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Tatjana Srebot-Rejec

Word Accent and Vowel Duration in Standard Slovene

An Acoustic and Linguistic Investigation

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TATJANA SREBOT-REJEC

WORD ACCENT AND VOWEL DURATION IN STANDARD SLOVENE

An Acoustic and Linguistic Investigation

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1988

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Tatjana Srebot-Rejec

Ljubljana, March 1988

CONTENTS

00050414

TABLES

FIGURES

ABBREVIATIONS

SS	Standard Slovene as spoken by educated speakers in Ljubljana
SSKJ	Slovar slovenskega knjižnega jezika (Dictionary of SS)
Ju, Ka, Pi	speakers
Lo, Sn	interpreters (identifiers, judges, listeners)
Lo = Sn = SSKJ	agreement concerning type of accent between Lo, Sn and SSKJ
Lo = Sn	Lo and Sn agree in their interpretation
Lo ≠ Sn	Lo and Sn disagree in their interpretation
FoP	fundamental frequency pattern (in sonagrams)
FoC	fundamental frequency contour (in sonagrams)
IP	indeterminate pattern (FoP in sonagram is indeterminate)
R	rising (adj.) or a rise (noun)
F	falling (adj.) or a fall (noun)
RF	rising–falling (adj.) or a rise–fall (noun)
FR	falling–rising (adj.) or a fall–rise (noun)
L	level
(•)	(above and following word) less distinct
•	(above and following word) very distinct

´	(above long accented vowel or *r*) acuted according to SSKJ
^	(above long accented vowel or *r*) circumflexed according to SSKJ
`	(above the short accented vowel /ə/) acuted according to SSKJ
˵	(above short accented vowels and /ə/) circumflexed according to SSKJ
‾	(above long accented vowel) either acuted or circumflexed according to SSKJ
x	(in tables) sonagram not clear, generally of too low frequencies to be measured
w.t.	word type
avgd.	averaged
typ.	typical
dist.	distinct
p.m.	pitch movement
t.	tonic
pret.	pretonic
postt.	posttonic
pos. p.m.	positive pitch movement
neg. p.m	negative pitch movement
' or ˈ	(before syllable) stressed

:	(after vowel) long
V	vowel
C	consonant
GP	general principle
2–4	vowel in position 2 of a word containing 4 letters
6–6	vowel in position 6 of a word containing 6 letters
>	(computer symbol) long vowel
<	(computer symbol) short vowel
○	average value of stressed vowel (in figs. in Ch. 3)
△	average value of poststressed vowel (in figs. in Ch. 3)
□	average value of prestressed vowel (in figs. in Ch. 3)

TECHNICAL TERMS AS USED IN THIS INVESTIGATION

accent, word accent syllable or unit where culmination of prosodic features inherent in a word (stress, length, pitch, intensity) occurs

circumflex type of word accent (accent 1), "falling"

acute type of word accent (accent 2), "rising"

barytone accent not on final syllable of word

oxytone accent on final (or only) syllable of word

00050414

tonic accented syllable

posttonic postaccented syllable

pretonic preaccented syllable

pitch movement difference in pitch between beginning and end of tonic (or posttonic)

positive pitch movement end of tonic (posttonic) higher in pitch than beginning

negative pitch movement end of tonic (posttonic) lower in pitch than beginning

contour direction of movement of tonic, (or tonic + posttonic)

jump difference in pitch between end of tonic and beginning of posttonic

jump up positive difference in pitch

jump down negative difference in pitch

intensity depending on amplitute in physical terms, perceived as loudness in auditory phonetics

intensity peak highest point of the amplitude display of an accented unit in a sonagram

duration measured length of time in acoustic phonetics, length in auditory phonetics

concave having a falling-rising contour

convex having a rising-falling contour

fundamental frequency pattern (FoP) pitch contour of accented + postaccented syllable in sonagrams with barytones

fundamental frequency contour (FoC) pitch contour of accented syllable with oxytones

voice range the highest and lowest frequencies of a FoP or FoC and the difference between them

intrinsic (inherent) duration duration of a vowel as determined by its phonetic quality

intrinsic (inherent) frequency of a vowel frequency of a vowel as determined by its phonetic quality

a typical circumflex having a ˆ FoP + ˆ Lo + ˆ Sn

a typical acute having an ˊ FoP + ˊ Lo + ˊ Sn

a (typical) circumflex having a ˆ FoP + ˆ or ˆ (•) Lo + ˆ or ˆ (•) Sn

a (typical) acute having ˊ FoP + ˊ or ˊ (•) Lo + ˊ or ˊ (•) Sn

tonematic (phonological term) having word accent

preemphatic 1 position immediately before an emphatic word

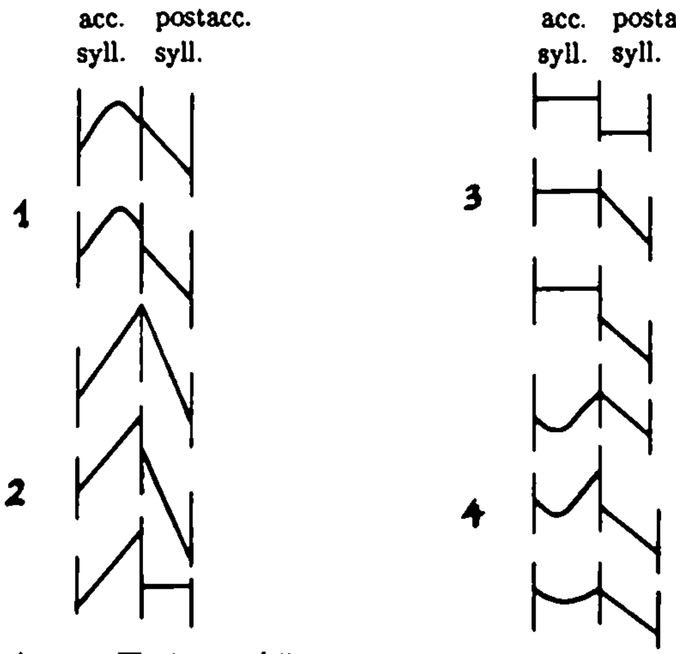
preemphatic 2 position two words before an emphatic word

postemphatic 1 position immediately after an emphatic word

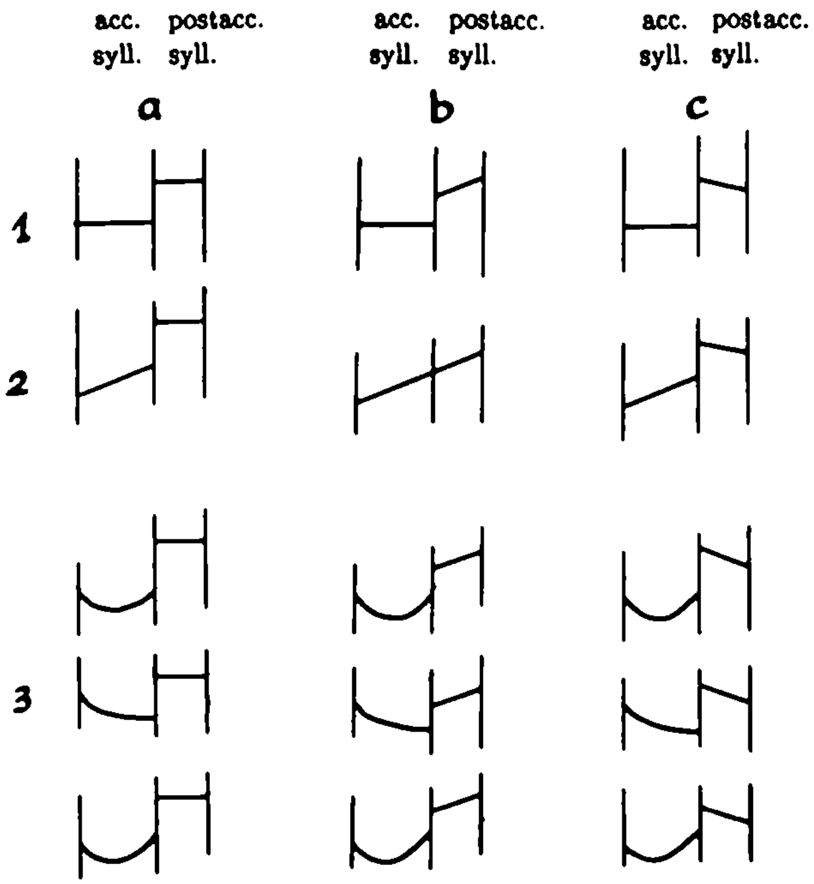
postemphatic 2 position two words after an emphatic word

FUNDAMENTAL FREQUENCY PATTERNS (FoPs)
(stylized)

Accent I: Circumflex (ˆ)



Accent II: Acute (′)



Chapter 1

A SHORT SURVEY OF SLOVENE TONEMATICS UP TO THE PRESENT

1.1 Tonematic Slovene, with its opposition between accent 1 and accent 2, also called the circumflex and the acute, is still spoken in the central dialects of Upper Carniola, Lower Carniola, in the Slovene dialects in Austrian Carinthia, in the Upper Soča Valley, in Slovene Venetia in Italy and in a part of Bela Krajina. The actual realization of the two word accents, however, differs from region to region.

Ljubljana, the capital of Slovenia, lies at a meeting point of the two large dialect groups of Upper and Lower Carniola, and so the influence of both is felt in the SS as spoken by its inhabitants. This fact has brought about a certain instability as to accent distinction which characterizes the pronunciation of many speakers of SS in Ljubljana (Vodušek, 37; Rigler 1968, 197).

Slovene accentology has a long tradition. The first to notice accent was Valentin Vodnik in his grammar of 1811.

In the 19th century SS was still remote from realization therefore each of the researchers was largely concerned with his own dialect.

1.2 For Luka Svetec (born at Podgorje near Kamnik, Upper Carniola) writing in 1863* the difference between the circumflex and the acute is in intensity. In oxytones the intensity peak is at the beginning of the syllable with the circumflex, and at the end with the acute; in barytones on the accented syllable with the circumflex, and on the postaccented with the acute.

1.3 Three years later Father Stanislav Škrabec (from Ribnica, Lower Carniola) was of the same opinion as Svetec before him, and stated explicitly that the difference between the circumflex and the acute was in the different curve of intensity, not pitch. He was the first to introduce the notion of word accent neutralization under the influence of sentence intonation. He also noticed that the acuted vowel tended to be longer than the circumflexed.

1.4 For Matija Valjavec (from Bela, Upper Carniola) (1897), on the contrary, Slovene accent had to do with pitch differences. He regarded the circumflex falling in tone and the acute rising. He was the first to point out that a circumflex vowel had a high pitch at the beginning and was then falling, whereas with the acute the postaccented syllable was higher in pitch than the accented.

1.5 The Norwegian Olaf Broch during his visit to Slovenia studied Slovene

*I partly follow Toporišič's historical survey of Slovene accentology (1976) for the older authors where the bibliographical data not mentioned here can be found.

as spoken in Ljubljana (pp. 289, 291–292, 311–312, 325–327). In its segmental characteristics it is a form of Slovene strongly under the influence of the dialect of Ljubljana, but in its tonemic characteristics his observations apply to SS as well, as the local and the standard dialects seem to coincide in their tonematic structure. There might be some differences in single words when on account of vowel reductions an open syllable is converted into a closed one, but the tone curves of the two accents should remain the same. Broch's observations indicate that he was a well trained phonetician with a particularly sensitive ear. Broch regards the circumflex as falling in tone and intensity and the acute as rising in tone and intensity. In everyday or in quicker speech the tone curve may not be so marked, especially with the acute; with the circumflex the falling part may be lost. In this case the two accents are held apart by the relatively higher tone of the circumflex, and the relatively lower tone of the acute. But he admitted that in this case they are often difficult to distinguish. He also noticed that the tone continues without any hindrance on the following /m/ or /n/. Broch was also very well aware of the great influence sentence intonation has on the tonic realization of an accented word, i.e. that the realization of the latter depends on its position in a sentence. He explicitly mentions that he has left unanswered the question of which component, intensity or tone, is decisive in the perception of accent in Slovene.

1.6 Fran Ramovš in his description of the dialect of Lower Carniola (1933) and in his historical grammar of the Slovene language (1935) states that the acute is lower in tone, that it can even fall at the beginning before it starts to rise. He represents the circumflex as being convex (a), and the acute as concave (b): a) $\frown$ b) $\smile$.

1.7 Alexander V. Isačenko (1939) regards the acute as rising in tone and intensity, and the circumflex as falling in tone and intensity. He says that on a falling nucleus the acute tends to become a circumflex.

1.8 Francè Bezlaj was the first (1939) to study the quantity of Slovene vowels (pp. 73–93) and also Slovene accent (pp. 97–100) instrumentally by means of a kymograph. He studied both on the same corpus of about 200 words in falling nucleus sentence position. Bezlaj had 4 informants, among them Fran Ramovš.

In his introduction to the chapter dealing with quantity (p. 73) he said that he had to limit himself to the study of vowel duration under the two accents in different positions and to the study of the length relationship between stressed and unstressed syllables. Bezlaj divides vowels into long and short stressed vowels and unstressed (= short) vowels. He measured the vowel length of long vowels with both types of accent in barytones and oxytones. Bezlaj complained that it was in most cases impossible to find minimal pairs that would differ only as to accent type and said that his findings as a result might not be as accurate as he would like them to be. That was also the reason why his findings were of a general character and not detailed. He gives the durations in centiseconds and the number of vibrations of the vocal cords during the articulation of the vowels under study.

Among Bezlaj's findings were the following: of the long accented vowels /a/ was the longest followed by /ọ/, /ẹ/; /o/, /e/; /ə/; /u/ and /i/. He noticed the extra shortness of the last two. Some of his speakers had no systematic difference of length between an acuted and a circumflexed long vowel, while with others the circumflex was longer.

Bezlaj found the vowels of some words to be 50–70% shorter when unstressed than when stressed (p. 89). In his examples the unstressed vowels – regardless of quality – are always shorter than the stressed ones. He admits to having found some cases where the initial unstressed vowel was longer than the following stressed one, but ignored them because he considered such a pronunciation abnormal (p. 89). The idea of the intrinsic duration of vowels depending on vowel quality was still strange to him, inspite of the duration differences found with long vowels. As far as I know Bezlaj was the first to notice that the duration of unstressed vowels increased in proportion to their proximity to a stressed syllable regularly in prestressed position, and less regularly in poststressed position (pp. 92–93).

He found that all vowels had approximately the same vowel frequencies (p. 74).

Bezlaj measured the melody contour of about 200 words and found that with the words which he (and Ramovš?) considered the long circumflex (a) 70% of the words had a rise up to half of their duration, followed by a gradual or steep fall, (b) in about 20% of the cases the contour was level with deviations upwards or downwards followed by a fall in the second half of the contour, and (c) in only 10% of the cases the contour was falling throughout. All the acuted utterances had a rising contour, (a) 50% rising throughout, (b) about 25% after an initial slight fall, and (c) the rest falling some time in the second half of the contour. Bezlaj noticed that the more energetic an utterance the more marked the rise. The less energetic utterances were more likely to be falling throughout.

Practically all Bezlaj's 64 illustrations (pp. 103–117) of the tone contours with both accents are rising on the tonic, although they are on a falling nucleus. With barytones the acute reaches its tonal peak at the very end of the accented syllable and the falling sentence intonation sets in only on the postaccented syllable. Most of the acuted words are not finally accented and are in open syllables. Most of the long circumflexes are on the ultimate syllable, and the tonal peak is followed by a fall on the same syllable.

There are only three circumflexed words not accented on the final syllable in his illustrations – their syllable structure and accent position can thus be compared with the structure of most of the acuted words. In two of these (*na*

00050414

pôsodo, kolôvrat) the tonal peak occurs earlier on the accented syllable than on the acuted accented syllables of words with a comparable syllable structure, while the third circumflex with this structure (*têdən*) is falling throughout. The acuted accented syllables are rising throughout, while the circumflexed contain a rise and the beginning of a fall.

With regard to words accented on a final syllable (24 circumflexed and 4 acuted examples), *dûh* - *debelúh* seem to be allotted to two different accents only on account of their different vowel durations, *zidár* is of relatively low pitch and shares with *stóz* a late peak.

Looking at this series of kymograms one receives the impression that the words must have been pronounced carefully, distinctly and with a certain energy. Bezlaj says (p. 98) that Ramovš articulated his utterances clearly and distinctly but without exaggerating. Toporišič mentions (1967, 81) that Bezlaj and Ramovš schooled their informants how to pronounce their corpus and later they selected the kymograms that they considered typical.

Bezlaj heard slight differences in the quality of some of the vowels in the medium height range depending on whether they were circumflexed or acuted, an observation not shared by any earlier or later researcher.

1.9 The next experimental study on this subject appeared in 1961 when Božo Vodušek published his kymographic study on the nature of the Slovene accent in six Slovene dialects, including SS as spoken in Ljubljana. He worked with six informants, five of them linguists, so chosen that all the main tonematic dialects, except the westernmost, were represented. He had a much smaller corpus than Bezlaj, but his words were often repeated. As he was aware of the different intrinsic pitches of the various vowels (something that Bezlaj had not paid attention to), he studied the two accents on barytones and on oxytones as realized on words containing accented /a/ to avoid the influence of intrinsic vowel pitch. Accent was studied on minimal pairs, where possible. The words were said in groups of several words – that is, all except the last with a rising nucleus and the last with a falling.

His findings, illustrated by diagrams, are that in the pronunciation of Ljubljana (and southern Upper Carniola and Central Lower Carniola) with words accented on the penultimate syllable the melodic contour stretches over the tonic and posttonic: the curve first rises on the tonic and then falls on the posttonic with the circumflex; and it first falls on the tonic and rises on the posttonic with the acute. On account of this and because the tonic is rising on the circumflex and falling on the acute, the relevant characteristic of the circumflex accent is a higher pitched tonic, and of the acute a lower pitched tonic.

Diagrams of words accented on the final syllable do not show any marked difference in their melodic contour between circumflexed and acuted words, both may be only rising in pitch, the circumflexed words being higher in pitch than the acuted. The circumflex should therefore be called the high toned accent, and the acute the low toned. Vodušek thus considers pitch the distinctive feature of the two accents. He further noticed that the pitch oppositions between the two accents were smallest in the utterances of the informant from Ljubljana.

1.10 The short description of presentday word accent in Jaksche (1965, 7) should also be mentioned. It is based on the tone curves of Slovene made on a Grützmacher–Lottermoser pitchmeter in the Slavonic Seminar in Göttingen (Prof. Braun and Dr. I. Mahnken). According to these tone curves the circumflex is a rising–falling accent (convex) and the acute a rising accent, the rise may be preceded by a slight fall (concave).

1.11 Vodušek's work was carried on by Jože Toporišič (1968), who set out to study Slovene tonematics as manifested in its natural surroundings, that is on words in sentences in initial, medial, final and emphatic position. He formed these sentences with 13 barytones (8 expected acutes, 5 expected circumflexes) and 12 oxytones (6 expected acutes, 6 expected circumflexes). All his sentences had 2 versions: one on a falling nucleus, and one on a high rising as declarative questions. To this he added a series of words with expected circumflexes and acutes said with a low rise – an intonation typical of enumeration – and the last with a fall. He had his recorded sentences, as spoken by 5 informants, analyzed on a Grützmacher–Lottermoser pitchmeter in Braunschweig (A detailed description of these sentences is on p. 133).

Toporišič analyzed the sentences of one speaker only, a female speaking SS influenced by the Lower Carniolan dialect. The sentences were interpreted as to accent type by 4 linguists, 3 of them phoneticians, and the speaker of the corpus.

In the sentences with a falling nucleus the expected acuted barytones were perceived as acuted in every case. Some disagreement arose in the circumflexed series, where judge Lo in a neutral sentence intonation position interpreted 4 out of 5 non–emphatically stressed realizations of the same word (*čâka*) as acuted, while in all the other cases the interpreters agreed that the expected circumflexes were realized. In the sentences consisting of oxytones with expected circumflexes all the accented words with their 7 realizations were unanimously considered circumflexed, while in the acuted series the interpreters disagreed in 8 cases out of the total number of 23.

Toporišič studied the following elements of an accented word as they appear in a sentence:

1) he measured the mid–point of the accented vowel in semi tones;
2) with these data he obtained the difference in pitch between an acuted and a circumflexed accented vowel in the same sentence position;
3) he measured the pitch interval between the accented and postaccented

syllable on barytones (always in the middle of the syllable), and the first and second half of the accented syllable on oxytones;

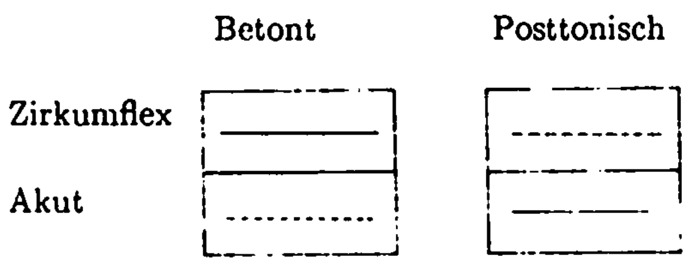
4) he further studied the pitch relationships between the successive pairs of accented and postaccented syllables from initial to final sentence position;
5) and he observed the shape and direction of the tone contours of accented vowels. As to shape a tonic could be: concave, convex, level or convex–concave. As to pitch movement (Toporišič calls it inclination angle) the shape of the tonic could be: rising, falling or level.

Toporišič's English summary of his results follows:

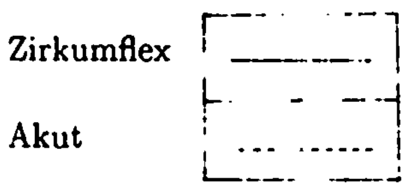
> The main relevant element of the opposition between the acute accent and the circumflex is the difference in the realized height of the arsis (= accented syllable, note T. S.), which is especially significant in the first measure of a segment and generally in the measures under the sentence stress. When this part fails, it can be replaced by the quotient arsis/thesis (thesis = postaccented syllable, note T. S.); when the latter is also neutralized the question of tonemicity is preserved (differently according to different measures, and especially according to sentence intonation) also by the inclination of the shape of the arsis, whereas the weakest distinctive force is given to the shape of the tonic movement of the arsis.

Toporišič represents this in the following 2 figures (1972):

Für Baritona ergibt sich also folgendes Bild:



Bei den Oxytona haben wir natürlich nur:



1.12 This survey, although short, would be deficient if we did not mention the work done on Slovene accentology in lexicography and by lexicographers.

The first and so far the only complete dictionary in which word accent is marked is Pleteršnik's Slovene–German dictionary (1894/95). Its lexicon and accentuation are in many cases out of date or are influenced by various dialects (Rigler 1968, 196). The same applies to inflectional accent alternations as defined by Valjavec, Škrabec, Breznik and Ramovš (Rigler 1968, 196).

1.13 The Dictionary of Standard Slovene of the Slovene Academy of Sciences and Arts (1970, 1975, 1979, 1985) has word accent marked, but is as yet not complete. Four volumes have been published so far, but the last has not yet appeared. When this is completed a norm as to which accent to use with single words will be set. Jakob Rigler, the late editor of this part of the dictionary, however, was very careful not to commit himself (personal communication 24 Nov. 1983) as to what exactly happened phonetically on an acute or circumflex. He distinguished the two accents very well by ear, but could not tell exactly how this was realized in terms of pitch, tone–contour, intensity or length. He therefore preferred the expressions circumflex – acute, and not falling – rising, or high pitched – low pitched. He thought that Toporišič in his study (1968, 1970, 1972) overemphasized the role of pitch to the detriment of the other parameters, especially tone–contour.

In his introduction to the Dictionary Rigler worked out the accent types in inflected forms of presentday SS.

In reply to Kolarič's assertion (in the commentary by Kolarič on the reprinting of Pleteršnik's Dictionary in 1974 at the end of the book) that Slovene word accent should be studied experimentally from dialect to dialect, Rigler said (1976, 286–287)

> that this holds of course only for the *character* (T. S. emphasis) of the intonation, but not at all for the *classification* (T. S. emphasis) of a word as to accent.

gler was convinced that for the identification of the 2 accent types

> the ear was still the most reliable apparatus – naturally an ear tuned to the tonemic system under study.

gler was further of the opinion that

> when identifying accent one should do it live. It is very difficult if not impossible to work with recorded material. It is well known that phonemes and tonemes occur within a certain range and they may be realized on the very border of it or even somewhat beyond it. When later listening to such an utterance one sees that one has not pronounced it well. Listening to the same recorded utterance a hundred times you will hear the same thing a hundred times. But if

a live person repeats an utterance he will pronounce it differently a second time and the phoneme or toneme will be identifiable. Imprecise realizations cannot be solved by experimental methods either.

Rigler looked at the Slovene word accent primarily from the point of view of a lexicographer who is concerned with an accurate accent type identification in the pronunciation of SS speakers in Ljubljana. He was concerned with what Isačenko (1974, 201) called "jeder Wortform zukommende (inhärente) Intonation ausserhalb des Kontextes", and therefore developed this method of working with his informants.

1.14 In actual life of course words appear in context and there is then a perpetual interplay between word-tone and sentence-tone. Toporišič (1968) and Neweklowsky (1973) made their accent studies from this point of view, while Ivić and Lehiste in their earlier sonagraphic studies (1963, 1965, 1967, 1970, 1972) tried to capture accent type in Serbo-Croatian in a neutral sentence intonation position in its "pure" form, and later also in sentences (1978). Both are valid methods so long as you are aware what you are doing.

1.15 Although word accent in Slovene was early identified and its lexicon classified as to accent type in the dictionary by Pleteršnik already by the end of the 19th century, the researchers relying only on their ears have had great problems in describing what actually happens in phonetic terms to the two accents. Broch (p. 325), Vodušek (p. 21), and Toporišič (1967, 64-65), all three agree that based on perception only, it is difficult, if not impossible, to say what exactly happens on an accented syllable in Slovene. We have just mentioned Rigler's opinion on this. Broch attributed this difficulty to the smaller pitch intervals found in Slovene as compared with Serbo-Croatian (p. 326). That the pitch difference between the circumflex and the acute was particularly small in SS as spoken in Ljubljana compared with other Slovene dialects was discovered by Vodušek (p. 31).

Comparing the findings and speculations of all this research with one another and with our sonagraph findings, one comes to the conclusion that most of these observations were right, but incomplete, as the researchers could not see the situation in its entirety, and as clearly as one can do this with the help of modern technology. It is to be hoped that the present investigation will shed some light on the relationship between perceptual interpretation and acoustic representation.

Word accent in Slovene has therefore never been phonetically codified, is ignored in the orthoepic dictionaries and is not taught in schools or university. The general attitude is: word accent cannot be taught, either you have it or you do not. You acquire it in your early youth if you live in tonematic surroundings. So two types of SS exist side by side: the non-tonematic variant and the tonematic one freed of explicit dialect colouring.

* * *

1.16 If we refer to the most important experimental post war research on tonemes in Slovene (Vodušek 1961, Toporišič 1968, Neweklowsky 1973) the present standpoint is: word accent in SS is primarily concerned with pitch relationships between stressed and poststressed syllables in barytones, and in oxytones the role of the stressed and poststressed syllable are telescoped into one syllable. Thus the circumflex accent has a higher tonic and lower posttonic, and the acute a lower tonic and a higher posttonic. On an oxytone the first half of the tonic has the function of the tonic and the second half of the posttonic. The circumflex is thus a high pitched and the acute a low pitched accent. Contour is irrelevant. Neweklowsky in his sonagraphic investigation of Slovene Carinthian dialects found the same conditions in the dialect of Podjunska dolina/Jauntal and in Ziljska dolina/Gailtal, while in Rož/Rosental tone contour of the tonic + posttonic were relevant (1973, 231, 244, 234–235).

Chapter 2

INTRODUCTION

2.1 The aim of this investigation was:

1) to investigate some basic aspects of vowel duration. The first and the last experimental study on vowel duration in Slovene by Bezlaj (cf. pp. 2–3) was incomplete as Bezlaj was the first to point out. Particular attention was paid to the following problems:
   a) is length phonologically relevant in the type of Slovene spoken by educated people in Ljubljana?
   b) what is the relationship between stress and duration?
   c) the influence of intrinsic duration on realized duration;
   d) the length relationship between stressed and unstressed vowels;
   e) the role of syllable structure;
2) to measure the intrinsic frequencies of Slovene stressed and unstressed vowels as nobody had previously done this;
3) to study word accent in SS in its "pure" form, as far as possible independent of sentence intonation, which had not previously been done; to study word accent context free in its intrinsic form; in short to study word accent in the form in which a lexicographer defines word accent from the perceptive angle, while I would try to find out its acoustic correlates;
4) I was further curious to see how far word accent as defined in SSKJ correlates with the actual usage of speakers of SS in Ljubljana (in so far as this is possible to study on so small a corpus as this one);
5) to study word accent under the influence of sentence intonation in greater detail and with more informants than has been done so far; to measure the frequency of accented and postaccented vowels at more points so as to obtain at least a stylized contour and to study its role, and to obtain numerical data on pitch movement; to find out the role length has in connection with accent;
6) as all the acoustic data are irrelevant unless we know how they are perceived I wanted to have them interpreted by at least two tonematicians – to see what constituted a typical circumflex and what a typical acute, to study how accent is perceived: which correlates of accent, if any, are decisive (pitch contour, pitch movement, overall pitch, length) with a certain speaker (or listener) in a certain situation, how these correlates can vary from speaker (listener) to speaker (listener), or from situation to situation, what are the reasons for ambiguous accent type and consequently for differing perceptions.

2.2 Segmental phonemes of SS.

SS has 29 phonemes, 8 vowels and 21 consonants:

high (close)	i						u
		ẹ				ọ	
				ə			
			e		o		
low (open)				a			

Fig. 1 Vowel phonemes of SS

Two e- and o- phonemes exist: open /e/, /o/ and close /ẹ/, /ọ/.

The words in the corpus appear in their ordinary spelling, except the 3 vowel phonemes /ẹ/, /ọ/, and sometimes /ə/ which differ from ordinary spelling. Therefore some basic pronunciation rules of SS should be menioned: The voiced obstruents (non-sonorants) /b, d, g, z, ž, ǯ/ in final position and before

	place of articulation / manner of articulation	bilabial	labiodental	dental	alveolar	postalveolar	palatal	velar
obstruents	plosives	p b		t d				k g
	affricates				c	č ǯ		
	fricatives		f		s z	š ž		x
			v					
sonorants	nasals	m			n			
	laterals				l			
	trills				r			
	glides						j	

Table 1. Consonant phonemes of SS.

voiceless obstruents are pronounced as voiceless [p, t, k, s, š, č]. And vice versa, the voiceless group becomes voiced before voiced obstruents. As seen in the table /c/ and /x/ are the only obstruents without a corresponding voiced phoneme pair, the two corresponding voiced sounds [dz] and [ɣ] being only positional variants (allophones) of /c/ and /x/. – The letter *v* is pronounced as /v/ only before vowels, otherwise as syllabic or non–syllabic /u/ (Srebot–Rejec 1981, 240–241).

2.3 INFORMANTS

A Speakers:

- Ju – a professional singer and student of Slovene at the Teacher Training College (Pedagoška akademija) in Ljubljana. Born at Vevče, a suburb of Ljubljana, in 1958. Has lived there all his life. Both his parents are from Vevče.
- Ka – a professional radio announcer at the broadcasting and TV station in Ljubljana. Born in Dubrovnik in 1950. Both his parents are Serbian. He has lived in Ljubljana since his second month and attended both primary and secondary school in Ljubljana. Ka is bilingual. His Slovene is perfect SS, free of any trace of any Slovene dialect or of Serbo–Croatian.
- Pi – a professional radio announcer at the broadcasting and TV station in Ljubljana. Born in Ljubljana in 1933. His mother was from Upper Carniola (Kamnik) and his father from Inner Carniola (Postojna). Pi spent his holidays in Kamnik in his youth. He attended both primary and secondary school in Ljubljana.

The three male speakers Ju, Ka and Pi were chosen because they all speak SS as spoken in Ljubljana and because of their sonorous voices which yield good sonagrams. They were chosen **completely at random** as far as Slovene word accent is concerned. Their use of word accent should thus show a realistic, not at all idealized, picture of presentday usage of word accent in Ljubljana in so far as 3 speakers only can give a good picture.

B Interpreters of word accent:

- Lo – Slovene dialectologist, university professor, member of the Academy of Sciences and Arts in Ljubljana. Professor Tine Logar was born at Horjul near Ljubljana in 1916. He has analysed about 200 Slovene dialect varieties so far.
- Sn – a Slavicist and a specialist in matters dealing with Slovene word accent. Professor Urška Snedic was born in Kranj (Upper Carniola) in 1937 and has lived there all her life. Sn is a pupil of Tine Logar and has done some field work for him.

Both T. Logar and U. Snedic cooperated with the late Jakob Rigler as main informants in matters of word accent in SSKJ. Both work by ear and identify Slovene word accent auditorily. When identifying accent Logar listens to both the accented and postaccented syllable in barytones, and he listens to both pitch and contour. Snedic says that she concentrates on the pitch contour of the accented syllable, regardless of whether there is a postaccented syllable or not. She considers pitch in absolute terms (acute – low, circumflex – high) irrelevant. What counts is the pitch contour of the accented syllable.

2.4 The CORPUS was recorded in a studio of the broadcasting station of Ljubljana (Ju and Ka in 1981, Pi in 1982) on a Philips stereo 4408 recorder. The tape speed was 7.5 inch./sec. The sonagrams were made at the Pedagoška akademija in Ljubljana on a Kay Sona-Graph Model 6061-B. Three displays were made of each unit: a wide–band sonagram for the study of duration of each syntagm, a magnified narrow–band display for the study of frequency, and an amplitude display for the study of relative intensity.

The speakers were asked to speak at their normal speed, neither slow nor fast, and to keep it up throughout the recording session. Ju and Ka followed these instructions, while Pi's nonsense series and single word series were spoken at a quicker speed than the rest of the corpus.

The corpus consists of:

1) 178 nonsense words (sonagrams 335–513);
2) 125 single word units (sonagrams 557–682);
3) 22 sentences (sonagrams 746–768);
4) 5 semantic accentual minimal pairs (sonagrams 736–745);
5) 7 morphological accentual minimal pairs (sonagrams 537–554);
6) 20 items on vowel duration in oxytones (sonagrams 514–532);
7) 23 items on vowel duration in stressed/prestressed position (sonagrams 269–278).

The text of the corpus is in the appendix. The corpus is described at the beginning of the chapters dealing with the corresponding parts of it.

2.5 It is well known that the sensitivity of an electroacoustic apparatus and that of the human ear differ (for a detailed study of this see Neweklowsky 1973, 49–70). This fact should be kept in mind when evaluating data obtained with a spectrograph. To mention just a few: generally speaking the human ear can perceive vowel quality clearly only when a vowel is at least 40 msecs. long; the pitch changes of a tone contour only if the segment under study is at least 100 msecs. long and the pitch changes amount to at least 14–17.5% of the fundamental frequency (Neweklowsky 1973, 58–59); it appears that in the range of the duration of speech sounds the just noticeable differences in duration are between 10 and 40 msecs. depending on the duration of the sound (Lehiste 1970, 13). On intensity see p. 56.

2.6 Vowel duration was measured in wide–band spectrograms. Since the corpus was recorded in ideal conditions and the speakers were chosen because their voices yielded clear spectrograms, the segmentation into vowels and consonants did not present any additional problems. For the usual problems connected with segmentation see Peterson & Lehiste 1960, 694–698. Vowel duration was defined with the help of voicedness and the corresponding formants. Diphthongs were measured either as one unit or as two in cases where the transition from one vowel to the other was relatively sudden and clear; in both cases the duration of the whole diphthong is evident. When two figures denote the duration of a pure vowel in end position, the first applies to the vowel proper and the second to the period of pure phonation without the particular vowel resonance (i.e. without the formants). In addition to the closure and stop period plosives contain the periods of frication and aspiration at the release stage. In this respect our segmentation differs from that of Peterson and Lehiste. The fricative part of a plosive which with certain speakers in final position may be extremely long was ignored. The measurements of sound duration made on the wide–band spectrograms were helpful for the segmentation of the corresponding narrow–band spectrograms in which the frequency contours of single sound segments were measured. And vice versa: sudden frequency changes in narrow–band spectrograms sometimes helped to segment a less clear transition from one sound to another. The frequencies not only of vowels, but also of sonorants belonging to the same syllable were measured if they formed a continuous unit with the preceding vowel.

2.7 The basics of Slovene accent and the meaning of the word "accent" as used here.

In English, and probably in many other languages, the most important indicator of stress is pitch (Fry 1955, 1958; Bolinger 1958). This is not so in Slovene. Stress and pitch may not coincide. Whether they do or not depends on the word–tone, the tone pattern realized on a word. Another prosodic feature intimately connected with stress and word–tone is length. We shall use the expression word accent or just accent for the result of the interaction between stress, length and pitch as realized on a word in Slovene independently of sentence intonation (Lehiste & Ivić 1978, 100–101). Accent here means the place in a word where the culmination of prosodic features occurs (Hyman 1978, 4).

Stress and accent always coincide in Slovene. Every stressed word can have only one stress and one accent in Slovene. It can be on any syllable of a word, although with a particular word it is generally fixed. This syllable can be either a stem or an ending. There are two distinctive accents in Slovene:

accent 1 (also called circumflex), and accent 2 (also called acute); the former traditionally considered falling, and the latter rising. One can study word accent best when it is realized in neutral sentence intonation position.

When a non-final syllable is accented in a word, the syllable following the tonic, the posttonic, is also important. The phonological feature distinguishing the two accents is the pitch difference between the end of the tonic and the beginning of the posttonic called "the jump" in this investigation. The circumflex accent has a jump down, and the acute a jump up. The domain of accent in this case is the accented and postaccented syllable.

Although the shape and pitch of the tonic are not of crucial importance for accent definition, they support the accent type when we have to do with a typical accent realization.

Vowels can be either stressed or unstressed. Stressed vowels are longer than the same vowel phonemes when unstressed. A stressed vowel is long in the type of educated Slovene as spoken by our three informants. Length is not an independent variable, a phonological feature, but a phonetic one supporting the perception of stress (see p. 211). Although with the acute the posttonic is higher in pitch, and with the circumflex the tonic, it is always the tonic that is perceived as stressed.

Finally accented words have no posttonic and no jump. The most important feature, the one that is of phonological importance with barytones, the jump, is missing in oxytones. The contour of an oxytone can be rising (R), rising-falling (RF), falling-rising (FR), falling (F) or level (L).

The spectrograms show certain recurring contours. In non-finally accented words the accented syllable forms with the following syllable certain patterns which differ with the circumflex and acute. A formalized list of these patterns (FoPs - fundamental frequency patterns) is found on p. XXI.

2.8 Slovene is a pitch accent language.

Hyman (1978, 1-4, 1981, 177-178) distinguishes between (a) tone languages, (b) accent languages and (c) languages which combine tone and accent in intricate ways. Tone is necessarily realized as a particular pitch pattern whereas accent need not be realized as a pitch pattern (i.e. in the case of "stress accent", e.g. English), though accent *can* itself be realized as a pitch pattern, namely in the case of "pitch accent". But Hyman sees the crucial difference in the *function* of tone and accent rather than in their realization: tone is "distinctive", i.e. it involves paradigmatic contrasts; whereas accent is "culminative" in Trubetzkoy's sense - i.e. it involves syntagmatic relations, and, for instance, enables one to identify the number of words in an utterance if all words carry one and only one accent.

Stress accents have no inherent pitch properties of their own, but rather receive all of their prosodic realization from the physical properties of the intonational patterns under which they occur. Tonal accents (also pitch accents) definitionally have an isolatable physical pitch property of their own which cannot be related in any way to intonation.

Tone always appears in connection with stress in Slovene. Every word has only 1 stress and consequently 1 accent. Though stress and accent are connected, tonal peak and stress need not coincide. The syntagmatic relation in this case is more important than the paradigmatic one. The stronger a word is stressed, the more characteristic becomes its type of accent, the more easily it is distinguishable from its opposite number. Slovene is a language that combines tone and accent, a so-called pitch accent language.

Chapter 3

NONSENSE WORDS – VOWEL DURATION AND FREQUENCY

3.1 Since the duration of Slovene vowels and their intrinsic frequency have not been experimentally and systematically studied yet (cf. p. 2–3) this has been attempted in the present investigation. It is well known that vowels in all languages have inherent durations and frequencies (Fischer–Jørgensen 1955; Peterson & Lehiste 1960; Ivić & Lehiste 1963; Neweklowsky 1975; etc.). The closer a vowel, the shorter it tends to be and the higher is its frequency; the more open a vowel, the longer it tends to be and the lower is its frequency. /i/ for example, is thus shorter and of higher frequency than /a/ which is longer and of lower frequency than /i/.

3.2 It is moreover well known that adjacent consonants have an influence on the duration and frequencies of a vowel. The influence of a consonant is primarily progressive as to frequency and regressive as to duration (Lehiste 1970, 20, 74).

3.3 The traditional tenets about stress and vowel duration in the grammar of SS (Toporišič 1984, 52) are: (1) Stress is free and can appear on any syllable in a word; (2) long vowels can appear only in stressed syllables; (3) unstressed vowels are always short; (4) a vowel in a finally stressed syllable can be either long or short, in a particular word only long or only short. Length is a distinctive feature; (5) /i, u, e, o, a/ can be either long or short and thus can appear in stressed or unstressed syllables; /ə/ can be only short, and can appear in stressed or unstressed syllables; /ẹ, ọ/ can be only long, and thus can appear only in stressed syllables.

This may be presented as follows:

<table>
<tr><td rowspan="3">stressed</td><td rowspan="2">long</td><td rowspan="2">in non-final syllable</td><td colspan="2">in final syllable</td></tr>
<tr><td rowspan="2">monosyllabic words</td><td rowspan="2">plurisyllabic words</td></tr>
<tr><td rowspan="2">short</td><td></td></tr>
<tr><td>unstressed</td><td colspan="3">in all positions</td></tr>
</table>

⟶ to be read from left to right.

Fig. 2. Quantity of Slovene vowels /i, u, e, o, a/ according to traditional grammar of SS.

Tenet 4 raises some doubts. If it did not hold, then length in presentday educated Slovene as spoken in Ljubljana would cease to be a distinctive feature, it would not be phonologically relevant any more, and would become a supportive feature of stress. I further believed that duration depended also on the structure of the syllable, that vowels in open syllables tended to be longer than those in closed syllables. I further wanted to study the extent of intrinsic vowel duration, and the duration relationships between stressed and unstressed vowels.

3.4 To eliminate the influence of adjacent consonants and to measure vowel duration in ideal conditions artificial nonsense words were created of different length and syllable structure, each word built on a certain vowel and a certain consonant, which were repeated as often as the structure of the word demanded it: the consonants were chosen so as to represent all the 4 manners of articulation (plosives, affricates, fricatives, sonorant consonants), always the voiceless and the voiced member of the pair where such exist. Of the 8 vowel phonemes 7 /i, u, ẹ, e, ọ, o, a/ were said with the same group of consonants and with the same syllable patterns. The 8th vowel phoneme /ə/ is not represented systematically as the words with this vowel in all syllables would sound too artificial.

The word types adopted in the nonsense words:

1) <u>'V:</u>CV – open stressed syllable (long)*, not preceded by a consonant in a disyllabic word, followed by an unstressed syllable;
2) CV'C<u>V:</u>CV – open stressed syllable (long)*, preceded by a consonant, in a trisyllabic word, so as to be preceded and followed by an unstressed syllable;
3) CV'C<u>V:</u>C – closed finally stressed syllable, long, preceded by an unstressed syllable;
4) CV'C<u>V</u>C – closed finally stressed syllable, short, preceded by an unstressed syllable.

The durations of vowels could thus be studied paradigmatically (intrinsic duration) and syntagmatically (stressed – unstressed), ignoring the influence of adjacent consonants. The nonsense words were stressed where intuitively the stress would most commonly appear on actual words. The text of the nonsense words is in the appendix (pp. 252–257). The words appear in the mid-position of a sentence frame. The 3 speakers were asked to pronounce them as if they were Slovene words and to incorporate them in the sentence so as to pronounce them free from sentence intonation. In mid-position sentence intonation influence is at its weakest.

*The brackets mean that it is automatically long because it is in an open syllable and stressed.

3.5 The frequencies were measured at the beginning and end of every vowel and in between if a change of direction in the frequency movement took place. These figures were then averaged for each vowel in each syllable of every word separately, and then again so that the average frequencies of the 8 (or 7) Slovene vowel phonemes in stressed (open, closed/long, short) and unstressed (pre–/poststressed) positions, as they are found in the enclosed tables (pp. 33, 36, 38), were obtained.

When studying frequency the influence of the preceding consonant in the groups of words said with the same vowel could be ignored as all vowels appeared in exactly the same surroundings. What, however, could not be ignored was accent influence on frequency, although it is difficult to speak about accent proper in nonsense words.

If word accent type is an integral part of every word (semantically conditioned) and word-form (morphologically conditioned), these conditions are missing in nonsense words. What we have is only word structure. Although word structure is not decisive for a particular accent in a particular word, it has a certain weight statistically: thus barytones accented on an open syllable tend to be acuted in SS and oxytones tend to be circumflexed to an even greater extent than the open syllabled barytones are acuted. So these general tendencies should show in the nonsense series. What should further appear are the idiosyncratic characteristics of each speaker (does he use accent at all, is he acute/circumflex orientated etc.).

3.6 Some general principles (GP) about vowel length that have emerged in the nonsense series:

1) Since every syllable must have a certain intrinsic length, a stressed (long) vowel is longest in an open syllable when forming this syllable without a preceding consonant (word type 1).
2) Vowels in the prestressed series are shortest because they are not stressed and are cut short by the following consonant (slots 5 and 6 in the tables).
3) Unstressed vowels in end position are longer and cannot really be measured. As there is no impedance to their duration phonation can continue (slots 7 and 8 in the tables). (Cf. also Neppert & Pétursson 1986, 161).
4) An intrinsically short vowel, though stressed, may be shorter than an intrinsically long vowel, though unstressed. In this case intrinsic duration prevails over stress duration. This fact is important because it explains why it is possible that a stressed vowel may be shorter than the neighbouring unstressed.
5) Every vowel, regardless of its tongue position, must have a certain minimal length to be properly perceived. If the intrinsically longer vowels

(e.g. in unstressed position) are near this value, the intrinsically shorter vowels cannot be much shorter, or they would not be properly perceived as to their quality. The role of intrinsic duration can in this case become minimal.

6) Vowel length can be studied only with the same speaker, and only the relationships within the same speaker, not length in absolute terms. Each speaker has his length system.
7) The greater the durations in absolute terms, the bigger the differences in length tend to be. Thus the ratio between the stressed and unstressed versions of the same vowel when comparing the two corresponding variants is increasing as the tongue moves from close to open position, because the stressed (long) vowels are getting longer and longer, while the corresponding unstressed (short) variants do not change their duration much.

3.7 Vowel durations

3.7.1 Speaker Ju

word type / vowel	in stressed syllable				in unstressed syllable: prestressed		poststressed	
	'(C)V:CV	CV'CV:CV	CV'CV:C	CV'CVC	CV'CV:CV	CV'CV:C CV'CVC	'(C)V:CV	CV'CV:CV
'i:	9.1	10.6	9.3					
'i				7.7				
i					7.1	6.4	9.6	11.0
'ẹ:	16.6	14.3	13.9					
e					7.6	7.6	10.8	11.3
'e				10.6				
'e:	16.2	14.8	12.4					
a					8.1	8.6	12.1	13.4
'a				11.9				
'a:	17.7	17.2	15.6					
o					7.8	8.0	10.7	12.4
'o				10.9				
'o:	16.2	16.4	12.7					
'ọ:	16.6	15.9	14.3					
u					6.9	6.6	9.4	12.1
'u				10.0				
'u:	14.7	12.3	10.6					
'ə				8.4				
averaged	15.3	14.5	12.7	9.9	7.5	7.5	10.5	12.1
computer symbol	2-4	4-6	4>-5	4<-5	2-6	2-5	4-4	6-6
no. of cases	2	7-15	8	8	8-16	16-24	1-4	8-16
	1	2	3	4	5	6	7	8

Table 2 Ju. Average vowel durations in csecs. in nonsense words.

Figures to Table 2 Ju are found at the end of this chapter on pp. 40–44.

3.7.1.1 Stressed vowels

I Long/short vowels. Ju follows the instructions and makes a perceptible difference in length between long and short vowels in finally stressed closed syllables in this series, 1.9 csecs. on the average (Table 2 Ju, columns 3, 4; Fig. 7a Ju 4>–5 and 4<–5).

II Intrinsic duration. /a/ is definitely the longest and /i/, /u/ (and /ə/) are the shortest vowels. The order of duration of the intermediate vowels is not so fixed. The average values in csecs. of stressed long vowels (Table 2 Ju, columns 1, 2, 3) are

'i:	9.7
'u:	12.5
'e:	14.5
'ẹ:	14.9
'o:	15.1
'ọ:	15.6
'a:	16.8

The ratio between the intrinsically longest stressed long vowel and the shortest /'a:/ : /'i:/ is 1.73 or 58%, i.e. if /'a:/'s duration is 100%, then /'i:/'s is 58% of that. As expected this ratio is smaller with stressed short vowels, /'a/ : /'i/ is 1.55, /'i/'s duration amounts to 65% of /'a/'s.

III Duration depending on position. The vowels in column 1 forming the syllable by themselves are longest (GP 1, p. 21. See also Figs. 3a Ju and 7a Ju, pp. 40 and 44). The duration of a vowel in an open syllable preceded by a consonant follows close behind (Table 2 Ju, column 2). A stressed long vowel with Ju is definitely shorter in a closed syllable than in an open one (cf. column 2 with 3; and Fig. 7a Ju 4–6 with 4>–5, p. 44), 1.8 csecs. on the average.

3.7.1.2 Unstressed vowels

Intrinsic duration differences are still to be seen in the unstressed vowel series. Open vowels are longer than close, although the duration differences are smaller than with stressed vowels. Vowels in the prestressed series are shortest (Table 2 Ju, columns 5 and 6; Fig. 4a Ju, p. 41). Prestressed vowels are shorter than any stressed vowel, except stressed short /'i/ and /'ə/.

3.7.1.3 Comparison between stressed and unstressed vowels

We shall make a comparison only between the averaged values of stressed long vowels and prestressed vowels. The duration of unstressed vowels in final position may not be realistic (GP 3, p. 21).

	csecs.		csecs.	ratio	percentage
'i:	9.7	i	6.8	1.43	70
'u:	12.5	u	6.8	1.84	54
'e:	14.5	e	7.6	1.91	52
'ẹ:	14.9				
'o:	15.1	o	7.9	1.91	52
'ọ:	15.6				
'a:	16.8	a	8.4	2.00	50
Averaged					
	14.2		7.5	1.82	56

As intrinsic duration plays a much greater role in stressed vowels than in unstressed the ratios between stressed/unstressed vowels increase as the intrinsic duration of stressed vowels increases from close to open vowels (GP 7, p. 22).

The ratios between stressed/unstressed vowels may be different in actual words, where, however, they are much more difficult to measure because the situation generally is not so clear as with nonsense words where we have the same vowel and the same consonant in the stressed and unstressed syllable.

3.7.2 Speaker Ka

word type / vowel	in stressed syllable				in unstressed syllable			
					prestressed		poststressed	
	'(C)V:CV	CV'CV:CV	CV'CV:C	CV'CVC	CV'CV:CV	CV'CV:C CV'CVC	'(C)V:CV	CV'CV:CV
'i:	8.7	7.9	7.9					
'i				7.8				
i					7.2	7.0	6.6	7.5
'ẹ:	11.3	10.0	10.3					
e					6.6	7.2	6.8	8.3
'e				9.4				
'e:	12.5	10.8	9.6					
a					7.4	7.9	6.8	8.0
'a				10.4				
'a:	12.1	12.5	12.8					
o					7.2	7.2	8.1	7.7
'o				9.4				
'o:	12.8	11.2	10.0					
'ọ:	12.1	12.3	11.3					
u					7.2	6.9	11.5	8.7
'u				8.8				
'u:	10.9	9.1	8.5					
'ə				-				
averaged	11.5	10.5	10.0	9.2	7.1	7.2	7.9	8.1
computer symbol	2-4	4-6	4>-5	4<-5	2-6	2-5	4-4	6-6
no. of cases	2	7-15	8	8	8-16	16-24	1-4	8-16
	1	2	3	4	5	6	7	8

Table 2 Ka. Average vowel durations in csecs. in nonsense words.

Figures to Table 2 Ka are found at the end of this chapter on pp. 45–49.

3.7.2.1 Stressed vowels

I Long/short vowels. Ka makes a perceptible difference between long and short vowels only with /a/ and perhaps with /o/, short /i/ and /e/ are only slightly shorter, and short /u/ is even slightly longer than long /u/. The length differences are not big enough to be linguistically relevant (Table 2 Ka, columns 3 and 4; Fig. 7a Ka 4>–5 and 4<–5, p. 49).

II Intrinsic duration. There is a clear tendency for /i/ to be the shortest vowel, followed closely by /u/. /a/ is the longest, except in column 1, where the data are less reliable as we have only 2 examples of each vowel. Close /ẹ/ and /ọ/ and open /e/ and /o/ are between the extreme values, the duration pattern, however, is not as regular as with the extreme vowels. The averaged values (columns 1, 2, 3) of stressed long vowels in csecs. are:

'i:	8.2
'u:	9.5
'ẹ:	10.5
'e:	11.0
'o:	11.3
'ọ:	12.0
'a:	12.5

III Duration depending on position. The vowels tend to be shorter as one progresses from column 1 to column 3 (Table 2 Ka; Fig. 7a Ka, p. 49). Vowels in an open syllable, forming that syllable without a preceding consonant are longest (column 1), followed by vowels in an open syllable preceded by a consonant (column 2). Another reason why vowels in column 1 tend to be longest is the fact that we have a disyllabic word in column 1, and a trisyllabic in column 2. The longer a word, the shorter its sounds tend to be. This tendency, however, is weaker than length differences due to intrinsic duration or to the fact that a vowel only forms the syllable. A vowel in a closed syllable with Ka tends to be shorter than the same vowel in the same surroundings in an open syllable (columns 2 and 3). This tendency with Ka overrules the length of word tendency: trisyllabic words with an open stressed syllable (column 2) tend to have a longer vowel than a disyllabic word with a closed syllable (column 3).

3.7.2.2 Unstressed vowels

Prestressed vowels are shortest (Table 2 Ka, columns 5 and 6). Their duration varies very little, and the duration differences are too small to be perceived. We cannot speak about intrinsic duration here. There is some trace of it only with /a/ in column 6 (GPs 2 and 5, p. 21).

Poststressed open syllables (columns 7 and 8) cannot be properly measured as to duration since phonation can continue without any hindrance in final position (GP 3, p. 21). Ka's /u/sounds show this clearly. We cannot speak about intrinsic duration here either.

3.7.2.3 Comparison between stressed and unstressed vowels

Ka's vowels in general are relatively short (Table 2 Ka). This applies especially to stressed vowels and to a lesser degree to unstressed. The ratio between stressed and prestressed vowels with Ka is thus relatively small, or the percentages of the durations of the unstressed vowels as compared with the stressed relatively high.

	csecs.		csecs.	ratio	percentage
'i:	8.2	i	7.1	1.15	87
'u:	9.5	u	7.0	1.36	74
'ẹ:	10.5				
'e:	11.0	e	6.9	1.59	63
'o:	11.3	o	7.2	1.57	64
'ọ:	12.0				
'a:	12.5	a	7.7	1.62	62
Averaged					
	10.7		7.2	1.46	70

The ratio is on the increase (GP 7, p. 22).

3.7.3 Speaker Pi

word type / vowel	in stressed syllable				in unstressed syllable			
					prestressed		poststressed	
	'(C)V:CV	CV'CV:CV	CV'CV:C	CV'CVC	CV'CV:CV	CV'CV:C CV'CVC	'(C)V:CV	CV'CV:CV
'i:	6.8	6.5	6.2					
'i				6.3				
i					6.3	5.7	4.5	7.2
'ẹ:	5.8	6.9	7.9					
e					5.6	6.0	4.7	5.9
'e				7.4				
'e:	8.8	7.6	7.5					
a					6.3	6.3	6.6	5.8
'a				8.1				
'a:	11.3	7.3	7.9					
o					5.2	5.5	14.3	4.8
'o				7.0				
'o:	9.1	5.4	6.6					
'ọ:	7.9	5.5	6.1					
u					4.5	4.8	4.5	5.5
'u				5.6				
'u:	8.3	6.9	5.4					
'ə				-				
averaged	8.2	6.6	6.8	6.9	5.6	5.7	6.9	5.9
computer symbol	2-4	4-6	4>-5	4<-5	2-6	2-5	4-4	6-6
no. of cases	2	7-15	8	8	8-16	16-24	1-4	8-16
	1	2	3	4	5	6	7	8

Table 2 Pi. Average vowel durations in csecs. in nonsense words.

Figures to Table 2 Pi are found at the end of this chapter on pp. 50–54.

3.7.3.1 Stressed vowels

Pi's vowels are the shortest of all three speakers. The short duration of his stressed vowels is striking, though his unstressed vowels are also relatively short.

I Long/short vowels. In spite of instructions to the contrary Pi does not distinguish between long and short vowels in closed finally accented syllables (Table 2 Pi, columns 3 and 4; Fig. 7a Pi 4>–5 and 4<–5, p. 54). His expected short vowels are even slightly longer on the whole than the corresponding expected long vowels (6.7 : 6.9 csecs. averaged). This difference, however, is too small to be perceptible.

II Intrinsic duration. Stressed long /i/ and /a/ are still the shortest and the longest vowel, respectively. The order of duration of the single vowels within these two extremes, however, is a bit confused. The averaged values in centiseconds of stressed long vowels (columns 1, 2 and 3) are:

'i:	6.5
'ọ:	6.5
'u:	6.9
'ẹ:	6.9
'o:	7.0
'e:	7.2
'a:	8.8

The overall contour of the averaged durations of the single vowels, however, if linked, is still convex with some possible deviations at both ends of the convex contour (Fig. 7a Pi, p. 54).

III Duration conditioned by position. Stressed vowels in an open syllable when forming this syllable by themselves (column 1) are the longest. The differences in duration between stressed long vowels in open and closed syllables however, are not systematic (Table 2 Pi, columns 2 and 3).

3.7.3.2 Unstressed vowels

The two prestressed sequences (Table 2 Pi, columns 5 and 6; Figs. 5a Pi and 6a Pi, pp. 52–53) show the same relationships as the stressed, although much less marked (GP 5, p. 21) while the poststressed show either values which are falling throughout (in trisyllabic words Table 2 Pi, column 8; Fig. 4a Pi, p. 51) or shooting up (/o/) out of all proportion (in the disyllabic series Table 2 Pi, column 7; Fig. 3a Pi, p. 50) (GP 3, p. 21).

Prestressed syllables when averaged tend to be shorter than poststressed (GPs 2 and 3, p. 21), though values vary within the two groups. There are cases where poststressed vowels are shorter than prestressed (/i/, /e/ in Table 2 Pi, column 7; Fig. 4a Pi, p. 51). The averaged durations of prestressed syllables do not quite follow the expected pattern of intrinsic durations. The shortest vowel is /u/, followed by /o/, /e/, /i/ and /a/, which is the longest (Figs. 5a Pi and 6a Pi, pp. 52 and 53).

