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## ON THE CAPACITY OF DIFFERENT WORD CLASSES TO SIGNAL PROSODIC PROMINENCE

A comparative study of Czech and English

The intonation of spoken language is a complex of prosodic features which provide important information about the contents of the message and the speaker's attitude or state of mind. Prosodic features are capable of drawing attention to important parts of the message, i.e. of signalling prosodic prominence. The present paper is a study of the relation between the prosodic prominence of a word as the smallest independent syntactic unit of language and its word class (part of speech) status. The study is based on an analysis of parallel Czech and English spoken texts; it examines some of the differences between Czech and English in spoken utterances.

### Word-class system

There are certain differences between the traditional Czech and English word class systems and between the individual approaches of different grammarians within each language. The word class interpretation presented in this study is a compilation of the approaches applied in Dušková et al. 1988, Karlík et al. 1995, Havránek and Jedlička 1960, Quirk et al. 1985, the Collins Cobuild Dictionary 1987 and The Concise Oxford Dictionary 1990 (eighth edition). The word class system developed on the basis of these sources enables the comparison of Czech and English despite the different approaches to word classes in the two languages. This system contains the categories of *nouns*, *adjectives*, *pronouns*, *numerals*, *verbs*, *adverbs*, *prepositions*, *conjunctions*, *interjections*, *particles*, and *articles*. Quantifiers, which in some English grammars are dealt with as a separate category, are classed as subcategories of adverbs, pronouns and numerals (indefinite numerals in Czech correspond to English quantifiers and are classed as quantifiers within the category of numerals). Demonstratives and possessives are classed as sub-categories of pronouns.

### Prosodic prominence

Connected speech is divided by means of intonation into *tone units* (Crystal 1969), termed by other representatives of the British 'contour analysis' *tone groups* (O'Connor and Arnold 1973), or *intonation groups* (Cruttenden 1986). Tone units may correspond to clauses or smaller grammatical units, e.g. noun or adverbial phrases; a tone unit may consist of a single word. A tone unit is a segment of speech identified phonologically as a unit containing one peak of prominence (though some authors recognize intonation units containing no peak (e.g. Chafe 1994.58) or two prosodic peaks (e.g. Chafe 1994.58, Palková 1994.290, 305) and divided from neighbouring tone units by tone unit boundaries.<sup>1</sup> 'Contour analysis' works with four degrees of prosodic prominence of different types of stress occurring within the tone unit (see Crystal 1969.207-235, Cruttenden 1986.21, O'Connor and Arnold 1973.1-37):

- (i-a) absence of stress
- (ii-a) unaccented/tertiary stress
- (iii-a) accented/secondary stress (pitch-prominent stress)
- (iv-a) accented nuclear/primary stress (nucleus)

The scale of prosodic prominence that most authors dealing with Czech intonation seem to distinguish has three degrees (see Palková 1994, Daneš 1957, Dokulil et al. 1986, Krčmová in Karlík et al. 1995):

- (i-b) absence of stress
- (ii-b) stress (main stress, word stress)
- (iii-b) intonation centre (sentence stress)

The focus of this study is the occurrence of the most prominent stress, as opposed to the other types of stress (degrees of prominence). The highest degree of prominence in the two scales above is represented by (iv-a) and (iii-b). Since the definition of (iv-a) (usually the last accented syllable in a tone unit) corresponds to the definition of (iii-b) (the stressed syllable of the last rhythm group of a tone unit), the discrepancy between the two scales as well as the terminological differences can be ignored.<sup>2</sup> The most prominent stress will be referred to in this study as the nucleus.

Nuclei in the examples in this paper are denoted by tonetic marks indicating pitch direction (rising, falling); pitch range (high, low) is not indicated.<sup>3</sup> Below is a list of the tonetic marks used in this study.

<sup>1</sup> For a more detailed description of tone unit boundaries and the structure of a tone unit see Crystal e.g. 1969.206-207 or Cruttenden 1986.24, 39-40.

<sup>2</sup> For a more detailed comparison of the two systems see Chamonikolasová 1998.4-21.

<sup>3</sup> For more information on pitch direction and pitch range of nuclei see e.g. Crystal 1969, Cruttenden 1986, O'Connor and Arnold 1973.

\	fall
/	rise
∨	fall-rise
∧	rise-fall
=	level

In addition to marks denoting nuclei, the examples contain the ‘pipe’ symbols (“|”) denoting non-nuclear accented (i.e. secondary) stress.

