

PERCEPTION OF ENGLISH WORD ACCENTUAL PATTERNS
IN THE SPEECH OF L₂ LEARNERS OF ENGLISH

L.Y.KUKOLSHCHIKOVA

I.V.PANKOVA

Dept. of Phonetics
Leningrad State Univ.
Leningrad, USSR, 199034

ABSTRACT

Perception by American subjects of English iambic and trochaic words spoken by L₂ learners of English whose native tongues were Russian, Chinese and Kirghiz has shed some light both on universal and specific properties of English word stress. The results seem to be helpful in practical pedagogical work.

Recent findings in the domain of word stress have been mostly connected with its perceptual aspect, human linguistic experience being in its centre, as Bondarko /1/ puts it. Within the frame of such an approach one can place studies on perception of distorted word accentual patterns. It is a widely known fact that target-language word accentual patterns suffer great changes in the speech of foreign language learners. Experimental perceptual studies of such patterns have become popular and contribute both to understanding stress as a language universal and to providing guide-lines in practical pedagogical work.

INTRODUCTION

In English word stress, as is well known, one can find the whole array of phonological problems: first and foremost, it plays an important role in organizing, recognition and discrimination of words. Another problem concerns the existence of degrees of stress. A specific feature of English stress is the occurrence of full grade quality vowels in pretonic and post-tonic syllables. In the latter case Gimson /2/ speaks about prominence of unstressed syllables. Then a question arises as to whether these two linguistic notions have anything in common with linguistic experience of English speakers. An experimental study conducted by Nadi-baidze /5/ provided no evidence in support of the existence of four distinctive degrees of stress in AE and seemed to confirm the view expressed earlier by Zinder /7/ that discrimination of the degrees of stress in phonetic terms is hardly possible. It may only have phonemic value.

METHODS AND MATERIAL

The present study was aimed at investigating the perception by American subjects of accentually distorted words in non-native pronunciation. The non-natives chosen for the experiments were Russian, Chinese and Kirghiz speakers. The languages they represented either distantly resembled English or crucially differed from it in terms of stress function in the phonetic systems of the languages under study as well as in the stress pattern manifestation.

Russian word stress is known to be an efficient means of combining syllables of a word into a close-knit unit. The existence of stress in Chinese has been proved by experimental investigations /6/. However, the viewpoint depriving Chinese of both the word in its classical form and word stress is not uncommon /4/. In a vowel harmony bound word of the Kirghiz language the main stress is traditionally assigned to the last syllable. Coexistence of two prosodic layers/stress and vowel harmony/ seems to be doubtful. Cross-language investigation in this study was not an end in itself. Cross-language interference has been used here as a natural means of modifying the accentual structure of a word in a predictable direction.

The inventory of linguistic material consisted of 135 English iambic and trochaic words, two syllable in size, with all the monophthongs possible both in stressed and unstressed syllables. The words were embedded in a contextually neutral carrier-phrase. The material was recorded by two Americans, two Russians, two Chinese and a Kirghiz speaker. The tokens produced by Americans were used as reference material. While recording the material, care was taken to ensure that the target-words were in a phrase-nuclear position. The tone was falling.

The team of trained phoneticians has chosen a set of 500 stimuli both close to the standard stress patterns and deviant from them.

The first listening test /Experiment I/ was designed to test American subjects on their ability to define accentual patterns in the presented material. The subjects were American students enrolled in a Russian language programme at The Leningrad State University. The procedure was the following: the subjects were asked to listen to experimental phrases and define the accentual patterns of the target words, i.e. the number of syllables and stress placement, using the symbols $\bar{\cdot}$, $\bar{\cdot}$, $\bar{\cdot}$. /To keep the experiment within the limits of feasibility, several subsets were prepared/.

RESULTS AND DISCUSSION

The results were evaluated by a sign test. The stimuli were divided into two major groups: the first, where our subjects displayed complete consistency in their judgements disregarding whether they identified the right or the wrong stress pattern, and the second group where their responses were inconsistent. /In TABLES I-IV: S1, S2 - American speakers, S3, S4 - Russian speakers, S5, S6 - Chinese speakers, S7 - Kirghiz speaker/.

TABLE I. Data on the perception of all the stimuli.