3.7.3.3 Comparison between stressed and unstressed vowels.The ratio of duration stressed : prestressed vowel is the lowest with Pi and never reaches 1.50 (or 50%).

	csecs.		csecs.	ratio	percentage
'i:	6.5	i	6.0	1.08	92
'ọ:	6.5				
'u:	6.9	u	4.7	1.47	68
'ẹ:	6.9				
'o:	7.0	o	5.4	1.30	77
'e:	7.2	e	5.8	1.24	81
'a:	8.8	a	6.3	1.40	72
Averaged					
	7.1	a	5.6	1.30	78

3.7.4 Summary – Ju, Ka, Pi

Vowel duration varies a lot with the three speakers. Ju has the greatest lengths and consequently his differences between stressed long vowels in open and closed syllables, and between stressed long and stressed short vowels, and between stressed and unstressed vowels are biggest. His duration relationships are also most systematic. Pi's vowels, on the other hand, are shortest and his duration relationships are least systematic.

If we compare vowel length in absolute terms, we see that Ju's unstressed vowels are as long as Pi's stressed (Ju 6.8–8.4 csecs., Pi 6.5–8.8 csecs.). Pi adopts the speed of "allegro" speech in the nonsense series. This shows quite clearly that duration is a matter of relations, not absolute figures (GP 6, p. 22). Neweklowsky in his study of Carinthian dialects (1973, 46) found the same state of affairs. Each speaker has his length system, the greater the durations in absolute terms, the bigger the differences in length tend to be. Ju's long stressed vowels range

from 9.7 to 16.8 csecs., a 7.1 csecs. range,
Ka's from 8.2 to 12.5 csecs., a 4.3 csecs. range, and
Pi's from 6.5 to 8.8 csecs., a 2.3 csecs. range.

Intrinsic vowel duration differences exist with all 3 speakers, although their range depends on duration in absolute terms. An overall generalization of Slovene vowels arranged as to their intrinsic duration might yield the following arrangement: i, u; ẹ, e, o, ọ; a. In the groups separated by a semicolon a rearrangement is possible.

Ju's prestressed vowels range
from 6.8 to 8.4 csecs., a 1.6 csecs. range,
Ka's from 6.9 to 7.7 csecs., a 0.8 csecs. range, and
Pi's from 4.7 to 6.3 secs., a 1.6 csecs. range.

The ratio between stressed long and unstressed (= prestressed) vowels varies
from 1.43 to 2.00 (70 to 50%) with Ju,
from 1.15 to 1.62 (86 to 62%) with Ka, and
from 1.08 to 1.40 (92 to 72%) with Pi.

Pi's utterances thus have the smallest difference between stressed and unstressed vowels. In all instances the two extreme vowels are /i/ and /a/.

With all 3 speakers the vowels are longest in an open stressed syllable forming that syllable on their own, without a preceding consonant (column 1). Ju is the only speaker that can make a perceptible distinction (1.9 csecs. on the average) between long and short vowels in closed finally stressed syllables in the nonsense series. Ka's expected averaged short vowels are throughout shorter than the expected averaged long vowels, but the distinction is not in all cases big enough to be perceptible. Pi is not systematic in his finally stressed expected long vowel and expected short vowel series. Some vowels are longer in the expected averaged long vowel series and some in the expected short vowel series. The overall averaged figures at the bottom of columns 3 and 4 show that the vowels in the expected short series are longer on the whole than in the expected long vowel series.

Ju makes a perceptible distinction in length between stressed (long) vowels in open syllables and stressed long vowels in closed syllables, 2.2 csecs. on the average. With Ka the vowels in an open syllable (except /a/) are longer than the same vowels in a closed syllable, but the difference often is not big enough to be really perceptible. Pi again, is unpredictable: sometimes it is in the open, and sometimes in the closed syllable, that the stressed vowel is longer.

3.8 Vowel frequencies

3.8.1 Speaker Ju

word type / vowel	in stressed syllable				in unstressed syllable: prestressed		in unstressed syllable: poststressed	
	'(C)V:CV	CV'CV:CV	CV'CV:C	CV'CVC	CV'CV:CV	CV'CV:C CV'CVC	'(C)V:CV	CV'CV:CV
'i:	'19	131	130					
'i				122				
i					103	103	140	122
'ẹ:	'08	116	121					
e					107	104	126	121
'e				111				
'e:	'04	108	121					
a					107	103	126	117
'a				122				
'a:	:00	104	117					
o					105	105	118	119
'o				124				
'o:	99	105	121					
'ọ:	'11	121	126					
u					122	118	135	154
'u				157				
'u:	132	131	147					
'ə				117				
averaged	110	117	126	126	109	107	129	127
computer symbol	2-4	4-6	4>-5	4<-5	2-6	2-5	4-4	6-6
no. of cases	2	7-15	8	8	8-16	16-24	1-4	8-16
	1	2	3	4	5	6	7	8

Table 3 Ju. Average vowel frequencies in Hz in nonsense words.

Figures to Table 3 Ju are found at the end of this chapter on pp. 40–44.

3.8.1.1 Stressed vowels

The expected intrinsic frequency properties of close – open vowels show up clearly: close vowels have higher frequencies than open. The frequency diagrams of all the 4 positions in which stressed vowels occur thus have a concave contour with /i/ and /u/ as the highest, and /a/ (or /o/) as the lowest in pitch. The contours with the longest vowels occurring in open syllables (Table 3 Ju, columns 1 and 2) are the lowest in pitch, and the highest in the stressed syllable series are the two contours with vowels occurring in closed syllables (Table 3 Ju, columns 3 and 4; Fig. 7b Ju, p. 44). In actual words finally accented closed syllables are predominantly circumflex, have thus higher frequencies than open syllables, in which the acute with lower frequencies is more common.

It is not really possible to arrange the vowels as to their intrinsic frequency because the measured frequencies are the result of intrinsic frequency *and* the Slovene word accent. We will therefore quote the vowel frequencies in Hz from the lowest to the highest in an open syllable series (column 1, 2–4) where all the utterances are acute–like (i.e. relatively low) and in a closed syllable series (column 3, 4>–5) where they are circumflex–like (i.e. relatively high):

	2–4		4>–5
'o:	99	'a:	117
'a:	100	'e:	
'e:	104	'ẹ:	121
'ẹ:	108	'o:	
'ọ:	111	'ọ:	126
'i:	119	'i:	130
'u:	132	'u:	147

The range of the acute–like series is 33 Hz; and the range of the circumflex–like series is 30 Hz.

3.8.1.2 Unstressed vowels

The frequencies of the vowels in prestressed position are the lowest in pitch (Table 3 Ju, columns 5 and 6; Figs. 4b Ju and 5b Ju, pp. 41 and 42). Although these are nonsense words and the type of accent realized on them is a matter of apparent chance, not choice, Ju, in these words, uses the acute pattern. This reflects the general tendency of the Slovene language mentioned by Rigler that in the word type /'CV:CV/ the acute accent was more common (Rigler 1968, 198).

In trisyllabic words, also with a stressed open syllable (Table 3 Ju, columns 2 and 8), although the acute pattern is much more common than the circumflex, the pattern adopted seems to be vowel dependent: /i/ and /ọ/ are predominantly circumflex-like and the rest acute-like. But a closer look at Fig. 4b Ju (p. 41) and at columns 2 and 8 reveals that the first 4 poststressed vowels all are said on practically the same pitch level which happens to be higher than /'ẹ:/, /'e:/, /'a:/ and /'o:/, and lower than /'i:/ and /'ọ:/.

3.8.1.3 Generally speaking Ju is acute orientated in open syllables in barytones (lower tonics, higher posttonics) and is circumflex orientated in closed syllables in oxytones (higher pitch of the tonics in closed syllables than in the open). This reflects the general tendencies of word-accented Slovene.

3.8.2 Speaker Ka

word type / vowel	in stressed syllable				in unstressed syllable			
					prestressed		poststressed	
	'(C)V:CV	CV'CV:CV	CV'CV:C	CV'CVC	CV'CV:CV	CV'CV:C / CV'CVC	'(C)V:CV	CV'CV:CV
'i:	111	123	129					
'i				125				
i					92	92	59	68
'ẹ:	107	105	102					
e					79	78	50	65
'e				108				
'e:	99	107	104					
a					73	72	43	62
'a				103				
'a:	101	91	93					
o					74	72	59	66
'o				92				
'o:	97	99	96					
'ọ:	111	97	104					
u					84	88	64	67
'u				119				
'u:	120	116	113					
'ə				-				
averaged	107	105	106	109	80	80	55	66
computer symbol	2-4	4-6	4>-5	4<-5	2-6	2-5	4-4	6-6
no. of cases	2	7-15	8	8	8-16	16-24	1-4	8-16
	1	2	3	4	5	6	7	8

Table 3 Ka. Average vowel frequencies in Hz in nonsense words.

Figures to Table 3 Ka are found at the end of this chapter on pp. 45–49.

3.8.2.1 Stressed vowels

The average frequencies of the single vowels if combined form an overall concave contour, although there may be some smaller deviations within it. The pitch differences between the 4 contours representing stressed vowels are small and the pitch opposition low – high in open – closed syllables is not so clear. This is so because both barytones (open syllables) and oxytones (closed syllables) are circumflex-like (Figs. 3b Ka–6b Ka, pp. 45–48).

As to intrinsic vowel frequency his vowel frequencies, whether in open or closed syllables, show some system in so far that /'i:/ or /'i/ generally are the highest vowels, followed by /'u:/ or /'u/, while /'a:/ or /'o:/ or /'o/ may be the lowest. The others are in between in any order (Fig. 7b Ka, p. 49).

3.8.2.2 Unstressed vowels

The inherent pitch differences, although less marked, are kept in the unstressed syllables as well.

Both the prestressed and the poststressed vowel nuclei are lower than the stressed. The 2 poststressed contours have the lowest frequencies. Especially low are those in disyllabic words (Table 3 Ka, column 7; Fig. 3b Ka, p. 45). With Ka the tonal peak in the nonsense words is definitely on the stressed syllable. Ka's word pattern clearly is circumflex-like. A pronunciation in which the circumflex accent, which is the unmarked accent (cf. p. 236), prevails, is a sign that word accent in this type of pronunciation is on the wane.

3.8.3 Speaker Pi

word type / vowel	in stressed syllable				in unstressed syllable			
					prestressed		poststressed	
	'(C)V:CV	CV'CV:CV	CV'CV:C	CV'CVC	CV'CV:CV	CV'CV:C CV'CVC	'(C)V:CV	CV'CV:CV
'i:	146	132	136					
'i				127				
i					123	120	128	127
'ẹ:	146	134	134					
e					133	132	143	130
'e				134				
'e:	137	137	131					
a					137	133	149	134
'a				137				
'a:	144	139	134					
o					143	139	142	138
'o				136				
'o:	139	140	137					
'ọ:	156	143	148					
u					130	141	146	148
'u				148				
'u:	153	164	157					
'ə				-				
averaged	146	141	140	136	133	133	142	135
computer symbol	2-4	4-6	4)-5	4<-5	2-6	2-5	4-4	6-6
no. of cases	2	7-15	8	8	8-16	16-24	1-4	8-16
	1	2	3	4	5	6	7	8

Table 3 Pi. Average vowel frequencies in Hz in nonsense words.

Figures to Table 3 Pi are found at the end of this chapter on pp. 50–54.

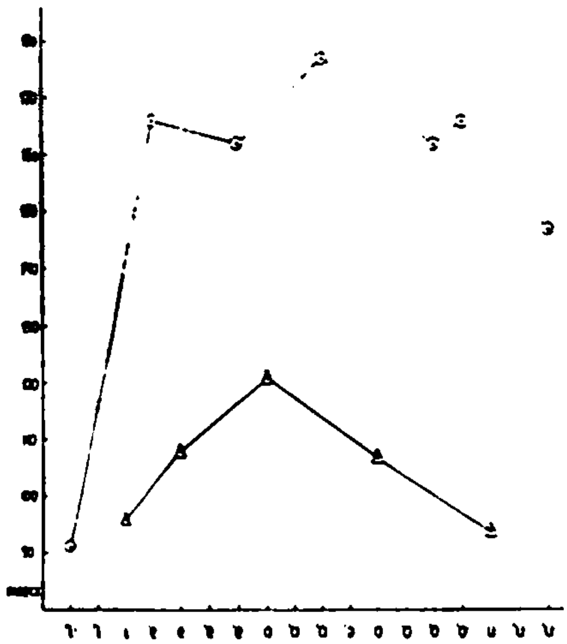
3.8.3.1 Stressed and unstressed vowels

Pi's frequency figures still show a concave contour though a much more shallow one than Ju and Ka. The speed of his utterances in the nonsense series is "allegro speech" where duration and frequency range are decreased (cf. Neweklowsky 1981, 57). The frequency differences between single vowels are smaller than with both Ju and Ka. It is quite common that a certain vowel, whether long or short, in closed or open syllable, stressed or unstressed, has the same or almost the same frequencies, so most of the contours cluster together (Figs. 3b–7b Pi, pp. 50–54). The only exception are some stressed vowels in the disyllabic word type (Table 3 Pi, column 1; Fig. 3b Pi, p. 50), where the close and some half-close vowels have above average frequencies. The 3 jumps up in the same series (on /'e:/, /'a:/, and /'o:/) are small, and are the only acute-like patterns. All the other barytones are circumflex-like with small jumps down if they resemble any accent pattern at all. So most of Pi's utterances in his nonsense series either do not have the typical characteristics of an accent type or do not sound accented. As the pitch differences between single vowels are small, any small change in the different word types can bring about a different sequence. Only /'ọ:/ (or /'o/) and /'u:/ (or /'u/) are consistently higher, the other vowels can appear in any order or disorder.

3.8.4 On the whole, we can say about Ju, Ka and Pi that in the nonsense group the expected intrinsic vowel durations appear more clearly and consistently than do the intrinsic frequencies, where accent interference is felt, or the "allegro" style of speech with Pi brings about a levelling out of expected frequency differences.

The convex/concave contours expressing the duration/frequency relationship between vowels (Figs. 3ab – 7ab Ju, Ka, Pi) make one think that there is a fixed quantity of energy for their production. Therefore the more energy is channelled into duration, the less is left for frequency and vice versa. The complementary distribution of duration and frequency in vowels certainly gives rise to such thoughts.

a) FIGURES TO TABLE 2 JU-AVERAGED VOWEL DURATION IN MSECS.
b) FIGURES TO TABLE 3 JU-AVERAGED VOWEL FREQUENCIES IN Hz



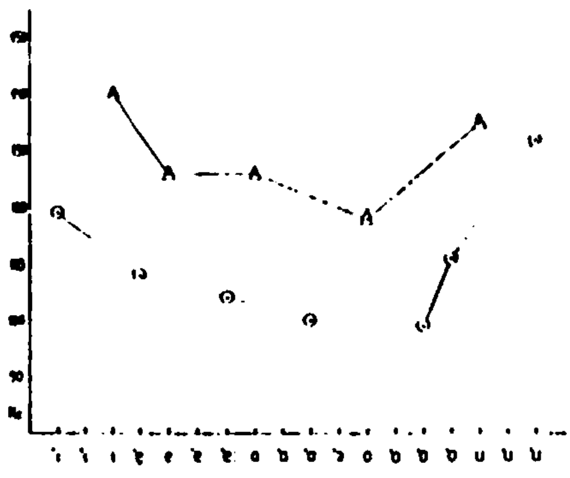
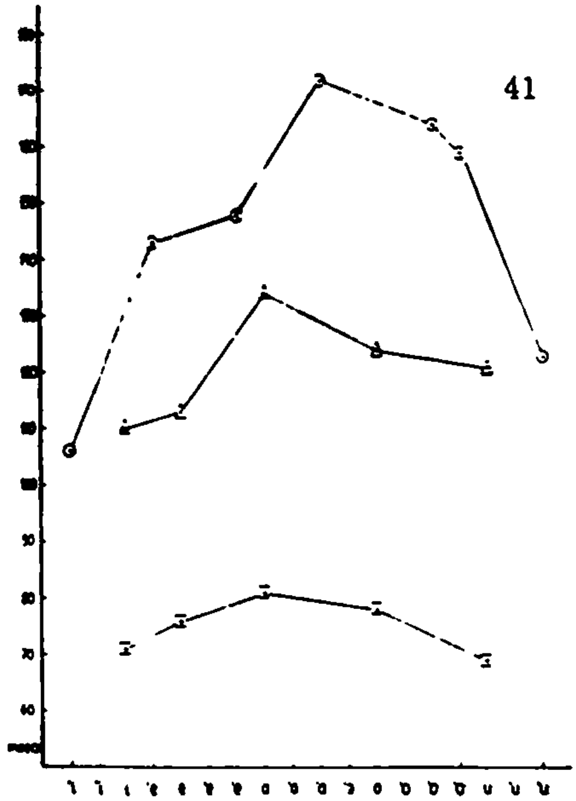


Fig. 3a Ju — Vowel durations
Fig. 3b Ju — Vowel frequencies
Word type: '(C)V:CV
Computer symbols: 2-4
4-4

○ = stressed vowels
Δ = poststressed vowels



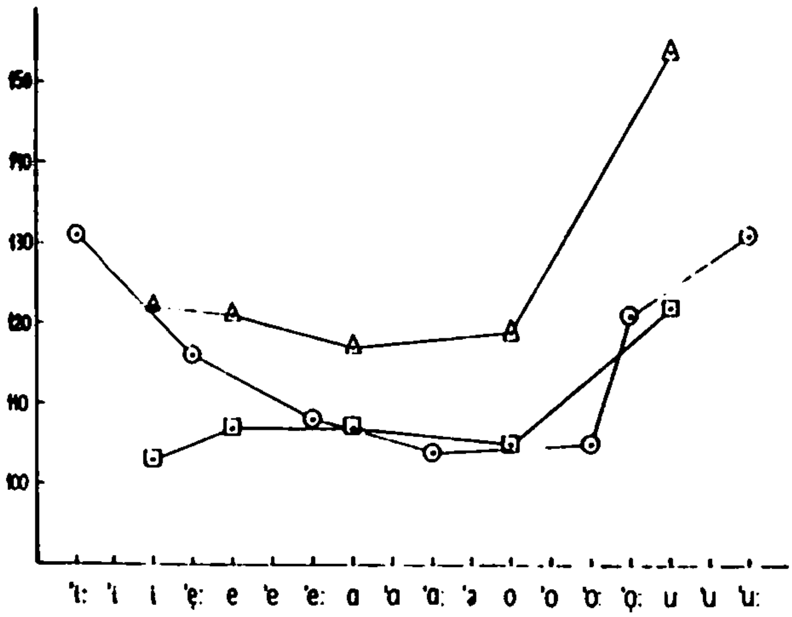
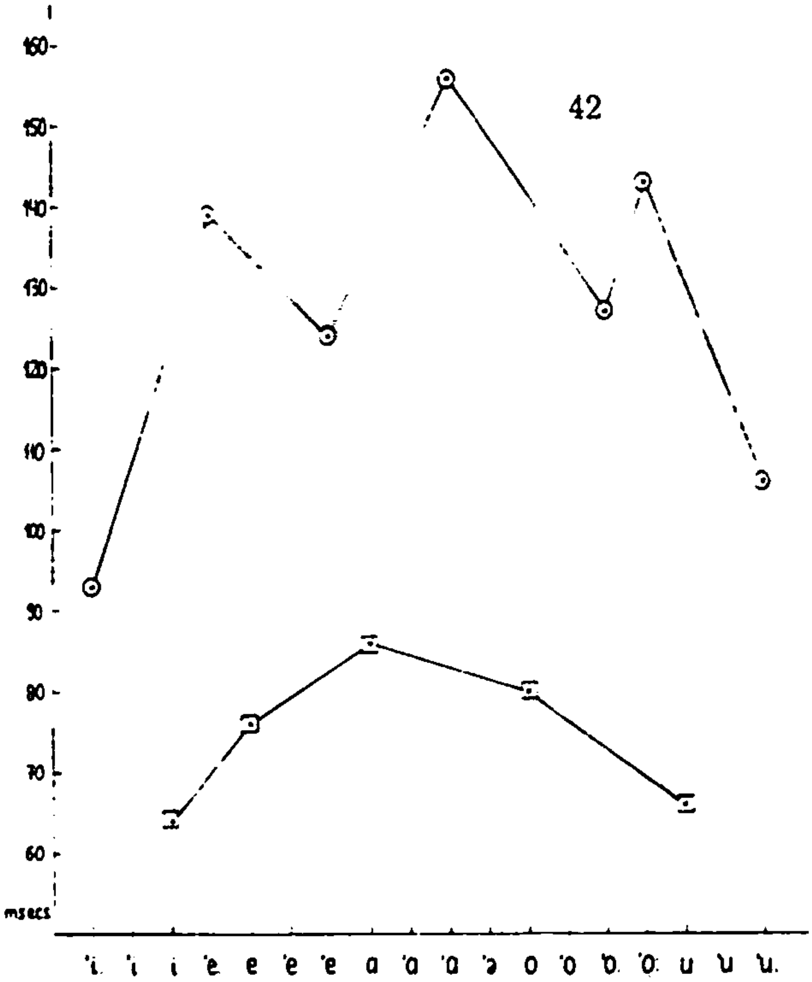


Fig. 4a Ju Vowel durations
Fig. 4b Ju Vowel frequencies
Word type: C<u>V</u>'C<u>V</u>:C<u>V</u>
Computer symbols: 4-6
2-6
6-6

○ = stressed vowels
Δ = poststressed vowels
□ = prestressed vowels



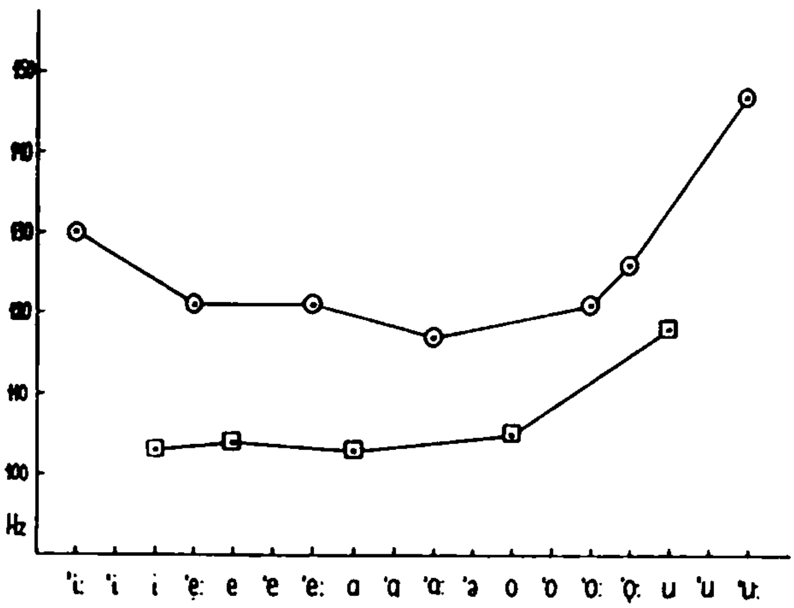
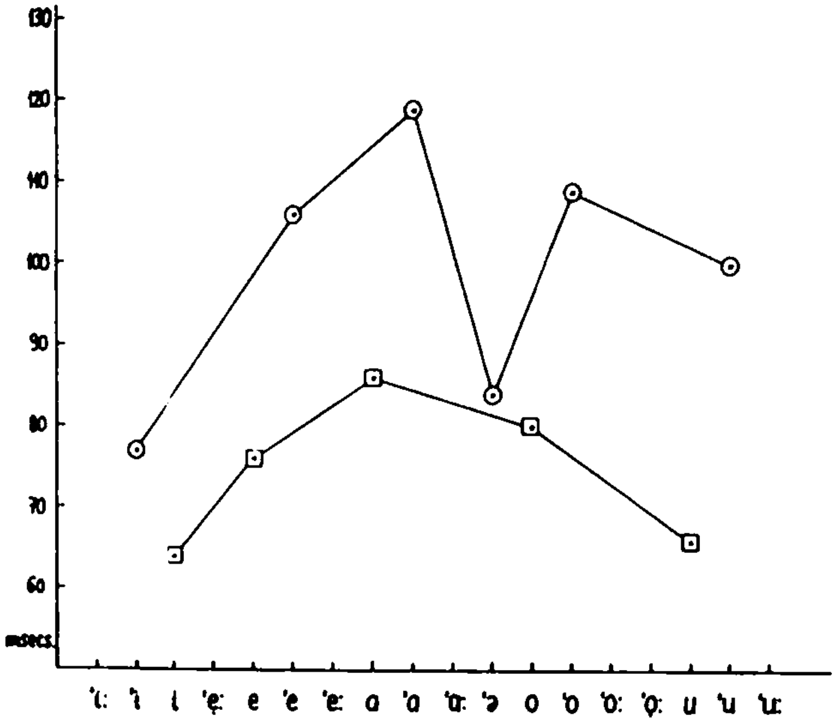


Fig. 5a Ju Vowel durations
Fig. 5b Ju Vowel frequencies
Word type: C<u>V</u>'C<u>V</u>:C
Computer symbols: 4 >-5
2-5



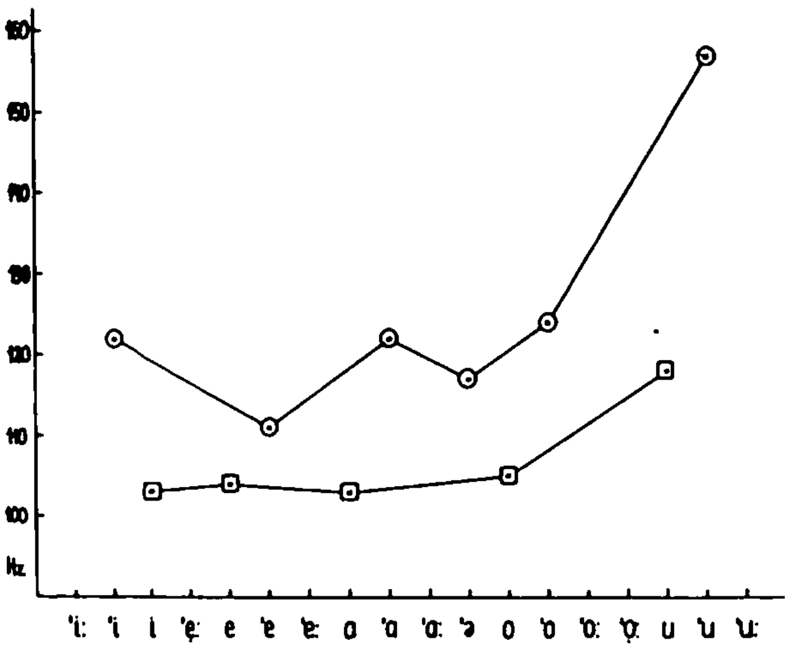
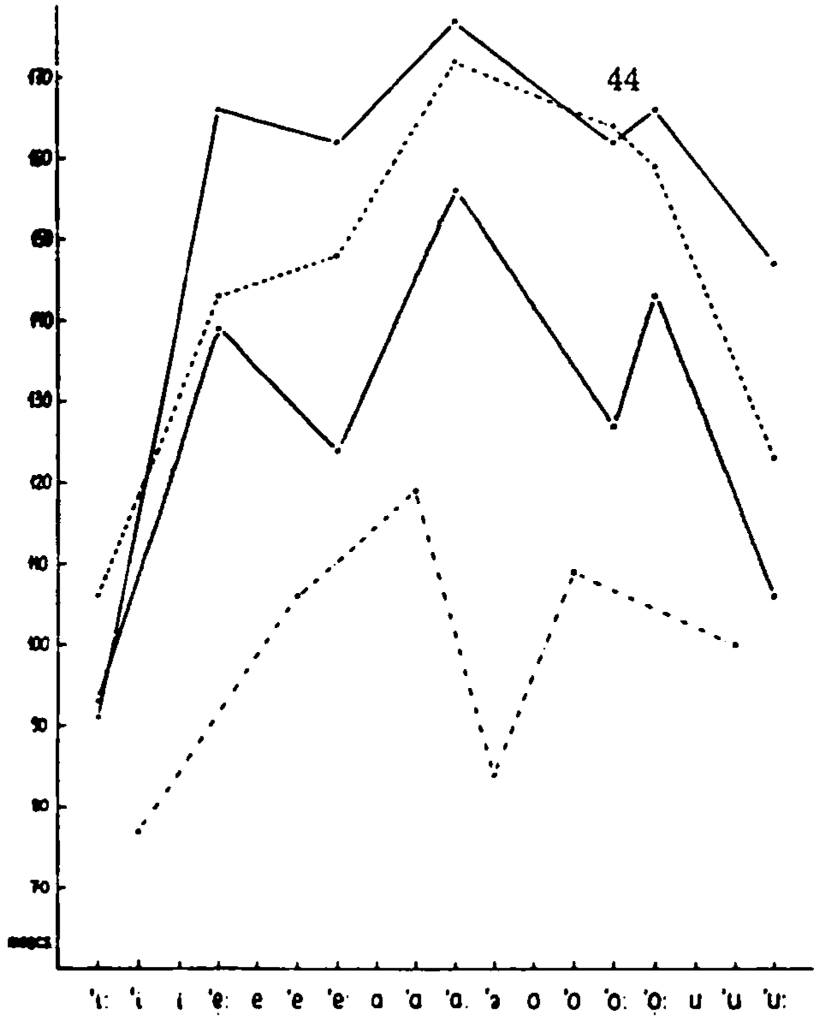


Fig. 6a Ju Vowel durations
Fig. 6b Ju Vowel frequencies
Word type: C<u>V</u>'C<u>V</u>C
Computer symbols: 4 <–5
2–5



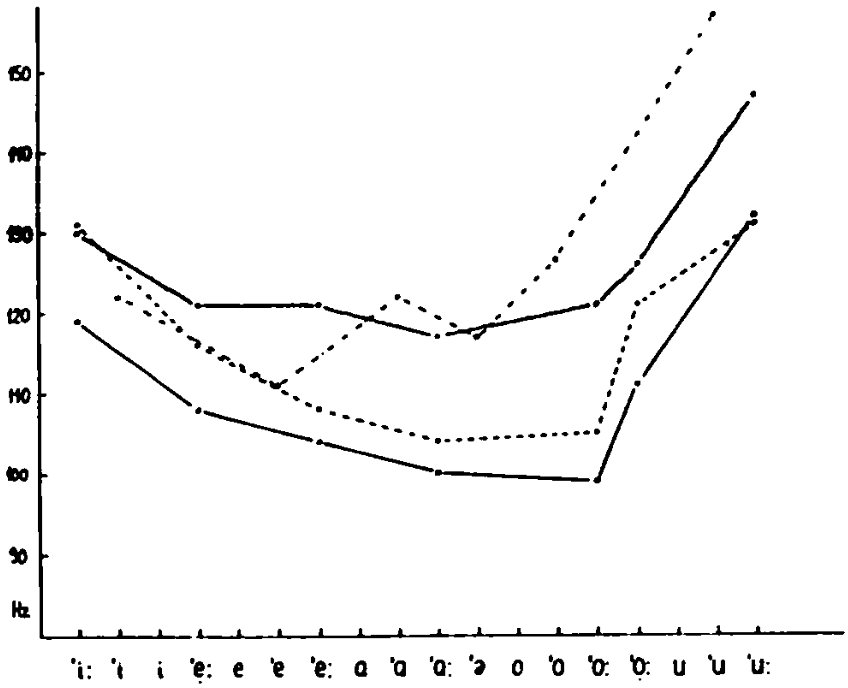


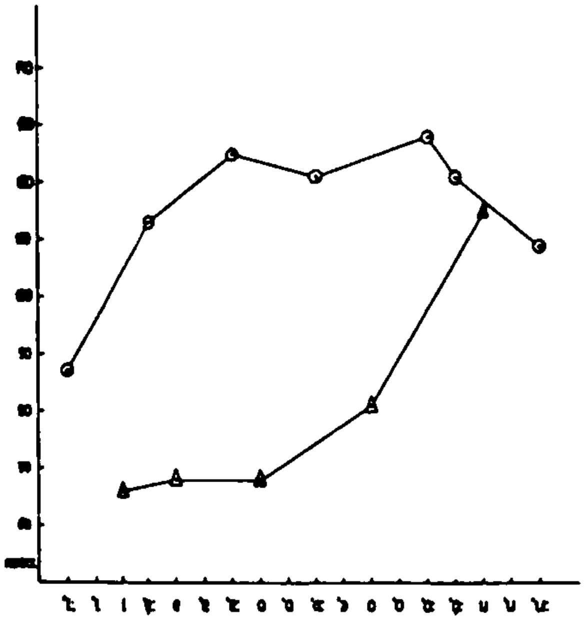
Fig. 7a Ju Durations of stressed vowels of all word types

Fig. 7b Ju Frequencies of stressed vowels of all word types

—— 2–4 ~~~~ 4 >–5

---- 4–6 -·-·- 4 <–5

a) FIGURES TO TABLE 2 KA-AVERAGED VOWEL DURATION IN MSECS.
b) FIGURES TO TABLE 3 KA-AVERAGED VOWEL FREQUENCIES IN Hz



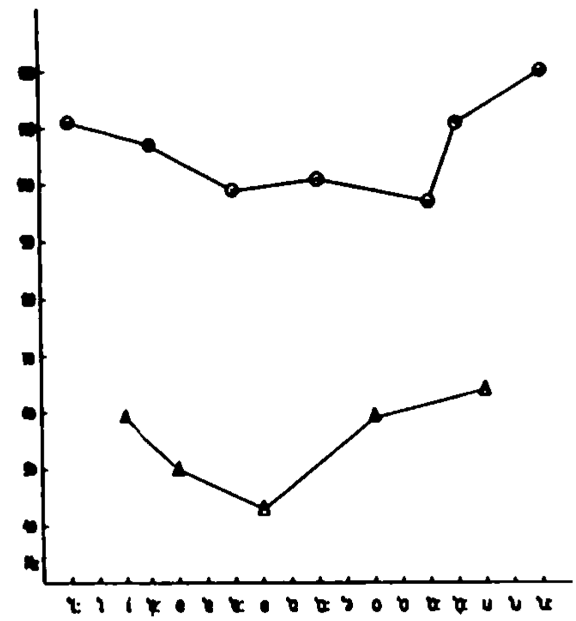
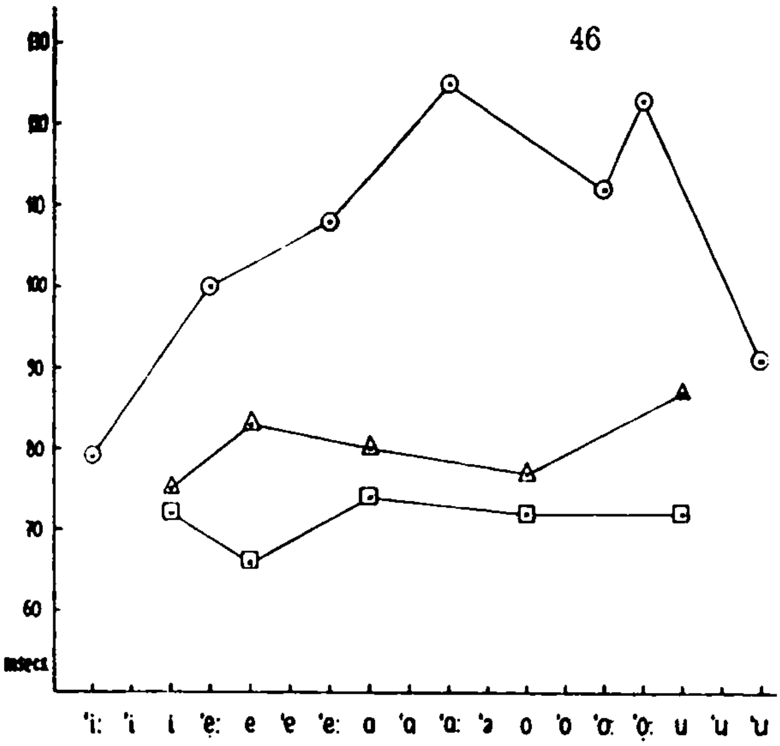


Fig. 3a Ka Vowel durations
Fig. 3b Ka Vowel frequencies
Word type: '(C)V:CV
Computer symbols: 2–4
4–4

○ = stressed vowels
△ = poststressed vowels



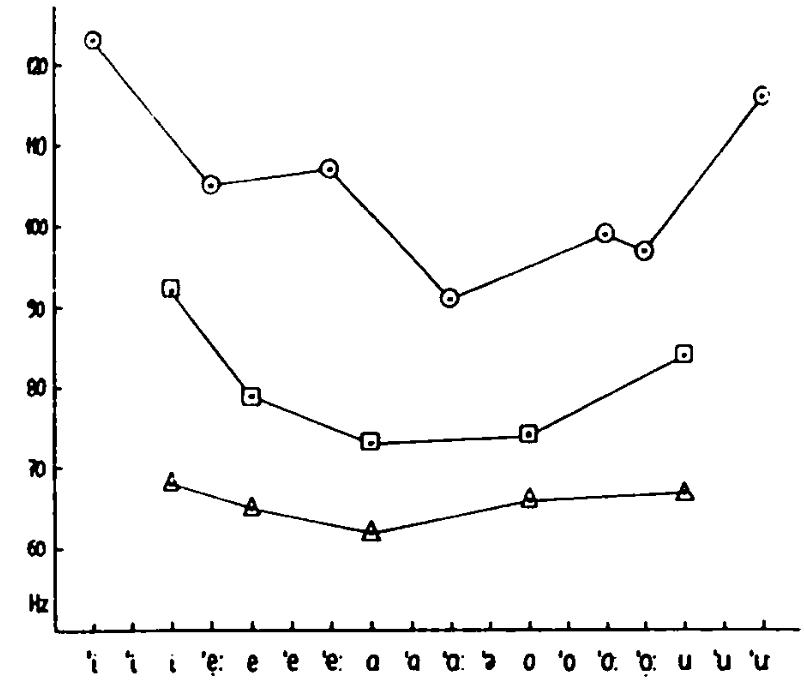
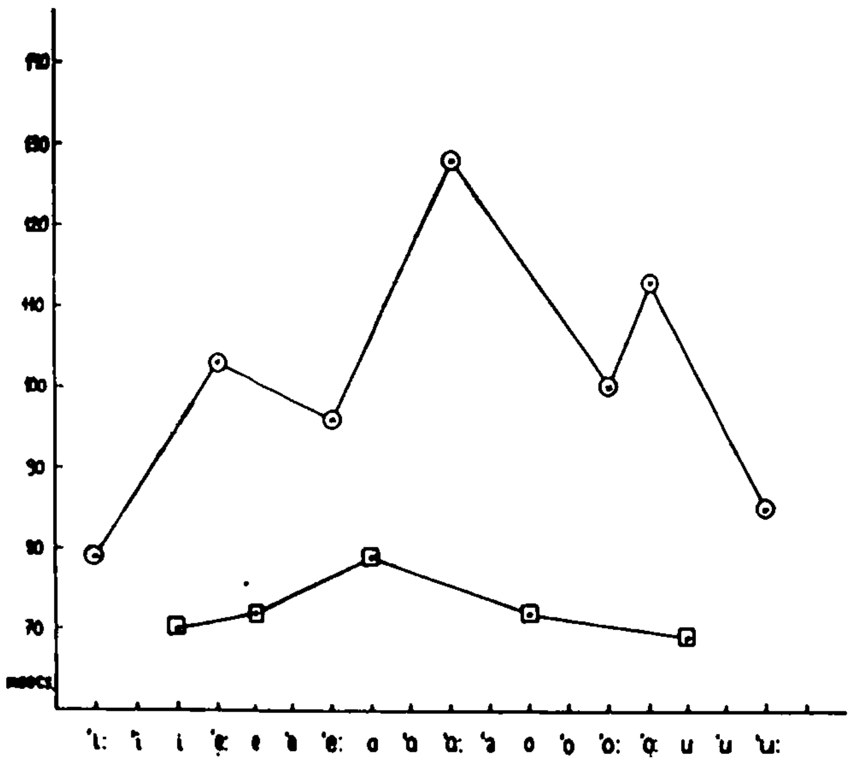


Fig. 4a Ka — Vowel durations
Fig. 4b Ka — Vowel frequencies
Word type: C<u>V</u>'C<u>V:</u>C<u>V</u>
Computer symbols: 4–6
2–6
6–6

○ = stressed vowels
△ = poststressed vowels
□ = prestressed vowels



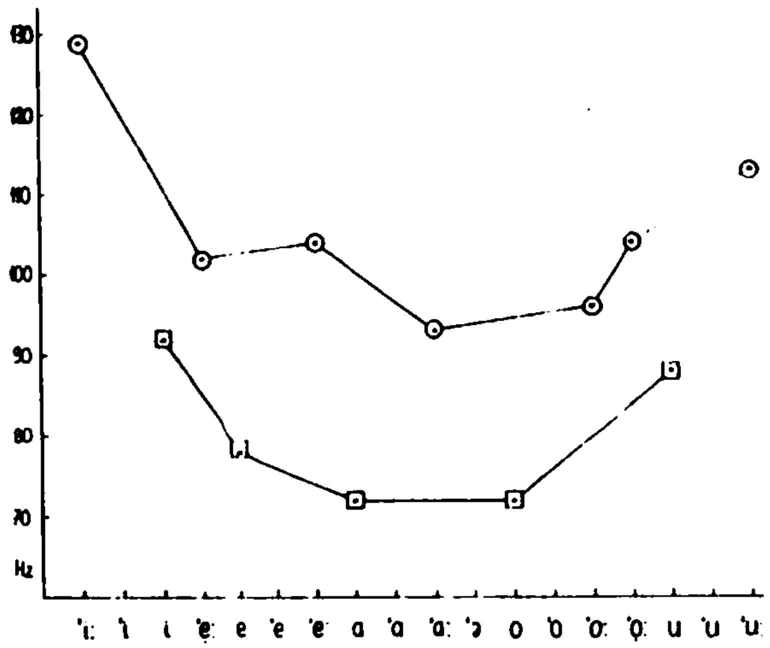
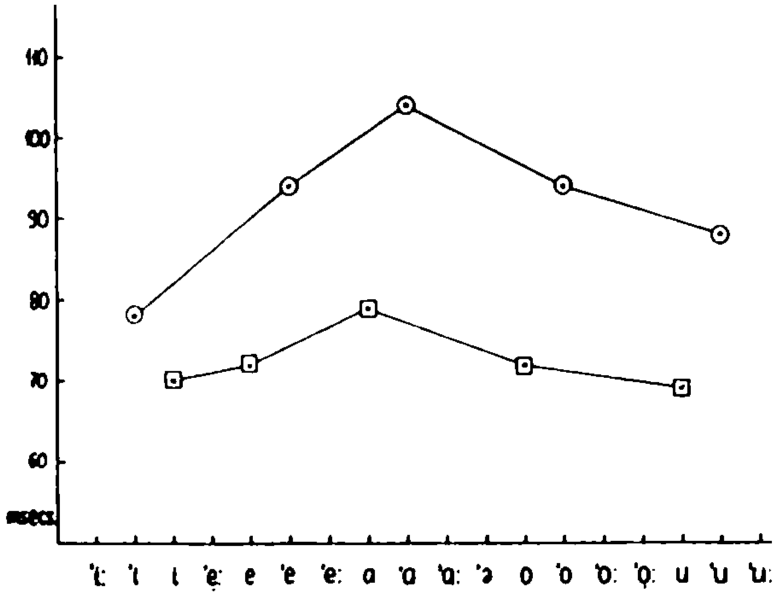


Fig. 5a Ka Vowel durations
Fig. 5b Ka Vowel frequencies
Word type: C<u>V</u>'C<u>V:</u>C
Computer symbols: 4 >-5
2-5



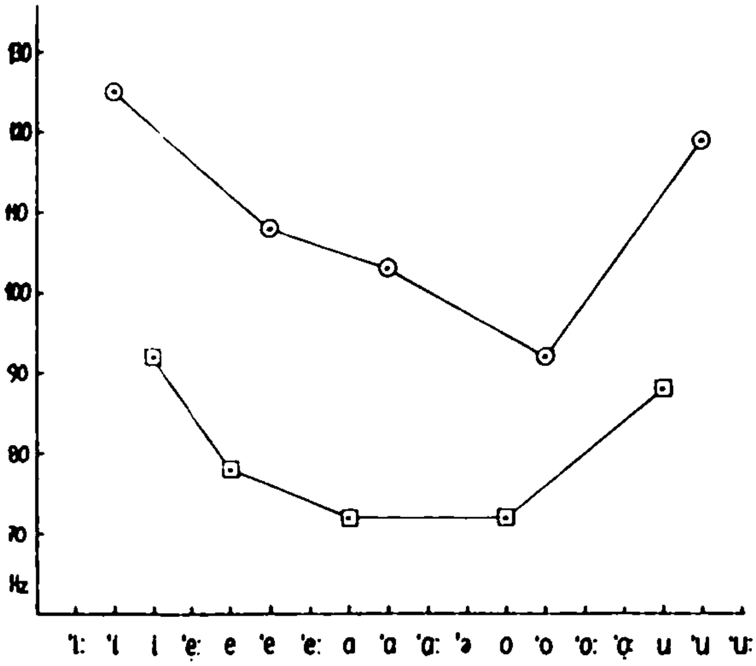
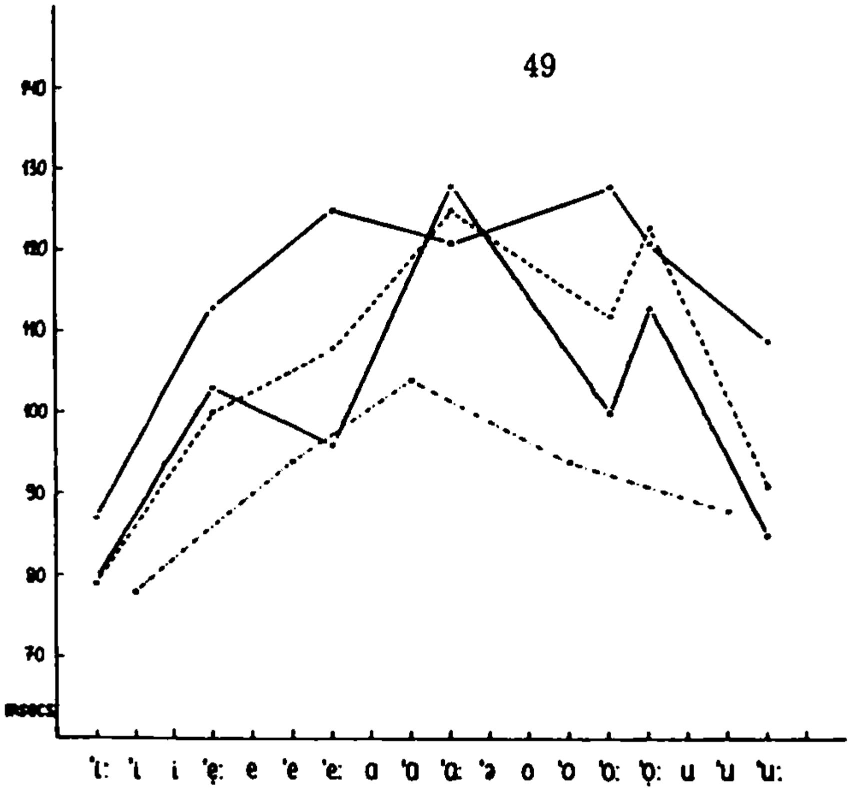


Fig. 6a Ka Vowel durations
Fig. 6b Ka Vowel frequencies
Word type: C$\underline{V}$'C$\underline{V}$C
Computer symbols: 4 <-5
2-5



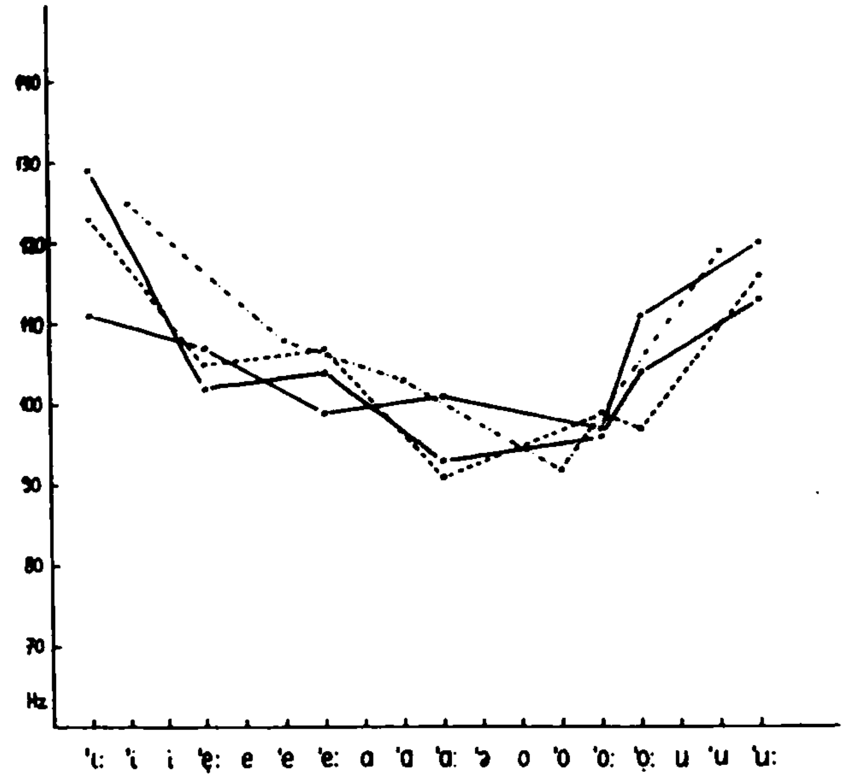
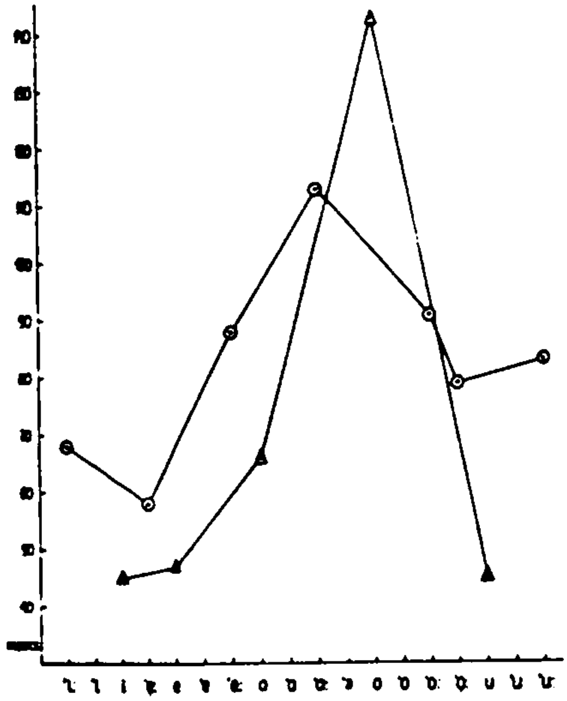


Fig. 7a Ka Durations of stressed vowels of all word types
Fig. 7b Ka Frequencies of stressed vowels of all word types

——— 2–4 ~~~~ 4 >–5
- - - - 4–6 -·-·- 4 <–5

a) FIGURES TO TABLE 2 PI–AVERAGED VOWEL DURATION IN MSECS.
b) FIGURES TO TABLE 3 PI–AVERAGED VOWEL FREQUENCIES IN Hz



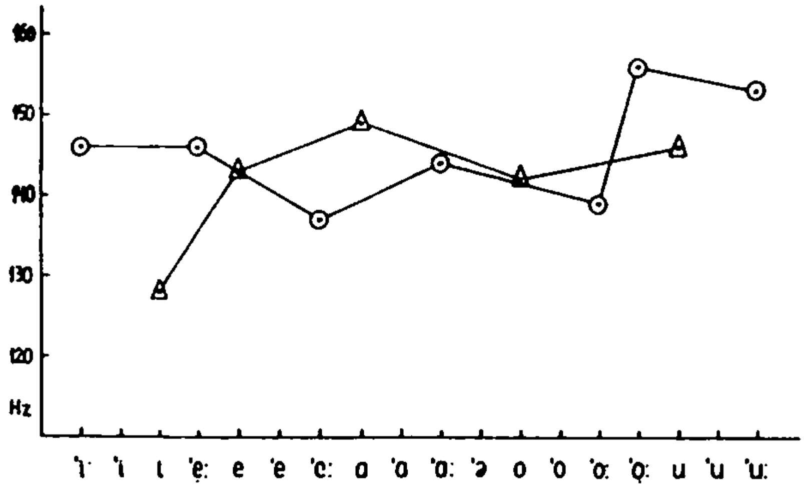
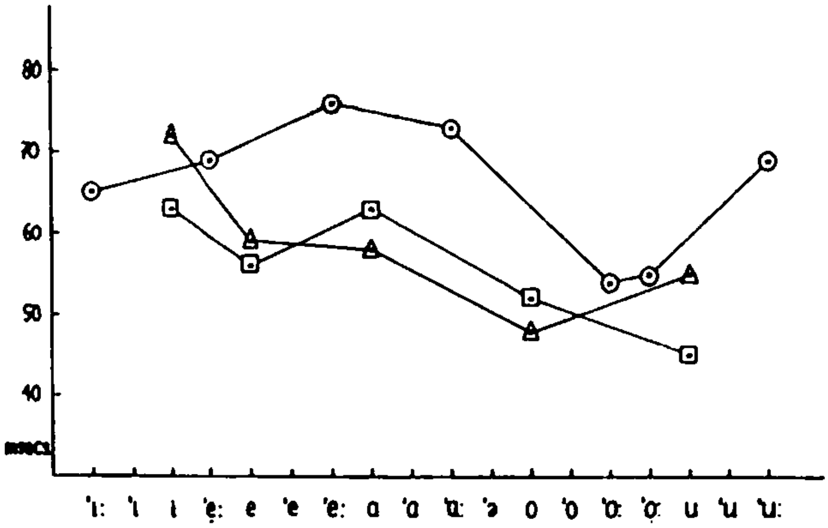


Fig. 3a Pi	Vowel durations
Fig. 3b Pi	Vowel frequencies
	Word type: ’(C)V:CV
	Computer symbols: 2–4
	4–4

○ = stressed vowels
△ = poststressed vowels



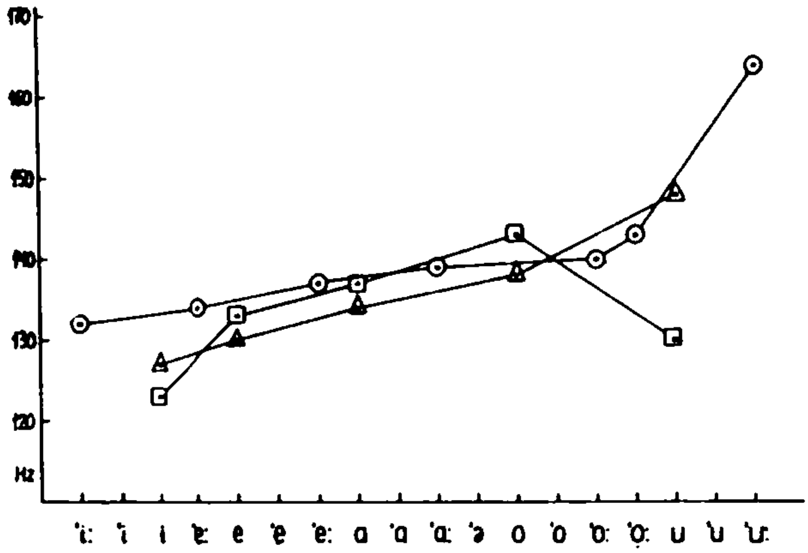
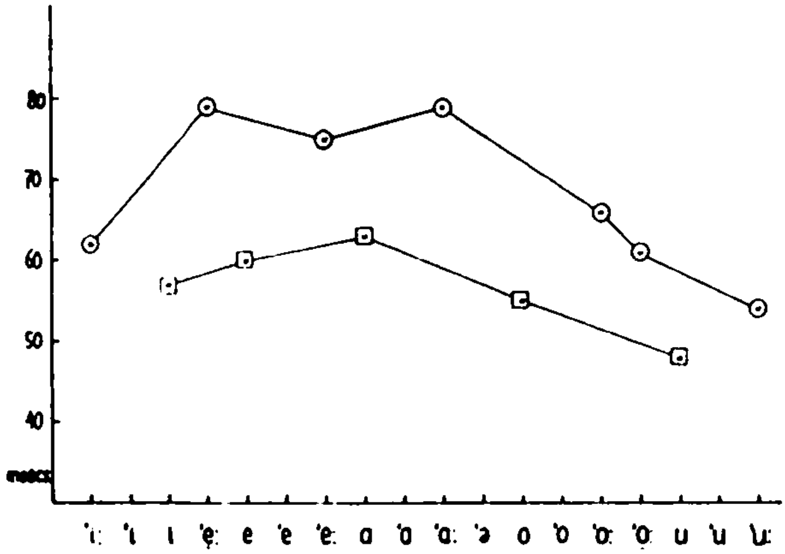


Fig. 4a Pi Vowel durations
Fig. 4b Pi Vowel frequencies
Word type: CV̲'CV̲:CV̲
Computer symbols: 4–6
2–6
6–6

○ = stressed vowels
△ = poststressed vowels
□ = prestressed vowels

00050414



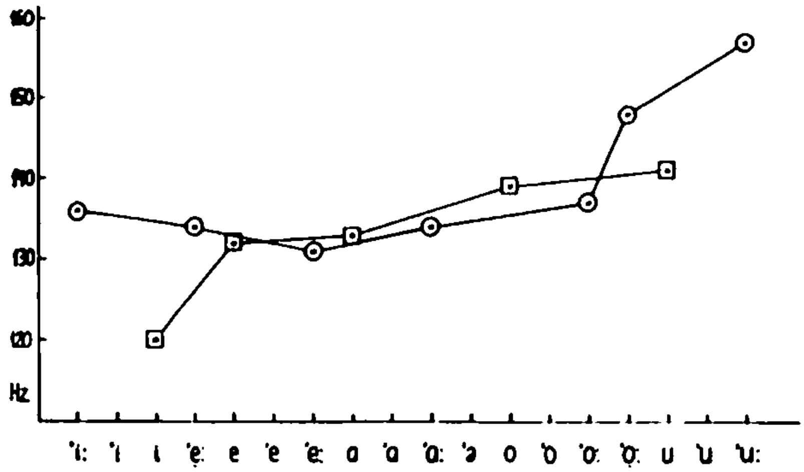
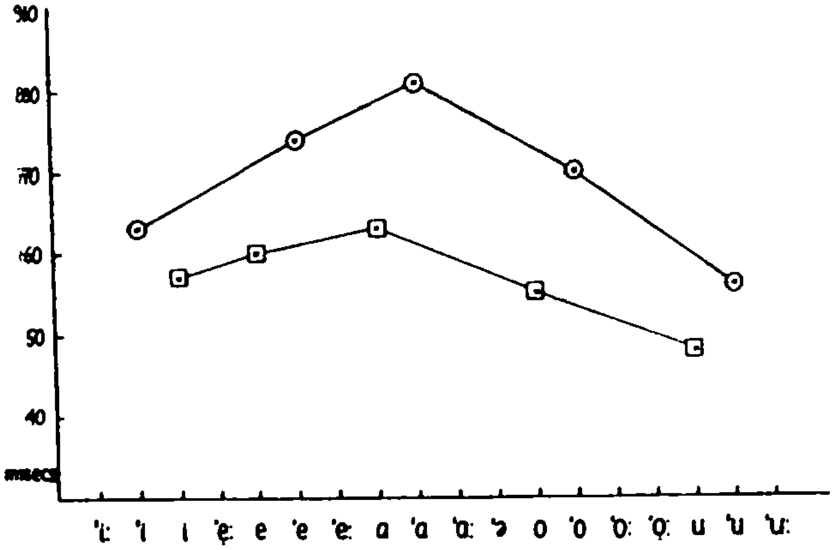


Fig. 5a Pi Vowel durations
Fig. 5b Pi Vowel frequencies
Word type: C<u>V</u>'C<u>V:</u>C
Computer symbols: 4 >-5
2-5



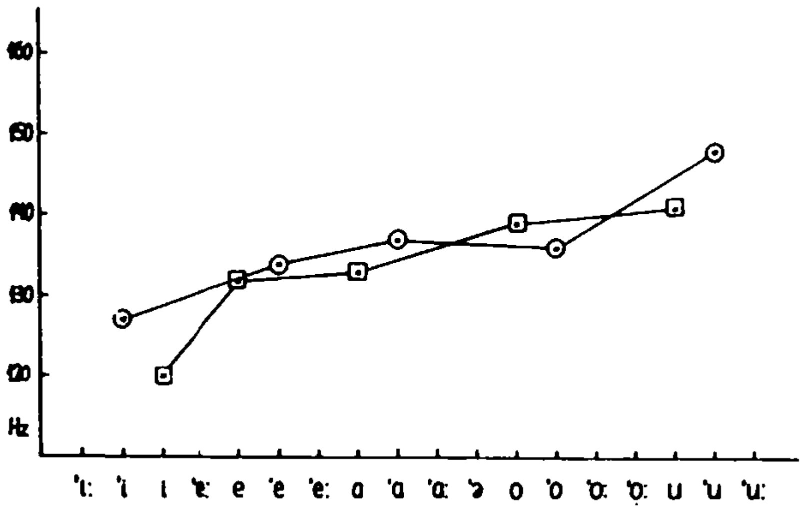
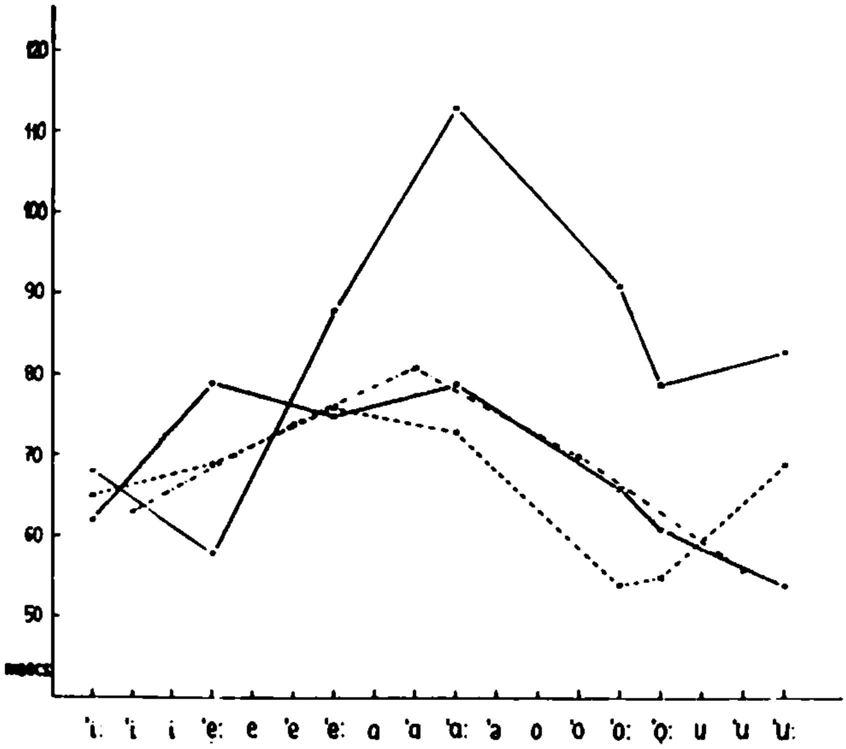


Fig. 6a Pi Vowel durations
Fig. 6b Pi Vowel frequencies
Word type: CV̲'CV̲C
Computer symbols: 4 <-5
2-5



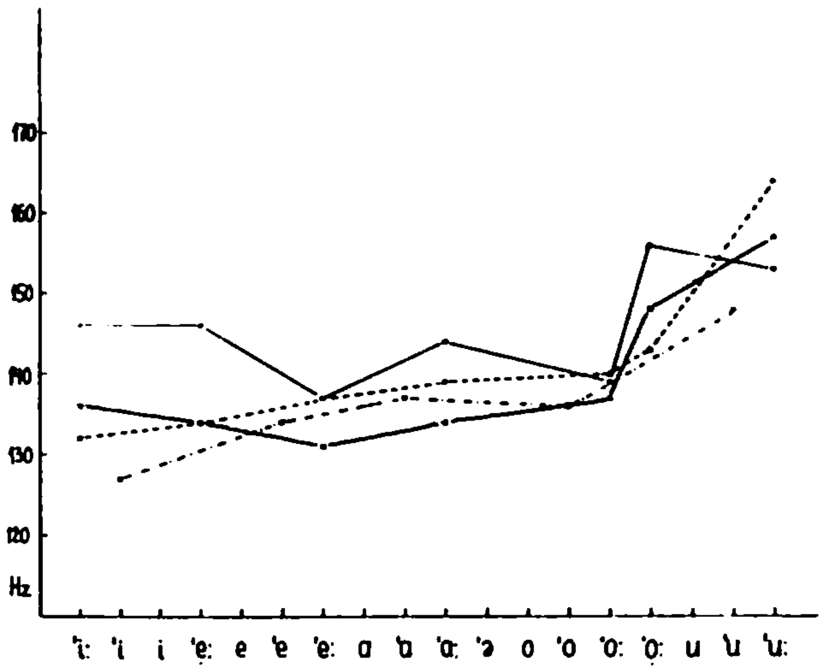


Fig. 7a Pi Durations of stressed vowels of all word types

Fig. 7b Pi Frequencies of stressed vowels of all word types

——— 2–4 ~~~~~ 4 >–5

- - - - 4–6 -·-·-·- 4 <–5

Chapter 4

ACCENT IN SINGLE WORDS IN NEUTRAL SENTENCE INTONATION POSITION

4.1 The single words in the corpus fall into two large groups: non–finally accented (barytones) and finally accented (oxytones). The tables containing the basic data of the 3 speakers (Tables 4 Ju, 4 Ka, 4 Pi) are at the end of this chapter on pp. 80–85, 86–91, 92–97 respectively. These data are further processed in Summary Tables 5–8 Ju, 5–8 Ka and 5–8 Pi which follow them on pp. 98–99, 100–101, 102–103 respectively.