### The capacity of different word classes to signal prosodic prominence

The present study of the relation between word class status and prosodic prominence is based on the analysis of two semantically equivalent (or nearly equivalent) texts: the original Czech version of the play *Protest* by Václav Havel (1992) and its English translation by Věra Blackwell (Havel 1990), as they were broadcast by Czech radio and by BBC radio.<sup>4</sup> In order to achieve a high degree of correspondence, all sections of the two texts that do not have an equivalent passage in the other text have been excluded from analysis. The analysis covers approximately one fourth of the entire text of each version. The Czech version, referred to as *Protest-Cz* consists of 967 words occurring in 253 tone units. The English version, referred to as *Protest-En* consists of 1237 words in 269 tone units. Below are extracts of the examined texts containing prosodic transcription and word-class tags. The texts are divided into separate tone units denoted by serial numbers. The serial number of the English tone units indicates the relation between the English and the Czech texts (e.g. tone units 16901 and 16902 of the English version correspond to tone unit 169 in the Czech version).

- 156,S,∧ne(Par)#  
 157,S,=nezlobte(V) se(Pro) Ferdinande(N)#  
 158,S,ale(Con) vy(Pro) . !nežijete(V) v(Pre) !normálním(Adj) \prostředí(N)#  
 159,S,!stýkáte(V) se(Par) jenom(Par) s(Pre) =lidmi(N)#  
 160,S,kteří(Pro) !tomu(Pro) všemu(Pro) !dokáží(V) \čelit(V)#  
 161,S,!dodáváte(V) si(Pro) . !vzájemně(Adv) \naději(N)#  
 162,S,kdybyste(V, Par) ale(Con) =věděl(V)#  
 163,S,v(Pre) !čem(Pro) musím(V) žít(V) \já(Pro)#  
 000,S,buďte /rád#  
 000,S,že s tím !vším už !nemáte nic \společného#  
 164,S,!člověku(N) se(Pro) . z(Pre) toho(Pro) !obrací(V) \žaludek(N)#  
 165,V,!myslíte(V) jako(Par) v(Pre) \televiz(N)i#  
 166,S,ale(Con) v(Pre) =televizi(N)#  
 167,S,=ve(Pre) filmu(N)#

<sup>4</sup> The broadcast texts deviate from the published book versions considerably.

168,S,\všude(Adv)#  
 169,V,v(Pre) \televizi(N) vám(Pro) \nedávno(Adv) něco(Pro) /\u00e1dávali(V)#  
  
 15671,S,now(Int) \forgive(V) me(Pro) \Ferdinand(N)#  
 15800,S,but(Con) you(Pro) don't(V, Par) \happen(V) to(Par) \live(V) in(Pre) a(Art)  
     \normal(Adj) en\\_\environment(N)#  
 15901,S,you(N) are(V) \mixed(V) with(Pre) \people(N) who're(Pro, V) \making(V)  
     a(Art) /stand(N)#  
 16100,S,you(Pro) \give(V) each(Pro) other(Pro) /hope(N)#  
 00000,S,and(Con) en\\_\couragement(N)#  
 16200,S,you've(Pro, V) no(Par) i\dea(N)#  
 16300,S,the(Art) \sort((N) of(Pre) en\\_\environment(N) \I've(Pro, v) got(V) to(Par) put(V)  
     \up(Adv) with(Pre)#  
 16400,S,it(Pro) really(Adv) \turns(V) your(Pro) \stomach(N)#  
 16500,V,you(Pro) \mean(V) in(Pre) \television(N)#  
 16600,S,\television(N)#  
 16700,S,\film(N) \studios(N)#  
 16800,S,you(Pro) \name(V) it(Pro)#  
 16991,V,you(Pro) \had(V) \something(Pro) on(Pre) the(Art) \box(N)#  
 16992,V,the(Art) other(Pro) /\night(N)#

The results of the analysis of the relation between word class status and prosodic prominence are given in Tables 1 and 2 and Figures 1 and 2 below. The data have been acquired through FoxPro processing.

