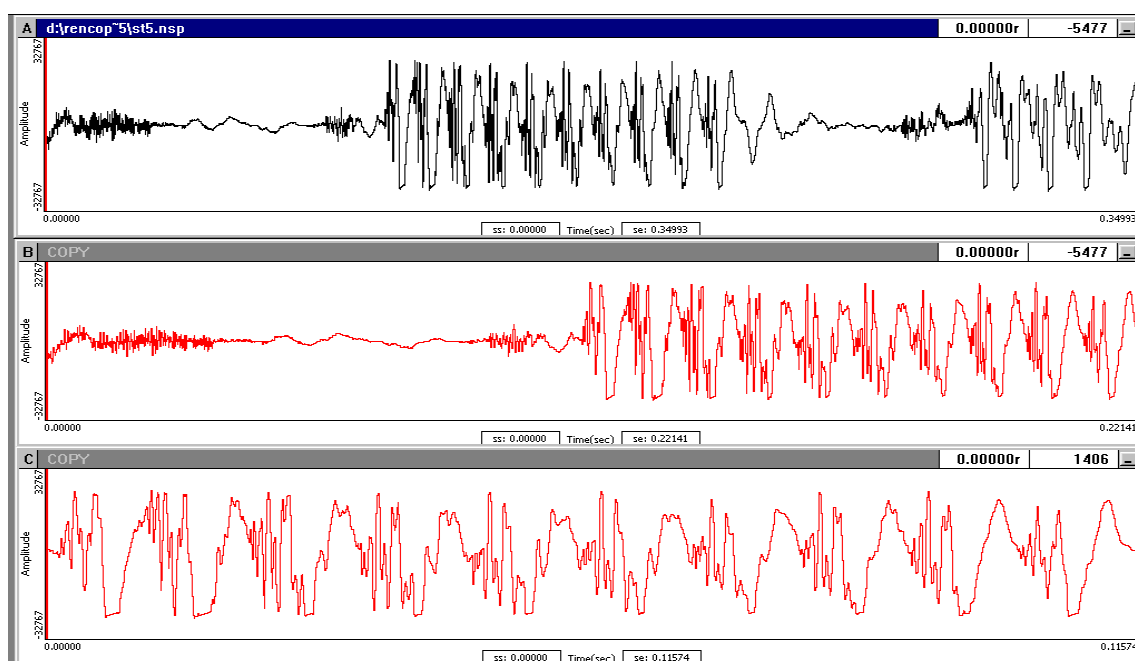


Figure 1 Oscillogram of the word štátu, syllable štá- and segmented sonantic nucleus [a:]

When digitising the speech signal, the sampling frequency 40 kHz was used, which means that the boundaries of sounds were delimited with the exactness 1/40 000 of a second (Sabol and Zimmermann 1994: 34).

The resulting numeral data for the duration of the sonantic nuclei of syllables in standard Slovak were compared to the results of older research in this field (Sabol 1984). Data on the duration of the sonantic nuclei of syllables in English were analysed according to the criteria presented in linguistic works dealing with the sound level of this language, but also according to the criteria influencing the realisation and function of quantity in Slovak. Finally, the realization of quantity in the structure of the Slovak syllable is compared with the realization of this sound phenomenon in English, and common and different aspects connected with the length of vowels in both analysed languages are summarized.

6.2 *Quantity in standard Slovak*

The experimental phonetic research on the feature of quantity in standard Slovak (carried out on the sampling from mass-media communication) supports the results of the previous investigations in this field (cf. Sabol 1984).

As mentioned above, the pronunciation ratio of the short and long syllabicity bearer in standard Slovak, which differentiates the meaning of words and word-forms, is approximately 1: 1.6. This proportion varies depending on the overall speed of the speech (utterance) in the individual fields of style and depends on the semantic ‘thickness’ of the text. It ‘grows’ from colloquial (1: 1.34), through artistic (1: 1.64) up to journalistic style (1: 1.66) (Sabol and Zimmermann 1986).

Despite the meaning-distinguishing function of quantity, the reporting genres of journalistic style are characterized by a strong tendency to shorten the duration of short and long sonantic phones: the average duration of the short sonantic phone in standard Slovak is 79 ms, and the long sonant lasts for approximately 125 ms (Sabol 1984: 515); the recorded data from Slovak radio reveals that the average length of the short sonant in journalistic style is 66 ms and of the long sonant 106 ms.

This tendency towards reducing length is the result of the more rapid speed of utterance in newscasts when compared with other styles.

The journalistic style has not only the shortest duration of the short and long sonants, but also the shortest duration of pauses. Since news text must be ‘squeezed’ into a predetermined time frame, this ‘necessity’ manifests itself in the shortening of pauses (ibid.).