4.1.1 The 3 speakers were asked to say the words embedded in the medial position of a frame sentence as part of that sentence (see Corpus, pp. 258–261). Since the words were originally meant to form the Slovene part of a Slovene–English contrastive analysis corpus (sonagrams 557–682), they contain all the Slovene vowels in stressed and unstressed position and the diphthong–like combinations of vowels with /j/ and /u/, and are some kind of "homonyms" to the corresponding English words (not dealt with in the present investigation). Because monosyllabic words are common in English and much less common in Slovene the number of monosyllabics is relatively big in the Slovene part of the corpus. This proved useful for the Slovene word accent studies, as there were thus enough examples of oxytones, about the accent of which less is known than about the word accent of barytones.

4.1.2 When breaking up the tone curves into smaller parts to formalize them, I tried to do it in such a way that would show up the tone movements that might be important in the identification of the two accents. I tried to do it, moreover, in such a manner that the course of the tone curve could be reconstructed without any special effort, just looking at the figures. The original data on the accented syllable (= the tonic) have been kept as they contain basic information, all the other figures to the end of the curve are not the original ones. They are there to show the relationship with the tonic data or with each other.

My aim was to have all the frequency changes in figures, numerically expressed, and not only as a description of the direction a contour takes. That is why on accented and postaccented syllables besides the starting point and the end point any inbetween point was measured where a change of direction occurred (hardly ever more than one). Where there was no change of direction on the accented vowel, the middle frequency figures in the basic tables (if present) are the mathematical mean between the starting point (= starting frequency) and end point (= end frequency) of the accented vowel. The frequencies of the starting and end point do not tell anything about the tone curve, unless it is the shortest distance between the two points. It is only the third figure that tells whether the tone curve is concave or convex, and what the size of the pitch changes is. This third point is so far formalized in the tables (see Fig. 8, p. 57) as it is supposed to be in the middle of the tonic (posttonics hardly ever have this third point), which of course actually often may not be the case. In other words: the distance from the starting point to the change of direction point was not measured. The resulting contour is in this respect formalized and does not represent its exact course.

The frequency difference between the starting and end point of a vowel gives the exact extent of pitch movement which can be rising (marked +) or falling (marked -).

Special attention was paid to the pitch difference between the end point of the accented vowel and the starting point of the postaccented vowel. This pitch difference can be either positive (up) or negative (down) and is disjunctive as a rule (only with sonorant consonants it may be continuous) and is therefore called "the jump". This frequency difference plays a crucial role in the perception of accent type as is evident from the identifications of the two interpreters. The average frequencies of the tonics and posttonics are in the basic tables because with vowels of shorter duration they might be nearer to the auditive perception than the original figures. In these instances they may show a more realistic picture of the pitch relationship between the tonic and posttonic, a relationship which I think is crucial for the identification of accent in barytones.

4.1.3 The durations of accented (underlined in the basic tables) and post-accented (or preaccented) vowels have been measured in centiseconds (csecs.) because of the intimate connection between duration and contour.

4.1.4 The intensity peaks as seen in the amplitude displays in the sonagrams have also been marked in the basic tables although it is believed that these data are less reliable and thus have a marginal role in accent identification. 0–0 means that it was not clear where the intensity peak was. Since the intensity peak is under the strong influence of the inherent intensity of a particular vowel and also depends on the neighbouring consonants, especially their manner of articulation and phonation, less attention was paid to these data and they were not further processed.

4.1.5 Pitch modifications within the domain of accent thus have to be viewed in 4 ways:

1) degree of change, the difference in frequency (pitch movement);
2) duration of change;
3) direction of change, ascending, descending, a combination of both (concave, convex);
4) mode of change:
   a) graded, continuous,
   b) abrupt, disjunctive (jump)

e.g.

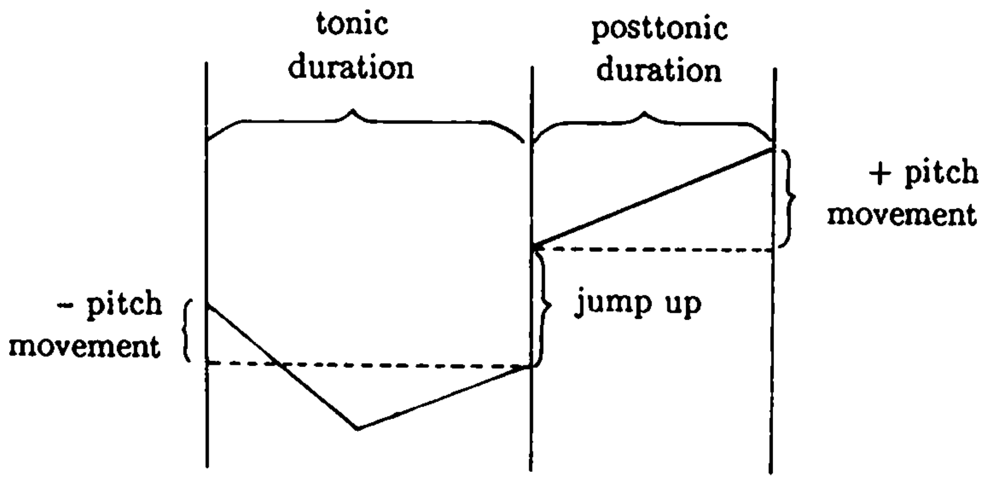


Fig. 8 The parameters of word accent that were measured in a barytone.

4.1.6 The sonagrams show certain recurring contours. In non–finally accented words the accented syllable, the tonic, forms with the following syllable, the posttonic, certain patterns which differ with the circumflex and the acute. Within each of these two groups certain phonetic variations are possible. A formalized list of these fundamental frequency patterns (FoPs) is found on p. XXI. Patterns that do not agree with any in the list are called IP (indeterminate pattern). Often they are falling throughout with no halt anywhere. With Ju and Ka, but much less with Pi, the FoPs are an important indicator of accent in the single words. So, for example, in only three words out of 62 as spoken by Ju do both interpreters Lo and Sn agree to disagrees with the FoP.

With oxytones tone contour and pattern coincide, there is no jump. We therefore speak about a R, F, RF, FR, or L fundamental frequency contour (FoC).

4.1.7 In Tables 4, which are the basic lists, containing most data on each word, the two groups (barytones and oxytones) are each subdivided into three subgroups: the circumflexed, the acuted, and the group less distinct as to accent. The two interpreters Lo and Sn are not always unanimous in their interpretation. Since one classification must precede we followed Lo's into the three groups. Where the two interpreters and the FoP agree the words in question are considered typical circumflexes/acutes. Even more interesting are the examples where they do not. It is this group that particular attention has been paid to for the light they throw on the interplay of duration, pitch movement and frequency in the perception of Slovene accent. As will emerge below, it is possible to draw various conclusions concerning which features are more or less important in different configurations, with different speakers and listeners.

Hardly ever do two utterances have exactly the same configuration of features. Although we are dealing only with duration, frequency and pitch movement, each utterance has a unique tone contour, the configuration possibilities being infinite. But each of them – or to be exact – most of them have certain characteristics, which result in the identification of one or other of the two accents. When the two interpreters have trouble in identifying the accent, I have tried to find out what exactly are the reasons for their difficulties.

4.2 Speaker Ju

Barytones

4.2.1 In his single word list Ju has 62 barytones. Of these 41 or 66% have an acute FoP, and 20, or 32% a circumflex FoP, and 1 has an IP (Summary Table 7 Ju, p. 99).

Of the circumflex FoPs the most numerous is FoP ˆ2 (12 instances) followed by ˆ1 (6 instances) and ˆ4 (2 instances) (Table 4 Ju, pp. 80–85).

Of the acute FoPs the most common is ´3b (14 instances), followed by ´3c (7 instances), ´2c (7 instances), ´3a (5 instances), ´1a (3 instances), ´1c (3 instances), ´1b (2 instances).

Of the 41 acute FoPs Lo + Sn perceived 33 or 80% as acuted or less distinctly acuted, the rest were perceived as acuted only by Sn, with the exception of 590 *âstma** (Lo + Sn ˆ) and 614 *ọ̑pera* (Lo ´ , Sn ˆ) (Summary Table 7 Ju, p. 99).

All the 4 averaged barytone acute FoPs (Figs. 9, 10, 11, 12, pp. 105, 106, 108) have a jump up between the tonic and posttonic (+19 Hz, +13 Hz, +19 Hz, +15 Hz). Figures 9, 10 and 11 have a concave tonic, and Fig. 12 a steadily rising one. The posttonic is level or only slightly rising in Fig. 9, rising in Fig. 10, and falling in figures 11 and 12. In spite of a falling posttonic the end-point of the posttonic is still higher than the end-point of the tonic – the auditive impression of a higher posttonic than tonic is retained.

The reasons for Lo's and Sn's different interpretations of the 6 words

*The words are always quoted with their expected word accent.

(Summary Table 6 Ju, p. 98) 584 *Amêrika*, 594 *mâki*, 646 *pâjek*, 650 *gâjič*, 680 *pâva*, 682 *grêje* in spite of an acute FoP are clear: the jumps up are smaller, in *Amêrika*, *pâjek*, *mâki* (Figs. 11a, 11b, 11c, pp. 106–107) +5 Hz, +8 Hz, +11 Hz respectively, the posttonic is falling, with *mâki* steeply falling, so that the posttonic ends even lower than is the starting point of the tonic. In these cases the human ear cannot clearly perceive whether the posttonic is higher in pitch than the tonic or not.

The acute prevails in Ju's barytones. Only one third of the barytones have a circumflexed FoP. In this group there is much less unanimity between Lo and Sn in accent evaluation than with acute FoPs. Of the 20 circumflex FoPs (Summary Table 7 Ju, p. 99) Lo interprets 18 as circumflexed, and Sn only 9. Figs. 13 and 14 (pp. 108, 109) represent these typical averaged barytone circumflexes perceived as such by Lo Sn. Both have a jump down between the tonic and posttonic (-28 and -11 Hz). Patterns ˆ1 and ˆ2 both have a continuously relatively steeply rising tonic. With ˆ1 the tonal peak is reached before the end of the tonic, so that the change of direction starts on the tonic and continues on the posttonic; with ˆ2 the tonal peak is at the very end of the tonic and the fall starts on the posttonic after a jump down between the tonic and posttonic. As Ju is acute orientated in his barytones, his tonal peak even on circumflexed words in pattern ˆ1 comes late, "at the last moment" so to say, and the fall on the tonic is indicated in Ju's sonagrams rather than actually carried out. That is why Fig. 13 does not show the change of direction towards the end of the tonic so clearly.

Circumflexed tonics are expected to be shorter than acuted. They may start on the same level as the acuted, but while the acuted are slightly falling, falling–rising, and in some few cases only rising with Ju, the rise on acuted tonics is not so steep and so continuous as with the circumflex. With the acute accent the tonal peak is not on the tonic, but on the posttonic, the highest averaged frequency on a typical acute tonic is 114 Hz and on a typical circumflex 145 Hz, because the tonal peak is reached on it.

That Sn should have interpreted half of the circumflex patterns (Summary Tables 6 and 7 Ju, pp. 98, 99) as acuted is strange. Cases like 577 *memorândum*, 604 *domệna*, 648 *bâjti*, 676 *teolộški* have a continuously rising tonic, a big enough jump down, so that their tonal peak is definitely on the tonic to be perceived as circumflexed. Or is it the length of the tonic which makes the rise so clearly perceptible that influenced Sn's judgement?

Sn must have here actually followed her own theoretical principle (ignored by her elsewhere) which has already been mentioned (p. 14) that on barytones too she defines accent by listening to the tonic only, and that the circumflex is a falling accent and the acute a rising one.

The two cases with FoP ˆ4 (557 *tộki* and 681 *mâvrica*) have a concave tonic though with a definitely rising overall pitch movement, 557 with a big jump down and 681 with a zero jump down and both with a definitely falling posttonic. They are not so typically circumflexed because of their concave tonic.

590 *âstma* (Fig. 15a, p. 109), on the other hand, is an interesting case as it is the only instance with an acute FoP which was perceived by both Lo and Sn as circumflexed. It seems that the extra shortness of the tonic /a/ and as a consequence a steeply rising tonic won over the big jump up in favour of a circumflex interpretation. Expected accent could have played its part as well.

The only other instance where both interpreters agree in their disagreement of the FoP are 617 *budîzem* and 622 *rudnīna* (Figs. 15b and 15c Ju, p. 110) with accent on the suffixes. They both perceived the circumflex FoPs as acuted. The reasons for it: a very small jump down (-4 Hz, -1 Hz) of less than a halftone, a long enough (9.1 and 10.6 csecs., while the averaged length of Ju's stressed /i/ in an open syllable in his nonsense word series is 8.2 csecs.) and low enough tonic on the vowel /i/, which is a vowel of small inherent duration and high inherent pitch. This only confirms the accent marking of the two words in SSKJ as either acuted or circumflexed.

4.2.2 Commentary to Summary Tables 5, 6, and 7 Ju (pp. 98–99). Of the 62 barytones 27 (44%) are expected circumflexes, 25 (40%) expected acutes, and 10 (16%) can take either accent.

The actual FoPs are shifted in favour of the acute: 41 (66%) have an acute FoP, 20 (32%) have a circumflex FoP, and 1 word has an indeterminate FoP.

Lo and Sn agree on accent in 45 utterances (= 73% agreement). Lo heard 36 (58%) as acuted and 25 (40%) as circumflexed, and 1 word as indeterminate. Sn heard 51 (82%) words as acuted and 11 (18%) as circumflexed.

All the expected barytone acutes have acute FoPs and are perceived by both interpreters as acutes. In addition 9 of the 27 expected barytone circumflexes have an acute FoP, 17 the expected circumflex FoP, and 1 has an IP. 7 of the unexpected acute FoPs are perceived as acuted by Sn while Lo perceives only 3 of these as acuted (Summary Table 6 Ju, p. 98).

Ju in his barytones is acute orientated. All the expected acutes have an acute FoP and are perceived as acutes by both judges. 9 of the 27 expected circumflexed barytones, moreover, have an acute FoP as well. They are in most cases perceived as acutes only by Sn and not by Lo.

The acute orientation of speaker Ju is confirmed by the FoP of the 10 words where the two accents can appear in free variation: 7 out of 10 have an acute FoP and with 1 exception are perceived by Lo and Sn as acuted.

As we can see from the above the two interpreters, too, are biased: Lo shows a circumflex orientation and Sn an acute. This attitude does not show in the 25 typically acuted words where there is complete agreement between SSKJ, the FoPs and Lo and Sn's auditive perception, or in the 7 acuted FoPs (Sn 7 ´, Lo 6 ´) in the SSKJ–free–variation–series.

The 8 utterances, for example, with a circumflexed FoP in the expected circumflex series (557, 577, 601, 604, 645, 648, 676, 681) interpreted as acuted by Sn, and the 4 circumflex perceptions of Lo's (584, 594, 646, 682) in the 9 utterances with an acute FoP in the expected circumflex series confirm that Sn is acute–biased and Lo circumflex–biased. Sn heard 82% of the barytones as acuted and Lo 58%.

Or should we rather say: Sn will hardly ever miss an acute FoP and Lo a circumflex.

Typical circumflexes and acutes are perceived by both Lo and Sn as circumflexes and acutes. Sn, moreover, hears the less typical acutes as acutes too, and Lo the less typical circumflexes as circumflexes. In the in–between–area, between an acute and a circumflex, Sn is acute–biased, and Lo circumflex–biased.

To sum up: Ju uses both accent types. The expected acute barytones are realized as acuted and some of the expected circumflexes as well, while the others are realized as circumflexed. Ju is acute orientated. A typical acute has a concave tonic with a slightly negative pitch movement, a jump up between the tonic and the posttonic, and generally a posttonic with rising pitch movement. A typical circumflex has a continuously more steeply rising tonic, a jump down between the tonic and posttonic, and a more or less steeply falling posttonic. – The main reason for differing interpretations of barytones are too small jumps (e.g. 584, 594, 646; 617, 622). – There are more differing interpretations of barytones with circumflex FoPs than with acute FoPs.

Oxytones

4.2.3 Ju has 75 oxytones in his single word list. Of these 48 or 64% have a rising contour, 8 or 11% a rising–falling, 6 or 8% a falling, 10 or 13% a falling–rising, and 3 or 4% a level contour (Summary Table 8 Ju, p. 99).

As to average vowel duration the longest are the falling–rising, 18.3 csecs., followed by the rising, 14.3 csecs., rising–falling 11.6 csecs., falling 10.4 csecs., and level 7.9 csecs., respectively. This is in agreement with the figures on the length of vowels in nuclear position in different sentence intonation patterns. There too, rising nuclei are longer than falling (cf. p. 138).

On account of accent type interference with Ju fall–rises and rises are longer than rise–falls. The level oxytone is shortest, where the vowel is not long enough, often because it is not stressed enough to change its level.

A rising contour, which with Ju is the prevailing contour in oxytones, can be perceived as either circumflexed or acuted (Figs. 16a Ju and 16b Ju, p. 111), depending on the steepness of the rise, on pitch and on vowel length. Fig. 16b Ju (A, B) represents the two averaged contours of a definite acute and a definite circumflex as perceived by Lo and Sn. It shows even more distinctly than Fig. 16a Ju (A, B), which also includes less distinct versions of the two accents, that a circumflex oxytone is a little shorter, steeper and has a wider pitch range than an acute oxytone.

The duration difference of 2 csecs. found in the 16a Ju and 16b Ju versions of the two accents can be well perceived by the human ear. Besides this constant difference of duration there may be a difference of a halftone between the two accents; or the circumflex may start even lower than the acute, but – though shorter – end higher in pitch than the acute. The contour of a circumflex is consequently steeper and has a wider pitch range than that of an acute. Lo's and Sn's evaluations of 12 identical words as acuted out of 48 shows that all these differences can be well perceived by a tonematically trained linguist.

Let us now take a close look at some of the 15 actual sonagrams (12 R, 3 FR) classified by both Lo and Sn as acuted or less distinctly acuted. All the tonics are rising, the rise is a little delayed, often preceded by a slight fall, so small that it generally cannot be perceived as a fall, only a delay of the rise, not evident in the basic frequency data in Table 4 Ju (p. 85) (nos. 566/3, 608, 609/2, 611, 619, 635; 612, 643, 671 – the last three with a definite fall before the rise). In the second half of the accented syllable there is a definite rise, which however is smaller than on a corresponding circumflexed syllable. The vowels are definitely longer than with the corresponding circumflexes. This fact also lessens the steepness of the rise. They might be lower in pitch than with the same vowel when circumflexed, but not necessarily. Compare e.g. the pitch of the acuted /í/s in nos. 566/3, 634, 642 with that of the circumflexed /î/s in 559, 560, 561, 567, where this difference holds; or the pitch of acuted /á/ in 609 with circumflexed /â/ in 586/2, or of acuted /ú/ in 619 with circumflexed /û/ in 627, where it does not. Only such examples have been chosen where Lo and Sn agree in their interpretation.

If the accented vowel exceeds a certain length and its pitch range is at the same time decreased rather than increased, the typical tone contour in this case is almost level in its first half and rising towards the end. Sn perceives such a contour as non-accented (Fig. 17 Ju, contour B, p. 112). Of the 14 non-accented utterances as perceived by Sn the averaged B contour shows extra long vowels with a small voice range (15 Hz) and with an end pitch that slightly exceeds the end pitch of a typical circumflex. Sn perceives these examples as non-accented because on account of their great duration they do not have a sufficiently rising contour. As she said herself she heard them as too long and too level with too small a rise at the very end to be either circumflexed or acuted. As soon as the accented syllable is shortened, its starting frequency slightly lowered, and its pitch movement increased (Fig. 18 Ju, p. 112) Sn perceives such a contour as acuted.

Interesting in this respect are the three realizations of the same word *pę̂t*. 640 and 647 have exactly the same duration, both start on the same frequency, differ widely in pitch movement (+3, +17 Hz) but are both classified by Sn as ˆ (•); 581 definitely shorter and with a markedly bigger rise (+27 Hz) is considered a distinct circumflex.

Lo's mind works differently here. He pays most attention to pitch, then to length, and then to contour. Sn, on the other hand, is more sensitive to contour, which is the result of duration and pitch movement, and less to pitch. Fig. 18 gives the averaged values of the borderline cases perceived as still acuted by Sn and already circumflexed by Lo.

If we examine all the six sonagrams in question (566/2 *dvę̂*, 589 *akǫ̂rd*, 592 *katalǫ̂g*, 628 *hurâ*, 632 *səm̂ənj*) we can see that in all the cases there is some reason for Sn's acute interpretation.

566/2, 589, 592, 628 – all have a delayed rise (589, 592 not so explicitly) and are long enough to be classified among the acutes. 589, 592, 628, moreover, are low in pitch. 566/2 *dvę̂* (Sn ´) has the same average frequency as 581 *pę̂t* (Sn ˆ). The classification criteria, here, seem to be length and contour (= pitch movement) with pitch as a supportive feature.

The last two words of the six that Sn considers acuted 632 and 638 have a continuous and not a delayed rise. If we compare 638 *imę̂j* with the earlier 635 *glę̄j* (which Lo and Sn defined as ´), *imę̂j* is much longer than *glę̄j* and so despite its great pitch movement of +27 Hz, which however is spread over a long period of time, supported by a relatively low pitch, Sn interprets *imę̂j* as acuted too.

/ə/ has the shortest inherent duration among all the Slovene vowels and therefore Sn perceives it in 632 *səm̂ənj* as a definite acute (= very long and low in pitch; 9.8 csecs. is long for the intrinsically short /ə/) and in 629 *p̂əs* (not averaged in Fig. 18 Ju) she interprets it as a less distinct acute (´ (•)), as it is a little shorter and higher in pitch, but is perceived as definitely too long for a circumflex. What Lo still considers the right length for a circumflex, Sn already feels too long for it.

In 571 *dẑę̂m*, 578 *cemȇnt*, 597 *rȁd*, 625 *lûk*, all with a rising tonic, Sn could not make up her mind whether they were acuted or circumflexed, although she was sure that they were accented. It seems that the length factor (in 571 and 578 the sequence vowel + sonorant consonant may be perceived as length) drew Sn's identification into the acute region, and the relatively big pitch movement into the circumflex region. About *dẑę̂m* which has only a small rise, and that initially, not delayed, Sn stated categorically that it certainly was accented but neither acuted nor circumflexed.

In 583 *režîm* and 672 *soldât* Sn vacillated between an acute and a non-accented interpretation. Vowel duration and the low pitch could point to an acute, but the pitch movement (+20 and +17 Hz) not.

A rise–fall is a typically circumflex contour, so none of the 8 rise–falls is perceived by either interpreter as acuted. If a rise–fall is especially long (576 *meděn*, 652 *zdȁj*), Sn considers it non–accented.

Falling–rising is a contour found with Ju in some of his utterances that have a relatively long vowel. As it is a contour typical of Ju in acuted barytone tonics, some of the longer utterances within this group (612 *pǭt*, 643 *krȁj*, 671 *sôld*) were interpreted by both Lo and Sn as acuted. Sn was mostly in doubt about the rest, and Lo interpreted them as circumflexed.

A falling contour in neutral sentence intonation position is either the result of weak stress, or the sentence intonation is not really neutral but falling. Sn therefore perceives only two words as definitely circumflexed, one where the fall is weak (586 *hûd*), and one where the vowel is so short that the fall cannot be perceived (618 *kȗp*). About the other 4 cases she is in doubt, or considers them not accented. Lo defines them all as circumflexed.

The three level oxytones have a relatively short vowel followed by a voiceless plosive. Two (559 *sȉt*, 627 *prodȗkt*) are too short for the tone contour to be perceived. What makes them circumfiexed is probably the overall pitch. 593 *mák* or *mȃk* seems to be long enough for Sn to perceive it as having a level contour and she therefore interprets it as non–accented.

The many zero and undecided classifications by Sn in the oxytone series are a sign that she did not feel at home with many of Ju's utterances. In the few cases where the pitch movement is small (568, 634, 661) this must have been the reason for Sn's zero classifications, while in the rest the greatest stumbling–block for her was the great length of the accented vowels in the words in question, 16.2 csecs. on the average (Fig. 17 Ju, B, p. 112). This then affected the contour, which was not rising enough to be considered accented.

The main reason for this is the fact that Ju's SS is under a weak influence of the Lower Carniolan dialect and thus has longer vowels than Sn's SS on an Upper Carniolan basis. The shape of the contour largely depends on its duration. Two tonics with the same pitch movement (i.e. frequency difference between the starting point and end point of the tonic) may vary greatly in the shape of their contours if the two tonics are not of approximately the same duration. A particular contour is always the result of pitch movement *and* duration. Besides these two elements the listener is, to a smaller or greater extent, also influenced by pitch. If one oversimplifies matters, one feels tempted to say that Lo, on the other hand, was very careful as to what constitutes an acuted oxytone, and classified the remainder by exclusion as circumflex. Lo's relatively few less distinct classifications, however, show that matters are not quite as simple as that.

To sum up the characteristics of Ju's oxytones:

1) an accented oxytone should have a rise;
2) the FoC can be: rising (most common), rising–falling, falling–rising (less

common), level or falling (the last 2 are rare);

a) the rise–fall is typical of the circumflex accent,

b) the rise can be either acuted or circumflexed, depending on the duration of the tonic, its steepness and frequency range;

c) a fall–rise, if long enough, is acuted, otherwise it is ambiguous;

d) a level or falling contour is a sign of too weak stress and may be perceived as unaccented;

3) A very long tonic is interpreted as unaccented by Sn.

4.3 Speaker Ka

Barytones

4.3.1 Ka in his accent realizations does not follow SSKJ as faithfully as Ju (Summary Table 5 Ka, p. 100). While all of Ju's expected acutes were interpreted by Lo and Sn as acuted, with Ka only 39% are interpreted by them as acuted, and almost half of them they both consider circumflexed. The circumflex accent has consequently supplanted almost half of the expected acutes. The percentage of expected circumflexes identified as such is much higher. A good 2/3 of the expected circumflexes are really circumflexed. Of considerable interest is the relatively high percentage of acutes in this series (15% – 4 cases). About Ka's accent we can say: only a good third of the expected acutes are realized as acutes, while 2/3 of the expected circumflexes are realized as such. In spite of the fact that Ka is circumflex orientated on the whole the 15% of unexpected realized acutes in the expected circumflex group are a sign that the changes of accent are two–way: the main stream from acute to circumflex, and a small stream from circumflex to acute. The cases in SSKJ where the two accents can appear in free variation with the same word are a sure indicator that Ka is circumflex biased: with barytones 56% of them are typically circumflex (with Ju 80% typically acuted), and with oxytones even 83% are circumflexed (with Ju 57% acuted).

On the whole the figures in the slots where Lo and Sn disagree in their judgements are considerably lower with Ka than with Ju (Summary Tables 5, 6, 7, 8 Ka, pp. 100–101). Sn had no problems here to interpret Ka as she had with Ju. The number of non–accented classifications is negligible.

The relationship between expected accent and interpreted accent is 39% with acutes and 67% with circumflexes (Summary Table 5 Ka, p. 100). The correspondence between FoPs and their interpretation is much better as we have to do this time with the same actual realization of a word – once from the point of view of acoustic phonetics and once from the point of view of perceptual phonetics. The two judges agree with 87% of acute and 76% of circumflex FoPs. (Summary Table 7 Ka, p. 101). With "Lo only" in the same table the acute agreement rises to 100%.

The 10 words (= 22% disagreement on the circumflex FoPs) in Table 7 Ka that are perceived as circumflex by one of the judges, not by both, show that they are circumflexed, but not typically circumflexed (Table 9 Ka, p. 67). We have made a list of them as well as of 2 acute FoPs with their technical details to see if we can find any reasons for their differing interpretations.

As long as there is a jump up between the accented and postaccented syllable, and the postaccented syllable is rising, Lo and Sn unanimously interpret the accent as acuted with Ka. 562 *síta*, however, has a falling posttonic, and so in spite of a jump up of +27 Hz Sn interpreted it as circumflex. Compared with 661 *pókoj* which too has a falling postaccented syllable of the same pitch movement, the bigger jump up of +37 Hz seems to counterbalance the fall, and so Sn here perceives an acute accent.

678 *rǟja* is perceived as less distinctly acuted by Lo, while Sn considers it circumflexed. The rise of +29 Hz on the accented syllable indicates rather a circumflexed accent. On the other hand this big rise may have been caused by the extraordinary low-pitched start of the accented syllable. There is no jump between accented and postaccented syllable, neither up nor down (due to the fact that there is a sonorant consonant between the two vowels?), while the postaccented syllable has an upward pitch movement, typical of Ka's acute postaccented syllables.

No. sona-gram	A C C E N T expected (SSKJ)	FoP	Interpreter Lo	Sn	D U R A T I O N of vowels in csecs.	T O N I C frequency in Hz	JUMP	POSTT. p.m.	INTEN-SITY peak	t. postt.
562	síta	ˉ3c	´	ˆ	5.3 7.9	107/102/97	+27	-11		+
678	rāja	`2b	´(*)	ˆ	12.1 4.5	67/86/96	0	+10		+
564	místik	ˆ4	´	ˆ	6.0 4.5	124/132/140	-31	-14	+	
596	v kádi	˙1	´	ˆ	12.1 6.0	119/113/110	-36	-12	+	
617	budīzem	ˆ1	´	ˆ	4.5 7.9 5.3	106/128/125	-15	-33	+	
621	rúti	ˆ2	´(*)	ˆ	7.5 4.1	120/122/123	- x	- x	+	
677	bâjer	ˆ2	´(*)	ˆ	13.2 10.2	64/86/108	0	- 8	0	0
636	glẹ̄jte	ˆ2	?	´(*)	9.1 5.3	108/115/122	- 9	-10	+	
645	râjni	ˆ4	ˆ	´	15.5 5.3	100/95/115	-45	-10	+	
648	bâjti	ˆ1	ˆ	´	14.7 4.5	80/92/104	-25	-10	+	
651	nẹ̄kaj	ˆ2	ˆ	´	8.3 5.3	111/122/133	-37	-38	+	
659	lojîtev	ˆ2	ˆ	´	5.7 6.0 10.2	80/94/108	-32	-14	+	

Table 9 Ka. Some cases of differing interpretations by Lo and Sn.

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Lo's 5 interpretations of barytones with a circumflex FoP as acuted or less distinctly acuted may in the first place be due to the psychological influence of the expected accent, except in 677 *bȃjer* which Lo considers less distinctly acuted anyhow. Differing interpretations of this word are probably due to the fact that there is no jump between the accented and postaccented syllable.

645, 648, 651, 659 are circumflexed. Sn must have ignored here the big jump down followed by a falling postaccented syllable. She seems to have followed her own theory here, namely that on barytones too you listen to the tonic only (cf. p. 14). The relatively low pitch of 645 (and a concave tonic), 648, 651, 659 may have acted as a supportive cue for her perception.

Oxytones

4.3.2 The prevailing contour in oxytones with Ka is the RF (64%), followed by the R (23%), while the number of other contours is much smaller (L 8%, F 5%) and there is no FR (Summary Table 8 Ka, p. 101).

Duration of accented vowels in oxytones. The only combined contour, consisting of two movements – first R, then F – is the longest (10.4 csecs.). It is followed by the F (8.6 csecs.), R (7.1 csecs.) and L (6.5 csecs.). The order is different here than with Ju (FR>R>RF>F>L). The fact that with Ka the F is longer than the R may be because we have only 4 instances of a F contour, of which 2 are diphthongs, which are by their very nature longer than pure vowels. The L contour is the shortest with both Ju and Ka.

We said that the RF was a typically circumflex contour and so 92% of the utterances in this group are interpreted by both listeners as circumflexed.

In the R–group 72% of the words are considered circumflexed by Lo and Sn, there are only 4 acute classifications, 2 by Lo and 2 by Sn, however, only once by both on the same word. 623 *ní* (Fig. 34, p. 121) was perceived as acuted by Lo, and after much hesitation as less distinctly acuted also by Sn. It has a gentler R than a typical R circumflex (Fig. 32, p. 120).

Differing identifications in the R–series. Sn considers 566/2 *dvẹ̑* (Fig. 35 Ka, p. 121) acuted probably on acccount of its low pitch, gentle R and length. In 609/1 *kọ̑d* both Lo and Sn deviate from the usual circumflex. The word has too small a pitch movement and is not high enough in pitch for a typical circumflex. Lo interprets it as acuted, and Sn as not accented, which goes to show that we are really in "no–man's land" with this word. 634 *smȓt* has the shortest vowel in this series and is perceived by Sn as non–accented. I can see no reason for Sn's interpretation of 674 *nȃg* as non–accented.

Differing interpretations in the RF series. In the 50 RFs there is almost complete unanimity as to accent between the two listeners. In 586/1 *hȗd* the small pitch movement up and down could be the reason for Lo's non–accented interpretation. In 634/2 *smrdí* (Fig. 36 Ka, p. 122) Lo's acute interpretation may be the result of expected accent, and a relatively low general pitch, ignoring the contour (see also p. 72). In any case, the fact that he classified it a less distinct acute shows that he was not quite sure about his perception. Sn's acute interpretation of 658 *lộj* (Fig. 37 Ka, p. 122) may be due to the combination of above average duration, relatively low overall pitch and positive overall pitch movement. A typical RF oxytone (Fig. 33 Ka, p. 120) with Ka has a negative pitch movement, i.e. it ends lower than it starts. 653/1 *dȁj* Sn considers non-accented. It has a well below average F.

There is no agreement between Lo and Sn in the 4 instances with a F-contour, except in 1 case where we have negative agreement when both consider 653/2 *tộ* non-accented. A falling contour in neutral sentence intonation position is really a sign of a non-accented pronunciation.

Four of the 6 L realizations contain a vowel between two voiceless plosives (581/1, 618, 619/1, 647/1), 5 utterances in this group (581/1, 568/1, 619/1, 642/1, 647/1) appear as the first word of a closely knit unit, which however does not start the tone group – both facts which favour a L contour. Only in one word does one of the interpreters (Lo) perceive an acuted accent (642 *mejȉ*) which has the lowest pitch in this series, in spite of the fact that /i/ is an inherently high pitched vowel. Lo concentrated here on the low pitch and ignored its short duration and the absence of the specific perceptive effect brought about by a R pitch that takes place in too short a time to be clearly perceived as a R. This and 568 *tȉ*, both containing /i/ of very short duration, were perceived as non-accented by Sn, probably on account of their weaker stress. The other interpretations were all circumflex. The direction of movement of the tonic cannot be significant here, but only pitch, as the contour is level throughout.

Ka has no FR contours as Ju has. A FR contour presupposes greater durations of vowels. Ju's averaged duration of the FR is 18.3 csecs., while Ka's longest averaged duration RF is 10.4 csecs. The FR is typical of Ju's barytone acutes and is – though much less common – found also in some of Ju's oxytones.

Ka uses the acute accent in barytones, although much less than Ju, but he never pronounces a typical acute oxytone. None of the 6 expected acute oxytones can be considered a typical acute, i.e. clearly perceived as such by both interpreters. While Ju still uses the acute in oxytones, we can say that with Ka there are no typical acutes, recognized as such by both listeners. Ka's preferred contour in oxytones is RF, a typically circumflex contour, and in the R-oxytones the vowels are below the threshold level of 12 csecs., the approximately minimal duration necessary for the perception of a contour (Neweklowsky 1973, 58). On an oxytone tonic of such short duration 2 accentually different rises are hardly possible. The cue of pitch contour is missing. The two accents could be held apart by a difference of pitch only.

Ka in his utterances of barytones and oxytones is definitely circumflex orientated.

We cannot say, however, that either of the two interpreters is biased as to accent type in Ka's utterances. The few examples where Lo and Sn disagree in their perception might be pointing to an expected pattern orientation of Lo's (Summary Table 6 Ka, p. 100), which can also be seen in his evaluation of some of Ju's less typical renderings of the two accents.

4.4 Speaker Pi

Barytones

4.4.1 As seen in Summary Table 5 Pi (p. 102) there is in the series of expected acutes 75% agreement between Lo and Sn in their interpretation of the realized accent, while agreement falls to 41% in the expected circumflex series. Lo proves to be more expected accent orientated than Sn with Pi too. Above 80% of the expected acutes and circumflexes he interpreted as expected. In the words where the two accents are expected to appear in free variation, we find 33% agreement on the acuted and only 11% on the circumflex accent, which, of course, does not mean that speaker Pi is acute orientated. It only confirms the fact we have just mentioned that between the two interpreters there is more unanimity as to what constitutes the acute accent, than what the circumflex. The relatively high number of words interpreted as non-accented in this series should also be mentioned (Summary Table 7 Pi, p. 103).

Fewer than half of the expected acutes have an acute FoP (Summary Table 6 Pi, p. 102) though all of these are recognized as acuted by both interpreters. With the 12 expected acuted words having a circumflex FoP, expected accent seemed to play an important role, 5 of them were jointly interpreted as acuted, in spite of a circumflex FoP, and only 1 was jointly considered circumflexed.

Of the 27 expected circumflexes, 19 have a circumflex FoP, but only 6 of them were interpreted as circumflexed by both judges. The rest Lo considered mostly circumflexed, and Sn less distinctly acuted or non-accented. None of the 3 expected circumflexes with an acute FoP was jointly interpreted as acuted. The circumflex FoP prevails in the free-variation-group, and again there is least agreement about the 5 circumflex FoPs.

Summary Table 7 Pi with its comparison between FoP and interpreted accent only confirms more clearly what we have already said about the 2 accents with Pi. While there is 73% agreement between the acute FoPs and their interpretation, the circumflex FoPs have only 19% agreement.

Pi articulates typical acute FoPs, but of his non-acute FoPs not quite 20% are typically circumflexed, and the rest are not. Consequently the latter are differently interpreted by the two judges: Lo is circumflex orientated, and considered them mostly circumflexes (14 instances), and Sn either acuted (11 cases), or non-accented (7 instances) or undecided (2 instances). The number of acute FoPs in the expected acute and expected circumflex series with Pi and Ka is approximately the same, the number of IPs (indeterminate patterns) of which Ju and Ka had 1 instance each has risen to 9 cases with Pi, replacing the

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circumflex FoPs, which in most cases are not typical, and have even become IPs in some cases.

As I follow the principle that an averaged figure should contain the averaged values of at least 4 items, there is only 1 example (Fig. 38, FoP ´ 1c, p. 123) of a Lo + Sn averaged acute. There is no other group of 4 words with the same FoP and a joint acute interpretation. So the other acute classes are represented by single examples of actual words (Figs. 39, 40, 41 Pi, pp. 123–124). The pitch movement of the accented syllable is either slightly rising or falling, a concave accented syllable is found in 1/3 of the cases. All utterances have a jump up. The jump up, however, is smaller on the average than with Ju and Ka. The 15 allotonic variants of the Pi acute have a falling postaccented syllable, with 2 exceptions (644 *kráji*, 617 *budīzem*). The voice range with Pi is relatively small.

Some differing interpretations. 662 *âvto* is difficult to classify: the accented syllable is level and is in the acute pitch range, there is a small jump up (less than a half tone), too small to be distinctly perceived, which is followed by a steeply falling postaccented syllable. I classified the FoP as acuted, Lo interpreted it as non-accented and Sn as less distinctly circumflexed. – In 594 *mâki* the accented syllable has an above average positive pitch movement for a Pi acute, the pitch reaches the circumflex region, the small jump up – big enough to be perceived – is followed by a greater fall. – 630 *və̂ndərle* is interpreted by both judges as circumflexed primarily on account of its extra short duration, supported by a high enough pitch for a circumflex, the jump up is not decisive, and is followed by a slight fall. – 673 *soldāščina* is much longer on account of /a/'s inherent duration, but all the other characteristics are the same as with 630.

The main reason for the many differing interpretations with the circumflexed FoPs with Pi is the small jump down of only averaged -9, -6, -7, -6 Hz in the four groups respectively, followed by a falling postaccented syllable (averaged -11, -9, -7, -4 Hz), which, however, is not falling steeply enough to support a definitely falling perception, which is the decisive characteristic of the circumflex accent in barytones. As a consequence the voice range in Pi's circumflex FoPs is smaller than with both Ju and Ka.

The joint acute interpretations of 566/1 *éna*, 596 *v kádi*, 620 *rúda*, 639 *na sẹ́ji* probably owe such an interpretation to the psychological influence of an expected acute combined with a small jump down and an insufficiently steep fall on the postaccented syllable. It seems that the mind of the two judges worked according to the principle: What is not properly falling is considered rising if you expect the acute accent. This also explains why the acutes with a small jump up are jointly perceived as acutes, while unanimity is broken with the circumflex FoPs with a small jump down.

I have toyed with the idea that this may be related to the fact that pitch perception functions logarithmically, and therefore the human ear is more sensitive to the higher pitch intervals than to the lower, i.e. even a small rise is perceived as a rise, while a falling interval has to be bigger to be distinctly perceived. I have, however, come to the conclusion that this is language conditioned. The difference in perception intervals with a frequency of 120 and 160 Hz is 1/4 of a tone, too small to be significant.

Rigler says that an acute cannot replace a circumflex, while it does not sound wrong to Slovene ears if a circumflex replaces an acute (Rigler 1968, 196). An acute sounds more specific than a circumflex, which is more neutral in its sound effect. The acute is the marked accent, the circumflex not (cf. p. 236). And so the acutes (even though the jumps may be small) are easier to perceive than the circumflexes.

Expected accent, however, is ignored with typical FoPs. Thus, for example, 563 *sítast* (Fig. 44 Pi, p. 126), is considered circumflexed by Lo + Sn on account of its relatively large jump down and the steeply falling postaccented syllable, strongly supported by the fact that the accented syllable is short and has the tonal peak.

The temptation to use a falling sentence intonation on a combination of two words as 596 *v kádi* and 639 *na sẹ́ji* forming a structural unit is especially great in spite of the instructions to the three speakers at the beginning of the recording session to incorporate these words in the frame sentence. In this case we would have to do with the acute accent on a falling sentence nucleus. These matters will be dealt with in the next chapter.

When allotting the circumflex FoPs to different classes a certain though small number of cases was noticed that had a typically acute accented syllable, i.e. first falling or level and then rising towards the end, a concave contour; followed by a jump down and a falling posttonic – which again was typically circumflex. As I consider the jump phonologically relevant these cases form the 4th class of the circumflex FoPs. With all three speakers this group had relatively the greatest number of differing interpretations.

Ju has only 2 such cases and no joint interpretation of the 2 words. Of the 4 interpretations 2 are circumflex, 1 acute and 1 less distinctly acute. Ka has 4 cases in this group with the circumflex interpretation prevailing because of the relatively large jumps down: 2 joint circumflex perceptions, 2 single circumflex, and 2 acute. Pi on account of his small jumps down has most confusion: 2 joint acute interpretations (596 *v kádi*, 639 *na sẹ́ji*), supported by the expected acute accent, and the rest are 4 single acutes, 4 less distinct acutes, 4 circumflexes, 3 non-accented, and 1 undecided. Sn never perceived this pattern as circumflexed. Where Lo perceives a circumflex accent, Sn generally interprets it as less distinctly acuted. She pays more attention to the accented syllable with its concave shape, while Lo to the accented + postaccented syllable and the jump down between them.

These data and their interpretations show that the shape of the accented syllable though not of phonemic importance can cause confusion in the interpretation of the FoPs.

Lo and Sn agree only about one barytone 651 *nẹ̄kaj* with an IP that it was non–accented. The accented syllable is exceptionally short (4.1 csecs.), the word has a jump down, and the tone contour in both the accented and postaccented syllable is falling throughout. The only other barytone that Lo interprets as non–accented is 662 *âvto* where the accented and postaccented syllables are also falling, but a slight jump up (+3 Hz) inbetween interrupts and halts the fall. Sn wondered if the word was circumflexed. Sn moreover considers 7 more circumflex FoPs non–accented. All these words have in common a tendency to a smaller than average jump down. No acute FoP is interpreted as non–accented by either Lo or Sn.

Oxytones

4.4.2 Pi has 72 oxytones in his single word list. No contour is really predominant, although the R has most examples (23–32%), followed by the F (20–28%) and the RF (16–22%). FR and L contours are less numerous (6–8% and 7–10% respectively).

As to averaged vowel duration the longest is the RF, 8.9 csecs. on the average, followed by the FR 8.6 csecs., the R 7.9 csecs., the L 7.2 csecs. and the F 7.2 csecs. The two contours with a change of pitch movement within their contour are the longest and form a group as they are practically of the same duration. At the other end are the durations of the L and F contours, and in between the two groups is the averaged R contour. Since each group contains examples with different vowels inherent vowel duration of single vowels can be ignored here.

13 of the oxytones with a R contour are jointly classified as circumflexed (Fig. 48 Pi, p. 128), and 3 as acuted (Figs. 45, 46, 47 Pi, pp. 126–127). Examining the graphs of these 3, comparing their durations, frequencies, and pitch movements I cannot see any other reason that 637 *smejọ̄č* and 642 *mejí* should be jointly perceived as acuted but expected accent, while 660 *lojár* is a typical acute, low enough in pitch with a concave, gently rising and long enough pitch contour. 637 and 642 are too short and too steeply rising for an acute and of the same pitch as a typical averaged circumflex oxytone.

The possible reasons for Lo's single acute interpretations of the three utterances 609 *kọ̄d*, 638 *imẹ̄j* and 650 *gajȉč* (Figs. 50, 51 Pi, p. 129): in *kọ̄d* the expected free variation of the two accents and the fact that we have a close /ọ/ and not an open could have contributed to an acute perception; in *imẹ̄j* it could be length combined with a gentle rise (Lo perceived it as ´ ⁽•⁾), and in *gajȉč* the low pitch of /i/.

I can see no reason for Sn's non–accented interpretations of 588 *aktivȉst* and 672 *soldât*, while 638 *imẹ̄j* is probably too long for her to be perceived as accented.

Pi's 6 FRs (Summary Table 8 Pi, p. 103) invite a lot of guessing and little unanimity. The contour is typically acute. Of the 6 words 3 have a single non–accented classification. Pitch, which is circumflex–like and contour, which is acute–like are in disagreement, hence the confusion.

There is much more unanimity with the RFs, a typically circumflex contour. Of the 16 words 13 are jointly perceived as circumflexed (Figs 53 Pi, p. 130). One word (634 *smrdí*, Fig 52 Pi, p. 130) is perceived as acuted: the circumflex contour seems to be here the result of an acute R on a falling sentence nucleus, the R is cut short by a F.

We have here to do with the last word of a sentence embedded in a frame, hence the fall at the end. The interpretation here is phonological, not phonetic (= a R acute accent on a F nucleus). 619 *rȗt* and 623 *mirȗ* Sn interprets as non–accented. Both are relatively short, have little pitch movement (5 and 3 Hz) and they start and end on the same pitch. She may therefore have perceived them as level.

Pi has relatively many oxytones with a falling contour. If the fall is not too steep and the vowels are in the right voice range the falling words are jointly interpreted as circumflexed (Figs. 54 and 55 Pi, p. 131), except 585 *alárm* (Fig. 54 Pi) where expected accent seems decisive. The feature common to the joint non–accented interpretations in 652 *zdȁj*, 667 *šȅl* and 675 *snộv* is a steeper fall (12–21 Hz) and a lower frequency than in the joint circumflex series.

4.5.1 Agreement between expected accent, FoP and interpreted accent on barytones (Summary Tables 6 Ju, Ka, Pi).

As the two interpreters have studied the whole vocabulary of the Slovene language they know the expected accent in most cases and are to a certain extent under its influence, especially where the FoP is not so specific.

Acute FoPs with speakers Ju and Pi are 100% and with Ka 90% jointly interpreted as acuted when the expected accent is the acute. The circumflex perception, though expected, will never reach this high percentage of unanimity. With Ju it drops to 53% (Lo only 100%), with Ka to 82%, and with Pi to 32% (Lo only 84%). This shows that it is not only expected accent that makes the two judges perceive the acute so well.

When the acute FoP is not supported by expected accent Lo + Sn agree with Ju's FoPs that they are acuted in only 22% of the cases (Sn only in 78% of the cases), while they both recognize unexpected acute FoPs with Ka 100%, and unexpected circumflex FoPs 73%. With Pi the FoP system seems to break down here: out of 12 circumflex FoPs only 1 (8%) is jointly perceived as circumflexed. The situation does not improve even if we take the single judgements of the two interpreters into consideration. The same holds for the 3 unexpected acute FoPs. None of them is jointly recognized as acuted.

With utterances where the two accents are expected to appear in free variation the situation should be most realistic. The two interpreters cannot have any preconceived notions as either accent can appear here. Of the 7 acute FoPs with Ju 6 (86%) are jointly recognized as such, while none of the 3 circumflexed words is jointly interpreted as circumflexed. Of the 8 circumflexes with Ka 5 (63%) are recognized as circumflexed. Of the 5 circumflexes with Pi none is jointly perceived as circumflexed. The situation improves if we consider Lo's perceptions only. He interprets 3 instances (60%) out of 5 as circumflexed.

The figures show that regardless of speaker it is easier to perceive an acute accent than a circumflex.

Perceptions of unexpected FoPs show that Ka's FoPs are easiest to define. With Ju Sn is an expert on his acutes, and Lo on his circumflexes. Pi's FoPs are not specific enough to be classified with certainty. Expected accent plays too great a part with them. Ka has the greatest jumps, while Pi's jumps are very small, and so the vital cue for accent interpretation is weak.

Of the 3 speakers Ju follows the prescribed accent more faithfully than Ka and Pi. All the expected acutes have acute FoPs and 1/3 of the expected circumflexes as well, which shows that Ju is acute orientated. There is no transition of an expected acute accent into a circumflex one.

Ka, however, is circumflex orientated. Over a half of his expected acutes have a circumflex FoP. On the other hand even this accent type is not firmly rooted with him. We find in Ka barytones, though to a much smaller extent, a few unexpected acute FoPs in the expected circumflex series.

While there is 1 IP with Ju, and 2 with Ka, their number increases to 9 with Pi. This fact and the fact that there is much less agreement between a FoP and its accent perception shows that Pi's tonematic pronunciation is in a stage where many of the FoPs themselves are not specific enough to be unambiguously classified.

With Ju and Ka the FoP always agrees with at least 1 perception of the two judges. Instances where both interpreters perceive an accent differently from the one signified by the FoP are extremely rare. We have 3 such cases with Ju, 617 *budīzem* and 622 *rudnīna*, both words accented on a suffix with the acute and the circumflex occurring in free variation and 590 *ȃstma*. With Ka there is only 1 such instance 626 *lúka*.

With Pi, however, this phenomenon is not so rare. We have 11 barytones with a circumflex FoP (558, 566, 596, 602, 620, 621, 622, 636, 639, 648, 659), 7 with an expected acute, 2 with an expected circumflex, and 2 with free variation accent. All are jointly interpreted as acuted or less distinctly acuted. All these words have a jump down of 0 to -7 Hz, too small to be properly perceived. Supported by an expected acute in most instances or a free variation acute they are jointly interpreted as acuted.

To what extent do the 3 speakers adhere to the acute/circumflex distribution in barytones as prescribed by SSKJ?

All three have both accents in barytones. Only one of them (Ju), though, uses one accent (the acute) wholly in the expected words. The distribution of the circumflex with Ju and of the two accents with Ka and Pi follows the expected distribution only in so far that the ideal distribution is reflected in the general tendencies of the FoP type.

Thus with Ka in the expected acute group the circumflex FoPs amount to 58%, and in the expected circumflex group to 81%. Pi has 50% circumflex FoPs in the expected acute group, and 70% in the expected circumflex. With Ju there are no circumflex FoPs in the expected acute group and 63% of circumflex FoPs in the expected circumflex group.

How many barytones are circumflexed/acuted throughout? That is:

1) they have an expected circumflex/acute;
2) all the three speakers articulated a circumflex/acute FoP;
3) all the 3 perceptions by the 2 interpreters are circumflex/acute;

e.g.

1) SSKJ: *dóba*
2) Ju ´ FoP; Ka ´ FoP; Pi ´ FoP.
3) Lo: Ju ´ FoP; Ka ´ FoP; Pi ´ FoP.
   Sn: Ju ´ FoP; Ka ´ FoP; Pi ´ FoP.

There must thus be tenfold circumflex/acute agreement. Only few words meet these strict conditions. Three circumflexes: 663 ***âvdion***, 565 ***mîting***, and 587 ***aktîven***; four acutes: 644 ***kráji***, 655 ***bóji***, 570 ***matemátika***, and 582 ***médel***. These words thus seem to have a firmly fixed accent.

With expected circumflexed words, acute orientated Ju with his acute FoPs in this series breaks the chain of agreement in 1/3 of the cases. Disagreement between FoP and interpretation, which is not so uncommon here as with acute FoPs, accounts for some more interruptions with Ju and Pi.

With expected acuted words the chain of agreement is broken by the many circumflex realizations of the circumflex orientated speaker Ka and also on account of the disagreement between Pi's FoPs and the perception of one of the interpreters.