Speakers	Patterns	Consistent judgement, %		Inconsistent judgement, %	
		right	wrong	right	wrong
S1	$\bar{\cdot}$	78	0	22	
	$\bar{\cdot}$	74	0	26	
S2	$\bar{\cdot}$	91	0	9	
	$\bar{\cdot}$	88	0	12	
S3	$\bar{\cdot}$	87	0	13	
	$\bar{\cdot}$	97	0	3	
S4	$\bar{\cdot}$	90	0	10	
	$\bar{\cdot}$	88	0	12	
S5	$\bar{\cdot}$	70	2	28	
	$\bar{\cdot}$	96	0	4	
S6	$\bar{\cdot}$	68	0	32	
	$\bar{\cdot}$	56	0	44	
S7	$\bar{\cdot}$	39	47	4	
	$\bar{\cdot}$	59	29	12	

The following observations can be made from TABLE I. There were no wrong judgements of accentual patterns in the stimuli pronounced by Russian and Chinese speakers. The opposite results were obtained for the stimuli spoken by the Kirghiz speaker. He was unable to realize the required accentual pattern, stress phenomenon being apparently of no linguistic importance for him.

The group of stimuli inconsistently judged by the subjects was not uncommon even within the group of tokens produced by American speakers. It is in that group that the subjects either placed two stress marks in one word, or shifted the stress mark from the syllable prescribed by the norm.

TABLE II. Data on perception of consistently judged stimuli.

Speakers	Patterns	PERCEPTION, %		
		Standard	Non-standard	one double-stress
S1	$\bar{\cdot}$	61	3	36
	$\bar{\cdot}$	59	3	38
S2	$\bar{\cdot}$	59	3	38
	$\bar{\cdot}$	66	8	26
S3	$\bar{\cdot}$	61	8	31
	$\bar{\cdot}$	71	8	21
S4	$\bar{\cdot}$	62	12	26
	$\bar{\cdot}$	63	10	27
S5	$\bar{\cdot}$	59	9	32
	$\bar{\cdot}$	49	12	39
S6	$\bar{\cdot}$	59	4	37
	$\bar{\cdot}$	59	5	36
S7	$\bar{\cdot}$	52	6	42
	$\bar{\cdot}$	60	4	36

When a t test was applied to the data of TABLE II, the values obtained never reached significance / $t_{05} = 1.96$ /, but for all the speakers the values were rather close to the critical value, especially so for the Kirghiz speaker. It seems that the subjects, when evaluating the accentual patterns of the group under study, found themselves in an ambiguous situation. This ambiguity, or entropy /H/, was subject to testing /3/. In our experiment $H_{max} = 1.58$, $H_{min} = 0$.

TABLE III. Entropy data on the consistently/A/ and inconsistently/B/ judged stimuli.

Speakers	H, BITS OF INFORMATION			
	A: $\bar{\cdot}$	A: $\bar{\cdot}$	B: $\bar{\cdot}$	B: $\bar{\cdot}$
S1	0.67	0.79	1.11	1.16
S2	0.59	0.60	1.13	1.21
S3	0.47	0.63	1.25	1.11
S4	0.65	0.56	1.30	1.26
S5	0.58	0.64	1.29	1.40
S6	0.54	0.52	1.17	1.20
S7	0.69	0.48	1.25	1.16

From comparison of the data it is obvious that the subjects experienced greater difficulties when defining the patterns of the stimuli in group B. To put it figuratively, those stimuli possessed a kind of "eroded", or "loose" structure.

It remained to be seen whether there were any phonetic grounds for assigning the stimuli to that group. At the present stage of the study we were content with evaluating the quality of vowels in unstressed syllables by ear.

The stimuli obtained from American speakers were those with full vowels in unstressed syllables. It is of interest that the entropy values calculated for all the stimuli produced by S1 were different for tokens containing / $\bar{\cdot}$ /, / $\bar{\cdot}$ /, on the one hand, and for full vowels in unstressed syllables, on the other hand, the values being 0.66, 0.78, 0.97 for iambic words and 0.65, 0.65, 0.95 for trochaic ones, respectively. The occurrence of full vowels in unstressed syllables seems to bring about ambiguity in defining the accentual pattern.