The speed of the utterance and pause (stop in the flow of speech) are the most important suprasegments with regard to the time transmission of language information. As it follows, the speed of the utterance is ‘tied’ to the language style to which the analysed text belongs. *Language style* (1) is thus considered to be among the most decisive criteria connected with the realisation of the length of sonantic sounds in standard Slovak.

The sound realization of a news text adapts to the selection and composition of the expressive means of the journalistic style whose sentences have fixed objective word order. The sentence nucleus (i.e. the most important word) is at the end of its sentence, or at the end of a tone unit; realization at the level of sound is intonationally neutral. The sound realization is unmarked, but the phase stress manifested by prolongation of pre-pause syllables is evident: the average duration of a long chrone in the analysed text is 106 ms, that of a short

chrone is approximately 66 ms, while the average duration of a long sonant in pre-pause syllables is 124 ms, and a short sonant in the same position lasts for 76 ms.

Thus *text phrasing* (2), the segmentation of an utterance (sentence) into smaller sections, is the second important factor having influence on the duration of syllabic nuclei.

Text phrasing reveals *the co-operation of sentence stress and quantity* and *the co-operation of word stress and quantity* (3). That stressed syllables are always longer than unstressed is true whether the stress is word or sentence related.

Time realisation of a long sonant in standard Slovak depends also on *the type of morpheme in which the long sonant occurs* (4). The average duration of a long sonant in a root morpheme is 117 ms, and likewise in the derivational morpheme the long sonant lasts for approximately 117 ms; the average duration of a long chrone in a grammatical morpheme is only 92 ms, which is the result of the tendency to shorten length at the ends of words and word forms.

In addition to the already mentioned factors [*language style* (1), *text phrasing* (2), *co-operation of sentence stress and quantity*, *co-operation of word stress and quantity* (3), *type of morpheme with a long sonant* (4)] that co-act more with the semantic aspect of an utterance and are thus connected with the phonological level of abstraction, the duration of sonantic phones in standard Slovak depends also on phonetic elements connected with the articulatory-acoustic base of sound creation and perception. The duration of a sonant is influenced by *the vocalic timbre* (5) of a given sonantic sound, by *the sequence of a syllable with a long vowel in a word* (6), and by *the sound environment* (7) of the sonant.

The analysis of data from broadcast news also demonstrates the dominant position of a-vowel type in the vocalic subsystem of Slovak (cf. Sabol 1984). The pronunciation proportion of short to long sonants for the a-vowel type is 1: 1.74; similarly for the o-vowel type, this average is 1: 1.71. For other vowel types the pronunciation proportion of the short and long syllabicity bearer moves from 1: 1.4 up to 1: 1.54.

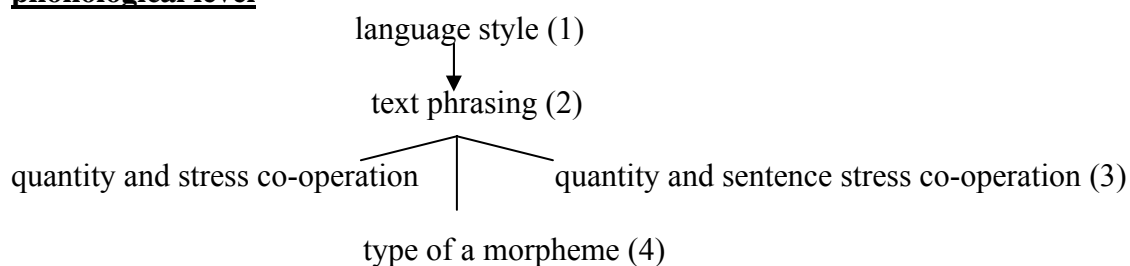
The research shows that long syllables are the longest at the beginning of words and word-forms and that the first syllables of words (and word-forms) are the places of maximum prosodic differentiation (Sabol 1977: 67).

The influence of the sound environment on the duration of the preceding and the following syllabicity bearer seems to be minimal, which is undoubtedly connected with the mutual interconnection of individual syllable segments (co-articulation and transgressivity) that causes difficulties when precisely segmenting and thus identifying the syllabic nucleus, especially in connections of syllabic nuclei with sonorous consonants.⁷

While *vocalic timbre* (5) seems to be a purely phonetic criterion, the other two observed factors, to wit *the sequence of a syllable with long vowel in a word* (6) and *the sound environment* (7) of the sonant, confirm the interconnection between the phonetic and the phonological level (Fig. 2).