No expected free variation word gets through this tenfold net. Here accent is expected to appear in free variation, and that is what really happens.

4.5.2 Some general observations on barytones (Table 10 Ju, Ka, Pi, p. 104).

It is believed that the acute accent tends to be longer than the circumflex (Neweklowsky 1973, 94 in Podjuna/Jauntal, but 145 not in Rož/Rosental; Rigler, personal communication, Nov. 24, 1983). Ju barytones, however, do not show this (Table 10). There are too many other, stronger, factors coinfluencing the duration of an accented vowel (cf. pp. 212–213). In the few examples of expected minimal pairs where the two accents appear in exactly the same conditions (Tables 15 Ju, 15 Ka, 15 Pi, pp. 208–210) even when they are not actually realized the (expected) acutes tend to be longer than the (expected) circumflexes. The same applies to Pi's accusative/instrumental series (Table 14 Pi, pp. 204–205).

Ju's acuted barytones mostly have a concave contour (3a, 3b, 3c). They are long enough for a concave contour, which more often has negative than positive pitch movement. Only the group with the shortest duration (2c) has a continuous, though gentle, rise. With all his acutes the jump up has the steady value of about two halftones, which can be well perceived. The posttonic is generally rising, but often also falling.

The two averaged circumflex groups have a steady rise, steeper than with the acute accent, the tonal peak is on the tonic. The change of direction in group ˆ1 is only indicated at the very end of the tonic rather than carried out, so that the frequency figures do not show it. The jump down (ˆ1, ˆ2) is big enough to be perceptible and is supported by a falling posttonic. In classes ´2c, ´3b, ´3c, ˆ2 the tonal peak, whether on the tonic or posttonic, amounts to about 124–129 Hz, and the lowest point to about 100–108 Hz. This is the normal voice range within which Ju moves. Averaged ˆ1, however, starts higher and ends higher, but the bigger jump down restores the normal values.

Acuted tonics with Ju tend to be lower than circumflexed, because the tonal peak is reached on the posttonic only. When the tonal peak is on the accented syllable (= circumflexed accent), the rise, naturally, is steeper and such a tonic, obviously, has higher frequencies than an acuted one.

Ka's vowels in general are shorter than Ju's. Group ´3b has definitely longer vowels, but the other acuted words have about the same length as the circumflexed.

In his acuted barytones Ka too, has slightly negative pitch movement, the jumps up, however, are twice as big as with Ju and are mostly supported by a rising postaccented syllable. With Ka's circumflex barytones, numerically, the R is smaller than with Ju, though actually it is much steeper as it takes place on a vowel of shorter duration. The jumps down are throughout bigger than with Ju and the postaccented syllable is always falling, as expected. The difference in overall pitch of the accented syllable under the two word accents is kept.

Acuted vowels do not tend to be longer than the circumflexed with Pi either, often it is even the other way round. In average length they are nearer to Ka than to Ju. Acuted accented vowels can be slightly rising or falling, in the biggest averaged group they are falling. When rising there is no definite difference between a rising acuted tonic and a circumflexed one. Neither is there a clear cut difference in pitch between the two accents. There are a few big jumps up and jumps down, but on the whole they are smaller than with Ju and Ka. As mentioned earlier when the jump up or down are approximately equal it is easier to recognize the acute accent than the circumflex accent.

Circumflex FoPs with small jumps down and accented vowels that do not differ in pitch from the acuted are easily ambiguous, especially if they are not backed by expected accent. The fact that Pi spoke these words at an above average speed might be the reason for his less specific FoPs.

4.5.3 On vowel duration in oxytones. Agreement between expected accent and interpreted accent in oxytones. The role of the FoC (Summary Tables 5 Ju, 5 Ka, 5 Pi, 8 Ju, 8 Ka, 8 Pi, pp. 98–103). Generally speaking one can say that accented vowels with a change of pitch movement are longer with all 3 speakers than those without one. Thus a FR or RF is longer than a R or F. Of the latter two a R tends to be longer than a F. F and L vowels tend to be shortest.

The expected length difference of the two accents shows clearly with Ju, whose acute oxytones are about 2 csecs. longer than his circumflex.

As with barytones so with oxytones all the Ju expected acutes are identified by both listeners as acuted. Of the 6 expected acutes with Ka only 1 is jointly interpreted as acuted (see pp. 68). Of the 5 Pi expected acutes 4 are jointly identified as acuted – expected accent seems to have been decisive here as only 1 word (660 *lojár*) has all the characteristics of an acute (see p. 73).

Almost half of Ju's oxytones (45%) are interpreted as undecided or non–accented by Sn. She had problems with Ju's long vowel durations, which also affected the contour (see p. 64).

Their number falls drastically with Ka where Sn interpreted 8 oxytones (10%) as non–accented and Lo 1. It rises again with Pi where Sn considered 22 words (31%) undecided or non–accented and Lo 1. This is so because Pi's FoCs tend to be less specific. Lo has fewer problems with the interpretation of words because he tends to be more expected accent orientated than Sn.

On the whole, we can say that barytones have fewer undecided or non–accented interpretations than oxytones.

The fundamental characteristic of an accented oxytone is a rising contour. This may be realized either as a pure R; a R followed by a F, and in some cases and with some speakers as a R preceded by a F. Instances that have no R in their contour (i.e. are F or L) amount to 12% with Ju and 13 with Ka.

As Ju is acute orientated, pure Rs prevail with him (64%), while the prevailing contour with Ka is RF (64%), which is typical of a circumflex orientated speaker. With both, however, a contour containing a R is typical (Ju 88%, Ka 87%).

Pi's weaker manifestation of accent has already been mentioned in connection with his barytone FoPs. These tendencies also appear in his oxytones. The proportion of only R versus only F oxytones is almost the same, 32% versus 28%. Instances with no R in their contour amount to 38% with Pi, as compared with 12 and 13% with Ju and Ka.

An acuted root morpheme in oxytones is very rare and has a small func-

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tional load. Such words as *alárm*, *lẹ́p*, *kọ́t*, *Víč*, *kljúč* with an expected acute are rare. The acute accent is expected also in final position in some bound morphemes, such as *-ár*, *-áč* or in verbal inflection. No experimental studies on how much the acute is still used in these endings have been undertaken yet. I could imagine that suffixes, being more frequent, might follow expected accent more faithfully than expected acutes in root morphemes, which are not so often used.

Lo + Sn's joint acute interpretations of 12 words out of 48 with a R contour and of 3 out of 10 with a FR show that Ju distinguishes between the two accents on oxytones very well. He can pronounce typical acute oxytones. The 6 more definite acute interpretations of utterances with a R contour made by Sn only (Fig. 18 Ju, p. 112) show that her acute perception has a wider range than Lo's. Her acutes can be slightly shorter than a joint acute (Figs. 16a Ju B, 16b Ju B, p. 111) and have a frequency range starting slightly higher and ending higher than a joint averaged acute. In barytones the vowel duration difference between a circumflexed and an acuted accented vowel was not so evident as it is in oxytones. It amounts to 2 csecs., which is easily perceptible to the human ear.

Ka and Pi have hardly any typical acute oxytones. The few perceptions of Ka's oxytones as acuted are single, not joint, or less distinct. Of the 3 joint perceptions of R oxytones as said by Pi two are obviously conditioned by expected accent, and only one has all the characteristics of the acute accent (see p. 73). The one joint less distinct perception of a RF as acuted seems to be phonological (see pp. 74), and for 585 *alárm* with a F contour expected accent seems to be decisive.

Ka and Pi practically do not use the acute accent in oxytones any longer.

The contour on which a typical acute is possible in our corpus in single oxytones is R and in a few cases FR (with Ju). The 1 RF (634 *smrdí*) by Pi, jointly interpreted as acuted, is a combination of a R on a falling sentence nucleus. The R can thus be acuted or circumflexed.

The RF is a typically circumflex contour. Joint agreement is more common here than with any other contour: 6 out of 8 of Ju's RFs are jointly classified as circumflexed, 46 of Ka's 50 instances, and 13 of Pi's 16 such cases (overall 88% agreement).

F and L contours with all 3 speakers have fewest joint interpretations. They are not really accented in neutral sentence intonation position.

No. sona-gram	A C C E N T expected (SSKJ)	FoP	Interpreter Lo	Sn	D U R A T I O N of vowels in csecs.				T O N I C frequency in Hz	p.m.	JUMP	POSTT. p.m.	AVERAGE FREQUENCY t.	postt.	INTEN-SITY peak t.	postt.
	Accent in non-final position															
557	tôki*	´4	ˆ	´(*)	10.2	4.5			155/148/164	+ 9	-46	-12	156	112	+	
565	miting	ˆ1	ˆ	ˆ	7.5	5.3			124/152/149	+25	-16	-30	142	118	+	
577	memorăndum	ˆ1	ˆ	´	9.1	7.5	12.8	6.0	99/103/108/122	+23	- 7	- 5	108	113	?	?
581/2	(pệt) mêtel	IP	ˆ	´	11.3	9.1			109/111/113	+ 4	+ 6	-22	111	108	0	0
584	Amêrika	´3c	ˆ	´	7.9	16.6	7.2	9.1	111/113/121	+10	+ 5	- 2	115	125	0	0
587	aktîven	ˆ1	ˆ	ˆ	6.0	9.4	6.8		135/143/140	+ 5	-13	-13	139	121	+	
590	âstma	´2c	ˆ	ˆ	9.8	9.0			97/104/111	+14	+21	- 7	104	129		+
601	mộto	ˆ2	ˆ	´	13.2	11.3			115/118/144	+29	-29	-37	126	98	+	
604	domệna	ˆ1	ˆ	´	9.1	19.6	7.5		101/111/121	+20	-33	-10	111	83	+	
630	vàndarle	ˆ3	ˋ	ˆ	6.0	6.0	9.1		113/114/114	+ 1	+ 2	-10	114	111	0	0
645	râjni	ˆ2	ˆ	´	27.2	9.4			106/121/135	+29	0	-20	121	125	+	
646	pàjek	´3c	ˆ	´	12.1	6.8			112/107/117	+ 5	+ 8	- 6	112	122	+	
648	pri bâjti	ˆ2	ˆ	´	19.2	14.7			106/123/140	+34	-33	-22	123	96	+	
650	gájič	´1a	ˆ	´	10.6	8.3			101/102/103	+ 2	+10	0	102	113		+
656	bojệvnik	ˆ1	ˆ	ˆ	7.5	17.4	5.3		123/145/163	+40	- 6	- 9	144	152	+	
659	lojîtev	ˆ2	ˆ	ˆ	7.5	11.3	17.7		91/116/140	+49	-35	-39	116	87	+	
662	âvto	ˆ2	ˆ	ˆ	21.1	10.6			103/135/135	+32	-10	-33	124	109	+	
663	âvdion	ˆ2	ˆ	ˆ	18.9	10.9	7.5		117/127/137	+20	- 4	-16	127	125		+
668	molîtev	ˆ1	ˆ	ˆ	9.1	6.0	15.1		124/148/172	+48	-75	-16	148	89	+	
673	soldăščina	ˆ2	ˆ	´	9.4	13.6	5.6	12.8	101/115/128	+27	- 2	- 8	115	122	+	
676	teolộški	ˆ2	ˆ	´	7.5	10.2	12.8	4.5	99/105/110	+11	- x	- x	105	x	+	
677	bàjer	ˆ2	ˆ	ˆ	13.6	6.4			116/109/135	+19	- 8	-21	120	117	+	
681	mâvrica	ˆ4	ˆ	´	19.6	7.9	9.8		103/97/122	+19	0	-12	107	116	0	0
682	grệje	´2c	ˆ	´	9.8	11.3			103/108/112	+ 9	+ 9	- 4	108	119	+	

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Table 4Ju. Basic data on single words in neutral sentence intonation position.

* The word accent of the words beginning with T-2 in this series that have not appeared yet in SSKJ were verified by J. Rigler personally.

No. sona-gram	A C C E N T expected (SSKJ)	FoP	Interpreter Lo	Sn	D U R A T I O N of vowels in csecs.					T O N I C frequency in Hz	p.m.	JUMP	POSTT. p.m.	AVERAGE FREQUENCY t.	postt.	INTEN-SITY peak t.	postt.
	Accent in non-final position (cont.)																
558	rékli (sta)	´3b	´	´	11.3	4.9				114/109/103	-11	+29	+ 6	109	135		+
562	sȋta	´3b	´	´	6.8	16.2				122/114/106	-16	+27	+10	114	136		+
563	sȋtast	´3b	´	´	6.0	7.2				131/125/119	-12	+12	+ 3	125	133		+
564	mȋstik	´1a	´	´	9.1	3.4				140/140/140	0	+27	- 2	140	166		?
566/1	éna	´3c	´	´	14.7	9.1				106/106/111	+ 5	+15	- 3	108	125	0	0
570	matemátika	´3c	´	´	3.8	6.0	12.1	4.5	9.1	114/119/123	+ 9	+30	- 3	119	152		+
572	cẹnter (or ē)	´1b	´	´	11.3	7.1				129/129/129	0	+14	+17	129	152	0	0
573	egocẹ́ntričen (or ē)	´2c	´	´	9.4	6.0	9.1	3.0	6.0	110/113/115	+ 5	+ 9	- 8	113	120	+	
580	méča	´3a	´	´	13.6	11.3				103/98/93	-10	+31	+ 1	98	124		+
582	médel	´1c	´	´	14.0	7.9				98/98/98	0	+25	- 6	98	123	+	
591	astmátik	´2c	´	´	6.0	13.6	4.1			103/105/106	+ 3	+23	- 8	105	125		+
596	v kádi	´3b	´	´*	20.4	13.6				110/91/88	-22	+17	+18	96	114		+
602	notọ́ričen	´3b	´	´	7.2	15.8	6.8	5.7		99/97/102	+ 3	+ 4	+ 8	99	110		+
603	dogmátik	´3c	´	´	6.8	12.1	5.3			99/97/103	+ 4	+15	- 7	100	115		+
605	gọ̄di mi	´3a	´	´	14.3	6.8	11.3			103/98/93	-10	+13	+ 1	98	107		+
610	dóba	´3b	´	´	17.4	15.1				96/89/91	- 5	+14	+ 3	92	107		+
614	ộpera	´3b	´	´	9.1	6.8	10.9			99/97/95	- 4	+20	- 6	97	112	+	
615	operácija	´3a	´	´	4.5	8.3	15.8	10.9	4.1	97/93/93	- 4	+ 7	- 2	94	99		+
617	budȋzem	ˆ2	´	´	7.5	9.1	6.0			107/114/121	+14	- 4	-15	114	110	+	
620	rúda	´3b	´	´	16.6	15.1				97/95/99	+ 2	+ 8	+11	97	114		+
621	(dvệ) rúti	´2c	´	´	8.3	9.1				101/104/106	+ 5	+23	- 3	104	128		+
626	lúka	´1c	´	´	10.6	12.8				102/101/101	- 1	+18	- 6	102	116		+

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Table 4Ju. Basic data on single words in neutral sentence intonation position.

No. sona-gram	A C C E N T expected (SSKJ)	FoP FoC	Interpreter Lo	Interpreter Sn	D U R A T I O N of vowels in csecs.	T O N I C frequency in Hz	T O N I C p.m.	JUMP	POSTT. p.m.	AVERAGE FREQUENCY t.	AVERAGE FREQUENCY postt.	INTEN-SITY peak t.	INTEN-SITY peak postt.
	Accent in non-final position (cont.)												
631	sàmanj	`3b	·	·	11.3 6.4	106/103/104	- 2	+14	+ 9	104	123		+
633	trúden	`3b	·	·*	12.1 9.8	114/106/112	- 2	+ 2	+ 9	111	119	0	0
636	glẹ̄jte	`3a	·	·	14.0 9.8	106/104/101	- 5	+23	+ 1	104	125	?	?
639	na séji	`3b	·	·	7.5 14.7 15.8	103/98/93	-10	0	+23	98	105	+	
641	sẹ̄jna	`3b	·	·	19.2 12.1	113/99/100	-13	+13	+15	104	121		+
644	kráji	`3b	·	·	18.9 15.1	108/101/94	-14	+ 6	+17	101	109		+
649	Bâjda	`1a	·	·	20.7 11.3	103/102/101	- 2	+20	0	102	121		+
651	nēkaj	`1b	·	·	9.8 6.4	101/101/101	0	+ 7	+ 8	101	112		+
655	bộji	`3b	·	·	20.7 6.8	96/86/91	- 5	+23	+11	91	120		+
657	bójler	`3a	·	·	16.6 9.8	96/97/103	+ 7	+16	0	99	119	+	
666	avtẹ́ntičen	`2c	·	·	12.1 9.8 3.8 6.8	101/110/118	+17	+ 3	-15	110	114	+	
678	rāja	`1c	·	·	15.8 10.9	91/90/89	- 2	+22	- 3	90	110		+
679	plệje	`3c	·	·	14.3 9.8	107/93/103	- 4	+14	-20	101	110		+
	Accent in final position												
559	sȉt (sem te)	L	^	^	5.3	168/168/168	0			168		+	
560	bȉk	RF	^	^(*)	6.8	129/153/150	+21			144		+	
561	lȉk	RF	^	^	7.9	139/159/141	+ 2			146		+	
566/2	dvệ	R	^	·	10.2	124/124/132	+ 8			127		+	
567	sȋj	FR	^	^	18.9	152/148/152	0			151		+	
568/1	tȋ (si krȋv)	F	^	0	5.7	168/166/164	- 4			166		+	
568/2	(tȋ si) krȋv	R	^	0	16.2	129/132/134	+ 5			132		+	
569	ekspộrt	R	^	0	4.5 10.2	150/160/170	+20			160		+	

Continued on the following page

Table 4 Ju. Basic data on single words in neutral sentence intonation position.

No. sona-gram	A C C E N T expected (SSKJ)	FoC	Interpreter Lo	Interpreter Sn	D U R A T I O N of vowels in csecs.	T O N I C frequency in Hz	T O N I C p.m.	JUMP	POSTT. p.m.	AVERAGE FREQUENCY t. postt.	INTEN-SITY peak t. postt.
	Accent in final position (cont.)										
571	džêm	R	·	?	6.0 (+12.5=m)	124/130/134	+10			129	+
574	mêt	R	·	·	10.6	115/112/116/135	+20			120	+
576	medện	RF	·	0	9.1 16.6	112/141/144/126	+14			131	+
578	cemênt	R	·	·, (·?)	6.8 12.4	115/132/149	+34			132	+
579	mêč	R	·	·	11.3	111/120/128	+17			120	+
581/1	pệt (mêtel)	P	·	·	8.3	112/126/139	+27			126	+
583	režîm	R	·	0, ·?	14.0 7.2	103/113/123	+20			113	+
586/1	hûd (ȃkt)	F	·	·	9.8	164/165/161	- 3			163	+
586/2	(hûd) ȃkt	R	·	·	11.3	102/110/117	+15			110	+
588	aktivîst	R	·	0	4.5 7.2 7.5	107/114/120	+13			114	+
589	akọ̑rd	R	·	·	8.3 12.1	118/122/126	+ 8			122	+
592	katalộg	R	·	·	4.9 6.4 12.1	111/119/126	+15			119	+
593	mák (or à)	L	·	0	11.7	113/113/113	0			113	L
595	kȃd	FR		0	11.3	125/119/112	- 3			122	L
597	rȃd	R	·	·(·?)	15.1	103/111/119	+16			111	+
598	rȃk	F	·	·(·?)	8.7	116/114/111	- 5			114	+
599	trȃk	F	·	·(·?)	13.2	121/114/106	-15			114	+
600	slȃb	FR	·	·(·?)	11.7	121/118/124	+ 3			121	+
613/1	hûd (oficiȃl)	RF	·	·	7.2	132/138/134	+ 2			135	+
613/2	(hûd) oficiȃl	R	·	·(*)	6.4 5.3 9.1 12.4	112/118/123	+11			118	+
606	shȏd	FR		·, (·?)	12.1	107/101/118	+11			109	+
616	pȏd (= tla)	R	·	0	14.3	103/101/116	+13			107	+
618	na kȗp	F	·	·	8.3 5.3	138/130/122	-16			130	+
624	rȕm	RF	·	·	9.8	128/141/129	+ 1			135	+
625	lûk	R	·	?	8.3	117/126/135	+18			126	+

Continued on the following page

Table 4 Ju. Basic data on single words in neutral sentence intonation position.

No. sona-gram	A C C E N T expected (SSKJ)	FoC	Interpreter Lo	Interpreter Sn	D U R A T I O N of vowels in csecs.		T O N I C frequency in Hz	T O N I C p.m.	JUMP	POSTT. p.m.	AVERAGE FREQUENCY t. postt.	INTEN-SITY peak t. postt.
	Accent in final position (cont.)											
627	prodûkt	L	-	-	8.3	6.8	117/118/118	+ 1			118	+
628	hurâ	R	-	-	9.1	15.8	103/106/144	+41			118	+
629	pə̂s	R	-	?	7.2		146/149/152	+ 6			149	+
632	səmə̂nj	R	-	-	8.3	9.8	103/112/121	+18			112	+
634/1	smə̀rt	R	-	0	7.5		124/127/129	+ 5			127	+
638	imẹ̀j	R	-	-	19.2		106/120/133	+27			120	+
640/1	pệt (sệj)	R	-	(*)	9.8		135/137/138	+ 3			137	+
640/2	(pệt) sệj	F	-	0	10.6	(j 9.1)	132/121/121	-11			125	+
647/1	pệt (bâjt)	R	-	(*)	9.8		135/144/152	+17			144	+
650	gajȉč	R	-	-	7.9	13.2	96/104/111	+15			104	+
652	zdə̂j	RF	-	0	20.0		107/118/99	- 8			108	+
653	də̂j (to)	R	0?	0	18.1		101/111/121	+20			111	+
654	v bȍj	RF	-	-	12.4		118/144/115	- 3			126	+
661	pokój (or ȏ)	R	-	0	4.9	21.1	99/95/108/106	+ 7			102	+
665	prə̂v	FR	-	0	23.4		105/102/118	+13			108	+
667	(səm) šə̂l	FR	-	0	20.7		118/115/129/121	+ 3			121	+
669	nȏv	R	-	0	19.6		106/111/126	+20			114	+
670	sọ̀l	R	-	0	21.9		122/121/135	+13			128	+
672	soldât	R	-	(0?)	11.7	12.8	103/112/120	+17			112	+
674/1	nâg (in gȏl)	R	-	0	14.3		102/108/121	+19			110	+
674/2	(nâg in) gȏl	R	-	-	18.9		102/121/129	+27			118	+
675	snộv	R	-	0	18.1		108/118/118/133	+25			119	+

Continued on the following page

Table 4 Ju. Basic data on single words in neutral sentence intonation position.

No. sona-gram	ACCENT expected (SSKJ)	FoP FoC	Interpreter Lo	Interpreter Sn	DURATION of vowels in csecs.	TONIC frequency in Hz	TONIC p.m.	JUMP	POSTT. p.m.	AVERAGE FREQUENCY t.	AVERAGE FREQUENCY postt.	INTEN-SITY peak t.	INTEN-SITY peak postt.
	Accent in final position (cont.)												
566/3	trî	R	·	·	16.6	106/106/118	+12			110		+	
608	kọ̑t	R	·	·*	17.0	99/103/116	+17			106		+	
609/2	(nȇ kọ̑d nȇ) kām	(F)R	·	·	13.6	106/104/115	+ 9			108		+	
611	dôb (pronounces ǫ)	R	·	·	17.4	102/109/115	+13			109		+	
612	pǭt	FR	·	·	15.1	103/97/106	+ 3			102		+	
619	(pệt) rût	R	·	·	11.3	114/112/119	+ 5			115		+	
634/2	smərdí	R	·	·*	8.3 15.1	103/115/126	+23			115		+	
635	glẹ̄j	R	·	·	15.1	124/124/141/144	+20			133		+	
637	smejọ̄č	R	·	·	7.2 12.8	118/127/135	+17			127		+	
642	mejí (na nas)	R	·	·	14.3 5.3	124/129/129	+ 5			127		+	
643	krȃj	FRF	·	·	26.8	118/111/145/123	+ 5			124		+	
660	lojár	R	·	·	9.1 20.4	93/102/110	+17			102		+	
671	sôld	FR	·	·	18.5	111/103/135	+24			116		+	
	Accent less distinct or ambiquous as perceived by Lo												
575	mệd	R	·(*)	?	14.3	103/110/118	+13			110		L	
585	alárm	R	·(*)	·	9.8 17.7	99/111/122	+23			111		+	
594	mâki	ˊ3c	?	·	11.3 8.3	101/110/118	+17	+11	-30	110	114		+
609/1	(nȇ) kọ̄d (nē kām)	R	·(*)	0	7.5	121/125/129	+ 8			125		+	
622	rudnīṇa	2	·(*)	·	8.3 10.6 14.3	103/109/114	+11	- 1	-16	109	105		+
623	(ní) mirû	R	·(*)	·(*)	9.1 7.5 15.8	111/126/140	+29			126		+	
647/2	(pệt) bâjt	R	·(*)	0	22.6	106/118/118	+12			114		+	
658	lộj	R	(*)	0	27.5	103/129/129	+26			121		+	
664	kȃl	FR	·(*)	0	24.1	113/99/121	+ 8			111		+	
680	pâva	ˊ2c	?	·	19.6 10.9	105/109/113	+ 8	+10	-22	109	112	+	

Table 4 Ju. Basic data on single words in neutral sentence intonation position.

No. sona-gram	A C C E N T expected (SSKJ)	FoP	Interpreter Lo	Sn	D U R A T I O N of vowels in csecs.	T O N I C frequency in Hz	p.m.	JUMP	POSTT. p.m.	AVERAGE FREQUENCY t.	postt.	INTEN-SITY peak t.	postt.
	Accent in non-final position												
563	sítast	3	ˆ	ˆ	4.5 7.9	150/150/150	0	-47	-42	150	82		+
565	mîting	˙2	ˆ	ˆ	6.0 4.9	105/115/125	+20	-39	-22	115	75	+	
572	cḗnter (or ē)	ˆ1	ˆ	ˆ	7.5 3.8	121/127/132	+11	- x	- x	127	x	+	
573	egocéntričen (or é)	ˆ1	ˆ	ˆ	6.8 5.3 7.5 5.3 4.5	114/124/121	+ 7	-41	- 7	120	77	+	
577	memorândum	ˆ1	ˆ	ˆ	4.1 7.5 8.3 5.3	79/87/95	+16	-21	-10	87	69	+	
580	méča	˙2	ˆ	ˆ	9.4 6.4	98/111/123	+25	-41	-13	111	76		+
581/2	(pệt) mêtel	˙2	·	ˆ	9.1 6.8	107/113/118	+11	-45	-10	113	68	+	
584	Amêrika	ˆ1	ˆ	·	6.0 9.1 4.5 6.0	93/118/112	+19	- 8	-10	108	99		+
587	aktîven	˙4	ˆ	ˆ	3.8 ? ?	123/101/80	-43	- x	- x	102	x	+	
590	âstma	ˆ1	ˆ	ˆ	8.3 6.0	128/123/117	-11	-55	- 4	123	60	+	
591	astmátik	ˆ1	ˆ	ˆ	6.4 7.5 3.8	103/109/114	+11	- x	- x	109	x	+	
601	mộto	ˆ1	ˆ	ˆ	7.5 5.3	124/130/124	0	-44	-23	126	69	+	
602	notóričen	IP	ˆ	ˆ	5.7 8.3 5.3 3.4	123/119/115	- 8	-21	-13	119	88	+	
603	dogmátik	˙2	ˆ	ˆ(*)	4.7 7.5 3.8	100/106/111	+11	-28	-20	106	73		+
604	domệna	˙1	ˆ	ˆ	6.8 8.3 7.5	92/123/118	+26	- x	- x	111	x	+	
605	gộdi mi	ˆ1	ˆ	ˆ	9.1 4.5 4.1	99/110/120	+21	-32	-20	110	78	+	
610	dóba	ˆ1	ˆ	ˆ	11.3 6.0	81/96/110	+29	-36	- 8	96	70	+	
614	ộpera	IP(ˆ3?)	ˆ	ˆ	7.5 3.8 7.2	126/124/122	- 4	-40	-18	124	73	+	
615	operácija	ˆ1	ˆ	ˆ	4.5 6.0 11.3 4.9 4.5	94/119/118	+14	- x	- x	107	x		+
622	rudnīna	ˆ1	ˆ	ˆ	4.9 5.6 7.2	103/123/118	+15	-50	-12	115	62	+	
630	vȃndarle	ˆ1	ˆ	ˆ	5.3 3.8 7.2	104/117/130	+26	- x	- x	117	x	+	
633	trúden	˙1	ˆ	ˆ	7.5 13.2 (*n)	130/143/130	0	-47	-21	134	73	+	
639	na séji	IP	ˆ	ˆ	5.7 5.3 9.1	126/123/120	- 6	0	-49	123	97	+	
641	sệjna	ˆ3	ˆ	ˆ	10.6 7.5	122/123/124	+ 2	?	- x	123	x	+	

Continued on the following page

Table 4 Ka. Basic data on single words in neutral sentence intonation position.

No. sonagram	A C C E N T expected (SSKJ)	FoP	Interpreter Lo	Interpreter Sn	D U R A T I O N of vowels in csecs.	T O N I C frequency in Hz	T O N I C p.m.	JUMP	POSTT. p.m.	AVERAGE FREQUENCY t.	AVERAGE FREQUENCY postt.	INTENSITY peak t.	INTENSITY peak postt.
	Accent in non-final position (cont.)												
645	râjni	ˆ4	ˆ	´	15.5 5.3	100/95/115	+15	-45	-10	103	65	+	
648	pri bâjti	ˆ1	ˆ	´	14.7 4.5	80/92/104	+24	-25	-10	92	74	+	
649	Bâjda	ˆ1	ˆ	ˆ	13.6 7.2	98/118/108	+10	-30	-10	108	73	+	
651	nệkaj	ˆ2	ˆ	ˆ	8.3 5.3	111/122/133	+22	-37	-38	122	74	+	
656	bojệvnik	ˆ1	ˆ	ˆ	6.8 13.6 x	100/114/102	+ 2	- x	- x	105	x	+	
659	lojītev	ˆ2	ˆ	ˆ	5.7 6.0 10.2	80/94/108	+28	-32	-14	94	69	+	
663	âvdion	ˆ1	ˆ	ˆ	16.6 9.1 7.9	96/96/116/107	+11	-27	-13	106	74	+	
666	avtệntičen	ˆ1	ˆ	ˆ	16.2 6.8 3.8 3.4	110/112/114	+ 4	-33	- 6	112	78	?	?
668	molītev	ˆ2	ˆ	ˆ	7.5 5.6 12.4	91/95/98	+ 7	- x	- x	95	x	+	
673	soldāščina	ˆ2	ˆ	ˆ	8.7 10.6 4.1 6.8	92/104/116	+24	-32	-11	104	79	+	
676	teolộški	ˆ1	ˆ	ˆ	6.8 4.9 10.2 3.0	80/110/102	+22	- x	- x	79	x	+	
679	plệje	1	ˆ	ˆ	9.8 7.5	106/110/92	-14	- x	- x	103	x	+	
680	pâva	ˆ1	ˆ	ˆ	11.3 7.1	104/104/90	-14	- x	- x	99	x	0	0
682	grệje	2	ˆ		5.6 9.4	103/110/117	+14	-14	-21	110	93	+	
558	rékli (sta)	´3a	´	´	7.9 5.7	84/74/63	-21	+55	0	74	118		+
562	síta	´3c	´	´	5.3 7.9	107/102/97	-10	+27	-11	102	119		+
566/1	éna	´2a	´	´	7.5 7.2	66/72/78	+12	+11	+ 1	72	90		+
570	matemátika	´3b	´	´	4.1 4.1 9.1 4.5 6.8	71/71/76	+ 5	+32	+ 3	73	110		+
582	médel	´3b	´	´	9.8 9.8	86/84/89	+ 3	+24	- 1	86	114		+
596	v kádi	ˆ1	´	ˆ	12.1 6.0	119/119/113/110	- 9	-36	-12	115	70	+	
631	sâmɔnj	´1b	´	´	7.9 2.3	83/84/84	+ 1	+30	+ 6	84	117		+
644	kráji	´3a	´	´	9.1 6.8	74/78/82	+ 8	+18	+ 1	78	101		+
646	pâjek	´3b	´	´	9.1 3.8	77/76/74	- 3	+30	+ 6	76	107		+

Continued on the following page

Table 4 Ka. Basic data on single words in neutral sentence intonation position.

00050414

No. sonagram	ACCENT expected (SSKJ)	FoP FoC	Interpreter Lo	Interpreter Sn	DURATION of vowels in csecs.			TONIC frequency in Hz	p.m.	JUMP	POSTT. p.m.	AVERAGE FREQUENCY t.	postt.	INTENSITY peak t.	postt.
	Accent in non-final position (cont.)														
655	bójl	´3b	´	´	12.1	5.6		72/67/70	- 2	+ 5	+25	70	88	0	0
657	bójler	´3b	´	´	14.7	6.8		66/65/63	- 3	+27	+ 4	65	92		+
661	pókoj	´3c	´	´	9.4	7.5		85/80/74	-11	+37	-11	80	106	+	
662	ȁvto	´3b	´	´	19.6	6.4		114/81/81	-33	+34	+ 5	92	118		+
681	mȁvrica	´3b	´	´	14.0	7.2	7.2	88/80/92	+ 4	+16	+ 4	87	110		+
	Accent in final position														
559	sȉt (sem te)	R	ˆ	ˆ	3.8			123/126/128	+ 5			126		+	
560	bȉk	R	ˆ	ˆ	6.0			118/127/136	+18			127		+	
561	lîk	RF	ˆ	ˆ	6.0			125/142/136	+11			134		+	
566/3	trî	RF	ˆ*	ˆ	6.4			123/128/118	- 5			123		+	
567	sîj	RF	ˆ	ˆ	18.1			158/160/103	-55			140		+	
568/2	(tî si) krîv	RF	ˆ	ˆ	17.7			128/130/80	-48			113		+	
569	ekspộrt	RF	ˆ	ˆ	5.6	9.1		125/139/125	0			130		+	
571	džệm	RF	ˆ	ˆ*	10.6			108/124/114/86	-22			108		+	
574	mèt	RF	ˆ	ˆ	6.8			114/122/115	+ 1			117		+	
575	mệd	RF	ˆ	ˆ	10.6			116/122/116	0			118		+	
576	medện	RF	ˆ	ˆ	6.0	10.6		105/118/110	+ 5			110		+	
578	cemênt	RF	ˆ	ˆ	5.6	9.1		96/125/123/102	+ 6			112		+	
579	mèč	R	ˆ	ˆ	8.3			100/112/123	+23			112		+	
581/1	pệt (mêtel)	L	ˆ	ˆ	6.4			120/121/122	+ 2			121		+	
583	režîm	RF	ˆ	ˆ	10.2	8.7		116/126/122	+ 6			121		+	
585/2	alárm	RF	ˆ	ˆ	8.7	10.2		94/113/104	+10			104		+	

Continued on the following page

Table 4 Ka. Basic data on single words in neutral sentence intonation position.

No. sona-gram	A C C E N T expected (SSKJ)	FoC	Interpreter Lo	Interpreter Sn	D U R A T I O N of vowels in csecs.	T O N I C frequency in Hz	T O N I C p.m.	JUMP	POSTT. p.m.	AVERAGE FREQUENCY t. postt.	INTEN-SITY peak t. postt.
	Accent in final position (cont.)										
586/2	(hûd) âkt	R	-	-	9.4	96/107/118	+22			107	+
588	aktivȋst	RF	-	-	5.3 5.7 6.8	116/128/124	+ 8			123	+
589	akǫ̑rd	RF	-	-	6.8 10.6	114/126/111	- 3			117	+
592	katalǫ̑g	RF	-	-	4.5 6.0 7.5	108/115/106	- 2			110	+
593	mák (or mȃk)	RF	-	-	8.3	93/108/123	+30			108	+
595	kȁd	RF	-	-	10.2	105/116/113	+ 8			111	+
597	rȁd	RF	-	-	8.3	103/110/117	+14			110	+
598	rȁk	R	-	-	8.3	103/111/118	+15			111	+
599	trȃk	R	-	-	7.5	117/123/129	+12			123	+
600	slȃb	R	-	-	6.8	116/119/122	+ 6			119	+
613	oficiȃl	RF	-	-	5.3 4.5 6.8 7.5	110/120/102	- 8			111	+
606	shȍd	R	-	-	7.5	104/112/119	+15			112	+
608	kǫ̑t	RF	-	-	9.1	127/130/118	- 9			125	+
609/2	(nȅ) kām	RF		-	8.7	116/121/116	0			118	+
611	dôb	R	-	-	10.6	88/103/118	+30			103	+
612	pǫ̑t	RF	-	-	9.8	110/117/114	+ 4			114	+
616	pȏd (= tla)	RF	-	-	9.1	116/120/111	- 5			116	+
618	na kûp	L	-	-	6.0 4.5	124/124/124	0			124	+
619/1	pę̑t (rût)	L	-	-	8.3	116/115/114	- 2			115	+
619/2	(pę̑t) rût	RF	-	-	7.9	122/130/123	+ 1			125	+
623	(ní) mirû	RF	-	-	7.5 10.2	116/124/102	-14			121	+
624	rûm	RF	-	-	12.1	98/124/115	+17			112	+
625	lûk	R	-	-	6.8	127/140/140	+13			136	+
627	prodûkt	R	-	-	6.0 5.3	126/129/131	+ 5			129	+
628	hurȃ	RF	-	-	5.6 12.4	93/118/102	+ 9			104	+
629	pȃs	RF	-	-	6.0	133/138/133	+ 5			135	+

Continued on the following page

Table 4 Ka. Basic data on single words in neutral sentence intonation position.

No. sona-gram	A C C E N T expected (SSKJ)	FoC	Interpreter Lo	Sn	D U R A T I O N of vowels in csecs.		T O N I C frequency in Hz	p.m.	JUMP	POSTT. p.m.	AVERAGE FREQUENCY t. postt.	INTEN-SITY peak t. postt.
	Accent in final position (cont.)											
632	səmə̂nj	RF	ˆ	ˆ	3.8	4.9	101/112/113	+12			109	+
634/1	smə̂rt	R	ˆ	0	2.6		108/112/115	+ 7			112	+
635	glẹ̄j	RF	ˆ		12.8		123/130/114	- 9			122	+
637	smejọ̄č	RF	ˆ	˙	3.0	10.6	94/112/102	+ 8			103	+
638	imệj	RF	ˆ	ˆ	6.8	11.7	118/128/98	-20			115	+
640/1	pệt (sệj)	R	ˆ	ˆ	7.5		125/128/130	+ 5			128	+
640/2	(pệt) sệj	F	ˆ	0	13.6		97/83/68	-29			83	+
642/2	(mejí na) nâs	RF	ˆ	`*	8.3		91/109/101	+10			100	+
643	kràj	RF	˙	-	15.1		114/124/94	-20			111	+
647/1	pệt (bâjt)	L	˙	ˆ	6.8		124/125/126	+ 2			125	+
647/2	(pệt) bâjt	RF	ˆ	ˆ	12.8		100/100/106/100	0			102	+
650	gajȉč	R	˙	˙	6.0	7.1	88/97/106	+18			97	+
652	zdȁj	RF	ˆ		12.8		89/118/100	+11			102	+
653/1	dȃj (tô)	RF	˙	0	11.7		100/98/113/108	+ 8			105	+
654	v bö̂j	RF	ˆ	ˆ	10.2		91/112/93	+ 2			99	+
658	lộj	RF	ˆ	ˆ	14.3		82/112/95	+13			96	+
660	lojár	RF	ˆ	ˆ	9.8	13.6	84/108/80	- 4			91	+
664	kə̂l	RF	ˆ	ˆ	15.1		117/116/80	-37			104	+
665	prə̂v	RF	ˆ	ˆ	14.3		128/129/96	-32			118	+
667	(səm) šə̏l	F	ˆ	ˆ(*)	10.6		121/114/107	-14			114	+
669	növ	RF	ˆ	ˆ	12.8		102/122/104	+ 2			109	+
670	sộl	RF	˙		12.8		116/128/113	- 3			119	+
671	sôld	RF	ˆ	ˆ	13.2		100/110/79	-21			96	+
672	soldât	RF	ˆ	˙	9.8	9.4	91/106/101	+10			99	+
674/1	nə̂g (in gȍl)	R	ˆ	0	8.3		87/94/100	+13			94	+
674/2	(nə̂g in) gȍl	RF	ˆ		13.6		95/100/113/100	+ 5			102	+
675	snộv	RF	ˆ	ˆ	11.3		122/128/100	-22			117	+

Continued on the following page

Table 4 Ka. Basic data on single words in neutral sentence intonation position.

No. sona-gram	A C C E N T expected (SSKJ)	FoC	Interpreter Lo	Sn	D U R A T I O N of vowels in csecs.			T O N I C frequency in Hz	p.m.	JUMP	POSTT. p.m.	AVERAGE FREQUENCY t.	postt.	INTEN-SITY peak t.	postt.
	Accent in final position (cont.)														
609/1	(nê) kọ̄d (nê kām)	R	˙	0	7.9			106/110/114	+ 8			110		+	
623/1	ní (mirû)	R	˙	´(*)	4.5			118/121/123	+ 5			121		+	
	Accent less distinct or ambiguous, or perceived às non-accented by Lo														
557	tộki	IP	´(*)	ˆ(*)	7.9	4.5		131/127/122	- 9	-48	-30	127	59	+	
564	místik	˙4	´(*)	ˆ	6.0	4.5		124/132/140	+16	-31	-14	132	102	+	
566/2	dvệ	R	ˆ(*)	˙	9.8			91/93/96	+ 5			93		+	
568/1	tî (si krîv)	L	ˆ(*)	0	5.3			123/125	+ 2			124		+	
585/1	hûd (alárm)	F	ˆ(*)	0	3.8			indistinct	x			x			
586/1	hûd (âkt)	RF	0	ˆ	6.0			105/110/108	+ 3			108		+	
594	mâki	´3a	´(*)	˙	9.8	4.5		90/88/95	+ 5	+38	+ 1	91	134		+
617	budīzem	ˆ1	´(*)	ˆ	4.5	7.9	5.3	106/128/125	+19	-15	-33	120	94	+	
620	rúda	ˆ2	ˆ(*)	ˆ	9.8	6.8		108/135/135	+27	-65	-12	126	64	+	
621	(dvệ) rúti	˙2	´(*)	ˆ	7.5	4.1		120/122/123	+ 3	- x	- x	122	x	+	
626	lúka	ˆ2	´(*)	˙	7.5	6.0		94/105/116	+22	-56	- 6	105	57	0	0
634/2	smɔrdí	RF	´(*)	ˆ	3.4	9.1		100/110/104	+ 4			105		+	
636	glẹ̄jte	ˆ2	0	´?	9.1	5.3		108/115/122	+14	- 9	-10	115	108	+	
642/1	mejí (na nâs)	L	´(*)	0	7.5	4.1		106/106/106	0			106		+	
653/2	(dâj) tộ	F	0	0	6.4			114/107/100	-14			112		+	
677	bâjer	˙2	´(*)	ˆ	13.2	10.2		64/86/108	+44	0	- 8	86	104	0	0
678	rāja	´2b	´(*)	˙	12.1	4.5		67/86/96	+29	0	+10	83	101		+

Table 4 Ka. Basic data on single words in neutral sentence intonation position.

No. sona-gram	A C C E N T expected (SSKJ)	FoP	Interpreter Lo	Sn	D U R A T I O N of vowels in csecs.				T O N I C frequency in Hz	p.m.	JUMP	POSTT. p.m.	AVERAGE FREQUENCY t.	postt.	INTEN-SITY peak t.	postt.
	Accent in non-final position															
557	tǫ̂ki	IP	ˆ	´(*)	6.4	4.9			150/145/140	-10	- 6	-10	145	129	+	
562	síta	ˋ2	ˆ	·	5.3	7.2			151/153/154	+ 3	- 4	-21	153	140		?
563	sítast	1	ˆ	·	3.8	7.2			152/180/164	+12	-18	-23	165	135		+
565	mîting	ˆ1	ˆ	˙(*)	3.8	4.5			165/168/171	+ 6	-12	-12	168	153	+	
572	cẹ̄nter (or ē)	ˉ1	ˆ	·	7.5	3.4			146/150/148	+ 2	- 7	- 5	148	141	?	?
577	memorândum	ˆ2	ˆ	·	5.7	5.7	9.4	4.5	143/147/150	+ 7	+ 1	-11	147	144		+?
581	(pệt) mêtel	˙2	ˆ	0	8.3	3.0			153/156/158	+ 5	0	-13	156	152		+
584	Amèrika	ˆ4	ˆ	´(*)	3.4	8.3	4.1	5.7	143/148/152	+ 9	+ 1	- 5	148	151		+
587	aktîven	ˆ2	ˆ	·	6.0	6.0	?		157/161/165	+ 8	- 3	- 9	161	158	+	
590	âstma	ˆ2	ˆ	·	9.1	6.4			142/144/146	+ 4	-21	-13	144	119	+	
594	mâki	´2c	ˆ	·	9.8	3.0			130/140/150	+20	+ 8	-11	140	153		+
601	mǫ̂to	ˆ2	ˆ	0	6.0	4.9			123/131/138	+15	+ 2	-19	134	126		+
604	domệna	ˆ3	ˆ	·	4.1	8.3	7.9		136/137/138	+ 2	-10	- 4	137	126		+
605	gǭdi mi	˙2?		´(*)	10.9	4.5	5.3		154/159/164	+10	-20	+5	159	147	+	
614	ǫ̂pera	ˆ3		·	6.8	4.9	6.8		144/142/141	- 3	- 9	- 6	143	129	+	
630	vằndərle	´2c	ˆ	ˆ	4.5	3.0	6.0		154/156/157	+ 3	+ 6	- 3	156	162	+	
641	sẹ́jna	4	ˆ	0	9.4	5.7			155/150/156	+ 1	-10	- 2	155	145	+	
646	pằjek	IP	ˆ	0,´?	6.8	5.3			135/132/128	- 7	- 3	- 4	132	130		+
649	Bâjda	ˆ4	ˆ	´(*)	14.0	6.8			122/119/134/150	+28	-14	- 1	131	136	+	
656	bojệvnik	IP	ˆ	ˆ(*)	6.0	9.1	3.8		129/124/120	- 9	- 6	- 7	125	111	0	0
663	ȃvdion	˙2	ˆ	*	15.1	8.3	5.3		150/159/160	+10	- 7	- 3	156	152		+
668	molîtev	˙2	ˆ	0	5.3	4.9	7.5		131/141/150	+19	- 6	-20	141	134	+	
673	soldāščina	´2c?	ˆ	ˆ(*)	9.1	10.2	4.1	6.0	136/148/160	+24	+ 6	- 6	148	157	0	0
676	teolǫ̂ški	ˆ3	ˆ	ˆ(*)	5.3	5.3	7.5	4.1	153/154/154	+ 1	-14	- 3	154	139	?	

Continued on the following page

Table 4 Pi. Basic data on single words in neutral sentence intonation position.

No. sonagram	A C C E N T expected (SSKJ)	FoP	Interpreter Lo	Interpreter Sn	D U R A T I O N of vowels in csecs.					T O N I C frequency in Hz	T O N I C p.m.	JUMP	POSTT. p.m.	AVERAGE FREQUENCY t.	AVERAGE FREQUENCY postt.	INTENSITY peak t.	INTENSITY peak postt.
	Accent in non-final position (cont.)																
677	bâjer	ˆ4	ˆ	ˊ(*)	6.8	5.7				140/130/136	- 4	- 6	- 8	135	126		+
679	plệje	ˆ2	ˆ	ˊ(*)	4.9	6.4				135/142/148	+13	-10	+ 5	142	141	0	0
681	mâvrica	ˆ2	ˆ	ˊ(*)	12.8	6.0	5.3			140/151/162	+22	- 6	0	151	156		+
682	grệje	IP	ˆ	ˊ(*)	8.3	4.5				132/129/125	- 7	- 6	-11	129	114	+	
558	rékli (sta)	ˆ3	ˊ	ˊ(*)	7.5	4.1				132/132/132	0	- 1	- 7	132	130		+
566/1	éna	ˆ2	ˊ	ˊ	10.2	7.2				128/131/133	+ 5	- 5	0	131	128	+	
570	matemátika	ˊ3a	ˊ	ˊ	4.9	4.1	9.4	4.1	5.3	125/127/129	+ 4	+21	-14	127	143		+
573	egocéntričen	ˊ3c	ˊ	ˊ	4.1	5.3	9.8	3.8		146/143/149	+ 3	+28	-13	145	167	+	
580	méča	ˊ2a	ˊ	ˊ	8.3	6.8				129/132/134	+ 5	+ 5	- 2	111	76		+
582	médel	ˊ3c	ˊ	ˊ(*)	8.7	7.1				140/145/149	+ 9	+ 4	- 8	145	149		+
591	astmátik	ˊ1c	ˊ	ˊ	6.0	9.1	4.1			138/137/136	- 2	+ 4	-16	137	132		+
596	v kádi	ˆ4	ˊ	ˊ	9.8	7.2				144/136/140	- 4	- 7	- 1	140	134		+
602	notóričen	ˆ4	ˊ	ˊ, 0?	6.0	6.8	5.7			145/143/153	+ 8	- 7	- 8	147	142	0	0
615	operácija	IP	ˊ	ˊ	4.1	6.8	9.1	?	4.5	133/131/128	- 5	-10	- 6	131	115		+
603	dogmátik	ˊ1c	ˊ	ˊ	4.1	8.3	3.0			130/131/132	+ 2	+ 3	-10	131	130		+
610	dóba	ˊ1c	ˊ	ˊ	9.4	6.0				132/131/130	- 2	+ 3	-12	131	127	+	
617	budīzem	ˊ2c	ˊ	ˊ(*)	4.9	5.3	3.4			123/120/117	- 6	+ 6	+ 3	120	125	?	?
620	rúda	ˆ3	ˊ	ˊ	8.3	7.5				143/142/142	- 1	- 2	-15	143	131	+	
621	(dvệ) rúti	ˆ1	ˊ	0ˊ?	8.3	4.5				153/158/150	- 3	0	- 7	154	147	+	
622	rudnīna	ˆ3	ˊ	0ˊ?	6.0	5.3	7.2			132/137/142	+10	- 4	- 7	137	135	+	
626	lúka	ˊ1c	ˊ	ˊ(*)	6.0	6.0				143/144/145	+ 2	+10	-26	144	142	+	
633	trúden	ˆ2	ˊ	ˊ	5.3	5.7 (=n)				143/151/149	+ 6	-16	+ 7	148	140	+	
636	glệjte	ˆ2	ˊ	ˊ	9.1	6.0				139/146/153	+14	- 3	-10	146	145	+	
639	na sệji	ˆ4	ˊ	ˊ	6.4	4.9	6.8			145/135/140	- 5	0	-11	140	135		+

Continued on the following page

Table 4 Pi Basic data on single words in neutral sentence intonation position.

T O N I C frequency in Hz	p.m.	JUMP	POSTT. p.m.	AVERAGE FREQUENCY t.	postt.	INTENSITY peak t.	postt.
138/134/130	- 8	+10	+ 3	134	142		+
138/133/143	+ 5	- 5	- 3	138	137		+
126/120/125/138	+12	- 5	- 5	127	131	+	
108/111/114	+ 6	+ 2	- 1	111	116	0	0
129/122/127	- 2	- 9	+ 2	126	119	+	
134/139/143	+ 9	- 3	+ 4	139	142	+	
134/124/131	- 3	+ 7	- 9	130	134		+
162/176/164	+ 2			167		+	
140/161/154	+14			152		+	
129/139/149	+20			139		+	
120/118/116	- 4			118		+	
147/163/152	+ 5			154		+	
149/157/134	-15			147		+	
157/157/147	-10			154		+	
138/144/138	0			140		+	
152/147/153	+ 1			151		+	
126/142/136	+10			135		+	
114/122/115	+ 1			117		+	
135/149/163	+28			149		+	
137/141/142	+ 5			140		+	
132/134/145	+13			137		+	
148/161/174	+26			161		+	
120/121/122	+ 2			121		+	

Continued on the following page

position.

No. sona-gram	A C C E N T expected (SSKJ)	FoP FoC	Interpreter Lo	Sn	D U R A T I O N of vowels in csecs.		
	Accent in non-final position (cont.)						
644	kráji	˙3b	´	´	7.5	4.5	
645	râjni	4	´	0	9.1	4.9	
648	pri bâjti	4	´	´(*)	11.7	4.1	
655	bóji	˙2a	´	´	7.5	4.5	
657	bójler	˙4	´	0	12.8	3.8	
666	avtẹ́ntičen	IP	´	´	10.6	9.4	2.3
678	răja	IP	´	´(*)	9.8	4.5	
	Accent in final position						
559	sȉt (sem te)	RF	ˆ	ˆ	4.5		
560	bȉk	RF	ˆ	ˆ	7.2		
561	lȋk	R	ˆ	ˆ(*)	6.4		
566/2	dvệ	F	ˆ	0	6.8		
566/3	trȋ	RF	ˆ	ˆ	6.8		
567	sȋj	RF	ˆ	ˆ	11.7		
568/1	tȋ (si krȋv)	F	ˆ	0	5.3		
568/2	(tȋ si) krȋv	RF	ˆ	ˆ	12.4		
569	ekspộrt	FR	ˆ	ˆ(*)	5.3	6.4	
571	džệm	RF	ˆ	ˆ	6.8		
574	mȇt	RF	ˆ	ˆ	9.1		
575	mệd	R	ˆ	ˆ(*)	9.1		
576	medện	R		(*)	4.5	[illegible]	
578	cemȇnt	R	ˆ	ˆ	4.5	8.3	
579	mȇč	R	ˆ	ˆ*	7.9		
581/1	pệt (mêtel)	R	ˆ	ˆ	6.8		

Table 4 Pi. Basic data on single words in neutral sentence intonation

No. sona-gram	A C C E N T expected (SSKJ)	FoC	Interpreter Lo	Interpreter Sn	D U R A T I O N of vowels in csecs.	T O N I C frequency in Hz	p.m.	JUMP	POSTT. p.m.	AVERAGE FREQUENCY t. postt.	INTEN-SITY peak t. postt.
	Accent in final position (cont.)										
583	režîm	RF	ˆ	ˆ	9.4 6.8	116/126/122	+ 6			121	+
586	âkt	R	ˆ	ˆ0?	9.1	144/154/164	+20			154	+
588	aktivîst	R	ˆ	0	5.7 4.5 7.5	128/134/139	+11			134	+
589	akộrd	L	ˆ	0	6.8 6.0	155/155/155	0			155	+
592	katalộg	F	ˆ	ˆ(*)	4.5 4.5 5.3	151/149/146	- 5			149	+
593	mák (or â)	F	ˆ	0	8.3	130/122/114	-16			122	+
595	kȃd	FR	ˆ	0	8.7	156/150/156	0			154	+
597	rȃd	L	ˆ	ˆ	4.9	140/140/140	0			140	+
598	râk	L	ˆ	0	4.5	142/142/143	+ 1			143	+
599	trâk	F	ˆ	ˆ	6.8	145/143/141	- 4			143	+
600	slȃb	F	ˆ	0	6.8	138/136/134	- 4			136	+
606	shȍd	L	ˆ	ˆ(*)	7.5	134/135/136	+ 2			135	+
609/2	(nȅ kọ̄d nȅ) kām	F	ˆ	0	8.3	151/147/143	- 8			147	+
611	dôb	R		·	7.5	124/132/140	+16			132	+
613	oficiȃl	F	ˆ	ˆ0?	4.5 3.8 4.5 5.3	130/124/117	-13			124	+
616	pȍd (= tla)	FR	ˆ	ˆ*	9.8	156/150/167	+11			158	+
618	na kȗp	F	ˆ	ˆ	6.0 4.9	157/155/153	- 4			155	+
619/1	pệt (rût)	R	ˆ	ˆ	7.5	153/158/163	+10			158	+
619/2	(pệt) rȗt	RF	ˆ	0	6.8	146/151/146	0			149	+
623	(nî) mirû	RF	ˆ	0	6.4 7.9	147/150/147	0			148	+
624	rûm	RF	ˆ	ˆ	8.3	127/132/136	+ 9			132	+
625	lȗk	RF	ˆ	ˆ	5.7	152/157/148	- 4			152	+
627	prodȗkt	R	ˆ	ˆ	4.9 4.9	134/144/154	+20			144	+
628	hurȃ	L	ˆ	0	4.1 9.1	133/133/133	0			133	+

Continued on the following page

Table 4 Pi. Basic data on single words in neutral sentence intonation position.

No. sonagram	A C C E N T expected (SSKJ)	FoC	Interpreter Lo	Interpreter Sn	D U R A T I O N of vowels in csecs.		T O N I C frequency in Hz	T O N I C p.m.	JUMP	POSTT. p.m.	AVERAGE FREQUENCY t. postt.	INTENSITY peak t. postt.
	Accent in final position (cont.)											
629	pâs	F	ˆ	0, ˆ?	6.4		155/153/150	- 5			153	+
632	səmânj	F	ˆ	ˆ	3.4	5.3	146/141/136	-10			141	+
634/1	smârt (smərdí)	R	ˆ	ˆ	3.0		161/164/166	+ 5			164	+
640	(pệt) sệj	L	ˆ	0	9.8		160/159/159	- 1			160	+
643	krȃj	F	ˆ	ˆ	7.9		153/146/138	-15			146	+
647	(pệt) bȃjt	R	ˆ	ˆ	6.8		153/157/161	+ 8			157	+
653	dȁj (tộ)	F	ˆ	0	7.5		147/145/143	- 4			145	+
654	v bȍj	F	ˆ	ˆ(*)	10.6		126/121/116	-10			121	+
658	lộj	FR	ˆ	0	9.1		112/107/109	- 3			109	+
664	kȃl	RF	ˆ	ˆ	14.3		156/156/153	- 3			155	+
661	pokộj (or ȏ)	RF	ˆ	ˆ	5.7	13.9	143/140/147/137	- 6			142	+
665	prȃv	R	ˆ	ˆ(*)	12.8		138/141/143	+ 5			141	+
671	sȏld	R	ˆ	ˆ	10.2		156/156/166	+10			159	+
672	soldȃt	R	ˆ	0	8.7	9.1	128/131/134	+ 6			131	+
674/1	nȃg (in gȏl)	R	ˆ	ˆ	8.3		146/151/156	+10			151	+
674/2	(nȃg in) gȏl	RF	ˆ	ˆ	12.8		131/163/151	+20			148	+
585	alárm	F	´	´	6.4	9.4	144/141/137	- 7			141	+
609/1	(nȅ) kộd (nȅ kãm)	R	´	´(*)	6.4		170/177/183	+13			177	+
634/2	smərdí	RF	´	´	3.0	6.8	131/139/131	0			134	+
635	glệj	L	´	0	8.7		130/129/128	- 2			129	+
637	smejộč	R	´	´	4.5	6.0	145/150/164	+ 9			150	+
642	mejí (na nȃs)	R	´	´	8.7	5.6	137/146/154	+17			146	+
650	gajȉč	R	´	´	7.5	4.9	120/123/126	+ 6			123	+
660	lojár	R	´	´	9.1	11.3	125/125/131	+ 6			128	+

Continued on the following page

Table 4 Pi. Basic data on single words in neutral sentence intonation position.

