

## FALLING WORD TONES IN SERBO-CROATIAN (II)

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In an earlier paper (ARIPUC 4, 1969) I examined the falling word tones in Serbo-Croatian. The purpose of that investigation was to examine whether wordforms with two falling tones differ first and foremost in length, or whether the highly different tone contours are in themselves sufficient to establish a distinction between the tones.

At the time when my first investigation was made, there was no possibility of making experiments with synthetic speech at the Institute of Phonetics, so it was made in a rather primitive way, the stimuli being produced by a linguistically trained native speaker. However, it is now possible to produce intelligible synthetic words and thereby to produce sets of stimuli for listening tests by keeping certain parameters constant whilst others are varied.

Thus 24 synthetic words of the type grad were produced, the parameter of tone being kept constant, whilst the parameters of duration and intensity were varied, and vice versa. The word grad in Serbo-Croatian means, when pronounced [grǎ:d], town, and when pronounced [grǎd], hail. The tone movement of the former is a rising-falling curve with a peak in the first third of the vowel. The latter has no characteristic tone movement, but may be rising-falling (with a peak in the middle of the vowel), rising, falling, or level according to the sentence intonation.

The 24 synthetic words were recorded on tape in a quasi-random order and played back to a number of native speakers who were to decide on the meaning of each test item. The tone movements, durations and intensities of the synthetic words are given in table 1.

TABLE 1  
[grɔd] with various duration, tone, and intensity  
movements

	duration in cs.	tone in cps.			intensity movement
		beg.	peak	end	
1.1	10	100	130	75	level
1.2	15	-	-	-	-
1.3	20	-	-	-	-
1.4	10	110		100	-
1.5	15	-		-	-
1.6	20	-		-	-
2.1	10	100	130	75	+ 3 db
2.2	15	-	-	-	-
2.3	20	-	-	-	-
2.4	10	110		100	-
2.5	15	-		-	-
2.6	20	-		-	-
3.1	10	100	130	75	- 3 db
3.2	15	-	-	-	-
3.3	20	-	-	-	-
3.4	10	110		100	-
3.5	15	-		-	-
3.6	20	-		-	-
4.1	26	100	130	75	level
4.2	-	-	-	-	+ 3 db
4.3	-	-	-	-	- 3 db



TABLE 1  
(continued).

	duration in cs.	tone in cps.			intensity movement
		beg.	peak	end	
4.4	26	110		100	level
4.5	-	-		-	+ 3 db
4.6	-	-		-	- 3 db

As for the stimuli presented under 4.1 - 4.6, all listeners decided without hesitation on the meaning town, whereas there was a clear uncertainty about the items 1.2, 1.5, 2.2, 2.5, 3.2, and 3.5, that is, the words with a duration of 15 cs, but with varying tone and intensity movements. There was a general agreement on the meaning hail of the words with a duration of 10 cs (i.e. items 1.1, 1.4, 2.1, 2.4, 3.1, and 3.4) and on the meaning town of the words with a duration of 20 cs (i.e. items 1.3, 1.6, 2.3, 2.6, 3.3, and 3.6) (both with a variety of tone and intensity movements).

The conclusion to be drawn from these data must be the same as in my earlier paper, that is, that the other parameters do not seem to have any effect on the identification. The distinctive feature of the falling word tones in Serbo-Croatian is duration, not tone movement. The intensity movement does not play any role in the identification, which was one of the open questions in the earlier investigation.

References

- Jacobsen, Per 1968: "The word tones of Serbo-Croatian, an instrumental study" ARIPUC 2, p. 90-108
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- Lehiste, Ilse and P. Ivić 1972: "Experiments with synthesized Serbocroatian tones" Phonetica 26, p. 1-15