The hierarchy of the criteria having influence on the quantity function in standard Slovak is a verification of the symbiosis between sound and meaning; furthermore, it is evidence of the linkage between the phonetic and phonological language levels. At the same time, a crucial fact is evident: none of the language phenomena, quantity included, exists in isolation, but only in broader, more general, more complex linguistic interconnections.

phonological level



phonetic level

vocalic timbre (5)

phonological level with overlap into phonology

number of syllables in a word + the sequence of a long sonant in a word (6)

sound environment (7)

Figure 2 *Criteria influencing quantity in standard Slovak*
(Bónová – Gregová 2004: 318)

6.3 *Quantity in English*

As mentioned above, the length of the English vowels depends on a number of factors: *the character of the following consonant* (fortis consonants shorten the preceding vowels, lenis consonants prolong them); *the stressed or unstressed character of the given syllable* (the stressed syllable is always longer than the unstressed); *word stress*; *final position* in a sentence (the longest syllables are those at the end of the utterance before a pause); *the utterance speed*, i.e. the pace of speech and *rhythm*, or better the tone unit length (the longer the tone unit, the shorter the syllables in it).

The measurement of the short and long syllables' duration in the English texts indicates that the theory of fortis and lenis consonants' influence (*the influence of the following consonant*) on the length of preceding vowels is valid only to a degree:

The short sonant lasts for approximately 63 ms and the average duration of the long sonant is 132 ms. A short sonant before a fortis consonant has 64 ms; a long sonant, 119 ms. Before a lenis consonant, the length of a short chrone is 63 ms, while the long one lasts for 152 ms.

As follows from the data, then, fortis consonants shorten the preceding long vowels, but have minimal influence on the preceding short vowels when compared to the average duration. Lenis consonants prolong the length of preceding long vowels, but have no influence on the preceding short vowels.

The minimal influence of fortis and lenis consonants on the preceding short vowels has already been mentioned by Roach (2000), who claims that the effect of these consonants on the length of preceding vowels "*has become exaggerated*" and has become the most

important signal of the difference between consonants *p, t, k* (shortening of preceding vowels) and *b, d, g* (prolongation of preceding vowels). As the author further adds, it is sometimes wrongly cited that consonants *b, d, g* prolong preceding vowels instead of the fact that *p, t, k* shorten them (Roach 2000: 35 – 36). Although, the shortening effect of fortis consonants has influence even on short vowels, it is observable especially on long vowels and diphthongs (ibid.: 54).

The considerable variation in vowel length not only in English, but also in the other languages, is created by many intra- and extra-lingual and extra-communicative conditions (Sabot 2004: 184) and has no influence on the fact that the short sonant is always shorter than the given long in the same context (op.cit.).

Thus, for the comparison of the duration of the English vowels traditionally indicated as ‘short’ and ‘long’ and for the evaluation of the phonological, functional value of this phonic phenomenon in English one condition must be fulfilled: the presence of an identical sound environment. Phonological validity of a sound is evaluated “against the other sound in the identical environment” (Sabot 1989: 42). It means that *duck* /dʌk/ should stand against *dark* /dɑ:k/, *bit* /bɪt/ against *beat* /bi:t/, *bid* /bɪd/ against *bead* /bi:d/, etc.

From the current data, the measurement of the length of 1737 short and 812 long syllables showed that in English (in RP) there is a considerable variation in the duration of short and long vocalic segments.

Syllables traditionally indicated as short are those containing monophthongs *ɪ, e, ʌ, ɒ, ʊ, ə, æ*. Syllables containing monophthongs *i:, ɜ:, ɑ:, ɔ:, u:* and diphthongs *eɪ, aɪ, ɔɪ, iə, eə, ʊə, əʊ, aʊ* are considered to be long. Since the number of syllables containing triphthongs was extremely low in the analysed sound material, they have been excluded from the results.

The following tables summarize the average values of short and long sonantic nuclei duration in RP (Tab. 1 – 3).

VOWEL	RANGE OF MINIMAL VALUES	RANGE OF MAXIMAL VALUES	AVERAGE LENGTH OF VOWEL
ɪ	30 – 40	80 – 90	60
e	40 – 50	110 – 120	74
ʌ	40 – 50	100 – 110	79
ɒ	30 – 40	100 – 110	70
ʊ	40 – 50	60 – 70	54
ə	30 – 40	60 – 70	52
æ	40 – 50	120 – 130	94

Table 1 *Variations in the duration of short vowels (in ms)*

VOWEL	RANGE OF MINIMAL VALUES	RANGE OF MAXIMAL VALUES	AVERAGE LENGTH OF VOWEL
i:	70 – 80	150 – 160	103
ɜ:	110 – 120	170 – 180	136
ɑ:	100 – 110	190 – 200	140
ɔ:	100 – 110	180 – 190	130
u:	80 – 90	190 – 200	107