No. sonagram	ACCENT expected (SSKJ)	FoC	Interpreter Lo	Interpreter Sn	DURATION of vowels in csecs.	TONIC frequency in Hz	TONIC p.m.	JUMP	POSTT. p.m.	AVERAGE FREQUENCY t.	AVERAGE FREQUENCY postt.	INTENSITY peak t.	INTENSITY peak postt.
	Accent less distinct or ambiguous, or perceived as non-accented by Lo												
564	místik	ˆ2	ˆ0?	˙	4.5 3.0	140/149/158	+18	- 8	-17	149	142		?
608	kǫ́t	F	ˆ.ˊ?	0ˊ?	6.8	151/148/144	- 7			148		+	
612	pǭt	FR	˙.ˆ?	˙	9.8	156/151/163	+ 7			157		+	
638	imę̂j	R	ˊ?	0	14.7	140/144/148	+ 8			144		+	
651	nę̄kaj	IP	0	0	4.1 5.6	132/130/128	- 4	- 4	-14	130	117	+	
652	zdȃj	F	0	0	9.4	128/122/116	-12			122		+	
659	lojȋtev	ˆ2	ˊ(*)	˙	1.9 10.6 8.3	119/130/141	+22	- 2	-13	130	133	+	
662	ȃvto	ˊ3c	0	ˆ?	9.8 5.3	133/131/130	- 3	+ 3	-18	132	124		+
667	(səm) šȃl	F	0	0 ·	7.5	151/141/130	-21			141		+	
669	nȍv	FR	0	ˆ(*)	7.9	150/148/152	+ 2			150		+	
670	sǫ̂l	F	0 ?	˙	10.6	155/140/137	-18			144		+	
675	snǫ̂v	F	0	0	6.8	144/138/131	-13			138		+	
680	pâva	IP	ˊ(*)	ˊ(*)	9.8 5.7	146/138/145	- 1	- 5	- 2	143	139		+

Table 4 Pi. Basic data on single words in neutral sentence intonation position.

Position of accent →	barytones			oxytones			
accent type → interpreter ↓	´	ˆ	´ or ˆ	´	ˆ	ˋ	´ or ˆ or ˵
Lo = Sn = SSKJ	100	37 △	0	100	28 △	30	57 *
Lo = Sn ≠ SSKJ		7 *	80 *		10 *		
Lo ≠ Sn		56	20		62	70	43
△Lo = SSKJ	100	81		100	85	96	
no. of cases	25	27	10	5	40	23	7

Table 5 Ju.

Summary data on single words in neutral sentence intonation position.

Comparison between expected accent (SSKJ) and interpreted accent in percentages.

* - interpreted by Lo + Sn as acuted
△ - Lo considerably greater agreement with SSKJ

Expected accent (SSKJ)	´			ˆ									´ or ˆ					
no. of cases	25			27									10					
FoP	´			´			ˆ			IP			´			ˆ		
no. of cases	25			9			17			1			7			3		
interpreted as→ interpreter ↓	´	ˆ	?	´	ˆ	?	´	ˆ	?	´	ˆ	?	´	ˆ	?	´	ˆ	?
Lo = Sn	25			2	1			9					6			2		
Lo only				1	4	1		8			1			1			1	
Sn only				5	1		8			1			1			1		

Total: Sn 51 ´ + 11 ˆ = 62
Lo 36 ´ + 25 ˆ + 1 IP = 62

Table 6 Ju.

Summary data on single words in neutral sentence intonation position.

Comparison between expected accent (SSKJ), FoP and interpreted accent in Ju barytones.

FoP	´			ˆ			IP		
no. of cases	41			20			1		
interpreted as → interpreter ↓	´	ˆ	?	´	ˆ`	?	´	ˆ	?
Lo = Sn = FoP	33				9				
Lo = Sn ≠ FoP		1		2					
Lo only	1	5	1		9			1	
Sn only	6	1		9			1		

Table 7 Ju.
Summary data on single words in neutral sentence intonation position.
FoP versus interpreted accent in Ju barytones.

FoC	R				FR				RF				F				L			
interpreted as → interpreter ↓	´	ˆ	?	0	´	ˆ	?	0	´	ˆ	?	0	´	ˆ	?	0	´	ˆ	?	(
Lo + Sn	12	8			3	1				6				2				2		
Lo only	1	27				6				2				4				1		
Sn only	7		7	14			2	4				2			2	2				
no. of cases	48				10				8				6				3			

Table 8 Ju.
Summary data on single words in neutral sentence intonation position.
Fundamental frequency contours (FoCs) versus interpreted accent in Ju oxytones.

Position of accent →	b a r y t o n e s			o x y t o n e s			
accent type → interpreter ↓	´	ˆ	´ or ˆ	´	ˆ	`	´ or ˆ or `
Lo = Sn = SSKJ	39	67		17	81	9i	83 △
Lo = Sn ≠ SSKJ	46 △	15 ✱	56 △	50			
Lo ≠ Sn	15	18	44	33	19	ı	17
No. of cases	26	27	9	6	43	2:	6

Table 5 Ka.

Summary data on single words in neutral sentence intonation pcsition.

Comparison between expected accent (SSKJ) and interpreted accemt in percentages.

△ - interpreted by Lo + Sn as circumflexed
✱ - interpreted by Lo + Sn as acuted

Expected accent (SSKJ)	´							ˆ									´ or ˆ				
no. of cases	26							27									9				
FoP	´			ˆ			IP	´			ˆ			IP			´			ˆ	
no. of cases	10			15			1	4			22			·			1			8	
interpreted as → interpreter ↓	´	ˆ	?	´	ˆ	?	ˆ	´	ˆ	?	´	ˆ	?	´	ˆ		´	ˆ	?	´	ˆ
Lo = Sn	9			1	11		1	4				18									5
Lo only	1			3							1	3		1			1			1	1
Sn only		1			3						3	1			1			1		1	2

Total: Lo 22 ´ + 39 ˆ + 1 IP = 62
Sn 18 ´ + 44 ˆ = 62

Table 6 Ka.

Summary data on single words in neutral sentence intonation pcsition.

Comparison between expected accent (SSKJ), FoP and interpretec accent in Ka baryto

FoP	´			ˆ			IP		
no. of cases	15			45			2		
interpreted as ⟶ / interpreter ↓	´	ˆ	?	´	ˆ	?	´	ˆ	?
Lo = Sn = FoP	13				34				
Lo = Sn ≠ FoP				1				1	
Lo only	2			5	4	1		1	
Sn only		2		5	5		1		

Table 7 Ka.
Summary data on single words in neutral sentence intonation positio^.
FoP versus interpreted accent in Ka barytones.

FoC	R				FR				RF				F				L			
interpreted as ⟶ / interpreter ↓	´	ˆ	?	0	´	ˆ	?	0	´	ˆ	?	0	´	ˆ	?	0	´	ˆ	?	0
Lo + Sn	1	13								46						1		4		
Lo only	1	3							1	2		1		3			1	1		
Sn only	1			3					1	2		1	1			2				2
ro. of cases	18				0				50				4				[illegible]			

Table 8 Ka.
Summary data on single words in neutral sentence intonation position.
Fundamental frequency contours (FoCs) versus interpreted accent in Ka oxytones.

Position of accent →	b a r y t o n e s			o x y t o n e s			
accent type → interpreter ↓	´	ˆ	´ or ˆ	´	ˆ	`	´ or ˆ or `
Lo = Sn = SSKJ	71	30	44°	80	59	61	14
Lo = Sn ≠ SSKJ	4▭	11✱	11△		3△	9△	14▭
Lo ≠ Sn	25	59	45	20	38	30	72
*Lo = SSKJ	88	81			92	83	
no. of cases	24	27	9	5	37	23	7

Table 5 Pi.
Summary data on single words in neutral sentence intonation position.

Comparison between expected accent (SSKJ) and interpreted accent in percentages.
° - 33% acuted + 11% circumflexed = 44%
△ - non-accented
▭ - circumflexed ✱ - acuted
* - Lo considerably greater agreement with SSKJ

Expected accent (SSKJ)	´							ˆ									´ or ˆ							
no. of cases	24							27									9							
FoP	´			ˆ			IP	´			ˆ			IP			´			ˆ			IP	
no. of cases	10			12			2	3			19			5			2			5			2	
interpreted as→ interpreter ↓	´	ˆ	?/0	´	ˆ	?/0	´	´	ˆ	?/0	´	ˆ	?/0	´	ˆ	?/0	´	ˆ	?/0	´	ˆ	?/0	´	?
Lo = Sn	10			5	1		2		1	1	2	6		1	1		1	1		1			1	1
Lo only				4	1	1			1		1	10			3					1	3			
Sn only				2	1	3		1			7		4	2		1				2		2		

Total: Lo 29 ´ + 27 ˆ + 3 ?/0 = 59
Sn 37 ´ + 10 ˆ + 12 ?/0 = 59

Table 6 Pi.

Summary data on single words in neutral sentence intonation position.

Comparison between expected accent (SSKJ), FoP and interpreted accent in Pi barytones

FoP	´			ˆ			IP		
no. of cases	15			36			9		
interpreted as →	´	ˆ	?	´	ˆ	?	´	ˆ	?
interpreter ↓			0			0			0
Lo = Sn = FoP	11				7				
Lo = Sn ≠ FoP		2		8			4	1	1
Lo only		1	1	6	14	1		3	
Sn only	1	1		11	1	9	2		1

Table 7 Pi.
Summary data on single words in neutral sentence intonation position.
FoP versus interpreted accent in Pi barytones.

FoC	R				FR				RF				F				L			
interpreted as → / interpreter ↓	´	ˆ	?	0	´	ˆ	?	0	´	ˆ	?	0	´	ˆ	?	0	´	ˆ	?	0
Lo + Sn	3	13				2			1	13			1	6	1	3		2		
Lo only	3	4				2	1	1		2				7	2		1	4		
Sn only	1	2	1	3	1	1		2				2			3	6				5
ro. of cases	23				6				16				20				7			

Table 8 P'.
Summary data on single words in neutral sentence intonation position.
Fundamental frequency contours (FoCs) versus interpreted accent in Pi oxytones.

FoP	No. of cases	Duration of vowels in csecs. t.	postt.	Frequencies in Hz t.			Pitch m. of t.	Jump	Pitch m. of postt.
Speaker Ju									
ˋ1	6	12.1	7.7	118	135	145	+27	-25	-14
ˋ2	12	14.7	9.8	106	117	129	+23	-10	-20
´2c	7	11.4	7.3	103	108	112	+ 9	+14	-10
´3a	5	14.9	9.7	101	98	97	- 4	+18	+ 1
´3b	14	14.3	10.8	108	101	100	- 8	+14	+10
´3c	7	13.3	7.3	107	106	114	- 1 + 8	+14	-10
Speaker Ka									
ˋ1	24	9.6	5.6	103	115	113	+12 - 2	-33	-13
2	14	8.2	6.8	99	110	118	+19	-28	-13
3	4	7.0	7.1	131	130	129	-	-29	-36
´3b	7	12.6	6.3	82	75	78	- 4	+24	+ 7
´3a	3	8.9	5.7	83	80	80	- 3	+37	+ 1
Speaker Pi									
ˋ1	4	5.9	4.9	154	164	158	+10 - 6	- 9	-11
ˋ2	15	8.1	5.6	140	146	151	+11	- 6	- 9
ˋ3	6	7.3	6.6	140	141	142	+ 2	- 7	- 7
ˋ4	10	9.4	5.5	138	136	144	- 2 + 8	- 6	- 4
´1c	4	8.2	4.8	136	136	136	-	+ 5	-16
´2c	4	7.5	3.4	136	141	146	+10	+ 7	- 4

Table 10 Ju, Ka, Pi.
Comparison between some averaged data in barytones for the same speaker, and between the three speakers.

Table 9 Ka is on p. 67.

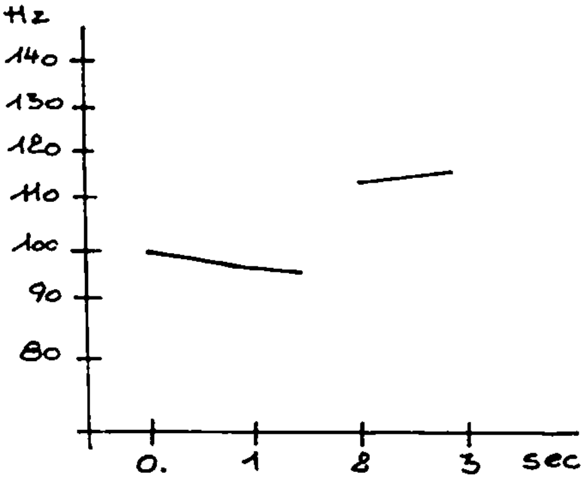

Fig. 9 Ju.
A (typical) averaged barytone acute.

FoP	´3a
Lo + Sn	´ or ´(•)
duration	14.9 9.7 csecs.
frequencies	101 98 97 +18 +1
voice range	97–116 Hz (19 Hz)
5 instances	580, 605, 615, 636, 657.

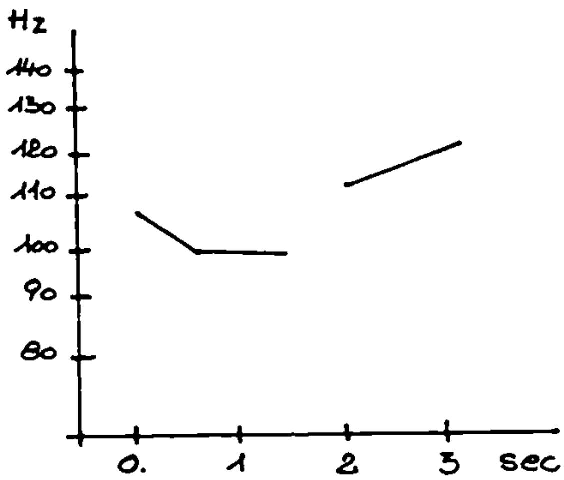

Fig. 10 Ju.
A (typical) averaged barytone acute.

FoP	´3b
Lo + Sn	´ or ´(•)
duration	14.7 11.1 csecs.
frequencies	108 101 100 +13 +11
voice range	100–124 Hz (24 Hz)
13 instances	558, 562, 563, 596, 602, 610, 620, 631, 633, 639, 641, 644, 655.

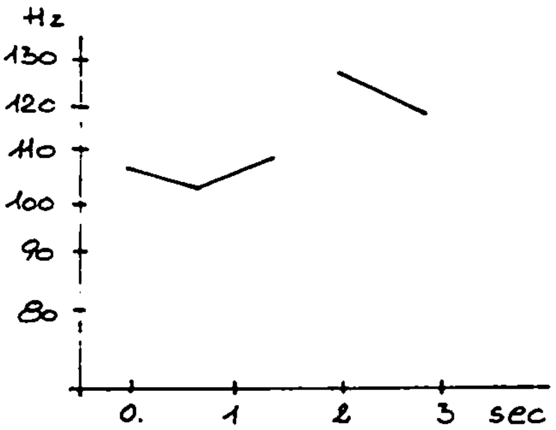

Fig. 11 Ju.
A (typical) averaged barytone acute.

FoP	´3c
Lo + Sn	´ or ´(•)
duration	13.3 7.2 csecs.
frequencies	107 104 110 +19 -8 Hz
voice range	104–129 Hz (25 Hz)
4 instances	566, 570, 603, 679.

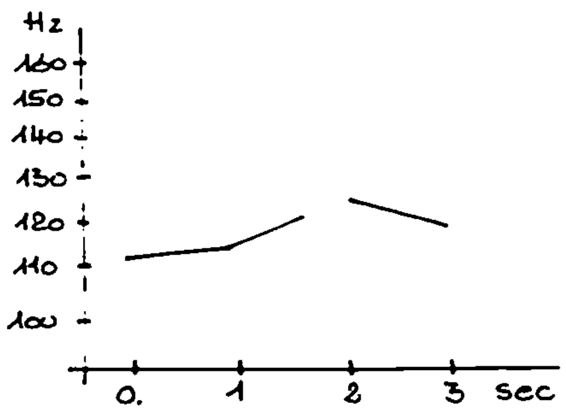

Fig. 11a Ju.
A less distinct barytone acute.

FoP	´3c
Lo	˙
Sn	´
duration	16.6 7.2 csecs.
frequencies	111 113 121 +5 -2 Hz
voice range	111–126 Hz (15 Hz)
1 instance	584 Amêrika

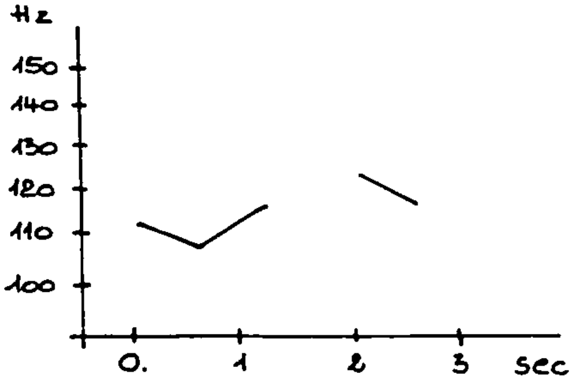

Fig. 11b Ju.
A less distinct barytone acute.

FoP	´3c
Lo	ˆ
Sn	´
duration	12.1 6.8 csecs.
frequencies	112 107 117 +8 -6 Hz
voice range	107–125 Hz (18 Hz)
1 instance	646 pâjek

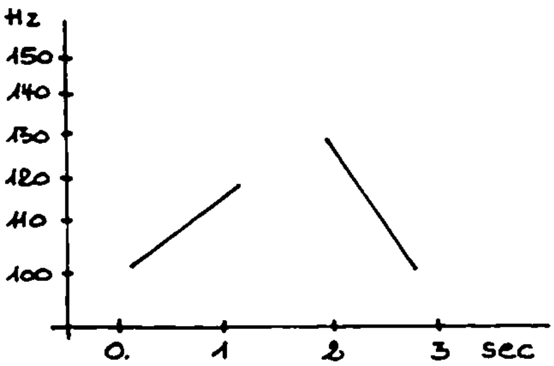

Fig. 11c Ju.
A less distinct barytone acute.

FoP	´3c
Lo	ˆ ?
Sn	´
duration	11.3 8.3 csecs.
frequencies	101 110 118 +11 -30 Hz
voice range	99–129 Hz (30 Hz)
1 instance	594 mâki

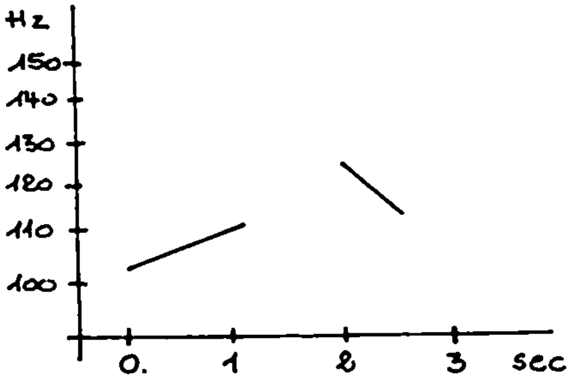

Fig. 12 Ju.
A (typical) averaged barytone acute.

FoP	´2c
Lo + Sn	´ or ´(•)
duration	10.2 5.0 csecs.
frequencies	104 108 111 +15 -9 Hz
voice range	104–126 Hz (22 Hz)
4 instances	573, 591, 621, 666.

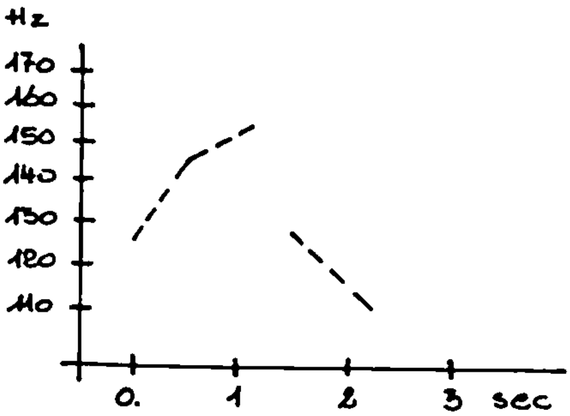

Fig. 13 Ju.
A (typical) averaged barytone circumflex.

FoP	ˆ1
Lo + Sn	ˆ or ˆ(•)
duration	10.1 8.1 csecs.
frequencies	127 147 156 -28 -17 Hz
voice range	156–111 Hz (45 Hz)
4 instances	565, 587, 656, 668.

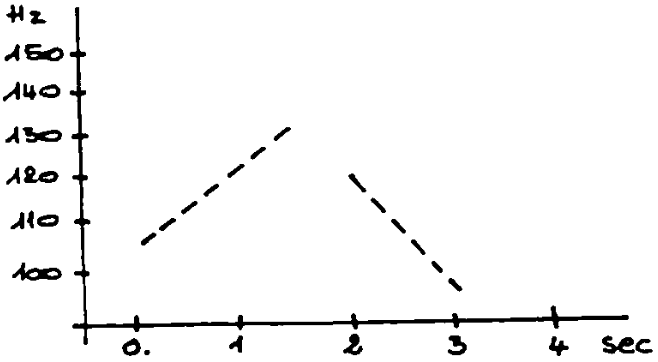

Fig. 14 Ju.
A (typical) averaged barytone circumflex.

FoP	ˆ2
Lo + Sn	ˆ or ˆ (•)
duration	14.2 10.3 csecs.
frequencies	108 120 132 -11 -24 Hz
voice range	132–97 Hz (35 Hz)
5 instances	630, 659, 662, 663, 677.

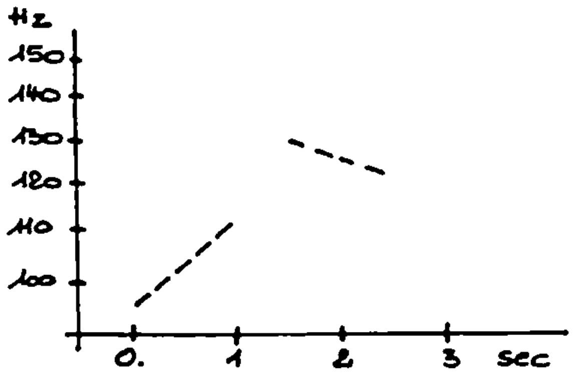

Fig. 15a Ju.
A barytone circumflex (?)

FoP	´2c
Lo + Sn	ˆ
duration	9.8 9.0 csecs.
frequencies	97 111 +21 -7 Hz
voice range	97–132 Hz (35 Hz)
1 instance	590 âstma

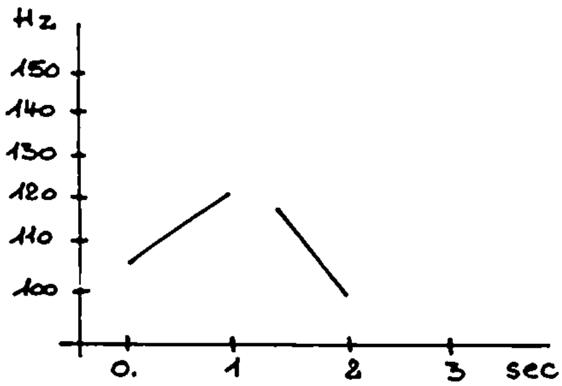

Fig. 15b Ju.
A barytone acute (?)

FoP	ˆ2
Lo + Sn	´
duration	9.1 6.0 csecs.
frequencies	107 114 121 -4 -15 Hz
voice range	121–102 Hz (19 Hz)
1 instance	617 budīzem

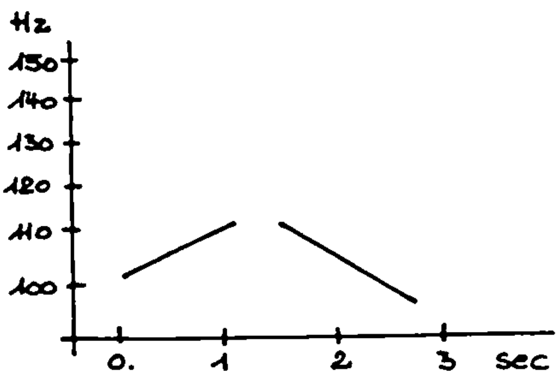

Fig. 15c Ju.
A barytone acute (?)

FoP	¯2
Lo + Sn	´ or ´(•)
duration	10.6 14.3 csecs.
frequencies	103 109 114 -1 -16 Hz
voice range	114–97 Hz (17 Hz)
1 instance	622 rudnīna

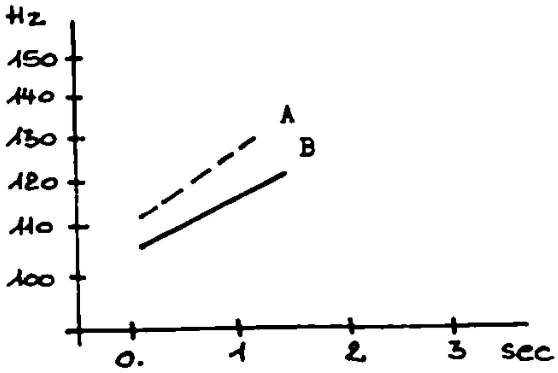

Fig. 16a Ju.
Two averaged oxytone rises: A) a (typical) circumflex,
B) a (typical) acute.

FoC	A: R	B: R
Lo + Sn	A: ˆ or ˆ (•)	B: ´ or ´ (•)
duration	A: 11.7 csecs.	B: 13.6 csecs.
frequencies	A: 114 122 131 Hz	B: 108 115 124 Hz
voice range	A: 114–131 Hz (17 Hz)	B: 108–124 Hz (16 Hz)
8/12 instances	A: 574, 579, 581, 586, 640, 647, 650, 674.	B: 566, 585, 608, 609, 611, 619, 623, 634, 635, 637, 642, 660.

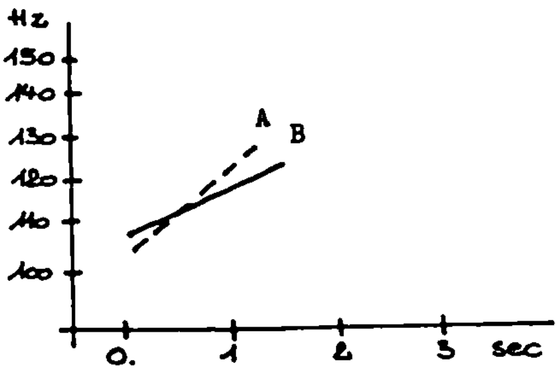

Fig. 16b Ju.
Two averaged oxytone rises: A) a typical circumflex,
B) a typical acute.

FoC	A: R	B: R
Lo + Sn	A: ˆ	B: ´
duration	A: 12.3 csecs.	B: 14.5 csecs.
frequencies	A: 106 116 127 Hz	B: 109 115 123 Hz
voice range	A: 106–127 Hz (21 Hz)	B: 109–123 Hz (14 Hz)
6/10 instances	A: 574, 579, 581, 586, 650, 674.	B: 566, 608, 609, 611, 619, 634, 635, 637, 642, 660.

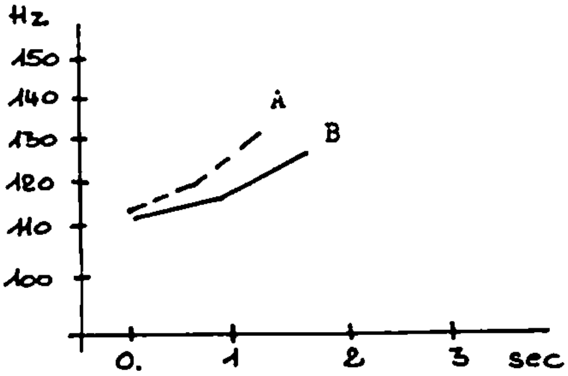

Fig. 17 Ju.
Two averaged oxytone rises: A) typicallly circumflexed for Lo,
B) non-accented for Sn.

FoC	A: R		B R
Lo	A: ˆ	Sn	B 0 (Lo 13 ˆ , 1´ (•))
duration	A: 13.2 csecs.		B 16.2 csecs.
frequencies	A: 114 120 131 Hz		B 113 119 128 Hz
voice range	A: 114–131 Hz (17 Hz)		B 113–128 Hz (15 Hz
32/14 instances	A: 566, 568, 569, 571, 574, 578, 579, 581, 583, 586, 588, 589, 592, 597, 616, 625, 628, 629, 632, 634, 638, 640, 647, 650, 653, 661, 669, 670, 672, 674, 674, 675.		B 568, 569, 588, 609, 616, 634, 647, 653, 658, 661, 669, 670, 674, 675.

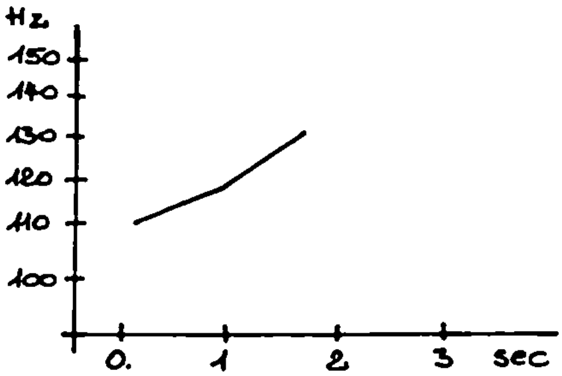

Fig. 18 Ju.
An averaged rising oxytone differently interpreted by Lo and Sn.

FoC	R
Lo	ˆ
Sn	´
duration	13.2 csecs.
frequencies	111 117 130 Hz
voice range	111–130 Hz (19 Hz)
6 instances	566, 589, 592, 628, 632, 638.

00050414

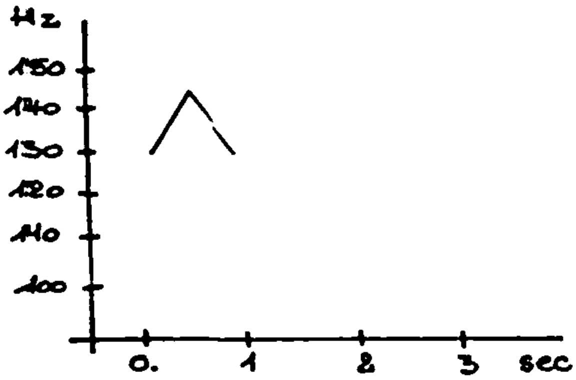

Fig. 19 J1.
An averaged typical rising–fallling oxytone circumflex.

FoC	RF
Lo + Sn	ˆ
duration	9.3 csecs.
frequencies	129 146 130 Hz
voice range	129–146 Hz (17 Hz)
4 instances	561, 613, 624, 654.

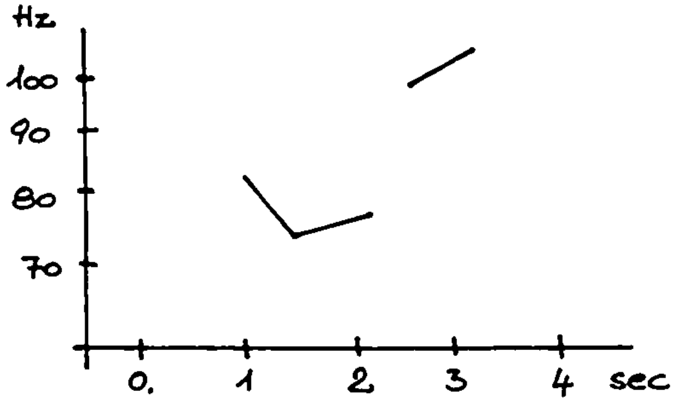

Fig. 20 Ka.
A typical averaged barytone acute.

FoP	´3b
Lo + Sn	´
duration	12.6 6.3 csecs.
frequencies	62 75 78 +24 +7 Hz
voice range	75–108 Hz (33 Hz)
7 instances	570, 582, 646, 655, 657, 662, 681.

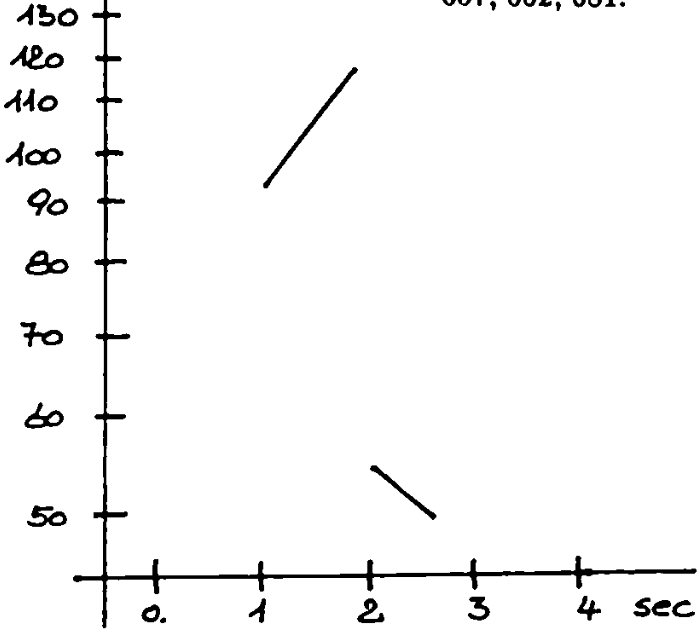

Fig. 21 Ka.
A barytone acute (?)

FoP	ˉ2
Lo + Sn	´ or ´(•)
duration	7.5 6.0 csecs.
frequencies	94 105 116 -56 -6 Hz
voice range	116–54 Hz (62 Hz)
1 instance	626 lúka

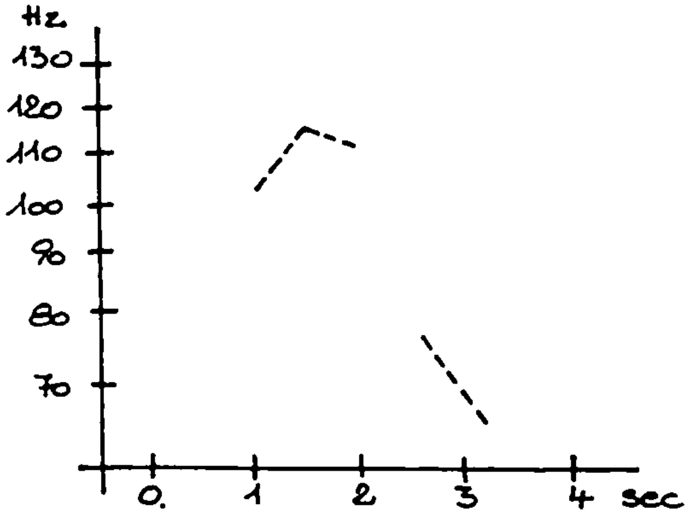

Fig. 22 Ka.
A typical averaged barytone circumflex.

FoP	ˆ1
Lo + Sn	ˆ
duration	9.3 5.6 csecs
frequencies	103 116 113 -35 -12 Hz
voice range	116–66 Hz (50 Hz)
21 instances	572, 573, 577, 584, 590, 591, 601, 604, 605, 610, 615, 622, 630, 633, 649, 656, 663, 666, 676, 679, 680.

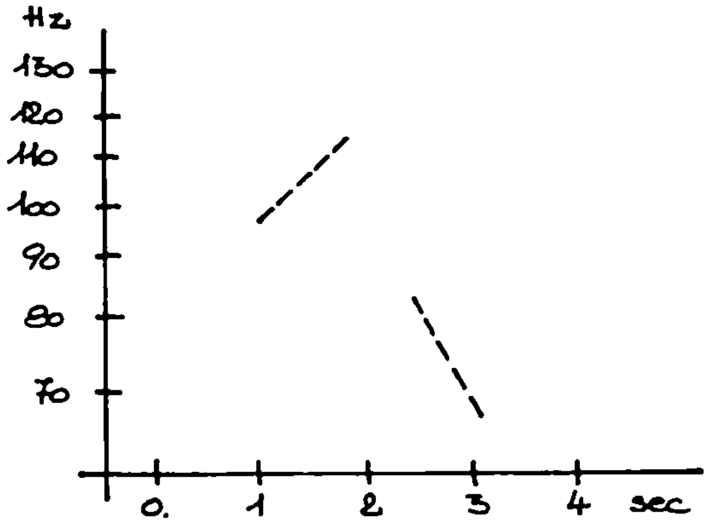

Fig. 23 Ka.
A typical averaged barytone circumflex.

FoP	ˆ2
Lo + Sn	ˆ
duration	7.7 7.3 csecs.
frequencies	99 108 116 -34 -15 Hz
voice range	116–67 Hz (49 Hz)
6 instances	565, 580, 581, 668, 673, 682.

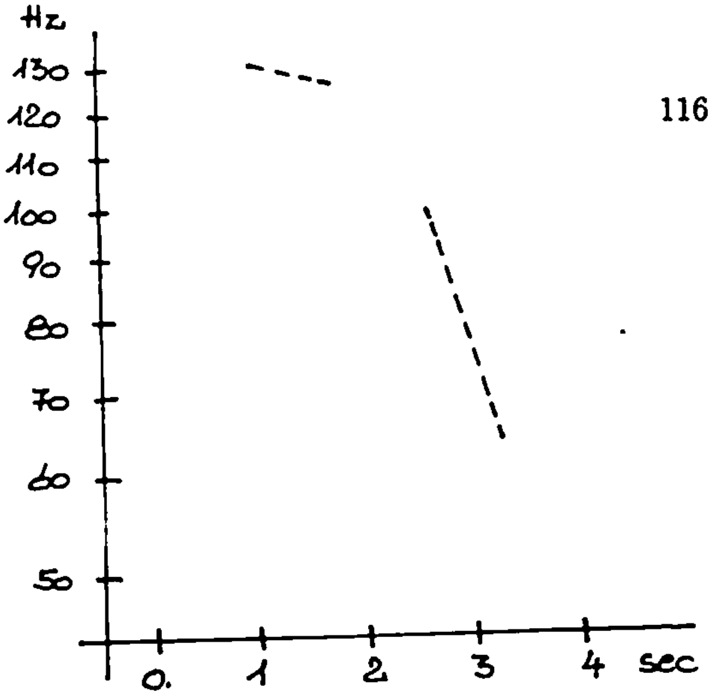

Fig. 24 Ka.
An averaged barytone circumflex.

FoP	ˆ3
Lo + Sn	ˆ
duration	7.0 7.1 csecs.
frequencies	131 130 129 -29 -36 Hz
voice range	131–64 Hz (67 Hz)
4 instances	563, 614, 639, 641.

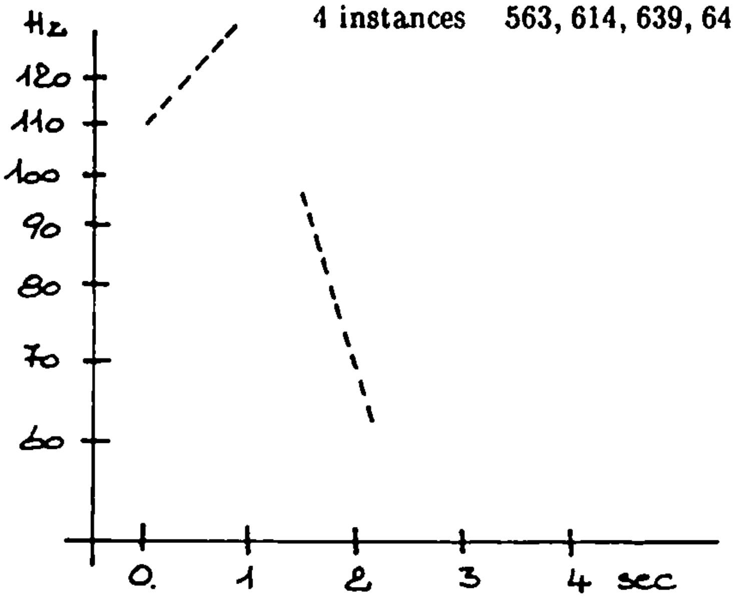

Fig. 25 Ka.
A less distinct* barytone circumflex.

FoP	ˆ2
Lo	ˆ
Sn	ˊ
duration	8.3 5.3 csecs.
frequencies	111 122 133 -37 -38 Hz
voice range	133–58 Hz (75 Hz)
1 instance	651 nẹ̄kaj

*is not really less distinct although Lo and Sn disagree in their interpretation (See p. 68).

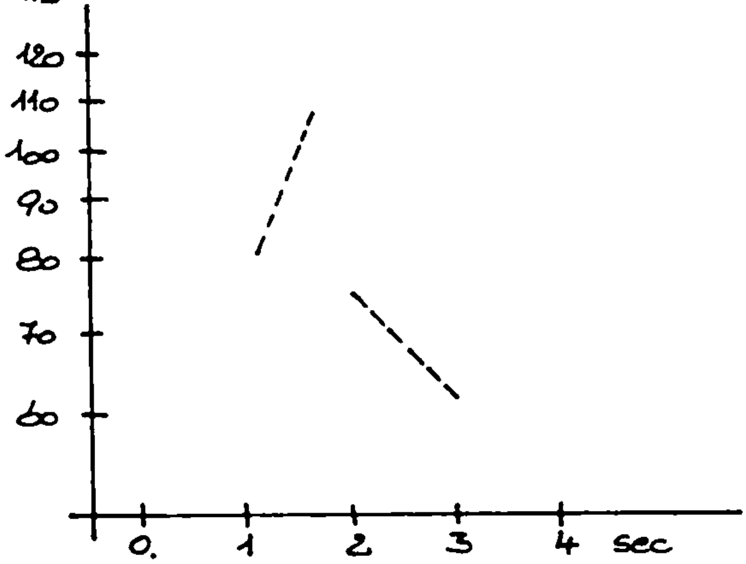

Fig. 26 Ka.
A less distinct* barytone circumflex.

FoP	ˆ2
Lo	ˆ
Sn	´
duration	6.0 10.2 csecs.
frequencies	80 94 108 -32 -14 Hz
voice range	108–62 Hz (46 Hz)
1 instance	659 lojîtev

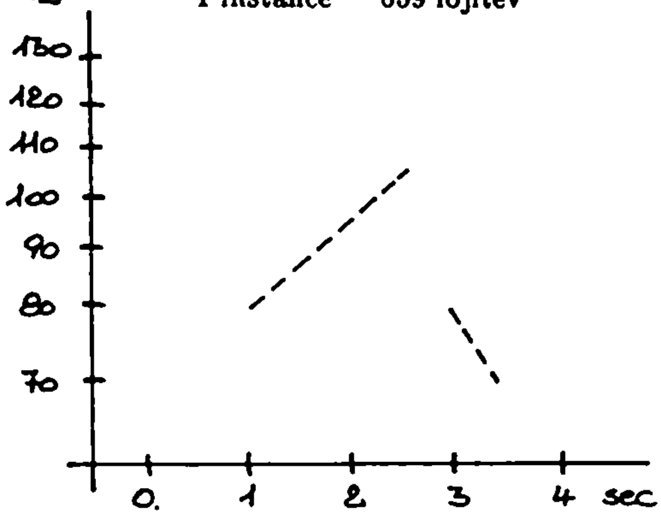

Fig. 27 Ka.
A less distinct* barytone circumflex.

FoP	ˆ1
Lo	ˆ
Sn	´
duration	14.7 4.5 csecs.
frequencies	80 92 104 -25 -10 Hz
voice range	104–69 Hz (35 Hz)
1 instance	648 pri bâjti

*is not really less distinct although Lo and Sn disagree in their interpretation (See p. 68).

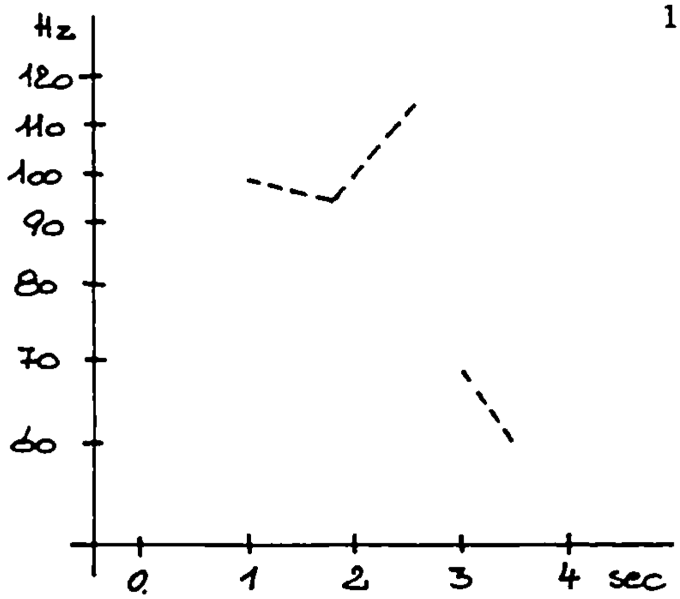

Fig. 28 Ka.
A less distinct* barytone circumflex.

FoP	ˆ4
Lo	ˆ
Sn	´
duration	15.5 5.3 csecs
frequencies	100 95 115 -45 -10 Hz
voice range	115–60 Hz (55 Hz)
1 instance	645 râjni

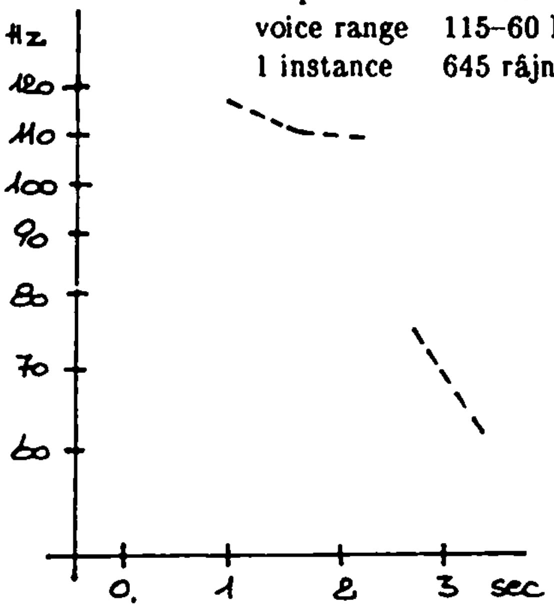

Fig. 29 Ka.
A less distinct barytone circumflex.

FoP	ˆ4
Lo	´
Sn	ˆ
duration	12.1 6.0 csecs.
frequencies	119 113 110 -36 -12 Hz
voice range	119–62 Hz (57 Hz)
1 instance	596 v kádi

*is not really less distinct although Lo and Sn disagree in their interpretation (See p. 68).

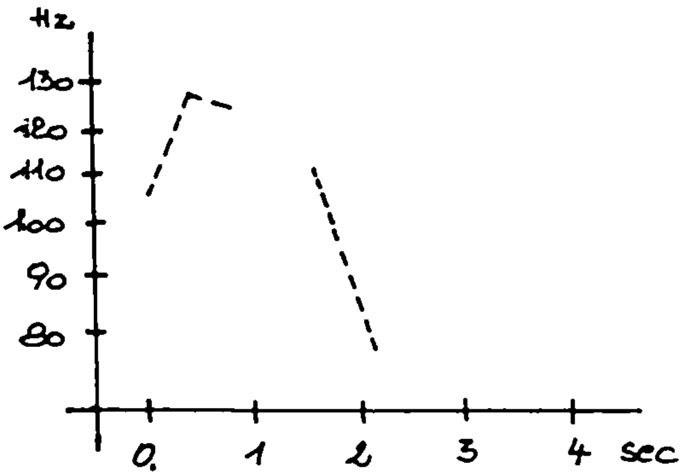

Fig. 30 Ka.
A less distinct barytone circumflex.

FoP	̂1
Lo	́
Sn	̂
duration	7.9 5.3 csecs.
frequencies	106 128 125 -15 -33 Hz
voice range	128–77 Hz (51 Hz)
1 instance	617 budīzem

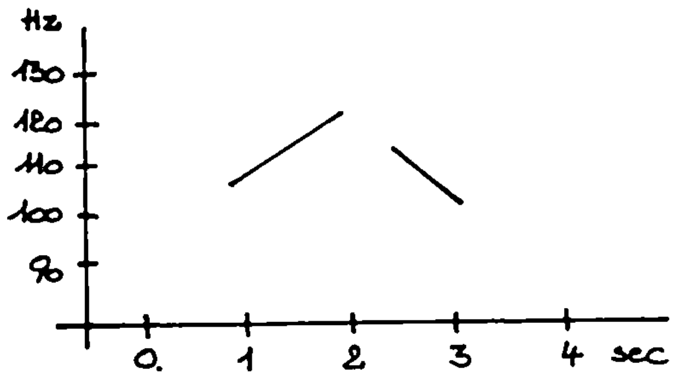

Fig. 31 Ka.
A perceptuallly indeterminate word accent.

FoP	̂2
Lo	?
Sn	́?
duration	9.1 5.3 csecs.
frequencies	108 115 122 -9 - 10 Hz
voice range	122–103 Hz (19 Hz)
1 instance	636 glẹ̄jte

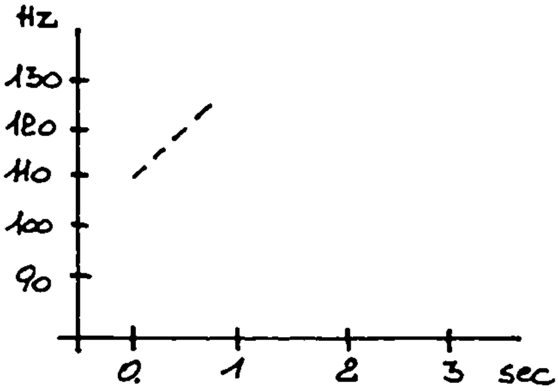

Fig. 32 Ka. A typical averaged oxytone circumflex.

FoC	R
Lo + Sn	ˆ
duration	7.3 csecs.
frequencies	110 118 124 Hz
voice range	110–124 Hz (14 Hz)
13 instances	559, 560, 579, 586, 598, 599, 600, 606, 611, 625, 627, 640, 650.

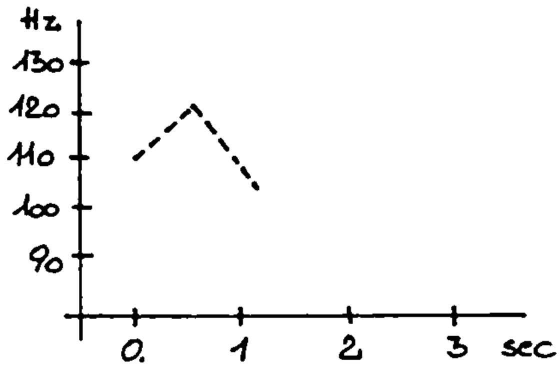

Fig. 33 Ka.
A typical averaged oxytone circumflex.

FoC	RF
Lo + Sn	ˆ
du-ation	10.5 csecs.
frequencies	110 121 104 Hz
voice range	121–104 Hz (17 Hz)
46 instances	561, 566, 567, 568, 569, 571, 574, 575, 576, 578, 583, 585, 588, 589, 592, 593, 594, 597, 608, 609, 612, 613, 616, 619, 623, 624, 628, 629, 632, 635, 637, 638, 642, 643, 647, 652, 654, 660, 664, 665, 669, 670, 671, 672, 674, 675.

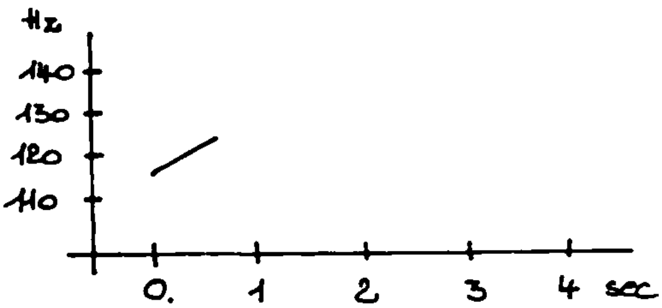

Fig. 34 Ka.
A less distinct oxytone acute.

FoC	R
Lo + Sn	´ or ´(•)
duration	4.5 csecs.
frequencies	118 121 123 Hz
voice range	118–123 Hz (5 Hz)
1 instance	623 ní

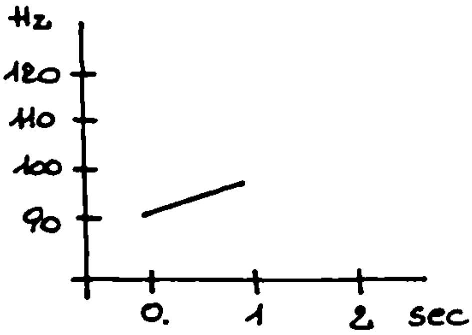

Fig. 35 Ka.
A less distinct word accent on an oxytone.

FoC	R
Lo	ˉ
Sn	´
duration	9.8 csecs.
frequencies	91 93 96 Hz
voice range	91–96 Hz (5 Hz)
1 instance	566 dvę̂

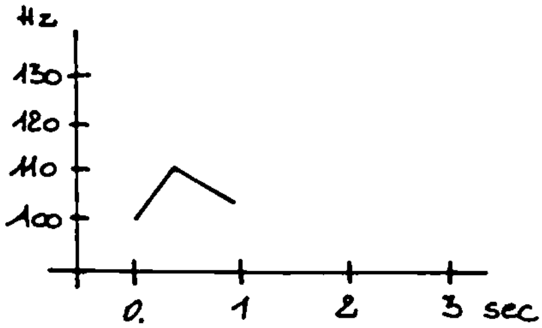

Fig. 36 Ka.
A phonetic (Sn) and a phonological (Lo) interpretation of a RF oxytone.

FoC	RF
Lo	´
Sn	ˆ
duration	9.1 csecs.
frequencies	100 110 104 Hz
voice range	100–110 Hz (10 Hz)
1 instance	634 smrdí

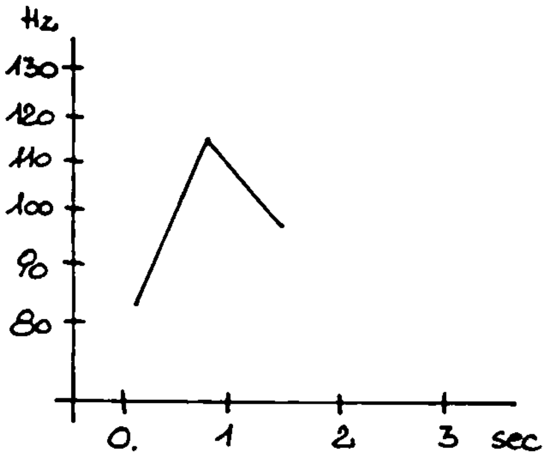

Fig. 37 Ka.
A less distinct oxytone circumflex.

FoC	RF
Lo	ˆ
Sn	´
duration	14.3 csecs.
frequencies	82 112 95 Hz
voice range	82–112 Hz (30 Hz)
1 instance	658 lǫ̂j

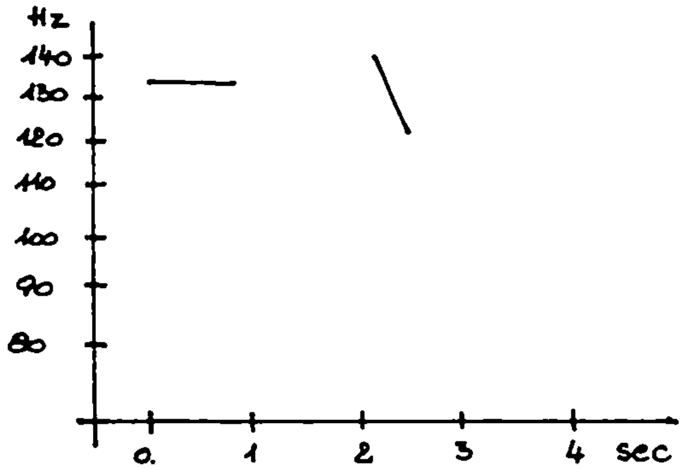

Fig. 38 Pi.
A (typical) averaged barytone acute.

FoP	´1c
Lo + Sn	´ or ´(•)
duration	8.2 4.8 csecs.
frequencies	136 136 136 +5 -16 Hz
voice range	141–125 Hz (16 Hz)
4 instances	591, 603, 610, 626.

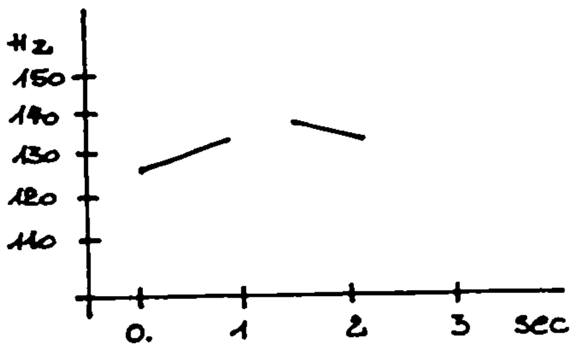

Fig. 39 Pi.
A typical barytone acute.

FoP	´2a
Lo + Sn	´
duration	8.3 6.8 csecs.
frequencies	129 132 134 +5 -2 Hz
voice range	129–139 Hz (10 Hz)
1 instance	580 méča

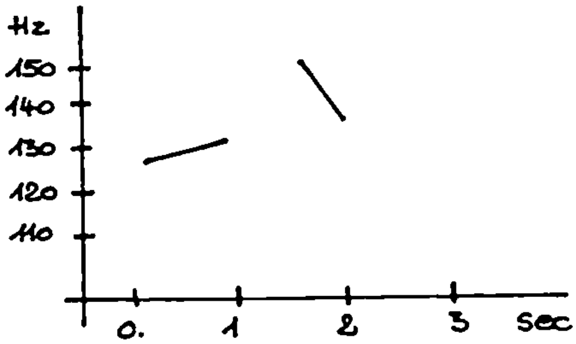

Fig. 40 Pi.
A typical barytone acute.

FoP	´3a
Lo + Sn	´
duration	9.4 4.1 csecs.
frequencies	125 127 129 +21 -14 Hz
voice range	125–150 Hz (25 Hz)
1 instance	570 matemátika

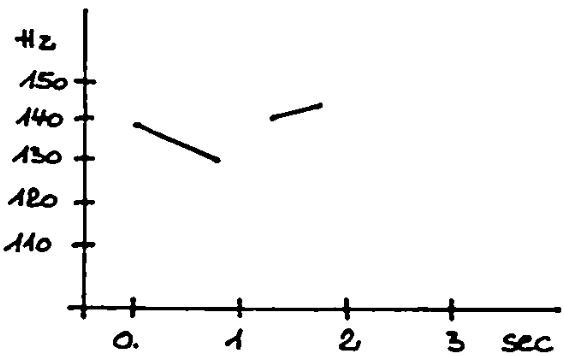

Fig. 41 Pi.
A typical barytone acute.

FoP	´3b
Lo + Sn	´
duration	7.5 4.5 csecs.
frequencies	138 134 130 +10 +3 Hz
voice range	130–143 Hz (13 Hz)
1 instance	644 kráji

00050414

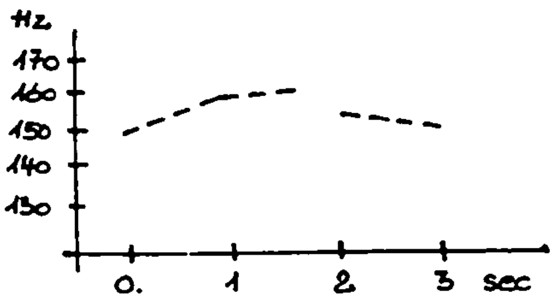

Fig. 42 Pi.
A typical barytone circumflex.