**Table 1**  
**Distribution of word classes**

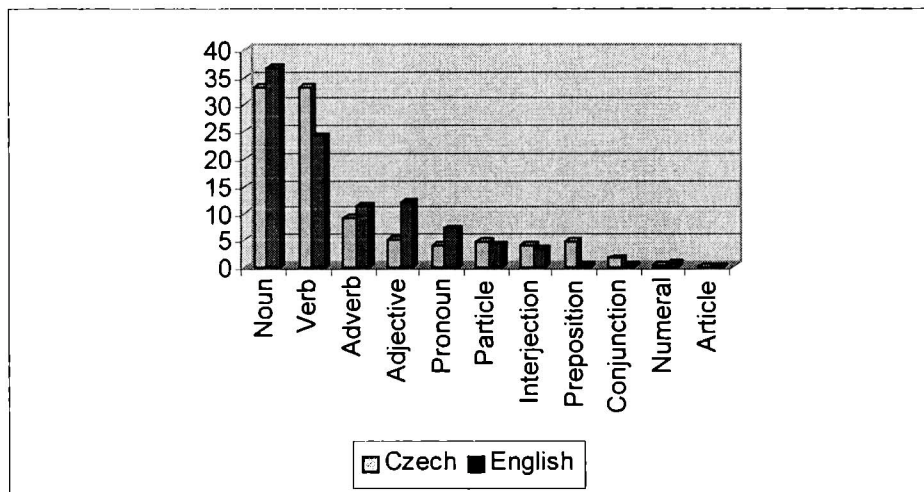
Word class	Protest-Cz Nucleus-bearing words		Protest-En Nucleus-bearing words		Protest-Cz All words		Protest-En All words	
	Occ.	%	Occ.	%	Occ.	%	Occ.	%
Noun	84	33.2	99	36.8	150	15.5	182	14.7
Verb	84	33.2	65	24.2	227	23.5	273	22.1
Adverb	23	9.1	30	11.2	149	15.4	119	9.6
Adjective	13	5.1	32	11.9	48	5.0	67	5.4
Pronoun	10	4.0	19	7.1	209	21.6	304	34.6
Particle	12	4.7	11	4.1	31	3.2	54	4.4
Interjection	10	4.0	9	3.3	28	2.9	24	1.9
Preposition	12	4.7	1	0.4	57	5.9	97	7.8
Conjunction	4	1.6	1	0.4	62	6.4	44	3.6
Numeral	1	0.4	2	0.7	6	0.6	9	0.7
Article	0	0.0	0	0.0	0	0.0	65	5.6
Total	253	100.0	269	100.1	967	100.0	1237	100.4

Table 1 displays the ratios of different word classes in the examined texts. Column 1 contains the list of the major word-class tags; columns 2 and 4 give the actual occurrences of the individual word classes within the **nucleus-bearing words** in the examined texts; these figures are followed by percentual representation (i.e. occurrence within one hundred nucleus-bearing words) in columns 3 and 5; the occurrences and percentual representation of the different word classes within **all** (i.e. nucleus-bearing and non-nucleus-bearing) words in the examined texts are given in columns 6-9.

The most frequent word classes within **nucleus-bearing words** are the noun and the verb. In Czech the ratios of nouns and verbs are equal (33.2%) while in English nouns are considerably more frequent (36.8%) than verbs (24.2%). Nucleus-bearing nouns and verbs are followed in frequency by adverbs and adjectives. The ratios of adverbs and adjectives are almost equal (11.2% and 11.9%) in the English text while in Czech adverbs are much more frequent (9.1%) than adjectives (5.1%). Pronouns represent 7.1% of all nucleus-bearing words in English and only 4.0% in Czech. Still relatively important as nucleus bearers are particles (4.7% and 4.1%) and interjections (4.0% and 3.3%); the remaining word-class categories display a very low prosodic prominence though nucleus-bearing prepositions in Czech, owing to cases of compulsory shift of the nucleus from the noun to the preposition (cf. Karlík et al. 1995:45), represent as much as 4.7% of all nucleus-bearing words. The comparison of word-class distributions in Czech and English based on data from Table 1 is illustrated by Figure 1 below.