Table 2 *Variations in the duration of long vowels (in ms)*

DIPHTHONG	RANGE OF MINIMAL VALUES	RANGE OF MAXIMAL VALUES	AVERAGE LENGTH OF DIPHTHONG
Aɪ	100 – 110	200 – 210	153
Eɪ	90 – 100	200 – 210	129
ɔɪ ⁸	100 – 110	150 – 160	150
ɪə	110 – 120	190 – 200	141
Eə	110 – 120	160 – 170	146
ʊə ⁸	100 – 110	190 – 200	139
Aʊ	130 – 140	160 – 170	151
əʊ	110 – 120	190 – 200	139

Table 3 *Variations in the duration of diphthongs (in ms)*

As the current research has shown, the length of the English vowels varies to a certain extent: the so-called long vowel in its shorter form is often identical with the so-called short vowel in its longer form, but that does not mean that the quantitative opposition should be excluded from the English language:

In the analysed sound material, there are the words *much* [mʌtʃ]) and *march* [mɑ:tʃ] in several different positions.

The vowel [ɑ:] in the monosyllabic word *march* in the phrase *the march was led by the several leading...* lasts for 226 ms, which is an extreme value for the length of this vocalic element (the average length of [ɑ:] is 140 ms). In the other sentence segment, *By the time the march reached...*, the length of [ɑ:] is 118 ms, which is a value close to the vowel's minimal range.

The vowel [ʌ] in the monosyllabic word *much* in the phrase *It is much more a question of ...* lasts for 92 ms (the average value in the [ʌ] duration is 74 ms) and in the

sentence segment ...*within the alliance much more*... the length of this vowel is 90 ms; both measured values for the duration of [ʌ] are maximal.

Comparison of the length of the extremely short 'long' [ɑ:] with the extremely long 'short' [ʌ] in the same context (i. e. sound environment) [mʌtʃ]) and [mɑ:tʃ] results in the quantitative proportion 118 : 90, i. e. a difference of almost 30 ms.

Given the same speech style and associated speech pace, there are other pairs of words whose differing meanings are marked by different lengths of sonantic nuclei: *feat* /fi:t/ – *fit* /fɪt/, *beat* /bi:t/ – *bit* /bɪt/, *mark* /mɑ:k/ – *muck* /mʌk/, *fool* /fu:l/ – *full* /fʊl/, etc.

But the different quantity of sonantic nuclei in the mentioned pairs of words is only one of two differences between the compared vowels; the other difference is that of their quality.

From this point of view the classic labels 'long' and 'short' in the vocalic subsystem of English seem to be inappropriate. The question is what other term would be more suitable and if the possible new denomination could assert itself given the traditional usage of the existing labels.

Perhaps the traditional labels should be retained, but used, of course, with the awareness of the correlation of relatively variable quantitative differences to the stable differences in the quantity of long and corresponding short vowels (on the impropriety of terms checked – free, lax – tense cf. Skaličková 1979: 14).

As it follows from the detailed analysis of syllables and words with the minimal and maximal values in the length of the English vowels⁹, the decisive influence on the prolongation of preceding short and long vowels is not the character of the following consonant, but the position of the given syllable before a pause, word stress and sentence stress. Analogically, the shorter time realization of the English vowels is not only the result of following consonant influence, but also of its occurrence in an unstressed syllable and of its occurrence in a longer sentence portion (text phrasing and rhythm).

As mentioned earlier the terms 'chrone' and 'chroneme' were introduced by Jones (1966) and also mentioned by Sabol (1989) with regard to vowel duration.

Sabol in his *Synthetic Phonological Theory* (1989) delimits five levels of this relation in the sound units of the given language on the basis of the relation between the variant and the invariant, or the concrete and the abstract:

(1) hypophone (HPh) – the concrete physical speech segment, concrete unreproducible sound that can be pronounced only once;

(2) phone (Ph) – sound, speech signal segment;

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

(4) morphophoneme (MPhm) – sound 'construct' delimited in a morpheme as the smallest bearer of the elementary or complex meaning;

(5) hypermorphophoneme (HMPhm) – the sound 'pre-basis' of morpheme from which the other units were generated as they originated historically (ibid.: 18 – 19).

By analogy with the units from the segmental level, Sabol delimits units following from quantity as the suprasegmental phenomenon:

(1) chrone (CH) – realized on sonantic phone;

(2) chroneme (CHm) – realized on sonantic phoneme;

(3) morphochroneme (MCHm) – realized on sonantic morphochroneme (ibid.: 140-141).

Data about the average length of individual vocalic segments thus represent data about the length of short and long sonantic chronemes (chronemes) – the duration of vowels on the level of phone (phoneme), while the variation in the length of the acoustic correlates of vocalic elements can be, in accordance with the work of Jones, indicated as allochrones.