Unstressed vowels produced by Russian speakers were considerably reduced both in quality and quantity. Nevertheless there was a group of stimuli where unstressed vowels seemed to be less obscured, where our subjects displayed a tendency to the increase of inconsistency.

As TABLE I indicates, inconsistency was most pronounced for Chinese speakers. The explanation of this tendency might be the preservation of tonal features in both stressed and unstressed syllables, tone I and tone IV being the most common associations with characteristics of both syllables of the word, as well as the relative pitch difference between them, as judged by ear.

In the experimental words pronounced by the Kirghiz speaker the unstressed vowels stood out both for quality and quantity which led the subjects to perceive them as stressed.

In planning Experiment I we started from the idea that a thick foreign accent would obscure the segmental structure and hence the meaning of the words under study. Our subjects were, therefore, expected to evaluate the accentual structure proper.

Experiment II was designed to test the validity of the results of Experiment I. The experimental material composed of randomly chosen stimuli of both A and B groups was presented to a group of 6 subjects in white noise /s/n ratio = -4dB/. Subjects were asked to tick the word in the carrier-phrase and mark stress /stresses/. Comparison of data of both experiments is given in TABLE IV.

As can be seen, the subjects' responses in Experiment I and Experiment II collapsed into the same groups with respect to their consistency and inconsistency. Thus,

the procedure in Experiment I seems to receive a certain support. /It is worth noting that the data on perception of both iambic and trochaic words, pronounced by speakers 3-7 as well as of the whole experimental set of stimuli of reference speakers were combined/.

TABLE IV. Data on perception of stimuli in Experiment I and Experiment II.

Speakers	PERCEPTION, %					
	Experiment I		Experiment II			
	Standard	Non-standard	Standard	Non-standard		
		one/double-stress		one/double-stress		
S1, S2	88	4	13	72	10	18
S3	88	3	9	94	1	5
S4	86	4	10	86	8	6
S5	78	5	17	69	5	26
S6	77	3	20	70	5	25
S7	81	2	17	68	6	26

In summary, the results of both experiments seem to shed some light on universal and specific properties of English word stress. From the point of view of native subjects' perception the linguistic material was divided into two main groups. In patterns with / $\bar{\cdot}$ / and / $\bar{\cdot}$ / in unstressed syllables the subjects found no difficulty in stress placement, though one might expect phonetic manifestation of stress to vary in the production of non-native speakers. These findings can be treated as manifestations of the universal character of the stress phenomenon. In structures with unstressed full vowels, stress failed to perform its organizing function. It is this group of stimuli that gives us a hint of the specific nature of English word stress. The findings reported here do not contradict what is known about intimate links of word and phrase prosody in English. In a once-observed production of a sentence "We've got a 'canteen, 'too", the nuclear tone occurred on a pretonic /according to the norm/ syllable / $\bar{\cdot}$ /. May not this shift of stress be attributed to the fact that for the English language speaker it is the rhythmic group and not the word that is of great importance both in language production and perception, as has been put by Kassevich? /personal communication/.

The reported data seem to have a certain instructional value for those involved in foreign language teaching. The knowledge of the universal and specific nature of word stress in a target and in native languages may contribute to devising a successful strategy in word accentual pattern training. Especially reassuring seems to be the finding that perception of stress

may not be hindered by its varying phonetic manifestation in the speech of L₂ learners of English.

REFERENCES

- /1/ L. Bondarko, Phonetic Description of Language and Phonemic Description of Speech, Leningradsky Universitet, Leningrad, 1981 (in Russian).
- /2/ A.C.Gimson, An Introduction to the Pronunciation of English, Second Edition, Edward Arnold, 1970.
- /3/ A. Yaglom, I. Yaglom, Probability and Information, Moskva, 1957 (in Russian).
- /4/ V. Kassevich, Phonological Problems of General and Oriental Linguistics, Moskva, Nauka, 1983 (in Russian).
- /5/ Y. Nadibaidze, Degrees of Stress: their Functions and Manifestations in AE, Leningrad, 1982, unpublished dissertation (in Russian).
- /6/ N. Speshnev, Chinese Phonetics, Leningradsky Universitet, Leningrad, 1980 (in Russian).
- /7/ L. Zinder, General Phonetics, Moskva, Vysshaja Shkola, 1979 (in Russian).