FoP	ˆ2
Lo + Sn	ˆ
duration	15.1 8.3 csecs
frequencies	150 159 160 -7 -3 Hz
voice range	150–160 Hz (10 Hz)
1 instance	663 âvdion

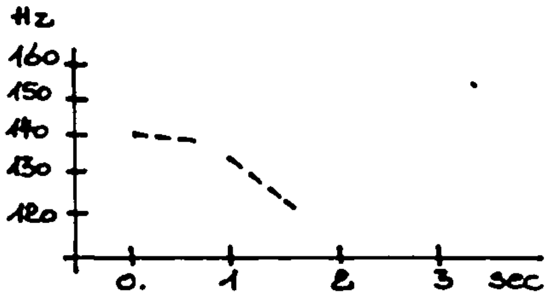

Fig. 43 Pi.
A typical barytone circumflex.

FoP	ˆ3
Lo + Sn	ˆ
duration	6.8 4.9 csecs.
frequencies	144 142 141 -9 -6 Hz
voice range	144–126 Hz (18 Hz)
1 instance	614 ộpera

00050414

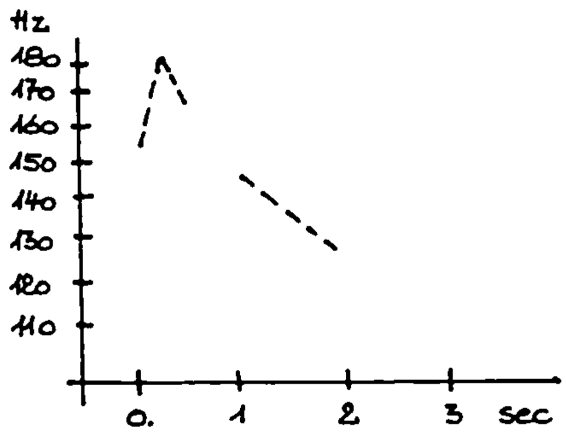

Fig. 44 Pi.
A typical barytone circumflex.

FoP	ˆ1
Lo + Sn	ˆ
duration	3.8 7.2 csecs.
frequencies	152 180 164 -18 -23 Hz
voice range	180–123 Hz (57 Hz)
1 instance	563 sítast

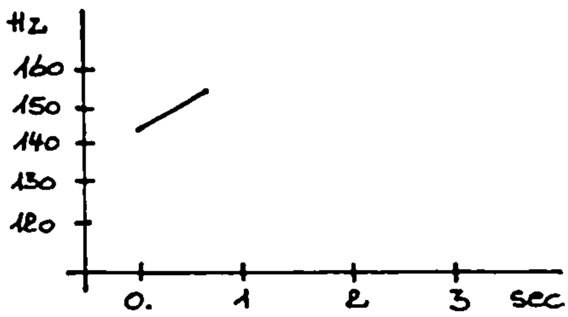

Fig. 45 Pi.
An oxytone acute.

FoC	R
Lo + Sn	´
duration	6.0 csecs.
frequencies	145 150 154 Hz
voice range	145–154 Hz (9 Hz)
1 instance	637 smejǫ̑č

00050414

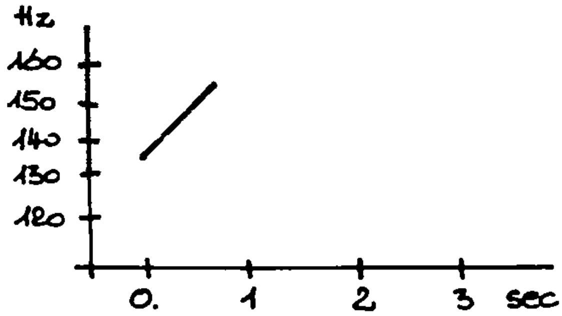

Fig. 46 Pi.
An oxytone acute.

FoC	R
Lo + Sn	´
duration	5.6 csecs.
frequencies	137 146 154 Hz
voice range	137–154 Hz (17 Hz)
1 instance	642 mejí

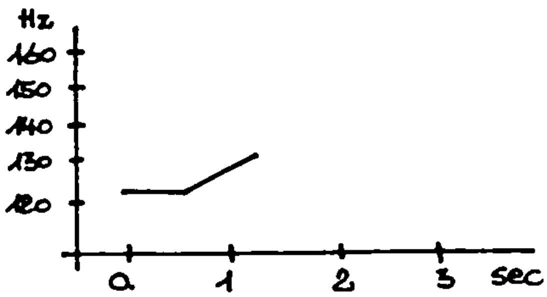

Fig. 47 Pi.
An oxytone acute.

FoC	R
Lo + Sn	´
duration	11.3 csecs.
frequencies	125 125 131 Hz
voice range	125–131 Hz (6 Hz)
1 instance	660 lojár

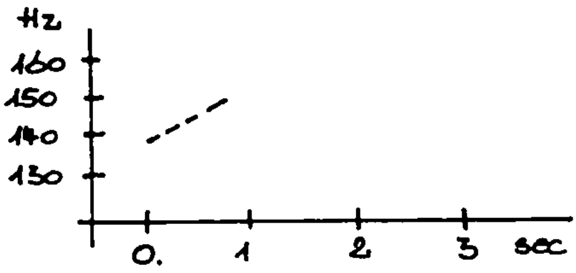

Fig. 48 Pi.
A (typical) averaged oxytone circumflex.

FoC	R
Lo + Sn	ˆ or ˆ (•)
duration	7.7 csecs.
frequencies	140 146 153 Hz
voice range	140–153 Hz (13 Hz)
13 instances	561, 575, 576, 578, 579, 581, 611, 619, 627, 634, 647, 665, 671.

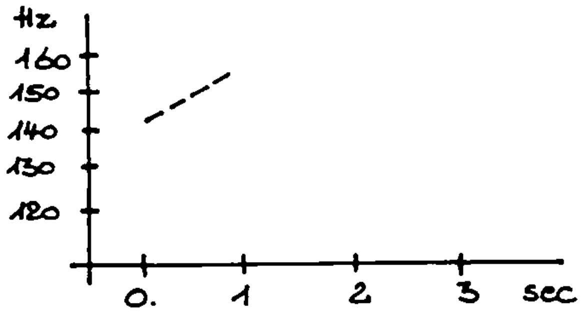

Fig. 49 Pi.
A typical averaged oxytone circumflex.

FoC	R
Lo + Sn	ˆ
duration	7.0 csecs.
frequencies	142 147 155 Hz
voice range	142–155 Hz (13 Hz)
9 instances	578, 579, 581, 611, 619, 627, 634, 647, 671.

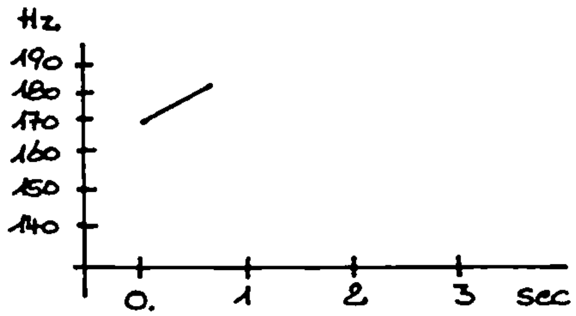

Fig. 50 Pi.
A R oxytone with an ambiguous word accent.

FoC	R
Lo	ˊ
Sn	ˆ (•)
duration	6.4 csecs.
frequencies	170 177 183 Hz
voice range	170–183 Hz (13 Hz)
1 instance	609 kǭd

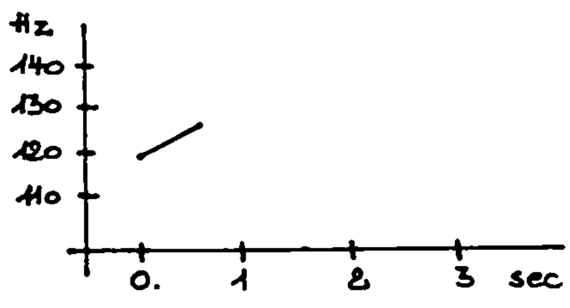

Fig 51 Pi.
A R oxytone with an ambiguous word accent.

FoC	R
Lo	ˊ
Sn	ˆ
duration	4.9 cescs.
frequencies	120 123 126 Hz
voice range	120–126 Hz (6 Hz)
1 instance	650 gajīč

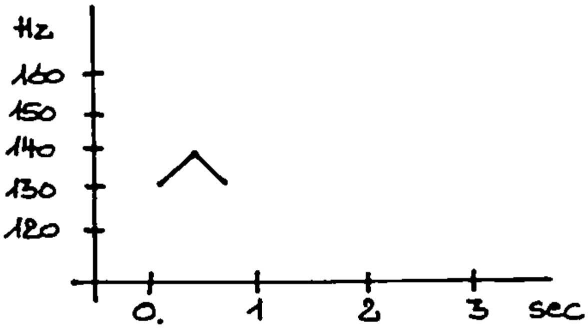

Fig. 52 Pi.
A phonological interpretation of a RF oxytone.

FoC	RF
Lo + Sn	´
duration	6.8 csecs.
frequencies	131 139 131 Hz
voice range	131–139 Hz (8 Hz)
1 instance	634 smrdí

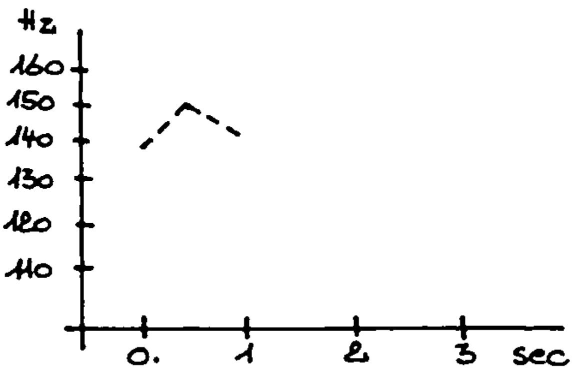

Fig. 53 Pi.
A typical averaged oxytone circumflex.

FoC	RF
Lo + Sn	ˆ
duration	9.3 csec.
frequencies	139 150 142 Hz
voice range	139–150 Hz (11 Hz)
13 instances	559, 560, 566, 567, 568, 571, 574, 583, 624, 625, 661, 664, 674.

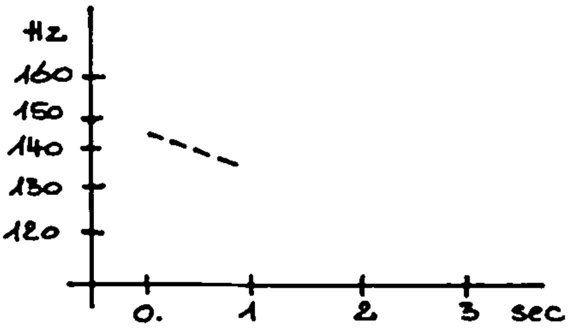

Fig. 54 Pi.
A F oxytone jointly interpreted as acuted.

FoC	F
Lo + Sn	´
duration	9.4 csecs.
frequencies	144 141 137 Hz
voice range	144–137 Hz (7 Hz)
1 instance	585 alárm

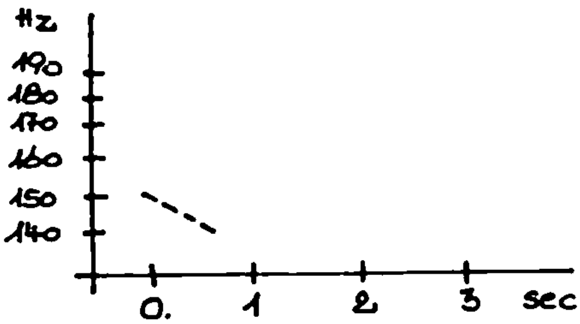

Fig. 55 Pi.
An averaged F oxytone circumflex.

FoC	F
Lo + Sn	ˆ
duration	6.2 csecs.
frequencies	150 146 142 Hz
voice range	150–142 Hz (8 Hz)
4 instances	599, 618, 632, 643.

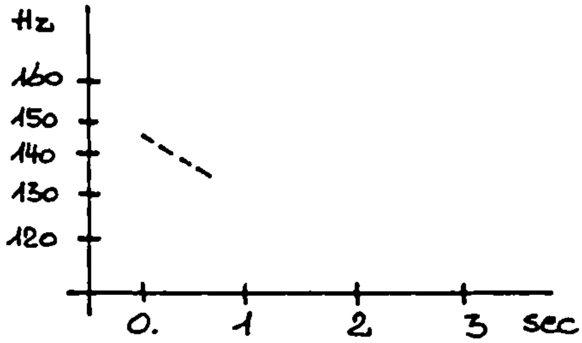

Fig. 56 Pi.
An averaged F oxytone circumflex.

FoC	F
Lo + Sn	ˆ or ˆ (•)
duration	6.8 csecs.
frequencies	146 143 138 Hz
voice range	146–138 Hz (8 Hz)
6 instances	592, 599, 618, 632, 643, 654.

Chapter 5

WORD ACCENT IN SENTENCES UNDER THE INFLUENCE OF SENTENCE INTONATION

5.1 Word accent in sentences is studied on the same sentences as Toporišič did in "Liki slovenskih tonemov". Whereas Toporišič studied word accent in statements and declarative questions as spoken by 1 speaker and as perceived by 5 linguists, we deal with statements only as spoken by the 3 speakers Ju, Ka and Pi and as they are interpreted by the 2 linguists Lo and Sn. The text of the sentences is in the appendix (pp. 261–262). The speakers were asked to pronounce the sentences in a natural way, neither slowly nor quickly.

Toporišič constructed 4 sentences, 2 with barytones, and 2 with oxytones. One barytone sentence consisted of only expected acuted barytones, and the other of expected circumflexed, and in both sentences most accented syllables had the vowel /a/. Depending on the number of accented words it contained, every sentence was said 5 to 7 times with all the accented words being in turn emphasized, 1 version was unmarked, and 1 ended with a low rising nucleus as it was followed by another tone group. The 2 oxytone sentences were constructed on the same principles. (More detailed information on Toporišič's investigation is on pp. 5–6.)

At the end of this chapter are to be found:

1) Tables 11 Ju, 11 Ka, 11 Pi (pp. 155–178) containing the basic data of the 3 speakers with the same parameters as in the single word series;
2) Tables 12 Ju, Ka, Pi containing the comparison between expected accent (SSKJ), FoP or FoC, and perceived accent in Ju, Ka and Pi acute and circumflex barytones and oxytones in sentences (pp. 179–181);
3) Figures 57–62 (pp. 183–185) of averaged FoPs and FoCs of some accented words contained in these sentences.

The emphatic versions of the accented words are dealt with in a separate chapter.

5.2 Speaker Ju (Tables 11 Ju, pp. 155–162)

5.2.1 In initial position

Barytones:
a) ***kráva/e*** (6 instances), ***kónji*** (1 instance),
b) ***stârček*** (5 instances), ***šǫ̑lar*** (1 instance).

Although ***kráva/e*** and ***stârček*** are disyllabic, and the two tonics contain the same vowel phoneme, they are not an ideal pair for comparison: ***kráva/e*** consists of two open syllables, and *stârček* of two closed. Some prosodic differences are probably due to the fact that the two words are differently structured. On the other hand, it is a fact that among the words with structure (a) more are acuted than circumflexed. An open syllabled disyllabic word tends to be acuted unless there are morphological or other reasons (e.g. a loanword) that make it circumflexed. *Stârček* is circumflexed by analogy with *stâr*.

Ju's accented vowels are shorter here than the same vowel phonemes in similar positions in the nonsense series, 15.5 and 10.3 csecs. versus 17.2 and 15.6 csecs. The averaged difference in duration between an open and closed syllable in the nonsense series was 1.8 csecs. and here it is even greater. When the barytone words were grouped as to accent (regardless of syllable structure) in the single word series there was no difference in duration with Ju between acuted and circumflexed vowels in barytones. That is why I consider duration in barytones to be more affected by syllable structure than accent type, although the fact that we have to do here with an open acuted syllable and a closed circumflexed may increase the duration difference even more.

The tonics of all the words (with 1 exception 746, which is falling) have a concave contour with negative pitch movement when acuted, and positive when circumflexed. All the expected acutes have a jump up, and most of the expected circumflexes a jump up too, although a jump down is possible. The degree of the jump up in the expected acutes does not differ systematically from the expected circumflexes. The posttonic is rising in the acute series, and falling in the circumflex. The average frequency of the accented vowel is throughout higher in the expected circumflex than in the acute vowels. The intensity peak in the acuted group is throughout on the postaccented vowel and in the expected circumflex on the accented vowel. The expected acute series has acute FoPs in all instances; of the 7 expected circumflexes, 3 have an IP.

All the expected acuted barytones have been interpreted as acuted by both listeners, the acutes are typical acutes.

There is hardly any unanimity between the two interpreters in the expected circumflex series. While Lo hears the expected accent in all cases but 1 (which he hears as a less distinct circumflex), Sn is not quite sure. Keeping in mind the features found typical of the two accents (in Chapter 4) and referring to Sn's interpretations of the less clear cases of word accent in the single word series, we may say that because she pays much attention to the concave contour and because she hears the jump up, she in most cases decides on an acute. But as the fall on the postaccented vowel is always bigger than the preceding jump up, and the pitch movement on the accented vowel is always positive, she thinks it a less distinct version of the acute accent. (The cases with emphatic and contrastive stress will be dealt with separately.)

The overall sentence intonation at the beginning of a sentence in Slovene is rising (Neweklowsky 1973, 158). We have thus two forces here working in opposite directions (a) the expected circumflex with a jump down on the one hand, and (b) the sentence intonation influence with a rise pushing it into the acute sphere. The jump up in the *stârček* series should be due to the latter (cf. also p. 152). The voiceless plosive affricate with which the posttonic starts may strengthen this tendency. The circumflexes are not typical, and hence the various interpretations. Initial position in a sentence in Slovene favours the acute accent.

Oxytones:
a) *ták* (4 instances),
b) *zvečêr* (pronounced [zvečîr]) (4 instances).

The acuted /á/ is very short even for a closed syllable. No Ju oxytones with intrinsically shorter vowels (with the exception of /u/) jointly perceived as acuted in the single word series (608, 609, 611, 612, 637, 660) have such short vowels. Only the emphatic version of *ták*, though much longer than the normally stressed ones, reaches the same duration as the shortest acuted vowel in a closed syllable in the single word series. The two main reasons for this are: (a) the fact that it stands between 2 voiceless plosives; especially the second plosive shortens the duration of the preceding vowel, (b) as already mentioned, the vowels in a sentence are shorter than in a single word, even if embedded in a frame.

All the acuted words have a falling contour. Is the reason for this the fact that they are so short, that there is "no time" for a rise? That we have only the 1st part of the concave contour and not the whole?

Both interpreters perceived *ták* as acuted. Sn perceived the shortest version in preemphatic position (764) with an above average fall as less distinct. The /a/ vowel in these words is on the average lower in frequency than the same sound in *stârček* also in position 1. This then should be the main reason for an acute interpretation, besides the fact that an acute accent is expected.

Zvečêr has no falls. The contour is either rising or level. The frequencies are near those found in long circumflexed nonsense words (Table 3 Ju, p. 33). The vowels are too short for the contour to be properly perceived. Both interpreters must have perceived them as circumflexed on account of their pitch and duration. In spite of their short duration Sn did not completely ignore contour: she perceived the two level versions as less distinctly circumflexed.

The two accents cannot really be compared here: /a/ is intrinsically long and has a low intrinsic pitch; and /i/ is intrinsically short and has a high intrinsic pitch. The former thus favours the acute and the latter the circumflex accent.

5.2.2 In mid-position

Barytones:
a) *páse(jo)* (6 instances),
b) *čâka* (5 instances).

The two vowels cannot really be compared as to their duration though they belong to the same phoneme and are both in an open syllable. That /a/ is longer in *páse(jo)* than in *čâka* is certainly due to the fact that in the first case it is followed by a fricative, and in the second by a plosive; and perhaps also to the fact that the first is acuted and the second has no typical accent. Compared with *kráva/e*, *páse(jo)* is shorter because it is in mid-position and is followed by a voiceless consonant, and *kráva/e* in initial position and followed by a voiced consonant.

Compared with the acute in position 1 the difference is only in a relatively bigger jump up, probably due to the fact that it is after a voiceless consonant, and the posttonic is falling, while in position 1 it is rising. The FoPs are typically acuted, both interpreters have perceived all versions as acuted. The only tonic with no pitch movement, although with a concave contour, Sn has interpreted as less distinct.

The tonics of *čâka* do not differ from the acuted of *páse*: the tonics are followed by a jump up, though usually smaller than with *páse(jo)*, the posttonic has approximately the same negative pitch movement as the acuted series. Small wonder then that the two listeners do not agree in their perception. The FoPs were considered acuted on account of their jump up. Sn perceived all versions that had a jump up as acuted; and as less distinctly acuted probably on account of their smaller jump up than in the *páse(jo)* series. Lo may have perceived them as circumflex because of this latter feature and because of their expected accent. The interpretations in the single word series have already shown that with Ju utterances Sn is acute orientated and Lo circumflex. The longest normally stressed version with an above average jump up they both considered acuted: Sn distinctly acuted, and Lo less distinctly. The decisive criterion for this interpretation seems to have been duration + degree (extent) of jump up. While in the typically acuted series the intensity peak is throughout on the postaccented vowel as expected, the intensity peak in the expected circumflex series is on the accented vowel; and in the two instances perceived as less distinctly acuted by both judges, on the postaccented vowel.

Oxytones:
a) *junák* (4 instances),
b) *dân* (4 instances).

The averaged durations of *ták* – *junák* differ by 3 msecs. in both averaged versions, which of course is not perceptible, and probably is due to the fact that we have a voiced nasal in front of /a/ in *junák* and not a voiceless plosive, in spite of the fact that *ták* has position 1, and *junák* position 2. ***Dân*** is on the average longer than *junák* as it is in voiced surroundings and not followed by a plosive. The expected acute/ circumflex duration difference shows up only in the emphatic version of the two words.

Three instances of *junâk* out of five (emphatic included) have a tonic with a wobbling tone contour with 4 changes of pitch on each tonic which, however are small. There is no contour that would be only falling. The general pitch level is the same as with *ták*.

Although Lo rarely perceives a word as not accented, he did so twice with *dân*. Neither the sonagrams nor the numerical data show clearly what are the reasons for the many zero classifications. Listening to the tapes helped to clear matters, 768, although shorter and with a weaker rise than 754, is jointly perceived as circumflexed, while 754 is considered not accented by both judges 754 is only weakly stressed, while 768 is normally stressed. The two intensity curves show this: with 754 it is falling throughout, and with 768 it is rising-falling. 766 has a shallow concave contour – something unusual on an oxytone circumflex and so is perceived as not accented by both listeners. 752 is a similar case. The intensity curve is in both cases (766, 752) level with a fall at the end

Barytones:
a) *lẹ́pi* (5 instances), *zdráve* (4 instances), *grẹ́mo* (1 instance).
Oxytone:
a) *bilọ́* (1 instance).

Lẹ́pi is typically acuted, recognized as such by FoPs and both interpreters The high intrinsic pitch of /i/ increases the jump up. *Zdrdve* and *kráva/e* can be compared on account of their identical sounds and structure. *Kráva* standing at the head of a sentence and forming a noun phrase on its own, has on the average longer vowels, a concave higher tonic, a bigger jump up and more pitch movement on the posttonic than *zdráve*, which is in the middle of a tone group and forms a noun phrase with the following noun. The FoP is always acuted, and both interpreters always perceive it as acuted, Sn generally as less distinctly acuted. The version with the deepest (= most difference between bottom and top of contour) concave contour and the biggest jump up (749) is the only one (emphatic excluded) that is perceived as distinctly acuted by both *Grẹ́mo* and *bilọ́* have little pitch movement, hence the many zero interpretations

5.2.3 In final position

5.2.3.1 On a rising nucleus

Barytones:
a) *trdvi* (1 instance),
b) *pomlâdi* (1 instance).
Oxytones:
a) *vdd* (1 instance), *vẹ́* (1 instance),
b) *končâ* (1 instance).

The vowels on a rising nucleus are lengthened. The added duration figures in 751a and 751b mean pure phonation, the vocal cords go on vibrating though the /a/ and /ẹ/ resonance have ended. *Trávi* with its concave tonic with negative pitch movement and a jump up, though small, is perceived as acuted by both listeners. Lo interprets *pomlâdi* as circumflex on account of its definite rise on the tonic and probably on account of expected accent, ignoring the jump up on the tonic and the positive pitch movement on the posttonic. Or should we rather say that Lo hears a circumflex accent on a rising nucleus: in this case we would have to do with a phonological and not a phonetic interpretation. Sn, on the other hand, seems to concentrate her attention on the jump up and rising posttonic and interprets it as acuted.

Vdá has a typically circumflex contour (RF) and is thus jointly interpreted as circumflexed, and *vẹ́* a concave and is thus considered acuted. *Končâ* in spite of its concave contour is ambiguous probably because it is too short for a proper acute.

5.2.3.2 On a falling nucleus

Barytones:
a) *trávi* (5 instances), *dẹ́telji* (1 instance),
b) *pomlâdi* (4 instances), *počîtnic* (1 instance).
Oxytones:
a) *vdd* (3 instances), *zastọ́nj* (1 instance),
b) *končâ* (3 instances), *spât* (1 instance).

If we compare the averaged durations of *krdva/e* (initial position), *zdráve* (mid-position) and *trávi* (end position – rising nucleus; end position – falling nucleus), the order of duration of the vowel /a/ from the longest to the shortest is as follows: *trávi* 15.8 (R nucleus) > *krdva/e* 15.1 (initial position) > *trávi* 12.6 (F nucleus) > zdráve 11.1 (mid-position).

All the barytones on a falling nucleus have a fall somewhere. The question is where it starts. On the tonic (and if, where on it), on the jump or on the posttonic. With barytones no tonic is falling throughout with Ju (or not properly falling). The original rise survives as a rise which is either cut short somewhere on the tonic or on the jump or on the posttonic. The FoPs are thus either circumflex or indeterminate. In some cases the result of an accented rise and a falling nucleus is a level contour. The utterances in the *trávi* group, though not having a concave tonic – they have a rise at the beginning, are level in the middle of their course and may have a fall at the end – are followed by a big jump down (of about 23 to 45 Hz) and a falling posttonic. In most cases the two interpreters perceive *trávi* as acuted, basing their judgement on the accented vowel and ignoring the big jump down and the steeply falling postaccented vowel and the intensity peak on the accented syllable. This judgement is obviously phonological (an acute on a F nucleus). Lo's only circumflex interpretation (756) is based on a steep rise on the accented vowel followed by a fall which continues on the jump and on the postaccented vowel – this is the only phonetic interpretation in this series. In spite of its concave accented vowel *dę́telji* is jointly interpreted as circumflexed because of its jump down and the very steep fall on the postaccented vowel.

The FoPs of *pomlâdi* are ambiguous. The patterns do not differ fundamentally from *trâvi*. Expected accent must be decisive with Lo. Sn's acute interpretation of 759, 760 and 761 might be due to the fact that they are similar to the preceding *trávi* and they happen to have tonics with the lowest frequencies within the group, although the frequencies of the tonics of the two groups taken as a whole do not differ. 749 is jointly perceived as circumflexed, perhaps on account of its having the biggest jump down in this series.

All oxytones on a F nucleus have a F contour, in some cases RF. The interpreters heard a circumflex in all cases, regardless of expected accent.

5.2.4 Summary

Expected barytone acutes have an acute FoP in initial position and in mid-position, and are in all cases except 1 (752 *grę́mo*) jointly interpreted as acuted. In final position on a R nucleus the 1 case has an acute FoP and is jointly interpreted as acuted. The expected acutes on a F nucleus have an acute FoP only under emphatic stress. On a F nucleus in 3 cases the initial part of the tonic is R, and somewhere in the middle it starts to fall and falls to the end, and in 1 case the tonic has a small F throughout its course. All the 4 cases were jointly interpreted as acuted, the interpretation is phonological (a R accent on a F nucleus), not phonetic. The only remainder of the acute accent is perhaps the general pitch of the accented vowel.

Expected barytone circumflexes are much less stable in their FoPs and perception. Although we have no typically acute FoPs in initial and final position where they are either circumflex or indeterminate, even the circumflex FoPs are not typically circumflexed. One could argue about some of the FoP classifications with *stârček* in initial position. I decided on a circumflex classification because the pitch movement of the tonic was positive, while with an acute accent it is generally negative with Ju, the jump up was smaller than in *kráva/e* in spite of the fact that a voiceless plosive favours a bigger jump up, and the following posttonic always had a bigger fall than was the rise of the preceding jump up. The contour of the tonic, on the other hand, is typically acute–like and the jump is an up one, not a down one. These circumflexes certainly are not typical. The tonic in most cases is higher in pitch than the corresponding acuted one: small wonder then that all these contradictory features cause confusion. In final position the pitch of most tonics (*pomlâdi*) seems too low to Sn to be circumflexed. And *čâka* in mid–position has no circumflex FoPs at all (except in emphatic position). In the expected circumflexes the FoPs are not typical enough for Sn to overcome her acute orientation. Or is it just expected accent that makes Lo hear the circumflex even though it is not typical?

Do the acutes survive the sentence intonation influence better because Ju is acute orientated in his pronunciation or because it is the marked accent (cf. p. 236), or perhaps on account of both influences?

In the oxytones *tǎk*, *junǎk* and *zvečêr*, overall pitch seems responsible for the accent interpretations, *dǎn* in mid–position in some cases does not seem to be stressed enough to be considered accented, while in final position all the oxytones are considered circumflexed probably on account of the fall caused by a falling nucleus. On a rising nucleus one would expect acutes, but only *vẹ́* is typically acuted and recognized as such by both interpreters, *vdá* has a rise–fall, and is consequently considered circumflexed, and *končâ* with a concave contour is interpreted by Lo as to expected accent and by Sn as to contour. On the whole we can say that in oxytones, contour is less resistant to sentence intonation than in barytones where we have more features distributed over a longer period of time that make up accent. The most persistent part of an oxytone that may resist sentence intonation may be overall pitch which in some of our examples is supported by the intrinsic pitch of a vowel (/a/ – low, /i/ – high).

5.3 Speaker Ka (Tables 11 Ka, pp. 163–170)

5.3.1 In initial position

Barytones:
a) *kráva/e* (6 instances), *kónji* (1 instance),
b) *stârček* (5 instances), *šộlar* (1 instance).

Ka's accented vowels are shorter here than the same vowel phonemes in similar positions in the nonsense series, 9.4 and 7.7 csecs. versus 12.5 and 12.8 csecs. Although stressed long /a/ (p. 26) in the averaged closed nonsense syllable is slightly longer, the overall averaged difference in duration between an open and closed syllable in the nonsense series is still 0.5 csecs. in favour of an open syllable. Here, however, it is much bigger, and amounts to 2.3 csecs. because the acuted tonic has a concave shape. A big difference in length between acuted and circumflexed words in the single word series appears only in FoPs ´3 on account of their concave tonics with a change of pitch movement, while the other subclasses do not show any marked duration differences between acuted and circumflexed utterances.

The acuted tonics are either slightly falling with a concave-like shape initially, or definitely rising after some initial hesitation, and they all have a definite jump up and a rising posttonic. All the expected acutes have an acute FoP and have been interpreted as acuted. Most of the expected circumflexes are slightly higher in pitch than the expected acutes, the accented vowel is in most cases slightly falling, most have a jump up, 1 has a jump down, and 1 has no jump, but they all have a definitely falling postaccented vowel. The FoPs vary, and there is practically no unanimity between the 2 interpreters. The contours of the accented vowels and the jumps up are acute-like, while the pitch of some accented vowels is rather circumflex-like, and the steeply falling postaccented vowels are definitely circumflex-like. Just as with Ju and for the same reasons (pp. 134–135) the circumflexes are not typical, which shows in their differing interpretations.

Oxytones:
a) *ták* (4 instances),
b) *zvečêr* (4 instances).

The /á/ in *ták* with its 7.4 csecs. is on the short side if compared with the /ȁ/ or /â/ realizations in the single word series even if it were circumflexed, let alone acuted. The contour is falling or level and the pitch moves within the same range as in *stârček*. In so far as there is definite unanimity between the two judges, it is negative, i.e. two of the four utterances are considered non-accented by both interpreters.

Although /i/ in *zvečêr* in absolute terms is as long as /a/ in *ták*, it is long enough for an /i/. The contour is either level, rising or rising-falling, and only the rising-falling utterance is jointly perceived as circumflexed.

Most of these oxytones (751, 765, 764, 767, 752, 768) do not seem to be stressed enough to Sn to be considered accented, in most cases on account of an emphatic word in their vicinity, which so to say "absorbs" most of the speech energy. In 765 and 764 Lo joins her judgement for the same reason, while he considers *zvečêr* circumflexed throughout on account of expected accent and/or general pitch (see also p. 135).

5.3.2 In mid-position

Barytones:
a) *páse(jo)* (6 instances),
b) *čâka* (5 instances).

Again the averaged /a/ in *páse(jo)* is longer than in *čâka*, and the difference is bigger than with Ju.

In the *páse(jo)* series the tonic is concave (FR) (748, 757, 758), or only initially concave (750, 755) with a negative pitch movement, and in 1 case (746) RF. The utterances have a definite jump up, except after the RF tonic, where the jump up is small, and all the posttonics are falling, 10 Hz at the most. The intensity peak is mostly on the posttonic. On account of the jump up the FoPs are classified as acuted. Sn also perceived all the utterances as acuted; and so did Lo except the only tonic with a RF (746), rising pitch movement on the tonic and the smallest jump up, which he perceived as circumflexed.

The situation in *čâka* is not so clear. 3 of the 5 utterances have an IP. The contours of the tonics do not differ from those in *páse(jo)* except that most of them are slightly higher in pitch (on account of the preceding /č/?); the pitch movement is negative, the jump up in some cases is smaller than in the preceding sequence, and all the posttonics are falling, in some cases steeply falling. The intensity peak is on the tonic or posttonic. Lo interprets all the preemphatic and postemphatic positions as not accented as he does not consider them stressed enough, and the rest as less distinctly acuted, and Sn generally decides that they are acuted.

Oxytones:
a) *junák* (4 instances),
b) *dân* (4 instances).

With *junák* and *dân* the situation is not clear. The /a/s in *junák* are shorter than in *dân* because they stand before a voiceless plosive. The contour of the tonic in *junák* is either rising or level. The frequencies are not lower than in *dân*. Lo hears the expected accent, the acute, and Sn interprets the two shortest versions (765, 751) with a falling intensity contour as not accented, and 763 as circumflexed (for which I can see no special reason). There is only 1 joint acute interpretation (753) with a R contour, which is long enough and low enough in pitch to be interpreted as acuted by both judges.

Dân has low pitched tonics and is not stressed enough to be perceived as having a definite pattern. Consequently it is considered either not accented or les distinctly accented.

Barytones:
lẹ́pi (5 instances), *zdráve* (4 instances), *grẹ́mo* (1 instance).
Oxytones:
biló̩ (1 instance).

The *lẹ́pi* versions are typically acuted: they have acute FoPs which are jointly perceived as acuted. Although the posttonic is falling, the jumps up are considerably bigger than the falls on the posttonic.

In *zdráve* the situation is quite clear: there is complete agreement between FoPs and the two interpreters. Utterances with F pitch movement on the tonic, or a concave (FR) tonic with slightly R pitch movement, with a jump up and positive pitch movement on the posttonic are perceived as acuted; and the utterance with a great R on the tonic, a jump down and a falling posttonic is considered circumflexed by both interpreters. On account of the different position of the tonal peaks and consequently the different pitch movements in the two accent types the acuted tonics are lower in pitch than the circumflexed. Contrary to traditional belief the circumflexed tonic is definitely longer than the acuted one. The duration relationships between averaged acuted and circumflexed tonics on barytones in single words (Table 10 Ju, Ka, Pi, p. 104) have already shown that the length distinction acute – longer, circumflex – shorter, need not appear as there are enough other distinctive features on barytones to keep the two accents apart. (See also Neweklowsky 1973, 145 and 184). The role of the intensity peak seems to be negligible.

Biló̩ is not stressed enough and so does not have enough pitch movement to be considered accented by either of the two interpreters.

5.3.3 In final position

5.3.3.1 On a rising nucleus

Barytones:
a) *trávi* (1 instance),
b) *pomládi* (1 instance).
Oxytones:
a) *vdá* (1 instance), *vẹ́* (1 instance),
b) *končȃ* (1 instance).

All these words have a lengthened tonic owing to the fact that they are said on a R nucleus. All the interpretations are unanimous and in agreement with the corresponding FoPs.

Since a R nucleus favours the acute accent, all the expected acutes have an acute FoP and are heard as acutes. Of the two expected circumflexes the barytone 747 ***pomlâdi*** retains its accent in spite of the R nucleus, while the oxytone 752 ***končâ***, where everything has to happen on a single syllable (cf. p. 140) loses it.

5.3.3.2 On a falling nucleus

Barytones:
a) ***trávi*** (5 instances), ***dẹ́telji*** (1 instance),
b) ***pomlâdi*** (4 instances), ***počîtnic*** (1 instance).
Oxytones:
a) ***vdá*** (3 instances), ***zastọ́nj*** (1 instance),
b) ***končâ*** (3 instances), ***spât*** (1 instance).

If we compare the averaged durations of ***kráva/e*** (initial position), ***zdráve*** (mid-position) and ***trávi*** (end position – R nucleus; end position – F nucleus), the order of duration of the vowel /a/ from the longest to the shortest is as follows: ***trdvi*** 12.4 (R nucleus) > ***trávi*** 10.5 (F nucleus) > ***kráva/e*** 9.4 (initially) > ***zdráve*** 9.3 csecs. (medially).

Only 1 of the normally stressed barytones on a F nucleus has a FoP, the rest are indeterminate as to pattern (IP). As there is much unanimity in the perception of the two interpreters their interpretations are of special interest. The first 3 instances (756, 757, 755) of ***trávi*** were by both perceived as acuted: the tonics are especially low, in the first two cases F throughout (tonic + jump + posttonic); in the third the tonic is low but level, followed by a jump down and a F posttonic. The last 2 cases are definitely higher in pitch, and the F is held up somewhere, or there is even a R in the course of the tonic and they are thus perceived as circumflexed. The pitch of the tonic seems to be decisive, the jump down is ignored – or better: the two interpreters know that they have to define accent on a F nucleus.

There is less agreement in ***pomlâdi***. Lo interpreted it throughout as to expected accent, i.e. circumflex; Sn interprets 3 of the 4 utterances as acuted, perhaps on account of their pitch, and 1 as not accented, perhaps on account of its great length. Matters certainly are not quite clear here.

Does Lo in 746 ***dẹ́telji*** listen primarily to the low pitch to interpret it as acuted, or has expected accent to account for it? How can Sn combine a F tonic and posttonic with a R accent and interpret it as acuted, or does she too follow expected accent?

Of the oxytones the only normally stressed utterance with a RF – which is also the longest – 753 ***vdá*** is jointly perceived as circumflexed. The 2 post-emphatic utterances are both F and clearly are ambiguous. Why ***končâ*** which is falling throughout, and is too low to be measured, is in most cases considered circumflexed by both judges is difficult to say as these utterances could not be properly measured on account of their low frequencies. Or is expected accent again the decisive factor?

5.3.4 Summary

Expected barytone acutes have an acute FoP in initial position, in mid-position and in final position on a R nucleus, except 1 case of *zdráve* (749). All the acute FoPs are jointly interpreted as acuted, except 746 *páse(jo)* (see p. 142). In final position on a F nucleus the FoP becomes indeterminate and the lower pitched versions are jointly considered acuted, and the higher where the F is halted or there is even a R somewhere on the tonic are jointly circumflexed. In the 1 instance of *dę́telji* perception differs. Acute FoPs tend to break down on a F nucleus. What may remain to serve as an indicator of accent type is overall pitch of the tonic. This seems to be the criterion for the acute/circumflex perceptions of *trávi*. – *Zdráve* with its two definitely different FoPs is a classic example what constitutes a typical acute and what a circumflex (p. 143). It shows, moreover, that accent type need not be an inseparable part of a word in a speaker's mind.

Although Ka was circumflex orientated in his single word utterances this does not show here. Expected barytone circumflexes are less stable in their FoPs and perception than acutes. Or is this so because initial position favours the acute accent, in medial position we have only 1 barytone expected circumflex that is not a good example anyhow, and in final position on a F nucleus, which favours the circumflex accent, unanimous circumflex perception is missing because Sn is acute orientated?

Ka's circumflexes in initial position are ambiguous: the negative pitch movement of the tonic and the jump indicate the acute, while the definitely falling posttonic and the overall pitch of some tonics rather point to the circumflex. Consequently the perception of the two interpreters differs. A striking example of a word that seems to have no fixed accent with all the 3 speakers and thus causes problems to its interpreters is *čȃka* – the only expected circumflex barytone in mid-position. With Ka it certainly is not circumflexed. The negative pitch movement of the tonic and the jump up point to the acute; the overall pitch of the tonic and in some cases the steep fall of the posttonic point to the circumflex. On a F nucleus the FoPs and the interpretations break down, the two judges disagree in their perceptions. Lo in this situation seems to rely on expected accent, and with Sn the zero and the less distinct classifications show that generally she was not sure of what she heard.

Oxytones with their fundamental frequency contours (FoCs), whether in initial or mid-position or on a F nucleus, and the differing perceptions of these utterances by the 2 interpreters show that Ka does not distinguish between the 2 accents on oxytones any longer. This confirms what has been found about his oxytones in neutral sentence position where the expected acutes were realized as circumflexes. An indicator of this state of affairs is the fact that in initial and mid–position, where the oxytone contour should contain a R, only in 7 out of 16 cases is a R actually found, the rest have a F or L contour. The only position where accent–like conditions appear to function on oxytones is on a R nucleus with lengthened vowels where, however, the R is sentence conditioned, not word conditioned. 751 *vdá* has a RF and is jointly perceived as circumflexed, 751 *vẹ́* has a R which is jointly perceived as acuted, and 752 *končâ* has a FR, a concave contour, which is jointly perceived as acuted.

5.4 Speaker Pi (Tables 11 Pi, pp. 171–178)

5.4.1 In initial position

Barytones:
a) *kráva/e* (6 instances), *kónji* (1 instance),
b) *stârček* (5 instances), *šǭlar* (1 instance).

Pi's vowels in actual words in these sentences are longer than in the corresponding nonsense words, which are spoken very quickly. Averaged nonsense /a/ in corresponding positions is 7.3 and 7.9 csecs. respectively (Table 2 Pi, p. 29), averaged *kráva/e* and *stârček* 10.2 and 9.1 csecs. respectively.

All the utterances of *kráva/e* have a R pitch movement, which is not concave but continuously R, a small jump up and a R pitch movement on the postaccented syllable. The R on the postaccented vowel is bigger than the preceding jump up. The FoPs are thus acute throughout and all the interpretations are in agreement with it.

With *stârček* the situation again is not so clear: although some of the averaged tonic frequencies of the utterances in the two groups coincide, all the accented vowels start on a higher frequency level than any *kráva/e* utterance (perhaps on account of the preceding /t/), they have a R pitch movement of the same size as the *kráva/e* group, a jump up which tends to be greater than with *kráva/e*, while the postaccented vowel is definitely falling in most cases. This latter is the only supportive (not distinctive) feature that characterizes the circumflex accent in this group besides the higher pitch of most accented vowels. As the distinctive feature for a circumflex, the jump down, is missing (the FoP is therefore classified as acuted throughout), only 1 utterance (747) has joint interpretation, and this circumflexed. The accented vowel of this utterance is relatively high–pitched, and in spite of its jump up (which however is the smallest in the group), which is followed by a F posttonic of the same size as the preceding R in the jump up, Lo and Sn perceive it as circumflexed.

Although emphatic utterances are dealt with separately, we should compare 747 (which is not said clearly contrastively) with emphatic 759 because the 2 tonics are almost identical as to duration and frequencies, the jump up in

759, however, is much greater, and so both interpreters perceived it as acuted. The decisive factor must have been the large jump up. The frequencies of the tonic, interestingly, are not a decisive obstacle to this perception. What in an unemphatically stressed utterance are circumflexed frequencies, in an emphatically stressed one (which is characterized by higher frequencies) can be perceived as acuted, if connected with a large jump up. The other jumps are too large (from 25 to 36 Hz) for a circumflex perception. The two interpreters perceive them as either non–accented or acuted (Lo less distinctly acuted).

Oxytones:
a) *ták* (4 instances),
b) *zvečêr* (4 instances).

Acuted oxytone /á/ in *ták* is as long on the average as in the barytone *kráva/e*, 10.3 and 10.2 csecs. respectively, while /î/ is much shorter, as expected.

Ták has a R contour throughout, which to Sn in the shorter versions (765, 764) with a large R is too steeply R for a typical acute. *Zvečêr* in most cases has a RF, a typically circumflex contour. As it is also high enough on account of its intrinsic frequency it is throughout jointly perceived as circumflexed.

5.4.2 In mid–position

Barytones:
a) *páse(jo)* (6 instances),
b) *čâka* (5 instances).

The accented averaged vowel in *páse(jo)* again is longer than in *čâka* (cf. pp. 136 and 142), as expected, and even longer than in initial *kráva/e*, contrary to expectation. Different from the accented vowels in initial position they have falling pitch movement and are generally higher in pitch than in initial position. The jumps up are large, and the falls smaller than the jumps up. All have an acute FoP, except 746 which has an exceptionally small jump up, and an exceptionally large fall on the postaccented syllable. The 2 interpreters agreed with expected accent and the FoPs in all cases. *Čâka* again is neither here nor there. The accented vowels tend to be somewhat higher in pitch and the jumps up smaller than in *páse(jo)*. The FoPs are mostly indeterminate on account of the greater falls on the postaccented vowels than the preceding jumps up. Most of the interpretations are less distinct acutes or non–accented with little unanimity between the two judges.

Oxytones:
a) *junák* (4 instances),
b) *dân* (4 instances).

As expected the averaged accented vowel in *junâk* in mid-position is shorter than in *ták* in initial position. The accented averaged vowel in *junák*, however, though before a voiceless consonant, is longer than in *dân* – on account of its acute accent?

Lo interprets all utterances of *junák* as acuted, while Sn perceives the two versions with a level and falling contour respectively as not accented, and the two versions with a fall-rise as less distinctly acuted. The rise is probably too small for a proper acute. I can see no reason but expected accent for Lo's perception of 765 as acuted with a level contour and a relatively high pitch, while 763 with a fall which happens in too short a time to be properly perceived ends low enough for an acute.

The criteria for Sn's non-accented and Lo's circumflexed interpretations of *dân* are not quite clear. Although in combination with /n/ there are some rising–falling contours, the intensity contours are mostly level. The utterances are less stressed than in initial or final position. Lo in his judgement seems to have been influenced by contour and Sn by weak stress.

Barytones:
lẹ́pi (5 instances), *zdráve* (4 instances), *grẹ́mo* (1 instance).
Oxytone:
bilọ́ (1 instance).

The averaged /ẹ/ in *lẹ́pi* again is longer than the corresponding /ẹ/ in the nonsense words with a similar structure, 7.8 versus 6.9 csecs. respectively.

Lẹ́pi is not problematic, it has acute FoPs which are interpreted as such. There is more variety within the *zdráve* group. The first 2 instances (760, 759) have an IP because they are falling throughout: the falls however are slow and gradual, the accented vowels – regardless of what follows – are acute-like and interpreted as such by both judges. 749 has an acute FoP and is interpreted as definitely acuted. 762 has an unusual FoP: after a rising tonic there is a small jump down (circumflex-like) followed by a *rising* posttonic (acute-like) which ends in a fall. And so the 2 interpreters could not decide on any accent. 752 *grẹ́mo* and 751 *bilọ́* are not stressed enough to be really accented.

5.4.3 End position

5.4.3.1 On a rising nucleus

Barytones:
a) *trávi* (1 instance),
b) *pomlâdi* (1 instance).
Oxytones:
a) *vdá* (1 instance), *vẹ́* (1 instance),
b) *končâ* (1 instance).

746 *trávi* has a longer accented vowel than 717 *pomlâdi*. 746 has a typically acute FoP: a concave tonic, a jump up and a rising posttonic. 747 not so: a definitely R tonic (influence of the R nucleus?), no jump and a rising-falling posttonic (the R is as big as the following F). Sn perceives it as acuted and Lo as circumflexed.

All 3 oxytones have a R contour, supported by a R nucleus. The 2 expected acutes are perceived as acuted, and the 1 expected circumflex as circumflexed. This latter has not the greatest rise, but it starts highest and ends highest and has the highest average frequency, but is slightly longer than the acuted /a/.

5.4.3.2 On a falling nucleus

Barytones:
a) *trávi* (5 instances), *dẹ́telji* (1 instance),
b) *pomlâdi* (4 instances), *počîtnic* (1 instance).

If we compare the averaged durations of *kráva/e*, *zdráve*, *trávi*, we get the following order: *trávi* (R nucleus) 13.6 csecs. > *trávi* (F nucleus) 13.2 csecs. > *kráva/e* (initially) 10.2 csecs. > *zdráve* (mid-position) 8.8 csecs.

All the normally stressed words on a F nucleus have an IP as they are falling throughout. There is 50% unanimity in the perception of the expected acute (*trávi*) and the expected circumflex (*pomlâdi*).

The accented vowels in the two groups do not differ in frequency. In the *trávi* group the lower frequencies tend to be acuted with both interpreters and the highest circumflexed. In *pomlâdi* however, Lo is expected accent orientated and Sn perceives the acute accent at the lower end and the circumflex at the higher end; why the in-between 759 is perceived as circumflexed and 761 as non-accented by her is difficult to say.

Oxytones:
a) *vdá* (3 instances), *zastọ́nj* (1 instance),
b) *končâ* (3 instances), *spât* (1 instance).

All the versions of the 3 words have a falling contour. The first 2 of *vdá* (763, 764) are continuously and steeply falling and Sn thus perceives them as not accented, the contour is too falling to be accented; Lo on the other hand, seems to concentrate on the overall pitch (supported by expected accent) and interprets the same two utterances as acuted. 753 starts much higher and has a steep fall only at its very end, the fall on the tonic is delayed, and it is therefore perceived as circumflexed by both interpreters.

The first 2 utterances of *končâ* (766, 767) with the lowest pitch are again perceived as not accented by Sn, although 766 has a relatively low fall; so it may be the low pitch rather than the fall that makes them non-accented to Sn, while the utterance (754) with a much higher pitch and a fall which is gentler on account of the vowel's long duration is considered circumflexed. Lo hears the expected accent in all cases, also in those with lowest pitch.

5.4.4 Summary

The great majority of expected acute barytones, whether in initial or mid-position have an acute FoP and are jointly perceived as acuted. This holds for *kráva/e*, *kónji*, *páse(jo)*, and *lẹ́pi*. All have a jump up, positive pitch movement on the tonic and posttonic in initial position; positive or negative pitch movement on the tonic and negative pitch movement on the posttonic in mid-position. The fall on the posttonic is smaller than the preceding jump up in the great majority of cases. The only expected acute word with indeterminate or not typical acute FoPs (3 out of 4) is *zdráve* in mid-position. The 3 lower pitched utterances (760, 759, 749) are still jointly perceived as acuted (or less distinctly acuted), and the fourth is not. In final position the 1 expected acute example on a R nucleus has an acute FoP and is jointly perceived as acuted, while all the utterances on a F nucleus (*trávi*, *dẹ́telji*) have an IP and this is reflected also in the differing perceptions.

With expected circumflexes the situation is less stable and more confused. Initial position favours the acute accent and the FoPs of *stârček* are thus rather acute-like than circumflex-like, and the perceptions of the 2 interpreters differ. With *čâka* in mid-position the FoPs are indeterminate and are interpreted accordingly.

747 *pomlâdi* on a R nucleus has the characteristics of both accents and so the 2 interpreters differ. On a F nucleus the *pomlâdi* utterances have an IP and are interpreted as circumflexed by the expected accent orientated Lo, while Sn's judgement seems to be influenced by the overall pitch of the accented vowel in the 2 extreme instances, and in the rest the criteria are not clear.

The situation is even more confused with oxytones. The perceptions are consistently unanimous and the two accents are kept apart only in initial position with *ták* and *zvečêr*, the former with a rising contour and the latter mostly with a rising-falling. The two accents moreover occur with the acute on the intrinsically low /a/ and with the circumflex on the intrinsically high /i/. So that they are kept apart by contour and pitch. In mid-position the two oxytones occur on the same vowel /a/ (*junák*, *dân*), there is no pitch difference between the two groups and the FoCs are not so clearly in favour of one or the other accent. Again, Lo is expected accent orientated, a criterium which is outside the range of experimental phonetics, and Sn is in doubt how to interpret the utterances in both groups. With 751 *vdá*, 751 *vę́*, and 752 *končâ*, all on a R nucleus, the R contour (under the influence of sentence intonation) and overall pitch make joint identification of the expected accent possible. – On a F nucleus all contours are falling. Lo in *vdá* is pitch orientated, while in the *končâ* series he is expected accent orientated. Sn is phonetically orientated and considers most of these utterances non-accented.

5.5 Summary (Table 12 Ju, Ka, Pi, pp. 179–181)

5.5.1 Barytones

In initial position the barytone expected acute (*kráva/e* with all 3 speakers in all its utterances has an acute FoP which is always perceived as acuted. The expected barytone circumflex (*stârček*), on the other hand, in this position has an IP or a circumflex FoP with Ju and Ka, and an acute FoP with Pi. As none of these FoPs are typical and clear the two interpreters have problems with their interpretations of these utterances, and they more often than not disagree in their perception.

In mid-position the expected acutes *páse(jo)* and *lę́pi* with all 3 speakers have acute FoPs and are interpreted accordingly. The same holds for Ju's *zdráve*. Ka's pronunciation of this word is either typically acuted or circumflexed, and is jointly interpreted as such. Pi also vacillates on *zdráve*, his FoPs are not always clear, although the interpretations are always unanimous (p. 148). The only expected barytone circumflex *čâka* is problematic with all 3 speakers. Its FoPs are not clear and the perceptions differ.

In final position the influence of the sentence intonation is at its strongest. So no acute FoP can exist on a F nucleus under normal stress. The stronger the influence of the nucleus, the earlier the fall starts on the word and the steeper it is. The resulting FoP is thus either falling throughout – an IP or rising-falling with the rise-fall on the tonic or spread over two syllables – a circumflex. The interpretation of the latter pattern can be either phonetic, i.e. perceiving the contour as it occurs – circumflexed; or phonological, i.e. interpreting it as the acute accent on a F nucleus – acuted.

Both judges Lo and Sn interpret Ju's acute on a F nucleus (*trávi*) phonologically. With Ka and Pi the same word on a F nucleus is falling throughout, and here the higher pitched versions are perceived as circumflexed and the lower as acuted. While in *trávi* 4 out of 15 cases started with a R, their number falls to 2 (found only in Ju's utterances) out of 12 cases with the expected circumflex in this position (*pomlâdi*), the rest are falling throughout (IPs). The utterances of all 3 speakers have mostly differing interpretations. We cannot speak of word accent proper any more.

Expected acutes seem to be more resistant to sentence intonation than expected circumflexes. Is this so because the acute is the marked accent? Ignoring *pomlâdi* on a F nucleus we have no proper circumflexes either with *stârček* or with *čâka*. Or is this word conditioned, i.e. that no good examples have been chosen to represent the circumflex accent, that *stârček* and *čâka* belong to that group of words where accent type is not so deeply rooted any more? Why has *šộlar* in the same position as *stârček* (although we unfortunately have fewer examples of it) always a circumflex FoP and is always jointly perceived as circumflexed?

The fact that also the acute *zdráve* (almost a minimal pair with *kráva/e*) in the same position as *lẹ́pi*, but different from it, with all 3 speakers is not so firmly acuted, lends some support to the hypothesis that with some words accent type is more deeply rooted than with others. It also shows that with Ju accent type is most deeply rooted (as already seen in the single words), with Ka less, though he realizes both accents unambiguously, and with Pi least: his FoPs are easily indeterminate even in non-nuclear position. In this sentence series Pi does not speak at an "allegro" rate, so this reason must be dropped here. Our corpus does not contain enough examples of barytones in sentences to solve this question.

5.5.2 Oxytones

FoCs with oxytones show less system than FoPs with barytones. The expected acute oxytones (*ták*) in initial position are very short with Ju and Ka, too short for an intrinsically long vowel to be properly accented. Although Ju's tonics are falling (F too short to be perceived) they are perceived as acuted probably on account of their low pitch. Ka's contours in the same words are mostly concave, but are too short for the contour to be perceived, and his pitch does not differ from that of circumflexed barytones in this position. So the perceptions of the 2 interpreters either differ, or Lo and Sn are unanimous that certain utterances are non-accented. Pi is the only speaker that has proper acute FoCs in this word: his utterances are long and R, while their pitch cannot really be compared with any other word as there is no other oxytone with the vowel /a/ in initial position.

Ju's expected circumflex oxytone (*zvečȇr*) in initial position in all its versions (whether R or L) is jointly interpreted as circumflex probably on account of its pitch. In Ka's versions of the same word Lo perceives the circumflex accent throughout, while Sn only in the one utterance with a RF contour and highest pitch. Pi's utterances with a RF contour are jointly interpreted as circumflexed.

The pitch contours of Ju's expected acute oxytone *junák* in mid-position are concave (although there is very little pitch movement and they are shallow) and so they are perceived as acuted by both judges. Ka's utterances of the same word are R or L and there is hardly any unanimity between the 2 interpreters. Lo is expected accent orientated and Sn can hear anything from acuted to circumflexed or non-accented. Where Pi's utterances have a concave contour the two interpreters are unanimous, while they disagree in the interpretation of a L or F contour.

Ju's expected circumflex oxytone *dȃn* in mid-position is jointly perceived as non-accented in postemphatic position or when not stressed enough. Ka's versions of this word are not stressed enough to have a definite accent, and the same seems to hold for Sn's non-accented interpretation of Pi's utterances of this word, while Lo follows the expected accent.

On a F nucleus a contour which is F throughout its course (regardless of expected accent) is predominant with all 3 speakers (*vdá*, *končȃ*). A RF is an exception. The predominant perception obviously is the circumflex. With Ju all the perceptions of expected acutes and circumflexes are joint and circumflexed. With Ka and Pi the 2 lower falls in the expected acute series are ambiguous (Sn 0, Lo ´ or ´(•)), the third and highest is perceived as circumflexed. With the expected circumflexes of *končȃ* Lo is expected accent orientated and Sn with Ka has zero and circumflex interpretations (why exactly is difficult to say as the frequencies are too low to be measured), while with Pi the lower pitched falls are non-accented, and the higher circumflexed.

The study of accent on single words has shown that on oxytones only Ju can keep the two accents apart systematically and in a clearly recognizable way. Here another factor which did not exist in the single words, the influence of sentence intonation, comes into play as well. What emerges is that as a result FoC in many cases has lost its role, although not in all cases. While FoP in barytones (except in nuclear position) still retains its importance, albeit with some modifications, on oxytones, under the impact of sentence intonation, where everything has to happen on one syllable, it seems to a great extent lost. What may remain in these cases to help perceive accent type is pitch, or in some cases length; expected accent in ambiguous accent conditions may play a more important role than with barytones. Consequently we are to expect less unanimity between the 2 interpreters, and more zero or less distinct classifications than with barytones.

Where they exist, the RFs are with 1 exception (Pi 768 *dân*) always jointly perceived as circumflexed. The FRs, which are typical of some speakers on barytone acute tonics, however, are not always perceived as acuted, although numerically (statistically), there is a marked tendency for a joint acute perception. Thus e.g. in Ka 751 and 761 *tâk* the concave contour is too short and it moreover starts and ends on the same frequency to be perceived as concave.