In the analysed sound materials used herein (recordings of newscasts from the BBC), the average short sonantic chrone lasts for approximately 63 ms and the long sonantic chrone for 132 ms (Table 4). The pronunciation proportion of the short and the long sonantic chrone in the English texts is 1: 2.10.

SHORT SONANT	63
LONG SONANT	132
SIMPLE LENGTH	120
DIPHTHONG	147
TRIPHTHONG	248 ¹⁰

Table 4 *The average duration of the short and the long sonantic chrone in the English journalistic texts (in ms)*

It seems that, despite the concensus of some authors (Skaličková 1979, Giegerich 1992) about the non-existence of the vocalic opposition ‘short – long’ in the phonological subsystem of English and despite the several degrees in the length of the English vowels’ acoustic correlates, only two length degrees should be considered functional or linguistically significant: vowels are either short or long (cf. Gimson 1970).¹¹

The duration of vocalic segments in English depends on the *position of the stress in a word*, as shown by phonetic analysis of the data. Stressed syllables are longer than unstressed (Tab. 5), showing universal typological regularity in the relation between quantity and stress.

	1 st syllable		2 nd syllable		3 rd syllable	
	stressed	unstressed	stressed	unstressed	stressed	unstressed
Disyllabic word	119	94	150	132	–	–
trisyllabic word	121	103	121	106	169	124

Table 5 *The average duration of the long syllabicity bearer in stressed and unstressed syllables (in ms)*

Finally, as mentioned in literature and proved by this analysis, the length of sonantic phones in English depends on the *speed of the utterance* and the final position of the sonantic sound, i.e. its *occurrence before a pause*.

In this section, the statistical data about the length of English vowels are analysed according to the factors that influence the length of Slovak vowels.

The speed of the utterance and any pauses connected with it belong among the most important factors in mass-media communication: they indicate the grammatical and lexical structure of a sentence, they signal the semantic filling of the text, they contribute to the stylistic categorization of the utterance and they organize the optimal time band of communication (Sabol and Zimmermann 1986: 102). The speed of the utterance is related to the language style to which the given text can be classified, and *language style* is the first criterion on which the length of Slovak vowels depends.

All results of this phonetic analysis of short and long sonantic nuclei duration in English were obtained from broadcasts in journalistic style. Journalism and news in English belong to the so-called formal colloquial pronunciation style (Urbanová 1989: 80) that is characterized not only by its faster speed (in comparison to the declamatory pronunciation style), but also by the tendency to prolong the final syllables before pauses. This tendency to prolong pre-pause syllables has been shown in this analysis, as mentioned above.

It is necessary to remember that the pronunciation ratio of the short and long sonantic phone in English is 1: 2.10. This proportion of short and long sonants in the English journalistic style should be compared with the results from other types of texts, especially artistic and colloquial as a topic for further research.

In addition to language style, quantity in standard Slovak depends on the sequence of long syllables in a word (the sonantic phones at the beginning of words and word-forms are the longest).

In English, this criterion seems to apply in reverse. The average duration of the long sonant in monosyllabic word is even shorter (139 ms) than in the last syllable of di-, tri- or quadri-syllabic word (146 ms, 142 ms, 185 ms).

The sound-prosodic structure of English is different from the sound-prosodic structure of Slovak. Quantity in English is closely connected with stress, pace and the whole intonation of the English sentence.

The longest duration is achieved by long sonantic phones at the end of words, before pauses, i.e. in syllables which carry tone (for detailed information about the intonation of English sentence cf. Roach 2000: 150-192).

The third factor influencing the sound materialization of quantity in standard Slovak is *the vocalic type of vowel on which the chrone is realized*.

In standard Slovak the a-vocalic type is decisive; in English it is the e-vocalic type (Tables 6 – 8). It appears that the individual vocalic elements belonging to this timbre have several specific characteristics contributing to the dominant position of this timbre in the sound subsystem of English:

- 1) The average value of duration for /æ/ is 94 ms, which is close to the average values of duration for long monophthongs (e. g. /i:/ – 103 ms, cf. Tab. 2). This is probably connected with the articulatory features of this vowel (the glide movement of the tongue from the position for a to the position for e. From this aspect the English /æ/ resembles the Slovak sound /ä/ (the so-called ‘wide e’ with typical glide movement of the tongue from e to a).
- 2) The so-called mixed vowel, schwa /ə/ has the highest frequency of occurrence out of all vowels. This central vowel can occur only in weak syllables, but it usually replaces the other vowels in the weak forms of grammatical words.