**Figure 1**  
**Distribution of word classes as nucleus bearers**

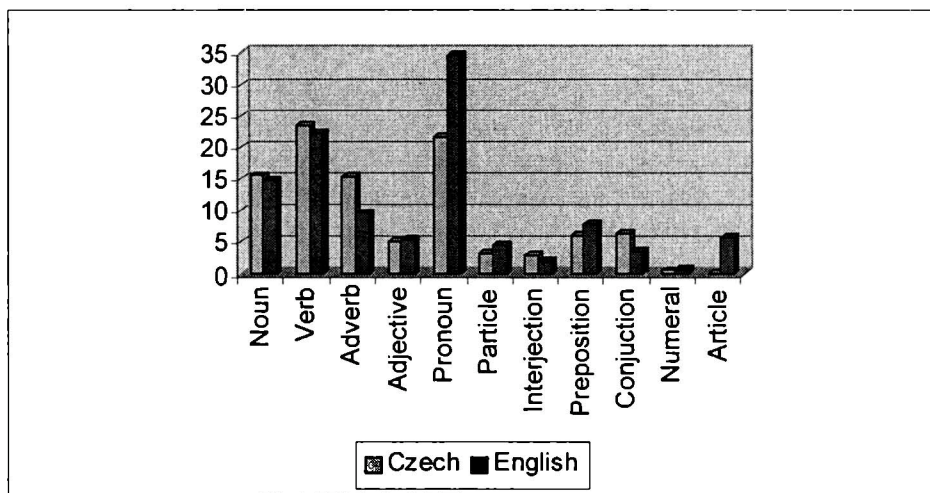
Per cent



The distribution of word classes within **all words** (i.e. non-nucleus-bearing and nucleus-bearing) in the examined texts (columns 6-9 of Table 1) differs considerably from the distribution within nucleus-bearing words (columns 2-5 of Table 1). The most frequent word classes are the verb (23.5% and 22.1), the pronoun (21.6% and 34.6%), the noun (15.5% and 14.7%), and the adverb (15.45% and 9.6%). Each of the remaining word classes represent less than 8% of all cases. The comparison of the general word-class distribution in Czech and in English is provided by Figure 2 below.

**Figure 2**  
**Overall distribution of word classes**

Per cent



The capacity of a particular word class to signal prosodic prominence depends on its frequency of occurrence both within nucleus-bearing words and within all words in the examined texts. The two different figures are related in Table 2 below, displaying the capacity of different word classes to signal prosodic prominence. The coefficients in Table 2 are the result of dividing the figures in columns 3 and 5 by the figures in columns 7 and 9 of Table 1.

**Table 2**  
**Coefficients indicating the capacity to signal prosodic prominence**

Word class	Protest-Cz	Protest-En
Nouns	2.1	2.5
Verbs	1.4	1.0
Adverbs	0.6	1.2

Word class	Protest-Cz	Protest-En
Adjectives	1.0	2.2
Pronouns	0.2	0.3
Particles	1.5	0.9
Interjections	1.4	1.7
Prepositions	0.9	0.1
Conjunctions	0.3	0.1
Numerals	0.7	1.0
Articles	0.0	0.0

The capacity to carry prosodic prominence seems to be highest with English nouns (2.5) and adjectives (2.2). Czech nouns and especially Czech adjectives are less powerful than English nouns, the coefficients being 2.1 for nouns and only 1.0 for adjectives. High coefficients have also been acquired for English and Czech interjections (1.7 and 1.4), Czech particles (1.5) and Czech verbs (1.4). The coefficients for English particles and verbs are lower (0.9 and 1.0). On the other hand, English displays higher coefficients for adverbs (1.2 compared to 0.6) and numerals (1.0 compared to 0.7). The capacity of the remaining word classes to signal prosodic prominence is very low with the exception of Czech prepositions (0.9) which often take over the nucleus from the following noun.

### Summary

The present paper is a study of the relation between the word-class status and the prosodic prominence of words in Czech and English. The most frequent word classes occurring in parallel English and Czech spoken texts seem to be verbs (representing 23.5% of all Czech words and 22.1% of all English words), pronouns (21.6% in Czech and 34.6% in English), nouns (15.5% in Czech and 14.7% in English), and adverbs (15.4% in Czech and 9.6% in English). Within the group of nucleus-bearing words, the most frequently represented word classes are nouns (33.2% in Czech and 36.8% in English) and verbs (33.2% in Czech and 24.% in English). The distribution of word classes within nucleus-bearing words (cf. Table 1) suggests that the prosodic prominence of nominal word class categories is higher in English than in Czech. The category of verb, on the other hand is more frequent in Czech than in English. The capacity of different word classes to signal prosodic prominence is in this study expressed by a coefficient based on the relation between the frequency of a word class within all words of the texts and its frequency within nucleus-bearing words. This coefficient is clearly highest for English nouns (2.5), English adjectives (2.2) and Czech nouns (2.1).

### ABBREVIATIONS

N	noun
V	verb
Adv	adverb
Adj	adjective



Pro	pronoun
Par	particle
Int	interjection
Pre	preposition
Con	conjunction
Num	numeral
Art	article

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