The acute perceptions in so far as they are found on *ták* (Ju, Ka, F or L FoCs) seem to be pitch conditioned, while the Pi series has the right length and contour for the acute accent. *Junák* has a few FRs which combined with a lower pitch are jointly perceived as acuted, while the versions with other contours have differing interpretations. *Dân* is mostly considered unaccented by both Lo and Sn.

The R nucleus supports the acute accent, as it is evident from Ju, Ka 751 *vẹ́* and Ka 752 *končâ*; while 751 *vdá*, in spite of its expected accent and a position favouring the acute is jointly perceived as circumflexed with Ju and Ka because it has a RF contour. The reason for the joint acute, respectively circumflex interpretation of Pi's 751 *vẹ́*, and 752 *končâ* is not contour but pitch.

On a F nucleus falling contours prevail with circumflex perceptions. There is most agreement between the 2 interpreters on Ju's utterances that they are circumflex, less on Ka's and least on Pi's. For the reasons for this, in as much as they could be detected, see the corresponding passages in the detailed commentary to each speaker.

No. sona-gram	ACCENT FoP	interpreter Lo	Sn	DURATION of vowels in csecs.		TONIC frequency in Hz	p.m.	JUMP	POSTT. p.m.	AVERAGE FREQUENCY pret.	t.	postt.	INTENSITY PEAK t.	postt.	TYPE OF STRESS or POSITION OF STRESS	
	1) krâve (= expected accent SSKJ)															
750	´3b	´	´	15.4	6.0	98/90/96	- 2	+ 4	+ 7		95	104		+		
758	´3b	´	´	12.1	6.4	98/92/96	- 2	0	+14		95	103		+	preemphatic	3
757	´3b	´	´	15.8	6.0	102/97/97	- 5	+ 9	+20		99	116		+	preemphatic	2
748	´3b	´	´	15.4	6.0	102/91/97	- 5	+23	+ 2		97	121		+		
756	´3b	´	´	14.3	4.9	104/96/100	- 4	+10	+12		91	116		+	preemphatic	1
746	´3b	´	´	17.4	7.9	104/94/107	+ 3	+13	+26		102	133		+	contrastive	
755	´3b	´	´	18.1	6.0	108/94/98	-10	+14	+12		100	118		+	emphatic	
	2) kónji (= expected accent SSKJ)															
746	´3b	´	´	13.2	5.3	99/94	- 5	+16	+ 5		97	113		+	contrastive	
	3) stârček (= expected accent SSKJ)															
760	^3	^	´(*)	9.1	4.9	102/102/105	+ 3	- 3	-10		103	97	+		preemphatic	1
762	IP	^	´(*)	10.6	3.8	108/111	+ 3	+15	-25		109	114	+		preemphatic	3
749	IP	^(*)	´(*)	11.3	3.8	112/104/114	+ 2	+11	-14		110	118	+			
747	IP	^	0	10.6	4.1	118/112/124	+ 6	+13	-20		118	127	+		contrastive	
761	^4	^	´(*)	9.8	4.1	118/118/135	+17	+ 1	-16		124	128	+		preemphatic	1
759	^4	^	^	10.6	3.8	120/116/128	+ 8	-25	-26		121	90	+		emphatic	
	4) šộlar (= expected accent SSKJ)															
747	^4	^	^	11.3	5.6	120/108/114	- 6	- 2	- 4		114	110	+		contrastive	
	Averaged values															
krâve (7 ex.)				15.5	6.2	102/93/99		+10	+13							
krâve (6 ex., emph. excl.)				15.1	6.2	101/93/99		+10	+14							
stârček (6 ex.)				10.3	4.1	113/110/120		+ 2	-19							
stârček (5 ex., emph. excl.)				10.3	4.1	112/109/118		+ 7	-17							

Table 11 Ju. Word accent in sentences, under the influence of sentence intonation:
Position 1 (in initial position) - barytones.

No. sonagram	ACCENT FoC	interpreter Lo	Sn	DURATION of vowels in csecs.	TONIC frequency in Hz	p.m.	JUMP	POSTT. p.m.	AVERAGE FREQUENCY pret.	t.	postt.	INTENSITY PEAK t.	postt.	TYPE OF STRESS or POSITION OF STRESS
	5) ták (= expected accent SSKJ)													
753	L	´	´	10.2	96/94	- 2				95		+		
751	F	´	´	11.3	100/93	- 7				97		+		
765	F	´	´	10.2	106/100/100	- 6				102		+		preemphatic 2
764	F	´	´(*)	7.1	114/100/96	-18				103		+		preemphatic 1
<u>763</u>	F	´	´*	12.8	119/99/98	-21				105		+		emphatic
	6) zvečêr (= expected accent SSKJ)													
754	R	^	^	7.5	117/114/122	+ 5				118		+		
<u>766</u>	RF	^	^	9.8	123/138/133	+10				131		+		emphatic
767	L	^	^(*)	7.1	125/124	- 1				125		+		preemphatic 1
768	L	^	^(*)	7.5	127/126	- 1				127		+		preemphatic 2
752	R	^	^	7.9	133/140	+ 7				137		+		
	Averaged values													
ták (5 ex.)				10.3	107/98/96	-11								
ták (4 ex., emph. excl.)				9.7	104/98/96	- 8								
zvečêr (5 ex.)				8.0	125/128/129	+ 4								
zvečêr (4 ex., emph. excl.)				7.5	126/126/128	+ 2								

Table 11 Ju. Word accent in sentences, under the influence of sentence intonation:
Position 1 (initial position) - oxytones.

No. sona-gram	ACCENT FoP	interpreter Lo	Sn	DURATION of vowels in csecs.			TONIC frequency in Hz	p.m.	JUMP	POSTT. p.m.	AVERAGE FREQUENCY pret.	t.	postt.	INTENSITY PEAK t.	postt.	TYPE OF STRESS cr POSITION OF STRESS
	7) páse(jo) (= expected accent SSKJ)															
755	´3c	´	´(*)	10.2	5.3		89/85/89	0	+ 7	- 6		88	93		+	postemphatic 1
758	´3c	´	´	11.3	3.0		96/91/98	+ 2	+31	- 8		95	125		+	preemphatic 2
750	´3c	´	´	12.8	3.8		98/92/92	- 6	+21	- 9		94	109		+	
748	´3c	´	´	14.3	5.3		99/93/92	- 7	+22	- 3		95	113		+	
756	´3c	´	´	12.1	3.8		102/90/87	-15	+44	-17		93	123		+	emphatic
757	´3c	´	´	10.6	3.8		107/101/103	- 4	+16	- 6		104	116		+	preemphatic 1
746	´3b	´	´	15.1	6.8	4.5	114/101/100	-14	+20	- 5	(+10 -15)	105	123		+	
	8) čâka (= expected accent SSKJ)															
762	´3c	^	´(*)	11.3	9.1		102/93/98	- 4	+ 7	-13		98	99	+		preemphatic 2
759	´3c	^	´(*)	10.6	7.1		103/86/89	-14	+13	-10		93	97	?	?	postemphatic 1
760	^4	^	^	14.3	8.3		107/98/114	+ 7	-22	- 4		106	90	+		emphatic
747	´3c	^	´(*)	9.8	6.0		108/105	- 3	+13	-14		107	111	+		
761	´3c	´(*)	´(*)	11.3	8.3		110/103/104	- 6	+ 8	- 7		106	109		+	preemphatic 1
749	´3c	´(*)	´	14.7	9.1		112/100/110	- 2	+11	- 5		107	119		+	
	Averaged values															
páse(jo)	(7 ex.)			12.3	4.5		101/94/94		+23	- 8						
páse(jo)	(6 ex., emph. excl.)			12.4	4.7		101/94/96		+20	- 6						
páse	(5 ex., emph. excl.)			11.8	4.2		98/92/95		+19	- 6						
čâka	(6 ex.)			12.0	8.0		107/98/103		+ 5	- 9						
čâka	(5 ex., emph. excl.)			11.5	7.9		107/97/101		+10	-10						

Table 11 Ju. Word accent in sentences, under the influence of sentence intonation:
Position 2 (medial position) - barytones.

No. sonagram	ACCENT FoC	interpreter Lo	Sn	DURATION of vowels in csecs.	TONIC frequency in Hz	p.m.	JUMP	POSTT. p.m.	AVERAGE FREQUENCY pret.	t.	postt.	INTENSITY PEAK t. postt.	TYPE OF STRESS or POSITION OF STRESS
	9) junák (= expected accent SSKJ)												
753	FR	´	´	10.6	92/85/84/99	+ 7				90		+	
764	F(FRF)	´	´*	12.8	99/96/100/96	- 3				98		+	emphatic
751	F	´	´	10.6	100/95/97	- 3				97		+	
763	FR	´	´(*)	9.8	106/98/101	- 5				102		+	postemphatic 1
765	L	´	´	9.1	107/105/107/106	-1				106		+	preemphatic 2
	10) dân (= expected accent SSKJ)												
766	FR	0	0	11.3	88/86/90	+ 2				88		+	postemphatic 1
754	R	0	0	10.6	99/99/112	+13				103		F*)	*) weak stress
768	R	ˆ	ˆ(*)	10.2	101/110	+ 9				106		+	preemphatic 1
767	R	ˆ	ˆ*	11.3	105/110	+ 5				108		+	emphatic
752	FR	´(*)	0	12.1	108/101/107/110	+2				105		+	
	Averaged values												
junák (5 ex.)				10.6	101/96/100	- 1							
junâk (4 ex., emph. excl.)				10.0	101/96/101	0							
dân (5 ex.)				11.1	100/100/106	+ 6							
dân (4 ex., emph. excl.)				11.1	99/98/105	+ 6							

Table 11 Ju. Word accent in sentences, under the influence of sentence intonation:
Position 2 (medial position) - oxytones.

No. sonagram	ACCENT FoP	interpreter Lo	interpreter Sn	DURATION of vowels in csecs		TONIC frequency in Hz	TONIC p.m.	JUMP	POSTT. p.m.	AVERAGE FREQUENCY pret.	ι.	postt.	INTENSITY PEAK ť	postt	TYPE OF STRESS or POSITION OF STRESS
	11) lẹ́pi (= expected accent SSKJ)														
756	´1a	´	´	7.9	3.8	84/81	- 3	+12	- 3		83	92		+	postemphatic 1
755	`3x	´	´	6.8	3.8	86/78/87	+ 1	+ x	x		84	?		+	postemphatic 2
758	´1c	´	´	8.3	6.0	92/92	0	+27	- 6		92	116		+	preemphatic 1
748	`3a	´	´	7.9	4.5	93/87	- 6	+18	- 2		90	104		+	
746	`3b	´	´	9.8	4.1	100/89	-11	+27	+10		95	121		+	
<u>757</u>	`3a	´	`*	12.1	3.8	101/92/88	-13	+27	- 1		94	115		+	emphatic
	12) zdráve (= expected accent SSKJ)														
759	`3b	´	`(*)	10.2	4.5	87/83	- 4	-20	+20		85	73		+	postemphatic 2
<u>761</u>	`3b	´	`*	13.6	4.1	87/90/90	+ 3	+14	+ 5		89	107		+	emphatic
<u>762</u>	´1a	´	`(*)	11.3	4.5	89/90	+ 1	+14	+ 1		90	106		+	preemphatic 1
760	`3b	´	`(*)	12.1	4.5	94/88/89	- 5	- 2	+ 3		90	89	0	0	postemphatic 1
749	`3c	´	´	10.9	4.5	94/87/97	+ 3	+16	- 3		93	112		+	
	13) grẹ́mo (= expected accent SSKJ)														
752	´1b	´	0	9.8	6.0	90/88/91	+ 1	+ 1	+ 8		90	96	+		
	14) bilọ́ (= expected accent SSKJ)														
751	F	0	0	4.5	6.8	110/110/100	-10				107				
	Averaged values														
lẹ́pi (6 ex.)				8.8	4.3	93/88/87		+22	0						
lẹ́pi (5 ex., emph. excl.)				8.1	4.4	91/88/87		+21	0						
zdráve (5 ex.)				11.6	4.4	90/88/90		+ 4	+ 5						
zdráve (4 ex., emph. excl.)				11.1	4.5	91/88/90		+ 2	+ 5						

Table 11 Ju. Word accent in sentences, under the influence of sentence intonation:
Position 2/3 (medial position) - 3 barytones, 1 oxytone.

No. sona-gram	ACCENT FoP FoC	interpreter Lo	Sn	DURATION of vowels in csecs.	TONIC frequency in Hz	p.m.	JUMP	POSTT. p.m.	AVERAGE FREQUENCY pret.	t.	postt.	INTENSITY PEAK t. postt.	TYPE OF STRESS or POSITION OF STRESS
	15) trávi, (= expected accent SSKJ)												
746	´3a	´	´	15.8 10.6	118/109/111	- 7	+ 3	- 1		113	114	+	
	16) pomlâdi,			(= expected accent SSKJ)									
747	´2b	ˆ	´	16.2 12.8	88/106	+18	+16	+18		97	131	+	
	17) vdá, (= expected accent SSKJ)												
751a	RF	ˆ	ˆ	13.6(+3.0)	108/114/110	+ 2				111			
	18) vę́, (= expected accent SSKJ)												
751b	FR	´	´*	9.8(+4.1)	100/98/108	+ 8				102			
	19) končâ, (= expected accent SSKJ)												
752	FR	ˆ	´(*)	10.9	110/106/113	+ 3				110			

Table 11 Ju. Word accent in sentences, under the influence of sentence intonation:
Position 3 (final position) on a low rising nucleus - 2 barytones, 3 oxytones.

No. sona-gram	ACCENT FoP	interpreter Lo	Sn	DURATION of vowels in csecs.	TONIC frequency in Hz	p.m.	JUMP	POSTT. p.m.	AVERAGE FREQUENCY pret.	t.	postt.	INTENSITY PEAK t.	postt.	TYPE OF STRESS or POSITION OF STRESS
	20) trávi. (= expected accent SSKJ)													
756	^1	^	^	13.2 6.4	74/90/86	+12	-36	- x		83	x	+		postemphatic 2
755	^1	^	^	10.2 7.2	78/94/78	0	-28	- x		83	x	+		postemphatic 3
757	^2	^	^	12.1 6.8	82/84/86	+ 4	-36	- x		84	x	+		postemphatic 1
750	IP	^	^	17.4 6.0	96/92/92/90	- 6	-23	- 4		93	65	+		
<u>758</u>	^3c	^	^	19.6 9.1	96/88/90	- 6	+19	- 6		91	106		+	emphatic
748	IP	^	^	10.2 5.6	99/95	- 4	-45	- x		97	x	+		
	21) dételjí. (= expected accent SSKJ)													
746	^4	^	^ .	9.1 5.3 3.4	109/101/111	+ 2	- 5	-35		107	89 66	+		
	22) pomlâdi. (= expected accent SSKJ)													
759	^1	^	^	5.3 12.1 7.5	86/91/83	- 3	-33	- x		87	x	+		postemphatic 3
761	IP	^	^	5.3 13.6 6.8	90/88	- 2	- 8	+ 3		89	82	+		postemphatic 1
760	IP	^	^	4.5 13.2 6.8	90/91	+ 1	+ 2	- 1		91	90	+		postemphatic 2
<u>762</u>	^1	^	^	4.9 14.3 5.3	93/97/87	- 6	+ 1	- 8		92	79	+		emphatic
749	^1	^	^	3.8 14.3 5.3	99/100/94	- 5	-44	- x		98	x	+		
	23) počítnic.			(= expected accent SSKJ)										
747	IP	^	^	5.6 5.3 5.3	121/109	-12	-34	-12		115	69	+		
	Averaged values													
trávi. (6 ex.)				13.8 6.9	88/91/88		-25	- x						
trávi. (5 ex., emph. excl.)				12.6 6.4	86/91/87		-34	- x						
pomlâdi. (5 ex.)				4.8 13.5 6.3	92/94/89		-16	- x						
pomlâdi. (4 ex., emph. excl.)				4.7 13.3 6.6	91/93/89		-21	- x						

Table 11 Ju. Word accent in sentences, under the influence of sentence intonation:
Position 3 (final position) on a low falling nucleus - barytones.

No. sona-gram	A C C E N T FoC	interpreter Lo	Sn	D U R A T I O N of vowels in csecs.		T O N I C frequency in Hz	p.m.	JUMP	POSTT. p.m.	AVERAGE FREQUENCY pret.	t.	postt.	INTENSITY PEAK t. postt.	TYPE OF STRESS or POSITION OF STRESS
	24) vdá. (= expected accent SSKJ)													
764	F	^	^(*)	12.8		92/84/86	- 6			92	87			postemphatic 1
765	RF	^(*)	^	13.6		96/104/94	- 2			111	98			emphatic
753	F	^	^	9.8		100/100/90	-10			88	97			
763	RF	^	^*	12.1		101/105/97	- 4			88	101			postemphatic 2
	25) zastǫ́nj. (= expected accent SSKJ)													
751	F	^	^	6.0	10.6	110/93/85/87	-17			94	102			
	26) končâ. (= expected accent SSKJ)													
767	RF	^	^(*)	6.0	12.4	84/88/84	0			89	85			postemphatic 1
766	L	^	^	6.0	9.1	85/85/88	+ 3			87	86			postemphatic 2
768	F	^	^	5.3	13.2	102/85	-17			90	94			emphatic
754	F	^	^*	4.5	7.5	104/88/84	-20			91	92			
	27) spât. (= expected accent SSKJ)													
752	F	^	^	6.8		112/72	-40				92			
	Averaged values													
vdá. (4 ex.)				12.1		97/98/92								
vdá. (3 ex., emph.excl.)				11.6		98/96/91								
končâ. (4 ex.)				5.5	10.6	94/90/85								
končâ. (3 ex., emph. excl.)				5.5	9.7	91/87/85								

Table 11 Ju. Word accent in sentences, under the influence of sentence intonation:
Position 3 (final position) on a low falling nucleus - oxytones.

No. sonagram	ACCENT FoP	interpreter Lo	Sn	DURATION of vowels in csecs		TONIC frequency in Hz	p.m.	JUMP	POSTT. p.m.	AVERAGE FREQUENCY pret.	t.	postt.	INTENSITY PEAK t.	postt.	TYPE OF STRESS or POSITION OF STRESS
	1) kråva/e (= expected accent SSKJ)														
748	´3 b	´	´	8.3	6.8	71/67/66	- 5	+11	+13		68	84		+	
756	´1b	´	´(*)	10.9	6.0	72/70	- 2	+12	+16		71	90		+	preemphatic 1
750	´3b	´	´	9.1	8.3	76/72/70	- 6	+ 7	+15		73	83		+	
757	´3b	´	´	8.3	6.0	77/73/76	- 1	+20	+13		75	103		+	preemphatic 2
755	´3b	´(*)	´	14.7	11.7	88/86/109	+21	+ 9	+28		94	132		+	emphatic
758	´2b	´	´	9.4	6.4	90/90/109	+19	+19	+18		100	137	0	0	preemphatic 3
746	´3b	´	´	10.2	6.0	94/86/102	+ 8	+23	+18		94	134		+	contrastive
	2) kônji (= expected accent SSKJ)														
746	´2c	´	´	9.1	6.0	104/112	+ 8	+17	- 9		108	125		+	contrastive
	3) stårček (= expected accent SSKJ)														
762	´3c	0	´	7.5	4.9	86/74	-12	+19	-10		80	88	+		preemphatic 3
760	IP	´(*)	´	7.5	5.6	94/88/88	- 6	0	-25		90	76	0	0	preemphatic 1
761	´3c	0	´(*)	7.5	4.5	98/95	- 3	+12	-10		97	102	0	0	preemphatic 2
747	´3c	´(*)	0	8.7	4.1	112/106/111	- 1	+13	-12		110	118	0	0	contrastive
759	^2	^	^	10.6	6.0	120/118/144	+24	-23	-15		127	114	+		emphatic
749	^2	^	0	7.5	4.1	126/134	+ 8	- 5	-13		130	123	+		
	4) šộlar (= expected accent SSKJ)														
747	^1	^	^	7.5	9.1	141/146/143	+ 2	- 6	-23		143	126	+		contrastive
	Averaged values														
kråva/e (7 ex.)				10.1	7.3	81/78/86	+ 5	+14	+17						
kråva/e (6 ex., emph. excl.)				9.4	6.6	80/77/82	+ 2	+15	+16						
stårček (7 ex.)				8.2	4.9	106/102/108	+ 2	+ 3	-14						
stårček (6 ex., emph. excl.)				7.7	4.6	103/98/100	- 3	+ 8	-14						

Table 11 Ka. Word accent in sentences, under the influence of sentence intonation: Position 1 (initial position) - barytones.

No. sona-gram	ACCENT FoC	interpreter Lo	Sn	DURATION of vowels in csecs	TONIC frequency in Hz	p.m.	JUMP	POSTT. p.m.	AVERAGE FREQUENCY pret.	t.	postt.	INTENSITY PEAK t.	postt.	TYPE OF STRESS or POSITION OF STRESS
	5) tåk (= expected accent SSKJ)													
753	F	´	´(*)	7.2	86/72	-14				83		+		
751	FR	´	0	7.5	96/89/98	+ 2				94		+		
765	F	0	0	7.9	100/90/92	- 8				94		+		preemphatic 2
764	FR	0	0	6.8	100/91/99	- 1				97		+		preemphatic 1
763	RF	ˆ	ˆ	9.1	127/150/146	+19				141		+		emphatic
	6) zvečêr (= expected accent SSKJ)													
767	L	ˆ	0	7.5	103/104	+ 1			81	104		+		preemphatic 1
752	R	ˆ	0	9.1	116/136	+20			79	126		+		
766	RF	ˆ	ˆ	13.6	126/148/108	-18			86	127		+		emphatic
768	R	ˆ	0	7.5	130/140/147	+17			99	136		+		preemphatic 2
754	RF	ˆ	ˆ	5.3	131/145/131	0			96	136		+		
	Averaged values													
tåk (5 ex.)				7.7	102/100/101									
tåk (4 ex., emph. excl.)				7.4	96/87/90									
zvečêr (5 ex.)				8.6	121/132/125									
zvečêr (4 ex., emph. excl.)				7.4	120/129/130									

Table 11 Ka. Word accent in sentences, under the influence of sentence intonation: Position 1 (initial position) - oxytones.

No. sona-gram	A C C E N T FoP	interpreter Lo	Sn	D U R A T I O N of vowels in csecs	T O N I C frequency in Hz	p.m.	JUMP	POSTT. p.m.	AVERAGE FREQUENCY pret.	t.	postt.	INTENSITY PEAK t.	postt.	TYPE OF STRESS or POSITION OF STRESS
	7) páse(jo) (= expected accent SSKJ)													
750	´3b	´	´	9.8 4.5	70/62/62	- 8	+19	+ 5		65	89		+	
756	´2a	¯	´	13.6 10.2	72/110	+38	+15	- 2		91	122	+		emphatic
748	´3c	´	´	9.1 3.8	76/66/70	- 6	+26	-10		71	91		+	
755	´3a	´(*)	´	11.3 3.8	80/68/69	-11	+13	- 2		72	81	+		postemphatic 1
746	´3c?	^	´	12.1 7.5 4.5	84/108/103	+19	+ 3	-10		96	101 89		+	
757	´3c	´	´	8.7 3.0	84/70/78	- 6	+31	-10		77	104		+	preemphatic 1
758	´3c	´	´	12.1 4.1	102/96/100	- 2	+23	- 7		99	120		+	preemphatic 2
	8) čâka (= expected accent SSKJ)													
762	´3c	0	´	7.5 7.5	83/77/78	- 5	+15	- 7		79	90	+		preemphatic 2
761	IP	0	´	7.5 9.1	90/84/89	- 1	+12	-25		88	89	+		preemphatic 1
747	´3c	´(*)	0	8.3 3.4	90/84/81	- 9	+25	- 7		85	103	+		
760	´3b	´(*)	´	12.1 12.8	90/86/96	+ 6	+20	+ 6		91	118	0	0	emphatic
759	IP	´(*)	´	10.6 9.1	93/85/86	- 7	0	-14		88	79		+	postemphatic 1
749	IP	0	´(*)	8.3 9.8	106/94/103	- 3	+ 9	-28		101	98		+	
	Averaged values													
páse(jo) (7 ex.)				11.0 5.3	81/80/85		+19	- 5						
páse(jo) (6 ex., emph. excl.)				10.5 4.5	83/78/80		+19	- 6						
čâka (6 ex.)				9.1 8.6	92/85/89		+14	-13						
čâka (5 ex., emph. excl.)				8.4 7.8	92/85/87		+12	-16						

Table 11 Ka. Word accent in sentences, under the influence of sentence intonation:
Position 2 (medial position) - barytones.

No. sonagram	ACCENT FoC	interpreter Lo	Sn	DURATION of vowels in csecs.		TONIC frequency in Hz	p.m.	JUMP	POSTT. p.m.	AVERAGE FREQUENCY pret.	t.	postt.	INTENSITY PEAK t.	postt.	TYPE OF STRESS or POSITION OF STRESS
	9) junák (= expected accent SSKJ)														
764	R	ˆ	´	7.9	13.6	70/138	+68			73	104		+		emphatic
753	R	´	´	4.1	9.1	72/74/84	+12			79	77		+		
763	L	´	ˆ	8.3	9.4	73/73	0			83	73		+		postemphatic 1
765	R	´	0	4.5	8.3	78/93	+15			81	86		+		preemphatic 2
751	L	´	0	7.5	7.9	98/97	- 1			101	98		+		
	10) dân (= expected accent SSKJ)														
752	R	0	0	12.1		68/84	+16				82		+		
768	R	´(*)	0	12.1		68/81/99	+31				83		+		preemphatic 1
766	F	ˆ(*)	0	9.1		70/63	- 7				67		+		postemphatic 1
754	L	0	0	10.6		71/72/70	- 1				71		+		
767	RF	ˆ	ˆ	13.6		88/118/107	+19				104		+		emphatic
	Averaged values														
junák (5 ex.)				6.5	9.7	78/88/97									
junák (4 ex., emph. excl.)				6.1	8.7	80/84/87									
dân (5 ex.)				11.5		73/83/85									
dân (4 ex., emph. excl.)				11.4		69/74/79									

Table 11 Ka. Word accent in sentences, under the influence of sentence intonation:
Position 2 (medial position) - oxytones.

No. sonagram	ACCENT FoP	interpreter Lo	interpreter Sn	DURATION of vowels in csecs		TONIC frequency in Hz	p.m.	JUMP	POSTT. p.m.	AVERAGE FREQUENCY pret.	t.	postt.	INTENSITY PEAK t.	postt.	TYPE OF STRESS or POSITION OF STRESS
	11) lẹ́pi (= expected accent SSKJ)														
746	˝2c	´	´	7.5	4.5	73/76	+13	+17	- 7		70	87		+	
755	˝3c	´(*)	´	7.5	4.1	68/50	-18	+30	-12		59	74		+	postemphatic 2
748	˝1b	´	´	7.5	4.5	68/66	- 2	+32	+ 9		67	103		+	
758	˝3c	´	´	9.1	5.3	68/66/69	+ 1	+34	- 7		68	100		+	preemphatic 1
756	˝3a	´(*)	´(*)	8.3	2.3	70/50	-20	+20	0		60	70		+	postemphatic 1
<u>757</u>	IP	´	´	10.6	6.0	81/106	+25	+19	-29		94	110	+		emphatic
	12) zdráve (= expected accent SSKJ)														
759	˝3b	´	´(*)	9.1	5.3	69/64	- 5	+ 2	+ 5		67	69	0	0	postemphatic 2
762	˝3b	´	´	8.7	5.3	70/66/73	+ 3	+15	+ 8		70	92		+	preemphatic 1
760	˝1a	´	´	9.1	5.6	70/68	- 2	+ 6	0		69	74	0	0	postemphatic 1
749	^2	^	^	10.2	5.3	82/101	+19	- 5	- 9		92	92		+	
<u>761</u>	^1	^	^	12.8	6.0	93/130/123	+30	-32	-25		115	79	+		emphatic
	13) grẹ́mo (= expected accent SSKJ)														
752	˝3b	´	´	6.4	4.5	68/60	- 8	+12	+ 4		64	74	+		
	14) bilọ́ (= expected accent SSKJ)														
751	RF	0	0	5.3	9.4	67/73/72	+ 5			72	71		+		
	Averaged values														
lẹ́pi (6 ex.)				8.4	4.5	69/64/70		+25	(- 7)*)						
lẹ́pi (5 ex., emph. excl.)				8.0	4.1	67/64/62		+27	(- 3)						
zdráve (5 ex.)				10.0	5.5	77/85/86		(- 3)	(- 4)						
zdráve (4 ex., emph. excl.)				9.3	5.4	73/73/77		(+ 5)	(+ 1)	*) The figures in brackets are not realistic.					

Table 11 Ka. Word accent in sentences, under the influence of sentence intonation:
Position 2/3 (medial position) - 3 barytones, 1 oxytone.

No. sona-gram	A C C E N T FoP interpreter FoC Lo Sn	D U R A T I O N of vowels in csecs.	T O N I C frequency in Hz	p.m.	JUMP	POSTT. p.m.	AVERAGE FREQUENCY pret.	t.	postt.	INTENSITY PEAK t.	postt.	TYPE OF STRESS or POSITION OF STRESS
	15) trávi, (= expected accent SSKJ)											
746	˝3b ˊ ˊ	12.4 6.8	88/82/92	+ 4	+12	+10		87	109		+	
	16) pomlâdi, (= expected accent SSKJ)											
747	ˆ1 ˆ ˆ*	7.1 11.7 5.3	100/116/103	+ 3	- x	- x	66	106	x		+	
	17) vdá, (expected accent SSKJ)											
751	RF ˆ ˆ*	13.6	113/133/112	- 1			83	119		+		
	18) vẹ́, (= expected accent SSKJ)											
751	R ˊ ˊ	12.8	82/108	+26				95		+		
	19) končâ, (= expected accent SSKJ)											
752	FR ˝(*) ˊ	5.3 14.3	90/83/98	+ 8			93	90		+		

Table 11 Ka. Word accent in sentences, under the influence of sentence intonation:
Position 3 (final position) on a low rising nucleus - 2 barytones, 3 oxytones.

No. sona-gram	ACCENT FoP	interpreter Lo	Sn	DURATION of vowels in csecs.	TONIC frequency in Hz	p.m.	JUMP	POSTT. p.m.	AVERAGE FREQUENCY pret.	t.	postt.	INTENSITY PEAK t.	postt.	TYPE OF STRESS or POSITION OF STRESS
	20) trávi. (= expected accent SSKJ)													
756	IP	´	´(*)	9.4 6.0	x	- x	- x	- x		x	x		+	postemphatic 2
757	IP	´	´	6.0 6.8	x	- x	- x	- x		x	x		+	postemphatic 1
755	IP	´(*)	´	12.1 7.5	62/62	0	- x	- x		62	x		+	postemphatic 3
750	^1	^	^	12.1 3.8	91/89/96/90	- 1	-16	-18		92	65	+		
748	IP	^	^	12.8 5.3	94/94/88	- 6	- x	- x		92	x	+		
<u>758</u>	^1	^	^	13.9 6.0	100/117/102	+ 2	- x	- x		106	x	0	0	emphatic
	21) dẹtelji. (= expected accent SSKJ)													
746	IP	´	^	12.1 4.5 6.8	81/57	-24	- x	- x		69		+		
	22) pomlâdi. (= expected accent SSKJ)													
759	IP	^	´(*)	5.6 10.9 3.8	x	- x	- x	- x	66	x	x	+		postemphatic 3
749	IP	^	0	6.0 11.3 4.9	x	- x	- x	- x	69	x	x		?	
761	IP	^	´(*)	6.8 10.2 5.3	66/66	0	0	-10	67	66	61	?	?	postemphatic 1
760	IP	^	´	6.0 10.2 5.3	72/71	- 1	- x	- x	78	72	x	?	?	postemphatic 2
<u>762</u>	^1	^	^	5.6 12.8 6.8	90/111/90	0	- x	- x	78	97	x	?		emphatic
	23) počȋtnic. (= expected accent SSKJ)													
747	IP	^	^	4.5 4.9 x	x	- x	- x	- x		x	x	+		

Table 11 Ka. Word accent in sentences, under the influence of sentence intonation:
Position 3 (final position) on a low falling nucleus - barytones.

No. sonagram	ACCENT FoC	interpreter Lo	Sn	DURATION of vowels in csecs	TONIC frequency in Hz	p.m.	JUMP	POSTT. p.m.	AVERAGE FREQUENCY pret.	t.	postt.	INTENSITY PEAK t. postt.	TYPE OF STRESS or POSITION OF STRESS
	24) vdá. (= expected accent SSKJ)												
763	F	´(*)	0	7.9 9.4	60/54	- 6			58	57		+	postemphatic 2
764	F	0, ´(*)?	0	9.1 5.6	66/53	-13			83	60		+	postemphatic 1
753	RF	^	^	6.8 11.3	92/106/95	+ 3			61	98		+	
<u>765</u>	RF	^	^	9.8 13.6	100/130/112	+12			69	114		+	emphatic
	25) končâ. (= expected accent SSKJ)												
766	F	^	^	4.5 9.4	x				64	x		+	postemphatic 2
767	F	^	^	5.6 10.6	x				68	x		+	postemphatic 1
754	F	^	0	4.1 10.2	x				72	x		+	
<u>768</u>	F	^	^	7.5 11.3	126/79	-47			78	103		+	emphatic
	26) zastǫ́nj. (= expected accent SSKJ)												
751	F	^	^*	6.4 8.3	120/91	-29			85	106		+	
	27) spât. (= expected accent SSKJ)												
752	F	^	^	7.5	x					x		+	
	Averaged values												
vdá. (4 ex.)				8.4 10.0	80/x/79								
vdá. (3 ex., emph. excl.)				7.9 8.8	73/x/67								
končâ. (4 ex.)				5.4 10.4	x								
končâ. (3 ex., emph. excl.)				4.7 10.1	x								

Table 11 Ka. Word accent in sentences, under the influence of sentence intonation:
Position 3 (final position) on a low falling nucleus - oxytones.

No. sonagram	ACCENT FoP	interpreter Lo	Sn	DURATION of vowels in csecs		TONIC frequency in Hz	p.m.	JUMP	POSTT. p.m.	AVERAGE FREQUENCY pret.	t.	postt.	INTENSITY PEAK t.	postt.	TYPE OF STRESS or POSITION OF STRESS
	1) kráva/e (= expected accent SSKJ)														
757	´2b	´	´	12.1	7.5	114/121	+ 7	+ 3	+16		118	135	0	0	preemphatic 2
748	´2b	´	´*	10 6	6.4	114/122	+ 8	+ 5	+22		118	138		+	
758	´2b	´	´	9.1	5.7	115/116/122	+ 7	+ 8	+19		118	137	0	0	preemphatic 3
750	´2b	´	´	9.8	6.8	116/122	+ 6	+ 4	+32		119	142		+	
756	´2b	´	´	10.6	6.4	120/122	+ 2	+15	+17		121	149		+	preemphatic 1
755	´3a	´	´	10.6	6.0	122/125/134	+12	+22	- 1		127	160		+	emphatic
746	´2a	´	´	9.1	6.0	124/142	+18	+ 4	+ 1		133	150		+	contrastive
	2) kónji (= expected accent SSKJ)														
746	´3b	´	´	12.1	3.0	119/114/118	- 1	0	+13		117	125		+	contrastive
	3) stârček (= expected accent SSKJ)														
760	´3c	´(*)	0	10.6	3.8	126/126/130	+ 4	+30	- 3		127	159	0	0	preemphatic 1
762	´2c	0	0	7.2	4.1	126/131	+ 5	+36	-17		129	159	0	0	preemphatic 3
749	´3c	´(*)	´	9.1	3.4	130/124/138	+ 8	+25	-17		131	155	0	0	
747	´2c	^	^	9.8	4.1	134/130/146	+12	+13	-14		137	149	0	0	contrastive
759	´3c	´	´	10.2	5.3	135/130/150	+15	+53	-22		138	192	0	0	emphatic
761	´3c	´(*)	0	8.7	5.3	136/128/144	+ 8	+29	-12		136	167	?	?	preemphatic 2
	4) šộlar (= expected accent SSKJ)														
747	^2	^	^	9.1	5.3	140/143	+ 3	+ 1	- 9		142	140	+		contrastive
	Averaged values														
kráva/e (7 ex.)				10.3	6.4	118/121/126	+ 8	+ 9	+18						
kráva/e (6 ex., emph. excl.)				10.2	6.5	117/121/125	+ 8	+ 7	+18						
stârček (7 ex.)				9.3	4.3	131/128/140	+ 9	+31	-14						
stârček (6 ex., emph. excl.)				9.1	4.1	130/127/138	+ 8	+27	-13						

Table 11 Pi. Word accent in sentences, under the influence of sentence intonation:
Position 1 (initial position) - barytones.

No. sona-gram	A C C E N T FoC	interpreter Lo	Sn	D U R A T I O N of vowels in csecs.	T O N I C frequency in Hz	p.m.	JUMP	POSTT. p.m.	AVERAGE FREQUENCY pret.	t.	postt.	INTENSITY PEAK t.	postt.	TYPE OF STRESS or POSITION OF STRESS
	5) ták (= expected accent SSKJ)													
765	R	´	´(*)	9.1	117/136	+19				127		+		preemphatic 2
751	R	´	´	11.3	120/152	+32				136		+		
753	R	´	´	10.6	120/126	+ 6				123		+		
764	R	´	´(*)	10.2	132/155	+23				143		+		preemphatic 1
763	R	´	´	11.3	140/152/152	+12				148		+		emphatic
	6) zvečêr (= expected accent SSKJ)													
752	R	^	^	6.0 8.3	143/145	+ 2			120	144		+		
767	RF	^	^(*)	4.9 9.1	144/154/142	- 2			122	147		+		preemphatic 1
754	RF	^	^	6.8 7.9	144/163	+19			121	154		+		
768	RF	^	^(*)	4.5 7.9	146/171	+25			124	159		+		preemphatic 2
766	RF	^	^	5.3 11.7	163/190/187	+24			120	180		+		emphatic
	Averaged values													
ták (5 ex.)				10.5	126/136/144									
ták (4 ex., emph. excl.)				10.3	122/132/142									
zvečêr (5 ex.)				5.5 9.0	148/161/162									
zvečêr (4 ex., emph. excl.)				5.5 8.3	144/154/155									

Table 11 Pi. Word accent in sentences, under the influence of sentence intonation:
Position 1 (initial position) - oxytones.

No. sonagram	ACCENT FoP	interpreter Lo	interpreter Sn	DURATION of vowels in csecs			TONIC frequency in Hz	TONIC p.m.	JUMP	POSTT. p.m.	AVERAGE FREQUENCY pret.	AVERAGE FREQUENCY t.	AVERAGE FREQUENCY postt.	INTENSITY PEAK t.	INTENSITY PEAK postt.	TYPE OF STRESS or POSITION OF STRESS
	7) páse(jo) (= expected accent SSKJ)															
758	´3c	´	´	10.6	4.9		122/128/120	- 2	+26	- 9		123	141		+	preemphatic 2
746	IP	´	´	12.1	4.1	6.4	130/126	- 4	+ 4	-22		128	118		+	
756	´3c	´	´*	12.4	4.9		130/121/121	- 9	+52	-12		124	167		+	emphatic
755	´1c	´	´	11.7	6.5		133/132	- 1	+25	-11		133	152		+	postemphatic 1
748	´3c	´	´	10.9	3.8		136/126/130	- 6	+36	-10		131	158		+	
757	´3c	´	´	10.9	5.3		136/125/126	-10	+20	-15		129	138		+	preemphatic 1
750	´3c	´	´	9.8	4.5		146/138/136	-10	+20	- 7		140	153		+	
	8) čâka (= expected accent SSKJ)															
759	IP	´	´(*)	11.3	7.5		126/113/108	-18	+ 4	-16		116	104	+		postemphatic 1
747	IP	^	´(*)	9.4	4.5		140/130/129	-11	+ 4	- 6		133	130	+		
762	IP	´(*)	0	9.4	7.5		144/140	- 4	+ 2	-16		142	134		+	preemphatic 2
749	IP	´(*)	´	9.8	6.8		145/135/139	- 6	+ 1	-14		140	133		+	
761	IP	0	0	9.4	6.8		156/150	- 6	-15	-33		153	119	0	0	preemphatic 1
760	^2	^	^	13.6	9.1		170/178	+ 8	-60	-21		174	108	+		emphatic
	Averaged values															
páse(jo)	(7 ex.)			11.2	4.6		133/128/127		+26	-12						
páse(jo)	(6 ex., emph. excl.)			11.0	4.6		134/129/128		+22	-12						
čâka	(6 ex.)			10.5	7.0											
čâka	(5 ex., emph. excl.)			9.9	6.6											

Table 11 Pi. Word accent in sentences, under the influence of sentence intonation: Position 2 (medial position) - barytones.

No. sona-gram	ACCENT FoC	interpreter Lo	Sn	DURATION of vowels in csecs.	TONIC frequency in Hz	p.m.	JUMP	POSTT. p.m.	AVERAGE FREQUENCY pret.	t.	postt.	INTENSITY PEAK t. postt.	TYPE OF STRESS or POSITION OF STRESS
	9) junák (= expected accent SSKJ)												
764	R	´	´	8.3 13.6	116/174	+58			125	145		+	emphatic
763	F	´	0	5.3 9.4	132/102	-30			202	117		+	postemphatic 1
753	FR	´	´(*)	5.3 9.4	140/131/135	- 5			153	135		+	
751	FR	´	´(*)	4.5 9.1	140/133/136	- 4			164	136		+	
765	L	´	0	6.0 9.8	140/142	+ 2			159	141		+	preemphatic 1
	10) dán (= expected accent SSKJ)												
766	F	^	0	9.1	100/100/92/90	-10				96		+	postemphatic 1
752	F	^	0	9.8	121/111/111	-10				114		+	
754	LR	^(*)	0	8.3	127/125/134	+ 7				129		+	
768	RF	^	0	8.3	130/133/154/146	+16				141		+	preemphatic 1
767	RF	^	^	11.7	134/183/163	+29				160		+	emphatic
	Averaged values												
junák (5 ex.)				6.5 10.3									
junák (4 ex., emph. excl.)				5.3 9.4									
dân (5 ex.)				9.4									
dân (4 ex., emph. excl.)				8.9									

Table 11 Pi. Word accent in sentences, under the influence of sentence intonation:
Position 2 (medial position) - oxytones.

No. sona-gram	ACCENT FoP FoC	interpreter Lo	Sn	DURATION of vowels in csecs		TONIC frequency in Hz	p.m.	JUMP	POSTT. p.m.	AVERAGE FREQUENCY pret.	t.	postt.	INTENSITY PEAK t.	postt.	TYPE OF STRESS or POSITION OF STRESS
	11) lẹ́pi (= expected accent SSKJ)														
746	ˋ3c	ˋ	ˋ(*)	8.3	4.5	95/92	- 3	+11	- 8		94	99		+	
756	ˋ3c	ˋ	ˋ(*)	6.8	3.8	106/96	-10	+ 6	- 6		101	99	0	0	postemphatic 1
758	ˋ2c	ˋ	ˋ	8.7	4.5	114/121/120	+ 6	+17	- 7		118	132		+	preemphatic 1
755	ˋ2c	ˋ	ˋ	7.5	3.8	117/122	+ 5	+18	- 6		120	137		+	postemphatic 2
748	ˋ2c	ˋ	ˋ	7.9	4.5	118/129	+11	+14	-12		124	137		+	
757	ˋ1b	ˋ	ˋ	12.1	4.9	120/121	+ 1	+47	+15		121	176		+	emphatic
	12) zdráve (= expected accent SSKJ)														
760	IP	ˋ	ˋ(*)	8.3	5.3	95/94	- 1	- 4	-10		95	85	0	0	postemphatic 1
759	IP	ˋ	ˋ(*)	7.5	5.3	98/92/91	- 7	- 6	- 5		94	83	0	0	postemphatic 2
749	ˋ1b	ˋ	ˋ	8.7	4.9	115/114	- 1	+ 8	+10		115	127		+	
762	IP	0	0	10.6	4.5	118/134	+16	- 6	- 3		126	129		+	preemphatic 1
761	ˆ2	ˆ	ˆ	11.7	6.0	148/173/168	+20	-35	-23		163	122	0	0	emphatic
	13) grẹ́mo (= expected accent SSKJ)														
752	IP	´	0	6.0	5.7	138/129	- 9	- 4	- 7		134	122			
	14) bilọ́ (= expected accent SSKJ)														
751	RF	0	0	5.3	6.4	112/116/112	0				113				
	Averaged values														
lẹ́pi (6 ex.)				8.6	4.3	112/113/113		+19	- 4						
lẹ́pi (5 ex., emph. excl.)				7.8	4.2	110/112/112		+13	- 8						
zdráve (5 ex.)				9.4	5.2										
zdráve (4 ex., emph. excl.)				8.8	5.0										

Table 11 Pi. Word accent in sentences, under the influence of sentence intonation:
Position 2/3 (medial position) - 3 barytones, 1 oxytone.

No. sonagram	ACCENT FoP interpreter FoC Lo + Sn	DURATION of vowels in csecs.	TONIC frequency in Hz	p.m.	JUMP	POSTT. p.m.	AVERAGE FREQUENCY pret.	t.	postt.	INTENSITY PEAK t.	postt.	TYPE OF STRESS or POSITION OF STRESS
	15) trávi, (= expected accent SSKJ)											
746	´3b ´ ´	13.6 7.2	108/104/115	+ 7	+18	+32		109	158		+	
	16) pomlâdi, (= expected accent SSKJ)											
747	´3b ^ ´	7.5 12.1 7.5	122/150	+28	0	0	118	136	153		+	
	17) vdá, (= expected accent SSKJ)											
751	R ´ ´	5.7 12.1	120/115/167	+47			103	134		+		
	18) vẹ́, (= expected accent SSKJ)											
751	R ´ ´*	9.1	103/153	+50				128		+		
	19) končâ. (= expected accent SSKJ)											
752	R ^ ^(*)	7.5 12.4	138/170	+32			102	154		+		

Table 11 Pi. Word accent in sentences, under the influence of sentence intonation:
Position 3 (final position) on a low rising nucleus - 2 barytones, 3 oxytones.

No. sonagram	ACCENT FoP	interpreter Lo	Sn	DURATION of vowels in csecs.	TONIC frequency in Hz	p.m.	JUMP	POSTT. p.m.	AVERAGE FREQUENCY pret.	t.	postt.	INTENSITY PEAK t.	postt.	TYPE OF STRESS or POSITION OF STRESS
	20) trávi. (= expected accent SSKJ)													
756	IP	´	´(*)	13.2 10.2	85/68/64	-21	- 1	- 3		72	62	+		postemphatic 2
757	IP	´	0	12.8 11.3	96/75	-21	- 8	- 2		86	66	+		postemphatic 1
755	IP	^	´	13.6 9.8	123/84	-39	-37	-11		104	42	?	?	postemphatic 3
748	IP	´	`*	14.3 9.8	130/116/128/115	-15	-45	-27		125	77	0	0	
758	^1	^	^	14.3 10.9	140/157/155	+15	-27	-65		151	90	+		emphatic
750	IP	^	^	12.1 10.6	147/121	-26	-32	-33		134	73	+		
	21) dételji. (= expected accent SSKJ)													
746	IP	^	^	9.4 7.5 9.1	136/114	-22	-10	-28	125	90	65	+		
	22) pomlâdi. (= expected accent SSKJ)													
760	IP	^	´(*)	5.3 9.8 9.4	73/68/67	- 6	- 6	- 2	84	69	59	+		postemphatic 2
759	IP	^	^	4.5 8.7 8.7	78/70	- 8	- 2	- 5	85	74	66	+		
761	IP	^	0	6.8 10.6 9.1	87/76	-11	- 6	- 4	104	82	68	+		postemphatic 1
762	^1	^	^	6.0 11.3 12.4	122/156/149	+27	-56	-38	116	142	69	+		emphatic
749	IP	^	^	5.7 10.6 9.4	134/113	-21	-25	-12	131	124	82	+		
	23) počîtnic. (= expected accent SSKJ)													
747	IP	^	^	5.3 5.3 8.7	155/145	-10	-55	-23	130	150	79	+		
	Averaged values													
trávi. (6 ex.)				13.4 10.4	120/112/102		-25							
trávi. (5 ex., emph. excl.)				13.2 10.3	116/103/92		-25							
pomlâdi. (6 ex.)				5.7 10.2 9.8	99/101/95		-19							
pomlâdi. (5 ex., emph. excl.)				5.6 9.9 9.2	93/87/82		-10							

Table 11 Pi. Word accent in sentences, under the influence of sentence intonation:
Position 3 (final position) on a low falling nucleus - barytones.

No. sona-gram	ACCENT FoC	interpreter Lo	Sn	DURATION of vowels in csecs.	TONIC frequency in Hz	p.m.	JUMP	POSTT. p.m.	AVERAGE FREQUENCY pret.	t.	postt.	INTENSITY PEAK t. postt.	TYPE OF STRESS or POSITION OF STRESS
	24) vdá. (= expected accent SSKJ)												
763	F	´	0	6.0 10.9	78/55	-23			90	67		+	postemphatic 2
764	F	´	0	6.8 11.3	86/54	-32			98	70		+	postemphatic 1
753	F	^	^(*)	4.9 14.3	132/108/68	-64			125	103		+	
<u>765</u>	RF	^	^	6.0 16.6	142/167/144	+ 2			111	148		+	emphatic
	25) zastónj. (= expected accent SSKJ)												
751	F	´	0	6.0 9.8	103/63/52	-51			114	73		+	
	26) končâ. (= expected accent SSKJ)												
766	F	^	0	4.5 12.8	78/62	-16			84	70		+	postemphatic 2
767	F	^	0	6.8 12.4	99/56	-43			99	78		+	postemphatic 1
754	F	^	^(*)	6.4 14.3	136/92	-44			134	114		+	
<u>768</u>	F	^	^	6.0 11.3	186/140	-46			119	163		+	emphatic
	27) spât. (= expected accent SSKJ)												
752	F	0	0(^)	10.2	93/63	-30				78		+	
	Averaged values												
vdá. (3 ex., emph. excl.)				5.9 12.2	99/82/59								
končâ. (3 ex., emph. excl.)				5.9 13.2	104/87/70								

Table 11 Pi. Word accent in sentences, under the influence of sentence intonation:
Position 3 (final position) on a low falling nucleus - oxytones.

Speaker →			Ju				Ka				Pi			
position in sentence	expected accent SSKJ	no. sona-gram	frequency sequence	FoP	Lo	Sn	frequency sequence	FoP	Lo	Sn	frequency sequence	FoP	Lo	Sn
1 initial	kráva/e	750	1	´3b	´	´	3	´3b	´	´	4	´2b	´	´
		758	2	´3b	´	´	5	´2b	´	´	3	´2b	´	´
		757	3	´3b	´	´	4	´3b	´	´	1	´2b	´	´
		748	4	´3b	´	´	1	´3b	´	´	2	´2b	´	´*
		756	5	´3b	´	´	2	´1b	´	´(*)	5	´2b	´	´
		746	6	´3b	´	´	6	´3b	´	´	6	´2a	´	´
	kónji	746		´3b	´	´		´2c	´	´		´3b	´	´
	stârček	760	1	^3	^	´(*)	2	IP	´(*)	´	1	´3c	´(*)	0
		762	2	IP	^	´(*)	1	´3c	0	´	2	´2c	0	0
		749	3	IP	^(*)	´(*)	5	^2	^	0	3	´3c	´(*)	´
		747	4	IP	^	0	4	´3c	´(*)	0	4	´2c	^	^
		761	5	^4	^	´(*)	3	´3c	0	´(*)	5	´3c	´(*)	0
	šộlar	747		^4	^	^		^1	^	^		^2	^	^
2 medial	páse(jo)	755	1	´3c	´	´(*)	3	´3a	´*	´	3	´1c	´	´
		758	2	´3c	´	´	6	´3c	´	´	1	´3c	´	´
		750	3	´3c	´	´	1	´3b	´	´	6	´3c	´	´
		748	4	´3c	´	´	2	´3c	´	´	4	´3c	´	´
		757	5	´3c	´	´	5	´3c	´	´	5	´3c	´	´
		746	6	´3b	´	´	4	´3c?	^	´	2	IP	´	´
	čâka	762	1	´3c	^	´(*)	1	´3c	0	´	3	IP	´(*)	0
		759	2	´3c	^	´(*)	4	IP	´(*)	´	1	IP	´	´(*)
		747	3	´3c	^	´(*)	3	´3c	´(*)	0	2	IP	^	´(*)
		761	4	´3c	´(*)	´(*)	2	IP	0	´	5	IP	0	0
		749	5	´3c	´(*)	´	5	IP	0	´(*)	4	IP	´(*)	´

Continued on the following page

Table 12. Comparison between expected word accent (SSKJ), FoP and interpreted word accent in Ju, Ka and Pi barytones under the influence of sentence intonation.

Speaker →			Ju				Ka				Pi			
position in sentence	expected accent SSKJ	no. sonagram	frequency sequence	FoP	Lo	Sn	frequency sequence	FoP	Lo	Sn	frequency sequence	FoP	Lo	Sn
2 Continued														
medial	lépi	756	1	´1a	´	´	5	´3a	´(*)	´(*)	2	´3c?	´	´(*)
		755	2	´3x	´	´	2	´3c	´(*)	´	4	´2c	´	´
		758	3	´1c	´	´	4	´3c	´	´	3	´2c	´	´
		748	4	´3a	´	´	3	´1b	´	´	5	´2c	´	´
		746	5	´3b	´	´	1	´2c	´	´	1	´3c	´	´(*)
	zdráve	759	1	´3b	´	´(*)	1	´3b	´	´(*)	2	IP	´	´(*)
		762	2	´1a	´	´(*)	2	´3b	´	´	4	IP?	0	0
		760	3	´3b	´	´(*)	3	´1a	´	´	1	IP	´	´(*)
		749	4	´3c	´	´	4	^2	^	^	3	´1b	´	´
	grę́mo	752		´1b	´	0		´3b	´	´		IP	´	0
3 final, R-nucleus	trávi,	746		´3a	´	´		´3b	´	´		´3b	´	´
	pomlâdi,	747		´2b	^	´		^1	^	^*		´3b	^	´
final, F-nucleus	trávi.	756	1	^1	^	´	1	IP	´	´(*)	1	IP	´	´(*)
		755	2	^1	´	´	3	IP	´(*)	´	3	IP	^	´
		757	3	^2	´	´	2	IP	´	´	2	IP	´	0
		750	4	IP	´	´	4	^1	^	^	5	IP	^	^
		748	5	IP	´	´	5	IP	^	^	4	IP	´	´*
	dételji.	746		^4	^	^		Ip	´	^		IP	^	^
	pomlâdi.	759	1	^1	^	´	1	IP	^	´(*)	2	IP	^	^
		761	2	IP	^	´	3	IP	^	´(*)	3	IP	^	0
		760	3	IP	^	´	4	IP	^	´	1	IP	^	´(*)
		749	4	^1	^	^	2	IP	^	0	4	IP	^	^
	počîtnic.	747		IP	^	^		IP	^	^		IP	^	^

Table 12. Comparison between expected word accent (SSKJ), FoP and interpreted word accent in Ju, Ka and Pi barytones under the influence of sentence intonation.

Speaker →			Ju				Ka				Pi			
position in sentence	expected accent SSKJ	no. sonagram	frequency sequence	FoC	Lo	Sn	frequency sequence	FoC	Lo	Sn	frequency sequence	FoC	Lo	Sn
1 initial	ták	753	1	L	´	´	1	F	´	´(*)	3	R	´	´
		751	2	F	´	´	2	FR(L)	´	0	2	R	´	´
		765	3	F	´	´	3	F	0	0	1	R	´	´(*)
		764	4	F	´	´(*)	4	FR(L)	0	0	4	R	´	´(*)
	zvečêr	754	1	R	ˆ	ˆ	4	RF	ˆ	ˆ	3	RF	ˆ	ˆ
		767	2	L	ˆ	ˆ(*)	1	L	ˆ	0	2	RF	ˆ	ˆ(*)
		768	3	L	ˆ	ˆ(*)	3	R	ˆ	0	4	RF	ˆ	ˆ(*)
		752	4	R	ˆ	ˆ	2	R	ˆ	0	1	R	ˆ	ˆ
2 medial	junák	753	1	FR	´	´	1	R	´	´	2	FR	´	´(*)
		751	2	FR(L)	´	´	4	L	´	0	3	FR	´	´(*)
		763	3	FR	´	´(*)	2	L	´	ˆ	1	F	´	0
		765	4	L	´	´	3	R	´	0	4	L	´	0
	dân	766	1	FR	0	0	3	F	ˆ(*)	0	1	F	ˆ	0
		754	2	R	0	0	4	L	0	0	3	LR	ˆ(*)	0
		768	3	R	ˆ	ˆ(*)	2	R	´(*)	0	4	RF	ˆ	0
		752	4	FR	´(*)	0	1	R	0	0	2	F	ˆ	0
3 final, R-nucleus	vdá,	751		RF	ˆ	ˆ		RF	ˆ	ˆ*		R	´	´
	vẹ́,	751		FR	´	´*		R	´	´		R	´	´*
	končâ,	752		FR	ˆ	´(*)		FR	´(*)	´		R	ˆ	ˆ(*)
final, F-nucleus	vdá.	764	1	F	ˆ	ˆ(*)	2	F	0, ´(*)	0	2	F	´	0
		753	2	F	ˆ	ˆ	3	RF	ˆ	ˆ	3	F	ˆ	ˆ(*)
		763	3	RF	ˆ	ˆ*	1	F	´(*)	0	1	F	´	0
	zastọ́nj.	751		F	ˆ	ˆ		F	ˆ	ˆ*		F	´	0
	končȃ.	767	1	RF	ˆ	ˆ(*)	2	F	ˆ	ˆ	2	F	ˆ	0
		766	2	L	ˆ	ˆ	1	F	ˆ	ˆ	1	F	ˆ	0
		754	3	F	ˆ	ˆ*	3	F	ˆ	0	3	F	ˆ	ˆ(*)
	spât.	752		F	ˆ	ˆ		F	ˆ	ˆ		F	0	0, (ˆ)

Figures of some typical Ju, Ka and Pi averaged word accents in sentences

Whenever an accented word as said by the same speaker has the same FoP or FoC in at least 4 versions which have joint interpretations, a graph has been drawn of the averaged values of these instances. Such cases are less common in this series and occur only with some acutes: thus initial *kráva/e* meets these conditions with all 3 speakers, medial *páse(jo)* with Ju and Pi, and initial *ták* with Pi.

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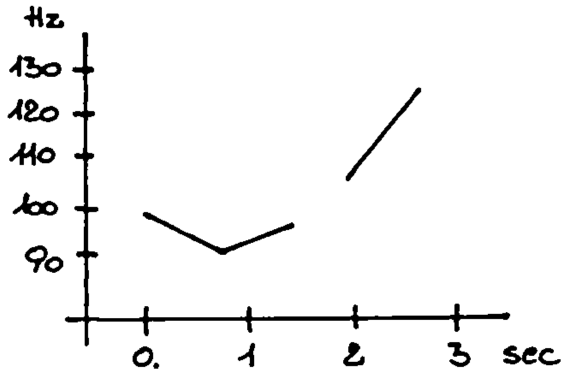

Fig. 57 Ju.
A typical averaged barytone acute (kráva/e) in sentence position 1.

FoP	´3b
Lo + Sn	´
duration	15.1 6.2 csecs.
frequencies	101 93 99 +10 +14 Hz
voice range	93–123 Hz (30 Hz)
6 instances	750, 758, 757, 748, 756, 746.