- 3) The highest number of diphthongs occurs in this vocalic timbre – /eɪ/, /eə/, /əʊ/.
The diphthong /eɪ/ has the highest frequency of occurrence out of all diphthongs.
- 4) The highest number of vocalic elements in English belongs to the e-vocalic timbre (Table 6): three short monophthongs (/e/, /æ/, /ə/), one long monophthong (/ɜ:/), three diphthongs (/eɪ/, /eə/, /əʊ/) and two triphthongs (/eɪə/, /əʊə/).

vowel type	short monophthong	Long monophthong	diphthong	triphthong
a-timbre	[ʌ] – 79	[ɑ:] – 140	[aɪ] – 153	[aɪə] – 240
			[aʊ] – 151	[aʊə] – 271
e-timbre	[e] – 74	[ɜ:] – 136	[eɪ] – 129	[eɪə] ¹²
	[æ] – 94		[eə] – 146	[əʊə] ¹²
	[ə] – 52			
i-timbre	[ɪ] – 60	[i:] – 103	[ɪə] – 141	
u-timbre	[ʊ] – 54	[u:] – 107	[ʊə] – 139	
o-timbre	[ɒ] – 70	[ɔ:] – 130	[ɔɪ] – 150	[ɔɪə] – 254

Table 6 *The average duration of individual phones (phonemes) in English according to vocalic timbre (in ms)*

	Short sonant	long sonant
i- timbre	60	111
e- timbre	61	134
a- timbre	79	152
o- timbre	70	132
u- timbre	54	110

Table 7 *The average duration of short and long phones in English according to vowel types (in ms)*

i- timbre	1: 1.85
e-timbre	1: 2.20
a-timbre	1: 1.92
o-timbre	1: 1.89
u-timbre	1: 2.04

Table 8 *The pronunciation proportion of short and long sonants in English journalistic texts (according to vowel types)*

The length of syllabicity bearers in Slovak depends on *the type of morpheme in which the long syllable occurs*.

The Slovak and English are languages belonging to different morphological types. The way of expressing grammatical forms, i.e. the way of expressing grammatical meanings, is different in both languages. Since English as an analytic language has only a few grammatical morphemes and its inventory of derivational morphemes is richer, only the root and derivational morphemes were delimited in the analysed English words. The average length of the long sonant in the root morpheme is 132 ms; in derivational morphemes it lasts for 122 ms.¹³

Similarly to standard Slovak (cf. Fig. 2), the mentioned factors connected with the realization of quantity in English can be specified according to their dependency on the phonetic or phonological level and at the same time they can be hierarchically ordered according to the degree of influence they have on vocalic length in this language.

Language style (1) seems to be the most decisive factor in English (the relation between the speed of the utterance and text semantics is a universal one).

Lengthening or shortening of sonantic chrones to a certain extent depends on the parsing of continuous speech into shorter sentence segments – *text phrasing* – and on the *length* of the given *sentence segments*. As a result, the time realization of vowels in longer sentence parts delimited by pauses is usually shorter. This fact is undoubtedly connected with the so-called *dimensional rhythm* (2), i. e. the tendency to level the timing of sentence parts. This is the result of the universal “communicative ‘habit’ to stay within a given time an approximately identical amount of information” (ibid.).¹⁴

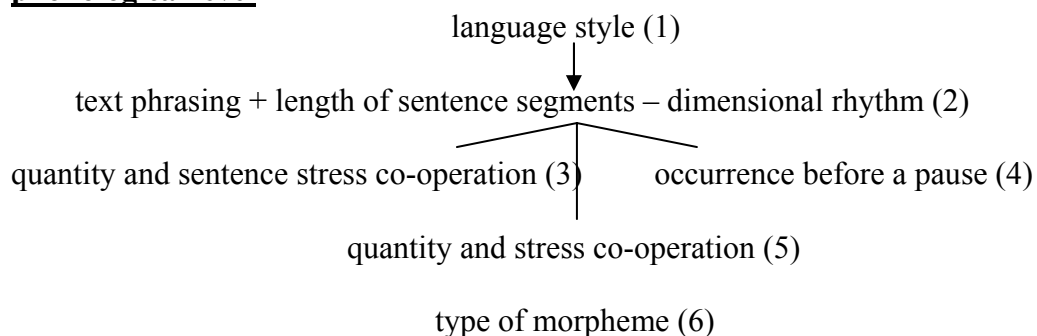
In English, there is a strong tendency to prolong *syllables before a pause* (3) and *syllables that receive sentence stress* (4). This analysis clearly showed the universal nature of the *relation between quantity and stress* (5): stressed syllables are always longer than unstressed syllables (Tab. 5).

These primary, dominant factors are bound to the phonological level of abstraction as well as *the type of morpheme with a long sonant* (6): long chrones are the longest in root morphemes, which are semantically important. The length of long phones in derivational morphemes is shorter.

The secondary criteria having influence on the length of the English vowels seem to be *sound environment*, i.e. *the character of the following consonant* (7) and *the vocalic type of phone on which the chrone is realized* (8).

While the vocalic type of phone is connected with the phonetic level of abstraction, the sound environment proves the interconnection between the phonetic and phonological language level (Fig. 3).

phonological level



phonetic level

vocalic type (7)

phonetic level with overlap into phonology

sound environment (8)

Figure 3 *Factors influencing quantity in English*

7. Conclusion

The aim of this research was the comparative investigation of quantity in standard Slovak and in one of the English standard accents, RP-English.

The material starting point of the research was sound records of news broadcasting in both languages (Rádio Východ and BBC radio). The selection of the sound material for the analysis was based on the assumption that the intonational realization of journalistic style news texts that have fixed objective word order is neutral in Slovak and in English.

The experimental phonetic research of quantity in standard Slovak demonstrates the accuracy of the results of previous research in this field (Sabol 1984).

Although the opposition of short and long sonantic phones in standard Slovak has a phonological-distinctive function, news genres of journalistic style are characterized by a strong tendency to shorten the time duration of short and long sonantic phones (the ratio of the short and long sonant in journalistic style is 1: 1.61).

This tendency towards length shortening is the result of the faster speed of speech (utterance) in newscasts. The speed of the utterance is tied with the language style to which the analysed text belongs.

But language style is only one of the criteria that have influence on the length of the Slovak short and long vowels. The other criteria are text phrasing (segmentation of a sentences into smaller semantically and intonationally concluded parts), quantity and word stress co-operation, quantity and sentence stress co-operation (stressed syllables – short or long – are always longer than the corresponding unstressed syllables), type of morpheme with a long sonant (syllables are the longest in root morphemes that are most important from

the semantic point of view), vocalic timbre (sonants of a-type are dominant in standard Slovak), number of syllables in a word and the sequence of a sonant in a word (the longer the word, the shorter the vowels within it) and the sound environment.

Experimental phonetic research of quantity in Slovak and English has shown that English has a higher variation in the duration of the individual vocalic segments than Slovak. But despite the noticeable dispersion in the duration of the English phonemes acoustic correlates, it is possible to talk about the phonological length in English (in RP-English), as well: a long vowel in its short form is never identical with a short vowel in its long form in cases when the change of vowel length can change the meaning of a word.

The 'validity' of this claim is proved also by the statistical analysis of quantity in English and in Slovak that reveals that, although the division of quantity (statistical mark) around the average, middle value (around the arithmetic mean) in English is not so balanced as in standard Slovak, still it is not so dispersed that one would not be able to work with average values of the individual vocalic segments' duration and the duration of vocalic types. And this is one of the conditions for adequate comparative research of these phonic elements in the analysed languages (Gregová 2007).

The mentioned variation in the length of English vowels is caused by several factors.

In English, as in Slovak, *language style* (1) can be considered the most decisive criterion influencing the duration of vocalic elements. Stylistic 'characteristics' of the utterance connected with its semantic filling determine the speed of the utterance during the sound realisation of a given text (Sabol 1977: 28-29).

The duration of English vowels is also influenced by *text phrasing* (2), i. e. by the segmentation of connected speech into smaller sections: the longer the sentence (utterance) section is (the higher the number of syllables in it), the more rapid the speed of its realisation, and the stronger the tendency to shorten individual syllables. This fact is also presented in dimensional rhythm.

Parsing, or the segmentation of connected speech, is undoubtedly closely connected with the so-called *dimensional rhythm*, with the tendency to level the time realisation of the individual sentence segments. This tendency is associated with a universal regularity in communication the need to present and/or to be given a certain amount of information in a certain time (ibid.: 77).

Text phrasing leads to another factor, that of *occurrence before a pause*. While text phrasing (which in reporting results from the physiological necessity of breathing in) and the tendency towards the isochronicity of sentence segments (dimensional rhythm) can be considered as universal factors, the tendency to prolong pre-pause syllables is more significant in English than in Slovak.

Sentence stress and *word stress* also have a decisive influence on the prolongation of vocalic elements in English: stressed syllables are always longer than unstressed ones; syllables with word stress are longer than syllables without it.

Co-operation of sentence stress and quantity and co-operation of word stress and quantity thus can be characterised as additional universal aspects connected with the length of syllable nuclei.

Type of a morpheme with a long sonant is another universal criterion influencing vowels duration that is applied in both analysed languages, although, only partly (in examining English as in analytic language the duration of chronemes only in root and derivational morphemes was measured).

The time of realisation of a long and a short sonantic sound in English partly depends on *the character of the following consonant*, on its being either a fortis (voiceless) or a lenis (voiced) consonant.

The analysis of the fortis/lenis consonants' influence on the duration of preceding vowels in the examined newscast texts has shown that the shortening or prolonging effect is observable especially in long sonantic phones: fortis consonants shorten them, and lenis consonants prolong them. This influence is negligible in short sonants.

The research into phonetic quantity as a suprasegmental sound phenomenon in Slovak and English (based on the texts from the area of mass media communication) has also proved several general linguistic theorems:

Sound elements (in the area of segments as well as suprasegments) function in dialectical union on different levels of abstraction as a differentiated relationship of the individual and the universal. From this point of view, the investigation of the specificity, but also of the cooperation of phonetic and phonological (or morphonological) level of the phoneme abstraction and its signal correlative is experimentally and functionally important.

The peculiarity, but also the inner interlinking, of the sound elements from the phonetic level of abstraction (hypophone and phone) and phonological (morphonological) level of abstraction (phoneme, morphophoneme and hypermorphophoneme) which are defined as the separate layers of the relationship between the individual and the universal according to the synthetic phonological theory is confirmed by signal coding/generating, transmission, perception and signal decoding according to the communicative degrees. Their links can be slightly differentiated in various language structures together with undoubted universal, invariant functions. This fact should be taken into consideration even in comparative research.

Research has also directed attention to the inevitability of searching for the typological characteristics of analysed languages. Structure-typological parameters of the phonic system are reflected into the selection and composition of elements when structuring sign units.

The function of phonic elements also has its specifics in individual varieties of literary or national languages. That is why it is important to pay adequate attention even to the relationship of norm, codification and usage when analysing given research material.

Notes

¹ Due to the fact that the number of syllabic consonants in the analysed sound material from Slovak and English is negligible, these sounds are not further analysed in this work.

² [] – phonetic transcription, the graphic representation of phone. In this contribution, the phonetic symbols and signs delimited by P. Roach (2000) are used. For other possibilities of graphic representation of the English vocalic segments cf. e.g. Urbanová 1989; Giegerich 1992.

³ The fact of vowels and fortis/lenis consonants co-operation can be interpreted either as the 'activity' of the consonants (especially the fortis ones) having influence on the duration of the previous vowel, or as a 'stationary' phenomenon given by the greater articulatory 'demand' of fortis consonants for the time of own articulation what leaves less time for the previous vowel that, with respect to the tendency towards the isochronicity of tone units, tends to be shorter.

⁴ It is important to mention that quantity in Slovak and Czech, with regard to the concrete sound manifestation of the phonological opposition quantitiveness:non-quantitiveness, is also relative on the level of the phone. It is ‘surfaced’ in the differential proportion of the long and the short syllabic phone in concrete pronunciation depending on the factors listed in 4. See Gimson’s statement (5) about the quantity realization in English.

⁵ But on page 97 in the same work the author writes that tension is “hardly definable.”

⁶ Oscillogram: the graphic representation of sound in a form of composite curves with the parameters time duration and momentary amplitude.

⁷ The influence of the phonic environment on the sound materialization of quantity is closely connected with the mutual interconnection of elements in a syllable that can be explained physiologically, either on the basis of co-articulation from the articulatory aspect or on the basis of transgressivity from the acoustic aspect. Co-articulation indicates the mutual influence of neighbouring speech segments. Some articulatory and acoustic features overlap at least for the duration of the syllable and thus they last over the neighbouring sounds. This means that one and the same segment can carry information about two neighbouring phonemes. The articulatory orders are not transmitted separately for the realization of the individual sounds, but for the higher units, particularly syllables (Kráľ – Sabol 1989: 146); the articulatory phases of the individual mutually neighbouring segments overlap on the basis of the fundamental syllabic structure. These co-articulation ‘cornerstones’ are evidently reflected in the acoustic spectrum of sound; for this reason, the facts about transgressivity (the feature of consonants parasitizing on the formant structures of neighbouring vowels) are taken into consideration when identifying the syllabic nucleus (cf. Bónová 2001).

⁸ Due to the low occurrence of these diphthongs in the analysed sound material, the data about their average length are only directional.

⁹ The contribution is based on the results of the experimental phonetic research whose detailed description is included in the dissertation thesis (Gregová 2004).

¹⁰ The data about the average duration of these triphthongs is, given their low occurrence in the text, only relative.

¹¹ It is significant to remember that the experiment was based on the sound material of RP-English. Other varieties of present-day English (General American, Scottish English, etc.) were not included in this analysis.

¹² The triphthongs [eɪə], [əʊə] are not represented in the analysed sound material.

¹³ Out of 812 long syllables measured in the analysed sound material, 767 were in the root morphemes and only 45 long chronemes were in the derivational morphemes. For this reason, data about the average length of a long sonant in derivational morphemes are only informational.

¹⁴ In English, a language with a high frequency of the so-called grammatical words like prepositions, articles, pronouns, etc., the tendency appears even more intensively than in the other languages.

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