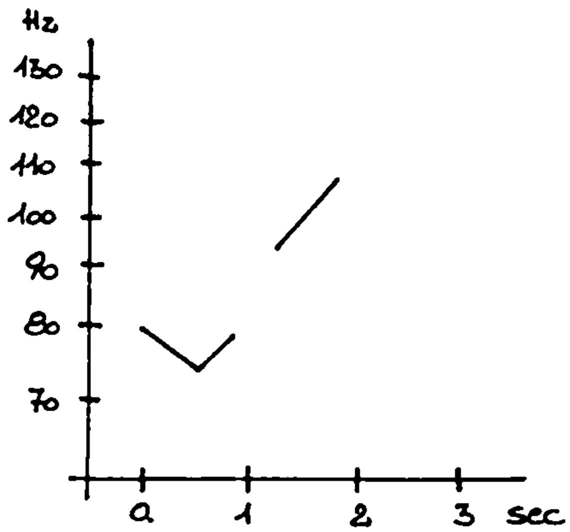

Fig. 58 Ka.
A typical averaged barytone acute (kráva/e) in sentence position 1.

FoP	´3b
Lo + Sn	´
duration	9.0 6.8 csecs.
frequencies	80 75 79 +15 +15 Hz
voice range	75–109 Hz (34 Hz)
4 instances	748, 750, 757, 746.

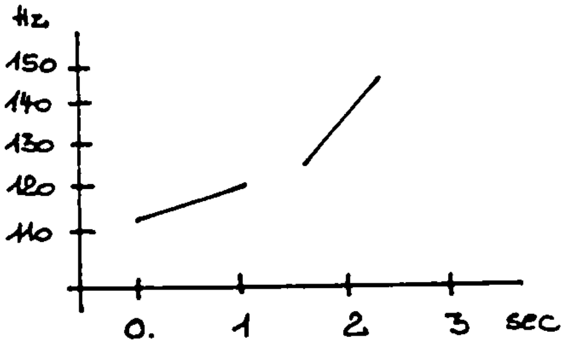

Fig. 59 Pi.
A typical averaged barytone acute (kráva/e) in sentence position 1.

FoP	´2b
Lo + Sn	´
duration	10.4 6.6 csecs.
frequencies	116 122 +7 +21 Hz
voice range	116–150 Hz (34 Hz)
5 instances	757, 748, 758, 750, 756.

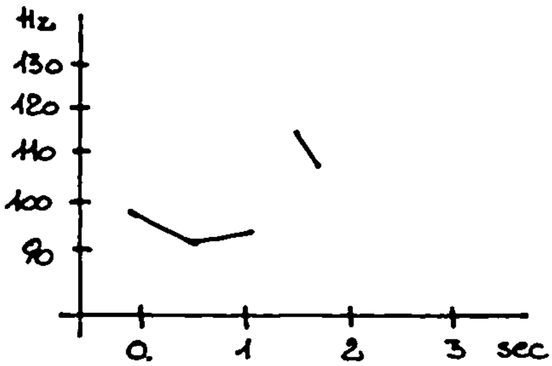

Fig. 60 Ju.
A typical averaged barytone acute (páse/jo) in sentence position 2.

FoP	´3c
Lo + Sn	´
duration	11.8 4.2 csecs.
frequencies	98 92 95 +19 -6 Hz
voice range	92–114 Hz (22 Hz)
5 instances	755, 758, 750, 748, 757.

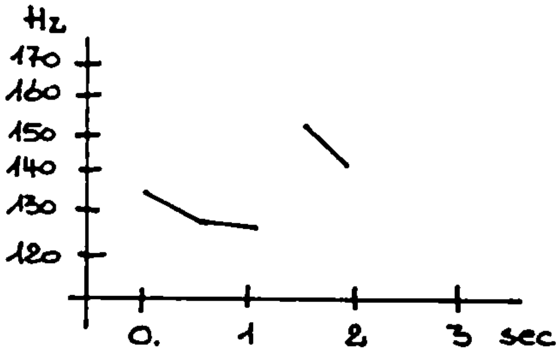

Fig. 61 Pi.
A typical averaged barytone acute (páse/jo) in sentence position 2.

FoP	´3c
Lo + Sn	´
duration	10.6 4.6 csecs.
frequencies	135 129 128 +26 -10 Hz
voice range	128–154 Hz (26 Hz)
4 instances	758, 748, 757, 750.

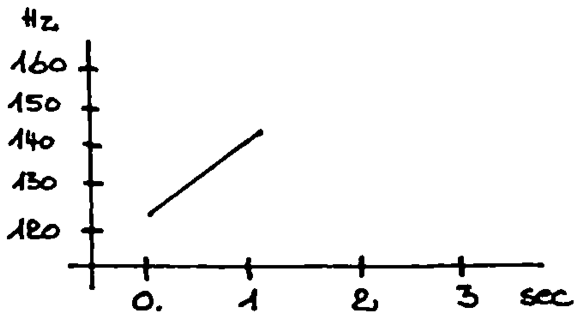

Fig. 62 Pi.
An averaged oxytone acute (ták) in sentence position 1.

FoC	R
Lo + Sn	´
duration	10.3 csecs.
frequencies	122 142 Hz
voice range	122–142 Hz (20 Hz)
4 instances	765, 751, 753, 764.

Chapter 6

WORD ACCENT CONTINUED

6.1 WORD ACCENT ON EMPHATICALLY (AND CONTRASTIVELY) STRESSED WORDS IN A SENTENCE

The parameters involved in emphatic and contrastive stress are the same as those involved in stress in general: duration, frequency (= pitch and contour), and amplitude (= intensity, loudness). In Slovene emphatic utterances all parameters are generally involved changed as to neutral speech.

6.1.1 Speaker Ju (Table 13 Ju, p. 192)

In an emphatic word, sentence intonation influence is strongly weakened if not eliminated. Emphatically pronounced words, barytones and oxytones, in all three positions – with the exception of oxytones on a F nucleus – were interpreted by both judges as having the expected accent, the accent prescribed by SSKJ. The FoP with barytones was the expected one having all the features typical of that accent type, in most circumflexed cases a definite circumflex FoP with Ju emerges only under emphatic stress. In barytones word accent clearly prevails upon sentence intonation, regardless of position.

Accent in oxytones even when under emphatic stress is not so free of sentence intonation influence. In initial and mid-position the expected accent is always jointly perceived, while on a F nucleus it is not (765 *vdá*). On the contour of initial 763 *ták* see pp. 135 and 188.

The most persistent indicator of emphatic stress is duration. The emphatic utterance generally has the longest tonic. The tonics of emphatic utterances are lengthened (in 1 case shortened) and amount from 98 to 156%, 123% on the average, of the normally stressed one. The posttonic does not seem to be affected. The expression "longer" in Table 13 means that the vowel of the tonic has second place as to duration in the group (compared with "longest" which has first place). Duration is generally combined with higher frequency and greater pitch contrasts on the tonic, with bigger jumps (either up or down depending on accent type), and in some cases with greater pitch movement (again either up or down) on the posttonic. Especially in initial position emphasis is marked by higher pitch, in mid-position it is not so very common, and in final position it does not occur at all with Ju. In final position the greater influence of sentence intonation shows on barytones in that there is no higher pitch on the tonic, while the jump up in the acute example is still above average. The posttonic is not rising as it often is on a normal acute accent with Ju, neither is it properly falling as it should be on a falling nucleus. The circumflex barytone (762 *pomlâdi*) on a falling nucleus at first sight does not show any emphatic features compared with e.g. 749. Compared with its preceding utterance

(761) however, it is longer, higher in pitch and has more pitch movement on its tonic. Emphasis generally manifests itself in absolute terms (i.e. longest, highest frequencies etc.), but not necessarily. Like most phenomena in phonetics it is relative, longer, higher etc. than the corresponding adjacent elements. As I compared every emphatic word with all the same words in the same position "normal" generally means average, although the same feature could be defined as longer, higher etc. if compared with the preceding utterance only.

The impression of emphasis is not gained by means of increased pitch only, but also by a fall in pitch. Oxytone *ták* (763) in position 1, and the tonics of barytone *páse* (765) and *lẹ́pi* (757) in position 2, all acuted, have an extra large fall. With barytone circumflexes the greater jump down contributes to the effect of emphasis (759, 760). Under emphasis all features may be "exaggerated", "bigger than in ordinary life".

Emphatic *ták* (763, position 1) is the longest, starts highest, and has the greatest fall in the group. *Zvečȇr* (766, position 1) is the longest and is the only one that has a typically circumflex contour (RF) in the group. The duration relationship between the emphatic tonic and the averaged normally stressed tonic is the same in both cases, 76 and 77% respectively. Emphatic *junák* (764, position 2) again is the longest, the pitch of the tonic is not increased, there is little variation within it although there are 4 small pitch changes on it as a consequence of its relatively great length, it is wobbling. The duration of the averaged normally stressed vowel again amounts to 78% of the emphatic one. Emphatic 767 *dȃn* (position 2) is an interesting example. Compared with its immediate predecessor (766) it is a little higher in pitch and has a slightly greater pitch movement. Compared with the other members of the group, neither duration, nor frequency or pitch movement indicate that it is emphasized although it is perceived as emphatic. So far we have ignored the amplitude display of the sonagrams as we considered it less reliable on account of the different intrinsic intensities that the different vowels have and on account of the influence that the manner of articulation of the neighbouring consonants has on the accented vowel. Here, however, intensity seems to play an independent role: the amplitude display clearly shows an independent peak above the vowel, emphatic stress seems to be realized here primarily by a heightened intensity curve. 765 *vdȃ* in final position has duration as its outstanding feature, frequency and tone contour do not have above average values. The 4 pitch changes of average size are a consequence of duration. 768 *končȃ* again stands out in the group on account of its duration. A non-emphatic utterance (754) has the same frequencies, contour and fall.

Just as duration seems to be the outstanding feature of stress compared with non–stress, so duration plays a crucial role with emphatic stress although frequency changes are a usual and important correlate of emphasis.

We can study only 1 example of contrastive stress as the others occur only once, and so cannot be compared with normally stressed utterances. What makes that example (746 *kráve*) contrastively stressed is the lengthened posttonic, an extra large rise on the tonic which continues on the lengthened posttonic where it is especially prominent.

With Ju the type of accent in emphatically stressed words is not only preserved, but strengthened and made more prominent. Its characteristics are more marked than under normal stress. The less stressed a word is, the weaker the tendency to a rise, which is the fundamental feature of both types of accent in Slovene. Tone is thus intimately connected with degree of stress – another sign that Slovene is a pitch accented language (cf. p. 16).

6.1.2 Speaker Ka (Table 13 Ka, p. 193)

The tonics of emphatic utterances are consistently lengthened from 120–184%, 140% on the average. The lengthening generally affects the posttonic as well. Lengthening is thus an indispensable feature of emphasis with Ka. It is always accompanied by greater pitch movement if not by a higher pitch.

Ka's circumflex orientation which was not seen in normally stressed words under the influence of sentence intonation here comes to the fore again: none of the acute realizations has all the characteristics of the acute accent, while all the circumflexes are typically circumflexed. Under normal stress Ka's acute tonics in barytones can have negative or positive pitch movement on the tonic (Ju – negative). Under emphatic stress if they do not all start and rise highest, they all end higher, all have definitely positive pitch movement, whether they are acuted or circumflexed. While the jumps up are normal on emphatic acutes, the jumps down in circumflexes are greater under emphatic stress than under normal stress. In short, the general tendency of Ka's utterances – a R tonic and a F posttonic – is strengthened under emphasis. Thus 755 *kráva* is considered less distinctly acuted by Lo because its tonic has above average positive pitch movement, too large a R for a typical acute. 756 *páse* has much too large a R on the tonic, and so Lo perceives it as circumflexed in spite of its perceptible jump up which should not appear in a circumflex in mid–position. 760 *čâka* as already observed in the single word series with Ka again exemplifies the fact that accent in certain words may not be firmly rooted with him; that though most of his transitions are from acute to circumflex, there are some from circumflex to acute. All his normally stressed versions of *čâka* have negative pitch movement on the tonic. This however has positive. While Sn still perceives it as definitely acuted Lo therefore perceives it as less distinctly acuted. 757 *lẹ́pi*, although jointly interpreted as acuted, I determined as IP because the steep fall, which is much greater than the jump up, is untypical of the acute accent. 761 *zdráve*, on the other hand, has not only a rising tonic and a falling posttonic, but also a jump down, which makes it typically circumflex and thus jointly perceived as such by both interpreters.

In end position on a F nucleus, Ka's tendency for the circumflex accent and sentence intonation go hand in hand, and as a result we have typical circumflex FoPs, whether expected or not (758 *trávi*, 762 *pomlâdi*).

The acutes survive with Ka in initial position, which favours the acute accent, though not as typical acutes, while there are none in final position on a F nucleus.

There is most ambiguity in mid-position where the influence of sentence intonation favouring one or the other accent is missing. Here the fact that Ka is circumflex orientated on the whole, and that accent on the other hand is not so firmly rooted with him as with Ju, again emerges.

The fact that Ka does not distinguish between the 2 accents on oxytones emerges in the emphatically stressed words as well. The expected circumflexes are all perceived as circumflexed. The expected acute oxytones are realized as definitely circumflexed (763 *ták*, 765 *vdá*) with a RF contour, whether in initial or final position; only in the neutral mid-position is the pattern only R (764 *junák*), which Sn on account of its low starting frequency perceives as acuted and Lo concentrating on the high end of the tonic as circumflexed.

Little can be said about Ka's utterances under contrastive stress. They either cannot be compared as they are the only version of a particular word, or they do not really sound contrastively stressed. 747 *pomlâdi* sounds contrastively stressed and is typically circumflexed and jointly perceived as such though it is on a R nucleus. As it is an only example it cannot be compared.

6.1.3 Speaker Pi (Table 13 Pi, p. 194)

Emphatic utterances with Pi differ in at least 2 features from normally stressed ones, generally in the length of the tonic and in its frequency (or pitch movement) or/and in a greater jump up or down. Most emphatic versions have longest tonics. All the tonics in mid-position are longest, and most of the posttonics in mid- and in final position are affected too and are longest. There is only 1 oxytone utterance (768 *končâ*) in final position with the shortest tonic in the group where the lack of duration is compensated for by highest frequency and the steepest fall. The tonics of emphatic utterances are in all cases, except in the last mentioned, lengthened from 104 to 155%, 123% on the average.

All the FoPs under emphatic stress are clear and specific enough and thus all the interpretations by the 2 judges are in agreement. The 2 emphatic barytones in initial position (755 *kráva*, 759 *stârček*) have an acute FoP and are thus perceived as acuted. The oxytone 766 *zvečêr* has a typically circumflex FoC and is perceived as circumflexed. 763 *ták* although having a quick R – which however is not exceptionally large – under the influence of expected accent (?) is perceived as acuted by both interpreters.

Of the 6 instances in mid-position (756 *páse*, 760 *čâka*, 764 *junák*, 767 *dân*, 757 *lẹ́pi*, 761 *zdráve*) all have the expected FoP (or FoC), and thus the expected interpretation, except 761 *zdráve* where the emphatic version is the only one in the group with a typically circumflex pattern (large R on tonic, large jump down, steep F on posttonic), and hence also is perceived as such. We could say that under emphatic stress the dichotomy stress on tonic and tonal peak on posttonic is lost here: both coincide on the tonic – and the result is the unmarked accent, the circumflex.

In final position the extra stress caused by emphasis results in a R on the tonic followed by a F (also on the tonic) which is brought about by a F nucleus – and the result is a typically circumflex FoP (ˆ 1), regardless of expected accent (758 *trávi*, 762 *pomlâdi*). For the same reasons the oxytone 765 *vdá* has the same RF contour while 768 *končâ* has a F tone contour just as all the non-emphatic utterances in this group, but different from the rest, it has a RF intensity contour – emphasis shows in a higher general pitch, greatest F and a RF intensity contour. Lo and Sn interpret it as circumflexed – one reason for it could be the extra short duration.

Initial position favours the acute accent, both barytones (755 *kráva* and 759 *stârček*) regardless of expected accent, have an acute FoP and are jointly perceived as acuted. Final position on a F nucleus favours the circumflex accent, both 758 *trávi* and 762 *pomlâdi* have a typically circumflex FoP and are jointly interpreted as such. Sentence intonation in both positions overrules expected accent even under emphatic stress. Of the 4 barytones in mid-position all 4 have typical FoPs, 3 in agreement with expected accent, and 1 (761 *zdráve*) not. The perceptions are in agreement and according to FoP.

With oxytones in initial and mid-position the expected accent is jointly perceived. The 2 expected circumflexes both have a typically circumflex FoC (RF) and the 2 expected acutes a R one. In final position on a F nucleus favouring the circumflex accent sentence intonation overrules accent and both oxytones (765 *vdá*, 768 *končâ*) regardless of expected accent are jointly perceived as circumflexed.

The 2 expected contrastively stressed barytones in initial position 746 *kráva* and 747 *stârček* do not sound contrastively stressed, although the first has the highest frequencies in the group and the greatest R. The jump up is below average, the posttonic is level and the durations are normal. The word sounds as said very distinctly. 747 *stârček* is discussed on pp. 146, 147.

No. sonagram	Word with expected accent	Position	FoP or FoC	Interpretation Lo + Sn	Duration tonic	Duration postt.	Tonic frequency	Tonic contour	Jump	Contour of postt.
755	kráve E	initial	typ. ˊ	ˊ	longest	normal	starts highest	greater contrasts within it; FR	up; a little above average	normal
746	kráve C	initial	typ. ˊ	ˊ	longer	longest	starts higher	above average R at end	up; a little above average	steeply R
746	kónji C	initial	typ. ˊ	ˊ	only 1 example,		no comparison possible			
759	stârček E	initial	typ. ˆ	ˆ	longer	normal	starts highest	normal	down; biggest	steeply F
747	stârček C	initial	IP	ˆ 0	not said with a		contrastive stress			
747	šộlar C	initial	ˆ	ˆ	only 1 example,		no comparison possible			
763	ták E	initial	F	ˊ	longest	-	starts highest	greatest neg. p.m.	-	-
766	zvečêr E	initial	the only RF	ˆ	longest	-	normal	greatest pos. p.m.	-	-
756	páse E	mid-	typ. ˊ	ˊ	normal	normal	starts normally	greatest neg. p.m.	up; biggest	steeply F
760	čâka E	mid-	the only typ. ˆ	ˆ	longer	normal	ends highest	greatest contrasts within it	down; biggest	normal
764	junák E	mid-	FRF	ˊ	longest	-	normal	wobbling	-	-
767	dân E	mid-	R	ˆ	normal	-	normal	normal	-	- strong stress louder
757	lépi E	mid-	typ. ˊ	ˊ	longest	normal	starts highest	biggest neg. p.m.	up; big	normal
761	zdráve E	mid-	typ. ˊ	ˊ	longest	normal	normal	normal	normal	normal
747	pomlâdi C	R end-nucl.	ˊ ˆ	ˊ	only 1 example,		no comparison possible			
758	trâvi E	F end-nucl.	the only ˊ	ˊ	longest	longest	normal	normal as if not on F nucleus	the only up; big	less F
762	pomlâdi E	F end-nucl.	ˆ	ˆ	longer	normal	normal	normal, RF	normal	normal
765	vdá E	F end-nucl.	FRF	ˊ(*) ˆ	longest	-	normal	greater contrasts within it; FRF	-	-
768	končâ E	F end-nucl.	F	ˆ	longest	-	normal	F	-	-

Table 13 Ju. Accented words under emphatic or contrastive stress in a sentence.

No. sona-gram	Word with expected accent	Position	FoP or FoC	Inter-pretation Lo + Sn	Duration tonic	Duration postt.	Tonic frequency	Tonic contour	Jump	Contour of postt.
755	kráve E	initial	´		longer	normal	higher	bigger p.m.	up; biggest	level
746	kráve C	initial	´	´	normal	normal	highest	biggest R	normal	level
746	kônji C	initial	´	´	1 example, no comparison possible, does not sound contrastively stressed					
759	stârček E	initial	´	´	longer	longer	rises highest	biggest R; concave	up; biggest	biggest F
747	stârček C	initial	´	^	normal	normal	normal	bigger R	normal	normal
					does not sound contrastively stressed					
747	šǫlar C	initial	^	^	1 example, no comparison possible					
763	ták E	initial	R	´	longer	-	starts highest	quick R	-	-
766	zvečêr E	initial	RF	^	longest	-	starts, rises, ends highest	biggest p.m.	-	-
756	páse E	mid-	typ. ´	´	longest	normal	normal	normal	up; biggest	normal
760	čâka E	mid-	typ. ^	^	longest	longest	highest	the only R	down; biggest	biggest F
764	junák E	mid-	R	´	longest	-	starts lowest, ends highest	biggest R	-	-
767	dân E	mid-	RF	the only joint ^	longest	-	starts, rises, ends highest	biggest p.m.	-	-
757	lẹ́pi E	mid-	typ. ´	´	longest	longest	starts highest	normal	up; biggest	the only R
761	zdráve E	mid-	typ. ^	^	longest	longest	starts, rises, ends highest	biggest p.m.	down; biggest	biggest F
747	pomlâdi C	R end-nucl.	´	´	1 example, no comparison possible					
758	trâvi E	F end-nucl.	typ. ^	^	longer	longest	rises highest	RF	down; normal	biggest F
762	pomlâdi E	F end-nucl.	typ. ^	^	longest	longest	rises highest	the only RF; the only pos. p.m.	down; biggest	biggest F
765	vdá E	F end-nucl.	RF	^	longest	-	highest	the only RF; the only pos. p.m.	-	-
768	končâ E	F end-nucl.	F	^	shortest	-	starts, ends highest	biggest F	-	-

Table 13 Pi. Accented words under emphatic or contrastive stress in a sentence

No. sona-gram	Word with expected accent	Position	FoP or FoC	Inter-pretation Lo + Sn	Duration tonic	Duration postt.	Tonic frequency	Tonic contour	Jump	Contour of postt.
755	kráve E	initial	ˊ	ˊ(*) ˊ	longest	normal	normal	biggest pos. p.m.	normal	biggest pos. p.m.
746	kráve C	initial	typ. ˊ	ˊ	normal	normal	starts highest	normal	up; biggest	normal
					does not really sound contrastive					
746	kónji C	initial	ˊ	ˊ	only 1 example, no comparison possible					
759	stârček E	initial	typ. ˆ	ˆ	longest	longest	ends highest	biggest pos. p.m.	down; biggest	normal
747	stârček C	initial	ˊ	ˊ 0	not said contrastively					
747	šộlar C	initial	typ. ˆ	ˆ	only 1 example, no comparison possible					
763	ták E	initial	RF	ˆ	longest	-	starts, rises, ends highest	the only RF contour	-	-
766	zvečêr E	initial	RF	ˆ	longest	-	rises highest ends low	biggest p.m. the only neg. p.m.	-	-
756	páse E	mid-	ˊ	ˆ ˊ	longest	longest	starts low, ends highest	biggest R	normal	normal
760	čâka E	mid-	ˊ	ˊ(*) ˊ	longest	longest	normal	the only pos. p.m. R	normal	the only R
764	junák E	mid-	R	ˆ ˊ	longest	-	starts lowest, ends highest	biggest R	-	-
767	dân E	mid-	RF	ˆ	longest	-	starts, rises, ends highest	biggest contrasts	-	-
757	lẹ́pi E	mid-	IP	ˆ	longest	longest	starts, ends highest	biggest R	up; normal	biggest F
761	zdráve E	mid-	typ. ˆ	ˆ	longest	longest	starts, rises, ends highest	biggest R	down; biggest	biggest F
747	pomlâdi C	R end-nucl.	typ. ˆ	ˆ	only 1 example, no comparison possible					
758	trávi E	F end-nucl.	typ. ˆ	ˆ	longest	normal	starts, rises, ends highest	greater contrasts	too low to be measured	F too low to be measured
762	pomlâdi E	F end-nucl.	typ. ˆ	ˆ	longest	longest	starts, rises, ends highest	greater contrasts	too low to be measured	F too low to be measured
765	vdá E	F end-nucl.	RF	ˆ	longest	-	starts, rises, ends highest	greater contrasts R	-	-
768	končâ E	F end-nucl.	F	ˆ	longest	-	starts highest, ends highest	steepest F	-	-

Table 13 Ka. Accented words under emphatic or contrastive stress in a sentence.

6.2 ACCUSATIVE AND INSTRUMENTAL SG. of feminine nouns ending in -a and acuted in the nominative and genetive sg.

The accusative and instrumental singular in these nouns are expected to differ only as to accent. The expected accent in the accusative is the acute, and in the instrumental the circumflex.

With Ju and Ka the 3 series of utterances (I A expected acute on a R nucleus contrastively stressed; I B expected acute on a F nucleus contrastively stressed; II expected circumflex in neutral sentence intonation position normally stressed) do not form minimal pairs because they have different positions intonationally. We can thus only observe their realisations in different sentence intonation positions and under different stresses. With Pi we have expected minimal pairs.

6.2.1 Speaker Ju (Tables 14 Ju, pp. 200–201)

6.2.1.1 Expected acutes, contrastively stressed

I A on a R nucleus

All the 6 utterances on a R nucleus are typically acuted; they have acute FoPs, and are always perceived as such by both interpreters. There are 3 reasons for this: (1) expected accent; (2) R nucleus; (3) Ju's acute orientation.

The 2 utterances with the greatest negative pitch movement on the accented syllable (537, 545) have the greatest jumps up, and the utterance with the smallest jump up (549) has the greatest positive pitch movement on the postaccented syllable. This compensational tendency enables the speaker to move within approximately the same pitch range (cf. p. 77).

I B on a F nucleus

Of the 6 utterances on a F nucleus only 1 (537) has a jump up (´FoP) and the others all have a jump down (ˆFoP), the latter however is circumflex, type 4 (ˆ4), which with its concave contour on the accented syllable is acute-like (cf. p. 72). In spite of a concave tonic the fall (brought about by the F nucleus) in most cases starts at the end of the tonic, and we thus get 2 changes of direction on the tonic (FRF) which yields an S–contour (∽). This circumflex FoP thus is not typically circumflex. All the perceptions in this group are unanimous, 5 of them acuted, i.e. phonological (phonetically backed by a concave contour on the accented syllable) – an acute accent on a F nucleus – and 1 (549) is jointly perceived as circumflexed. It contains the only tonic with a circumflex-like contour (RF), has the shortest vowel, and a big jump down, while the R posttonic is something quite exceptional on a circumflex. That is why it was classified as having an indeterminate pattern.

6.2.1.2 Expected circumflexes, normally stressed

II in a neutral sentence intonation position

Where there is a zero jump or a jump up (538, 554) the 2 interpreters jointly perceive such an utterance as acuted, ignoring in 538 the high pitched tonic and the steeply F posttonic. In the remaining 4 utterances the interpretations differ or are less distinct. The tonic in all these cases has a higher pitch than in the corresponding expected acutes, the jump is always a definite jump down, followed by a F pitch movement on the posttonic. In spite of these circumflex features interpretations vary on account of the concave-like pitch contour of the tonic (cf. p. 72).

The durations of the expected acute and circumflex tonics cannot be compared because they are in different sentence intonation positions which influence their duration. The expected circumflex series moreover is problematic as to perceived accent anyhow. The perceived acutes on a R nucleus are definitely longest. A comparison of vowel duration between the perceived acutes on a R (I A) and on a F (I B) nucleus could show the extent of sentence intonation influence in the 2 series. Only the first 4 pairs can be compared and have the following differences in duration 0.8, 2.3, 2.6 and 0 csecs. The difference depending on the type of nucleus can thus be relatively large (cf. pp. 138, 144, 149 and 226). The postaccented vowel /o/ is the same in all words. On a R nucleus and contrastively stressed its averaged duration is 11.4 csecs., on a F 6.7 csecs., and in neutral position 6.4 csecs. We have here the same phenomenon already observed in the chapter on emphatic words, namely that Ju tends to lengthen the posttonic of the first word of a contrastively stressed pair. But whereas in 746 *kráve* (p. 189) the lengthened posttonic is very steeply R compared with the normally stressed words in the same position, one has the impression (there are no normally stressed words to compare these utterances with) that besides the duration of the posttonic the jump up is above average (for a low R) and thus is the second indicator of contrastive stress on a R nucleus, while the pitch movement on the posttonic is increased only in some cases (there where the jump up is relatively smaller, 537, 549). If we compare the durations of the posttonics in the R group with those in the other two, the difference certainly is striking and is brought about by 2 factors: (1) a R nucleus, and (2) contrastive stress.

6.2.2 Speaker Ka (Tables 14 Ka, pp. 202–203)

6.2.2.1 Expected acutes, contrastively stressed

I A on a R nucleus

Although the acute is the expected accent, and although the words are on a R nucleus (which favours the R accent) all the FoPs are circumflex and all perceptions (with 1 exception) are joint circumflexes. Contrastive stress brings out Ka's circumflex orientation: when a word is more than normally stressed, stress and tonal peak with Ka in this series tend to coincide, regardless of expected accent, and as a result we get the circumflex accent. Why Lo hears 549 *múlo* as acuted is not clear to me (cf. also Table 4 Ka, sonagram 626, p. 91). The FoPs are typically circumflexed, the accented syllables have a convex pitch contour (except 539), mostly positive pitch movement, a large jump down and steeply falling posttonics.

I B on a F nucleus

Though a F nucleus favours the circumflex accent in this group of expected acutes on a F nucleus only 2 utterances have a circumflex FoP and the remainder are F throughout and thus have an IP. In a contrastive pair clearly the first member only is strongly stressed, while the second is not. Most words are not stressed enough to have an initial R and so the F sentence intonation prevails. Only those words that have a convex (RF) accented pitch contour are jointly perceived as clearly circumflexed (539, 551, 553). About the rest Lo is in doubt, while Sn perceives them as definitely circumflexed. 537 *krávo* is the only joint acute and differs from the rest on account of its concave tonic. The interpretation of the two judges is phonological here, an acute accent on a F nucleus.

6.2.2.2 Expected circumflexes, normally stressed

II in a neutral sentence intonation position

In this group expected accent and Ka's circumflex orientation coincide, while sentence intonation is at its weakest. So the FoPs are circumflex, and in 2 cases (540, 546) IP, i.e. falling throughout, although the fall at the beginning of the tonic or on the tonic is gradual, not steep. Again, these utterances are not stressed enough to have a R.

In all 3 groups (I A, I B, II) the FoPs are mostly circumflex, a few are IP, and not one is acute. The perceptions are almost throughout joint circumflexes. Ka's circumflex orientation which is stronger than sentence intonation comes to the fore.

Concerning the vowel duration of accented vowels the 2 accents cannot play any role with Ka as he is circumflex throughout. The different nuclear positions influence vowel durations less systematically than with the other two speakers. The accent with Ka in all 3 groups (I A, I B, and II) is circumflex, so all the posttonics regardless of sentence position are F, most steeply F on a F nucleus (I B). The longest averaged posttonic is in neutral sentence intonation position, 8.8 csecs., followed by 7.9 csecs. on a R nucleus and 6.2 on a F nucleus. Compared with Ju the differences are small.

6.2.3 Speaker Pi (Tables 14 Pi, pp. 204–205)

6.2.3.1 Expected minimal pairs contrastively stressed

I A – expected acutes on a R nucleus
II A – expected circumflexes on a R nucleus
I B – expected acutes on a F nucleus
II B – expected circumflexes on a F nucleus

Pi in this series of expected minimal pairs is completely under the influence of sentence intonation, word accent is swamped by sentence intonation. Regardless of expected accent Pi uses the R intonation on a R nucleus and the F intonation on a F nucleus. In the two A-groups the FoPs are acute throughout and interpreted as such by both Lo and Sn, and in the two B-groups circumflexed or IP when F throughout, perceived as circumflexed.

The contrastive meaning of the pairs of words in a sentence makes him say the two words very distinctly which with Pi whose inherent word accent is more weakly rooted than Ju's and Ka's (cf. pp. 77 and 152), seems to strengthen the influence of the sentence intonation. We saw in Table 13 Pi (p. 194) that even under emphatic stress in *kráva/stârček* and *trávi/pomlâdi*, regardless of expected accent, sentence intonation overrules word accent, with the acute in initial and the circumflex in final position (cf. p. 191).

The expected minimal pairs are thus not realised at all.

The few differing perceptions in Pi's utterances should be mentioned here. Why Sn perceptions 551 *múlo* on a F nucleus with a circumflex FoP; and 552 *z mûlo* and 554 *s sōvo*, both on a F nucleus and an IP, all as acuted, is not clear (cf. Lo's acute perception of Ka 549 *múlo* /Table 14 I Ka, p. 202/ and Lo + Sn's acute perception of Ka 626 *lúka* /Tables 4 Ka, p. 91/, both with a circumflex FoP).

The only remainder of the 2 accents is the persistent difference in vowel duration. All the expected acutes have a longer vowel than the expected circumflexes in the same position. The duration difference varies from 0.4 to 2.2 csecs. Within the expected acuted series those on a R nucleus are longer than those on a F, while within the expected circumflexed series this tendency is weaker. This persistent vowel duration difference is surprising in a speaker who is the least systematic of the three as far as vowel duration is concerned (cf. p. 32).

In posttonics, however, Pi again upsets the expected pattern – his posttonics after a R nucleus are shorter, 6.5 csecs. on the average (6.6 and 6.4), and on a F nucleus 10 csecs. on the average (10.4 and 10.1). Unlike the other two speakers, he does not make any pause whatsoever after the first clause, while there is a pause at the end of the sentence, and hence the unexpected difference.

6.2.4 The basic characteristics of each speaker emerge in this series again. Ju's basically acute orientation: the expected acutes, whether on a R or F nucleus, are perceived as acuted in spite of a jump down on account of a F nucleus because the greater part of the tonic is not affected by the F. The perception is thus phonological not phonetic. The expected circumflexes have certain features of the circumflex accent and others of the acute, and so the interpretations of the 2 judges often differ.

Ka's utterances are circumflex regardless of sentence intonation. The unmarked accent dominates.

Pi's utterances are unaccented with sentence intonation dominating them completely: acutes on a R nucleus, and circumflexes on a F. Word accent with Pi is less firmly rooted than with the other two speakers.

No. sona-gram	A C C E N T expected (SSKJ)	FoP	Interpreter Lo	Interpreter Sn	D U R A T I O N of vowels in csecs.	T O N I C frequency in Hz	T O N I C p.m.	JUMP	POSTT. p.m.	AVERAGE FREQUENCY t.	AVERAGE FREQUENCY postt.	INTEN-SITY peak t.	INTEN-SITY peak postt.
	I A												
537	píto,	´3b	´	´	8.7 13.6	120/106	-14	+35	+ 5	113	145		+(?)
539	krávo,	´3b	´	´	17.4 12.8	103/88/94	- 9	+17	+22	95	127		+
545	péto,	´3b	´	´	13.2 10.2	106/86	-20	+38	+ 8	96	126		+(?)
547	nógo,	´3b	´	´	15.5 11.3	92/92/97	+ 5	+20	+12	94	121		+
549	múlo,	´1b	´	´	14.7 10.6	101/101/102	+ 1	0	+26	101	115		+
551	vǝ́rbo,	-	-	-									
553	lọ́ko,	´1b	´	´	13.2 9.8	95/95	0	+30	+ 5	95	126		+(?)
	I B												
539	píto.	ˆ4	´	´	7.9 6.0	110/103/111	+ 1	- x	- x	108	x	+	
537	krávo.	ˆ3c	´	´	15.1 9.8	94/90/93/90	- 4	+16	-11	92	102		+
547	péto.	ˆ4	´	´	10.6 6.4	104/100/103/102	- 2	- x	- x	102	x	+	
545	nógo.	ˆ4	´	´	15.5 6.8	100/96/100	0	- x	- x	99	x	+	
551	múlo.	-	-	-									
549	vǝ́rbo.	IP	ˆ	ˆ	7.5 6.0	106/111	+ 5	-40	+12	109	77	+	
553	sóvo.	ˆ4	´	´	14.3 5.3	106/100/102/97	- 9	-14	- x	101	x	+	

Table 14 I Ju. Accented words under contrastive stress in a sentence.

Case	accusative sg.	
expected accent	´	
type of stress	contrastive	
sentence intonation		
position	A: R-nucleus	B: F-nucleus
sentence frame	Vidim x̲́, ne pa ý.	Vidim ý, ne pa x̲́.
	(I can see x̲́, but not ý.)	(I can see y, but not x̲.)

No. sonagram	A C C E N T expected (SSKJ)	FoP	Interpreter Lo	Interpreter Sn	D U R A T I O N of vowels in csecs.		T O N I C frequency in Hz	p.m.	JUMP	POSTT. p.m.	AVERAGE FREQUENCY t.	postt.	INTENSITY peak t. postt.
	II												
538	s pîto	ˆ2	´	´	8.3	7.2	131/139	+ 8	0	-30	135	124	+
540	s krâvo	ˆ2	ˆ	´	14.3	5.3	105/106/120	+15	-24	- 2	110	95	+
546	s pēto	ˆ2	´(*)	ˆ(*)	10.9	7.2	105/114	+ 9	-16	-13	110	92	+
548	z nõgo	ˆ1	ˆ	ˆ(*)	12.8	6.8	110/115	+ 5	-15	- 3	113	99	+
550	z mûlo	ˆ1	ˆ	´	8.7	6.8	110/131/126	+16	-30	-14	122	116	+
552	z vârbo	-	-	-									
554	z lộko	´1c	´	´	10.6	5.3	100/99	- 1	+27	-18	100	117	+

Table 14 II Ju. Accented words in a sentence.

Case	instrumental sg.
expected accent	ˆ
type of stress	normal
sentence intonation	
position	medial (neutral)
sentence frame	Reci z X dvakrat, ne trikrat. (Say with X twice, not three times.)

No. sona-gram	A C C E N T expected (SSKJ)	FoP	Interpreter Lo	Interpreter Sn	D U R A T I O N of vowels in csecs.		T O N I C frequency in Hz	p.m.	JUMP	POSTT. p.m.	AVERAGE FREQUENCY t.	postt.	INTEN-SITY peak t.	postt.
	I A													
537	píto,	ˆ1	ˆ	ˆ	6.8	9.8	127/138/130	+ 3	- x	- x	132	x	+	
539	krávo,	ˆ1	ˆ	ˆ	13.6	7.5	104/106/94	-10	-29	-15	101	58		?
545	péto,	ˆ2	ˆ(*)	ˆ	9.8	8.3	90/106	+16	- x	- x	98	x	+	
547	nógo,	ˆ1	ˆ(*)	ˆ	12.4	6.8	87/98/88	+ 1	-21	-25	91	55	+	
549	múlo,	ˆ1	ˇ	ˆ	8.3	9.8	111/125	+14	-29	-34	118	79	+	
551	várbo,	ˆ2	ˆ	ˆ	6.0 (+r 5.3)	6.8	108/126	+18	-57	-16	117	61	+	
553	lóko,	ˆ2	ˆ	ˆ	9.1	6.4	84/104	+20	- x	- x	94	x	+	
	I B													
539	píto.	IP	ˆ	ˆ	6.8	4.5	102/94	- 8	- x	- x	98	x	+	
537	krávo.	IP	ˈ	ˈ	14.0	7.5	90/63/53	-37	- x	- x	69	x		?
547	péto.	IP	ˆ(*)	ˆ	9.8	6.8	110/72	-38	- x	- x	91	x	+	
545	nógo.	IP	ˆ(*)	ˆ	12.1	5.3	93/87	- 6	- x	- x	90	x	+	
551	múlo	ˆ1	ˆ	ˆ	9.1	7.5	100/108/99	- 1	-22	-40	102	57	+	
549	várbo	ˆ3	ˇ(*)	ˆ	5.3 (+r 5.3)	6.0	107/107	0	- x	- x	107	x	+	
553	sóvo.	IP	ˆ	ˆ	12.4	6.0	105/73	-32	- x	- x	89	x	+	

Table 14 I Ka. Accented words under contrastive stress in a sentence.

Case	accusative sg.	
expected accent	ˆ	
type of stress	contrastive	
sentence intonation		
position	A: R-nucleus	B: F-nucleus
sentence frame	Vidim x̲́, ne pa ý.	Vidim ý, ne pa x̲́.
	(I can see x̲́, and not ý.)	(I can see ý, and not x̲́.)

No. sona-gram	A C C E N T expected (SSKJ)	FoP	Interpreter Lo	Sn	D U R A T I O N of vowels in csecs.		T O N I C frequency in Hz	p.m.	JUMP	POSTT. p.m.	AVERAGE FREQUENCY t.	postt.	INTEN-SITY peak t.	postt.
	II													
538	s pîto	^1	^	^	7.2	10.2	124/128/123	- 1	- x	- x	125	x	+	
540	s krȃvo	IP	^	^	12.1	8.7	105/103/83	-22	-15	-20	97	58		+
546	s pēto	IP	^	^	10.6	9.4	107/104/100	- 7	- x	- x	104	x	+	
548	z nōgo	^1	^	^	11.3	7.5	94/104/95	+ 1	- x	- x	98	x	?	
550	z mûlo	^1	^*	^	7.9	9.1	98/110/104	+ 6	-24	-32	104	64	+	
552	z vә̂rbo	^1	^	^	6.8 (+r 5.3)	7.9	105/116/112	+ 7	-46	-10	111	61	+	
554	z lộko	^1	^*	^	9.1	8.7	106/118/106	0	- x	- x	110	x	+	

Table 14 II Ka. Accented words in a sentence.

Case	instrumental sg.
expected accent	^
type of stress	normal
sentence intonation	
position	medial (neutral)
sentence frame	Reci z X dvakrat, ne trikrat.
	(Say with X twice, not three times.)

No. sonagram	A C C E N T expected (SSKJ)	FoP	Interpreter Lo	Interpreter Sn	D U R A T I O N of vowels in csecs.		T O N I C frequency in Hz	p.m.	JUMP	POSTT. p.m.	AVERAGE FREQUENCY t.	postt.	INTENSITY peak t.	postt.
	I A													
537	píto,	ˊ1b	ˊ	ˊ	8.7	7.5	122/120	- 2	+30	+10	121	155	+	
539	krȃvo,	ˊ3c	ˊ	ˊ	11.3	6.8	114/109/113	- 1	+12	- 6	112	122		+
545	péto,	ˊ2c	ˊ	ˊ	11.3	6.8	118/124	+ 6	+14	- 8	121	134	+	
547	nǫ́go,	ˊ3b	ˊ	ˊ	12.1	6.0	118/114/118	0	+13	+ 5	117	134		+
549	múlo,	ˊ2b	ˊ	ˊ	9.1	7.2	125/134	+ 9	+ 8	- 4	130	142	+	
551	və́rbo,	ˊ2c	ˊ	ˊ	6.8	6.0	128/133	+ 5	+12	- 3	131	144	+	
553	lǫ́ko,	ˊ1c	ˊ	ˊ	10.6	6.0	128/130	+ 2	+29	- 9	129	155	+	
	II A													
538	s pîto,	ˊ2b	ˊ	ˊ	7.5	6.8	113/116	+ 3	+20	+ 8	115	140	+	
540	s krȃvo,	?	ˊ	ˊ	9.8	6.0	121/124/120	- 1	+12	- 3	122	131		+
546	s pȇto,	ˊ3b	ˊ	ˊ	10.9	6.8	124/117/120	- 4	+17	+11	120	143	+	
548	z nǫ̑go,	ˊ2a	ˊ	ˊ	10.6	6.0	112/118	+ 6	+24	+ 2	115	143	+	
550	z mûlo,	ˊ2b	ˊ	ˊ	7.5	7.2	117/130	+13	+ 8	+ 9	108	124	+	
552	z və̂rbo,	ˊ2b	ˊ	ˊ	6.0	6.0	119/128/128	+ 9	+13	+ 4	125	145	+	
554	z lǫ̂ko,	ˊ2c	ˊ	ˊ	8.3	5.7	119/128	+ 9	+26	- 8	124	150	+	

Table 14 Pi I A and II A. Expected minimal pairs under contrastive stress in a sentence.

Case	I A: accusative sg.	II A: instrumental sg.
expected accent	ˊ	ˆ
type of stress	contrastive	contrastive
sentence intonation		
position	R-nucleus	R-nucleus
sentence frame	Vidim x̲́, ne pa ý. (I can see x̲́, and not ý.)	Reci z x̲̂, ne pa z ŷ. (Say with x̲̂, and not with ŷ.)

No. sona-gram	A C C E N T expected (SSKJ)	FoP	Interpreter Lo	Interpreter Sn	D U R A T I O N of vowels in csecs.		T O N I C frequency in Hz	p.m.	JUMP	POSTT. p.m.	AVERAGE FREQUENCY t.	AVERAGE FREQUENCY postt.	INTEN-SITY peak t. postt.
	I B												
539	pſto.	^2	^	^	6.4	11.7	153/170	+17	-73	-35	162	80	+
537	krávo.	IP	^	^	12.8	10.6	153/102	-51	-19	-20	128	73	+
547	péto.	IP	^	^	9.8	12.1	150/132	-18	-42	-32	141	74	+
545	nógo.	^1	^	^	12.8	12.1	132/146/108	-24	-28	-24	139	127	+
551	múlo.	^1	^	´	9.1	7.5	130/135/126	- 4	-37	-26	130	76	+
549	vә́rbo.	^1	^	^	4.9	9.1	135/142/136	+ 1	-48	-30	138	73	+
553	sóvo.	IP	^	^	12.4	9.8	144/110	-34	-27	-23	127	72	+
	II B												
540	s pîto.	^1	^	^	5.3	10.6	160/178/164	+ 4	-61	-46	167	80	+
538	s krâvo.	IP	^	^	11.3	12.8	144/100	-44	-19	-22	122	70	+
548	s pêto.	IP	^	^	9.1	11.3	142/126	-16	-63	-30	134	48	+
546	z nōgo.	IP	^	^	12.1	11.3	140/110	-30	-29	-23	125	70	+
552	z mûlo.	IP	^	´	6.8	8.7	133/120	-13	-35	-21	127	75	+
550	z vә̂rbo.	^1	^	^	7.2	8.7	128/138/127	- 1	-47	-23	131	72	+
554	s sōvo.	IP	^	´	12.1	7.5	112/76	-36	0	-18	94	67	+

Table 14 Pi I B and II B. Expected minimal pairs under contrastive stress in a sentence.

	I B	II B
Case	accusative sg.	instrumental sg.
expected accent	´	^
type of stress	contrastive	contrastive
sentence intonation		
position	F-nucleus	F-nucleus
sentence frame	Vidim ý, ne pa x́. (I can see ý, and not x́.)	Reci z ŷ, ne pa z x̂. (Say with ŷ, and not with x̂.)

6.3 EXPECTED MINIMAL PAIRS (according to SSKJ)

In this series there are 3 pairs of barytones with the same sequence of sounds where expected word accent should be the only difference between them; and 2 pairs of oxytones, each with an expected short circumflex* and with an expected long one, the only difference between the two should thus be vowel duration. The text of the sentences is in the appendix (p. 263).

6.3.1 Speaker Ju (Table 15 Ju, p. 208)

Only 1 pair of barytones follows the expected course in every respect: 736 *lẹ́ta* has an acute FoP and is perceived as acuted by both interpreters; 741 *lẹ̑ta* has a circumflex FoP, and is perceived as circumflexed by both interpreters. 737 *písma* is perceived according to the expected accent although it has an IP: instead of a jump up it has a small jump down. This relatively small jump down may be attributed to the influence of a falling sentence intonation which – as has already been noticed (p. 72) – may be felt when we have more than a single word embedded in a frame, which in our case forms a sentence. As noticed elsewhere (p. 71) it is not so uncommon for a small jump down to be perceived as acuted. All the other features in this case are acute–like: a slightly falling tonic which is lower in pitch than the corresponding expected circumflex one and the pitch movement of the posttonic is neutral as it is level and not falling. The corresponding expected circumflex utterance 742 *pȋsma* is not problematic: it is circumflex throughout, FoP and both interpretations.

Of the third expected minimal pair the expected acute 738 *kọ́si* is acute throughout, FoP and perception; while the expected circumflex 743 *kọ̑si* has an acute–like tonic contour and a jump up the overall pitch of the tonic, however, is higher and its duration shorter than that of the corresponding acute, and the negative pitch movement on the posttonic is as large as the preceding jump up. Sn paying most attention to the contour of the tonic considers it acute, and Lo to the pitch of the tonic and posttonic, perceives it as circumflexed.

The duration difference between the expected short circumflex 745 *slȁb* and the expected long circumflex 740 *slâp* is 0.8 csecs. and should be below the perception level. 745 has a level accented vowel and Sn perceived it as unaccented on account of this, and 740 has a concave contour, which would indicate an acute, but is too short for an acute, so Sn cannot decide what she hears, while Lo is expected accent orientated and hears circumflexes in both cases.

All the acute barytones have longer accented vowels than the circumflexes.

*Although there are no oxytones with a short acute in Slovene the expression "short circumflex" is commonly used by Slovene linguists as a phonetic term.

In the second oxytone pair Ju makes a pause after the expected short circumflex 739 *lȁz* pronouncing it on a R nucleus and so the vowel under the influence of the sentence intonation is much longer than in the expected long circumflex 744 *lâs*. Sn interprets the long R accented vowel as acuted in 739, and Lo is expected accent orientated. 744 they both hear as circumflexed.

6.3.2 Speaker Ka (Table 15 Ka, p. 209)

Ka in the 3 expected minimal pair barytones does not follow the expected pattern. The accented syllables have hardly any pitch movement and are practically level, most of the jumps are proper jumps down, and the contour of the postaccented syllables is either falling or level, never rising. There is only 1 acute FoP (743 *kộsi*) and that on an expected circumflex. Two of the 3 expected circumflexes 742 *pîsma* and 741 *lệta* are jointly perceived as circumflex, and the third expected circumflex with an acute FoP (743 *kộsi*) is perceived as acuted or undecided (acuted/non-accented) while none of the expected acutes has an acute FoP and none of the perceptions in the expected acute series are unanimous. The acute FoP on an expected circumflex again shows that although Ka is circumflex orientated on the whole he may have an acute FoP in an unexpected position (cf. p. 65).

Vowel durations do not show any system.

Of the 2 oxytone minimal pairs Ka pronounced only 1 and that with the expected difference in length 0.7 csecs., which, however, is too short to be perceived. Both 739 *lȁz* and 744 *lâs* have a R contour. Lo perceived both as circumflexed, and Sn the more steeply R realisation (or rather the more quickly R) 739 *lȁz* as acuted, the less steeply as circumflexed (cf. Sn's theoretical views on both accents, p. 14).

6.3.3 Speaker Pi (Table 15 Pi, p. 210)

With Pi, compared with Ka, it is just the other way round: the expected acute barytones are jointly perceived as acutes (FoPs acute or indeterminate), while the expected circumflex barytones have differing perceptions, circumflex, non-accented or acute (FoPs ˆ3 or IP). In the expected acute – circumflex pairs the expected circumflexes are in all 3 cases higher in pitch than the expected acutes. That may be the reason why Lo interprets all 3 barytone pairs as to expected accent, while Sn perceives the two expected circumflexes with a level tonic (742, 743) as non-accented. There are no systematic duration differences between the two accents.

Pi in the two oxytones does not make the expected vowel duration differences: in the pair 745 *slȁb* – 740 *slâp* the two vowels are of the same length, and in the pair 739 *lȁz* – 744 *lâs*, the expected shorter vowel is longer than the expected longer one. 740 with a FL contour is perceived as not accented by Sn, and the others with R or RF contours are jointly perceived as circumflexed.

No. sona-gram	A C C E N T expected (SSKJ)	FoP FoC	Interpreter Lo	Sn	D U R A T I O N of vowels in csecs.		T O N I C frequency in Hz	p.m.	JUMP	POSTT. p.m.	AVERAGE FREQUENCY t.	postt.	INTEN-SITY peak t.	postt.
737	(ní) písma	IP	´	´(*)	7.5	9.8 (+ 3.8)	129/121	- 8	- 6	+ 1	125	116		+
742	(trî) pîsma	^3	^	^	7.2	8.3	133/135	+ 2	-42	-22	134	82	+	
736	(ôn) léta	´3c	´	´	12.8	11.3 (+ 4.5)	96/88/88	- 8	+26	- 5	91	112		+
741	(trî) lę̂ta	^1	^	^	11.7	10.2	125/129/123	- 2	-13	-35	126	93	+	
738	(Pẹ́ter) kọ́si (domâ)	´3c	´	´	11.3	7.9 (+ 5.7)	95/89/93	- 2	+33	- 3	92	123		+
743	(trije) kộsi (períla)	´3c?	´	´	10.2	4.1	121/116/129/127	+ 6	+11	-12	123	132	+	
745	slə̂b (pâdar)	L	^	0	8.3		113/111/112	- 1			112		+	
740	slə̂p (pâda)	FR	^	?	9.1		125/116/128	+ 3			123		+	
739	lə̂z (in bâjto)	R	^	´	12.8		97/123	+26			110		+	
744	lə̂s (v juhi)	R	^	^	9.1		105/115	+10			110		+	

Table 15 Ju. Five expected minimal pairs.

No. sona-gram	A C C E N T expected (SSKJ)	FoP FoC	Interpreter Lo	Interpreter Sn	D U R A T I O N of vowels in csecs.		T O N I C frequency in Hz	p.m.	JUMP	POSTT. p.m.	AVERAGE FREQUENCY t.	AVERAGE FREQUENCY postt.	INTEN-SITY peak t.	INTEN-SITY peak postt.
737	(ní) písma	ˆ1	´(*)	ˆ	6.4	5.7	119/122/119	0	-49	- 2	120	69		+
742	(trî) pîsma	ˆ3	ˆ	ˆ	4.9	7.2	117/115	- 2	-31	0	116	84		+
736	(ȍn) léta	IP	ˆ(*)	0 or ´	7.9	5.6	124/121	- 3	-14	-19	123	98	+	
741	(trî) lẹ̑ta	IP	ˆ	ˆ	9.1	6.0	117/113	- 4	- 2	-15	115	104	+	
738	(Pẹ́ter) kọ̑si (domȃ)	ˆ3	ˆ	´	8.7	4.5	115/114	- 1	-11	-23	115	92		?
743	(trije) kọ̑si (períla)	´1a	´	0 or ´	7.2	4.1	100/95/98	- 2	+18	0	98	116	?	?
745	slȃb (pȃdar)	L	ˆ	0	5.3		129/125	- 4			127		+	
740	slȃp (pȃda)	-	-	-										
739	lȁz (in bȃjto)	R	ˆ	´	12.1		78/108/108	+30			98		+	
744	lȃs (v juhi)	R	ˆ	ˆ	12.8		86/113	+27			100		+	

Table 15 Ka. Five expected minimal pairs.

No. sonagram	A C C E N T expected (SSKJ)	FoP FoC	Interpreter Lo	Sn	D U R A T I O N of vowels in csecs.		T O N I C frequency in Hz	p.m.	JUMP	POSTT. p.m.	AVERAGE FREQUENCY t.	postt.	INTENSITY peak t.	postt.
737	(ní) písma	IP	˙	˙	6.8	5.7	139/124	-15	-18	- 6	132	103	+	
742	(trȋ) pȋsma	^3	^	0	8.3	6.0	157/154	- 3	-36	- 8	156	114	+	
736	(ōn) léta	ˊ1c7	˙	˙	7.9	6.0	130/130	0	+ 4	-21	130	124	+	
741	(trȋ) lẹ̑ta	IP	^	˙	7.5	5.3	158/148	-10	-14	-17	153	126	+	
738	(Pẹ́ter) kọ́si (domȃ)	ˊ1c	˙	˙	8.7	4.9	130/128	- 2	+ 1	-11	129	124	0	0
743	(trije) kọ̑si (períla)	^3	^	0	7.5	3.8	160/160	0	-17	-14	160	136	+	
745	slȃb (pȃdar)	R	^	^	4.9		169/173	+ 4			171		+	
740	slȁp (pȃda)	FL	0	^	4.9		153/146/148	- 5			149		+	
739	lȁz (in bȁjto)	RF	^	^	11.3		109/197	+88			153		+	
744	lȃs (v juhi)	R	^	^	9.1		142/146	+ 4			144		+	

Tab Table 15 Pi. Five expected minimal pairs.

Chapter 7

VOWEL DURATION CONTINUED

7.1 In the present chapter we intend to deal with those aspects of word duration and length that have not been dealt with yet or enlarge upon others about which something more should be said.

7.1.1 Traditional grammar teaches that from the prosodic point of view vowels in SS fall into 3 groups: (1) long stressed vowels, (2) short stressed vowels, (3) short unstressed vowels (Toporišič 1984, 65). Since a stressed vowel, according to this theory, can be either short or long in the same position (i.e. in the last syllable of a word), length is phonologically relevant. Since a short vowel in the same position (i.e. in the last syllable) can be either stressed or unstressed, stress is phonologically relevant. There are thus 2 phonological prosodic features in SS: stress and length.

7.1.2 Our measurements of expected minimal pairs and of words of similar structure and expected length distinctions (Tables 16 Ju, Ka, Pi I and II, pp. 216–217) have shown that in SS as spoken in Ljubljana this expected length distinction does not exist any longer as none of the 3 speakers adheres to it.

In the nonsense series the 3 speakers were asked to pronounce the nonsense word group structured CV'CVC once with the second vowel long, and once with the second vowel short. Ju pronounced according to instructions and made a perceptible difference in vowel duration between the 2 groups. Ka too made a difference between the two though not large enough to be linguistically relevant, while Pi did not (could not?) follow the instructions. (For details see Tables 2 Ju, 2 Ka, 2 Pi, pp. 23, 26, 29; and pp. 31–32). (We certainly do not want to imply that Pi cannot make the difference between a longer and a shorter vowel as a matter of principle. In the acc./instr. series (Tables 14 Pi, pp. 204–205) Pi was the only one to make the expected length difference systematically though not always long enough to be linguistically relevant, i.e. perceived (p. 199). Though Ju was able to make a perceptible difference between a long and a short vowel, and Ka a difference, though not perceptible, in artificial words, no speaker, not even Ju, made this difference systematically and always in actual Slovene words.

E. Stankiewicz (1979, 130–131), although he did not carry out any actual measurements to prove it, knew of this type of SS and called it the colloquial form of the literary language. Not being a native speaker of Slovene he must have been told about it, perhaps by J. Rigler. Rigler was well aware of the fact that length was not distinctive in educated Slovene as spoken in Ljubljana and said that the length distinction was "held up artificially" (personal communication Nov. 24, 1983).

In SS as spoken by educated people in Ljubljana a vowel is longer when it is stressed, and shorter when it is unstressed. Length thus ceases to be an independent feature and becomes a supportive feature of stress. Length is a consequence of stress. Vowels in SS thus fall into 2 groups: stressed and unstressed; when stressed they are longer than when unstressed. All other conditions being equal, a stressed vowel is longer than an unstressed vowel. The longer a stressed vowel is the bigger is the duration difference between it and its unstressed counterpart (GP 7, p. 22). This difference thus varies as we have seen in the nonsense words where this problem has been studied in ideal conditions.

7.1.3 What makes stressed vowels (and unstressed vowels, though to a smaller extent) differ in length is their intrinsic duration. Thus a second factor comes into play: How long a vowel actually is does not depend on stress alone, but also on its intrinsic duration (pp. 24, 27, 30). Our measurements have shown that in most words the stressed vowel is the longest. Stress is thus the strongest influence on duration.

But there are cases where it is quite common and to be expected that an unstressed vowel is longer than the stressed one. This can happen when an intrinsically short vowel is stressed and an intrinsically long vowel in the same word is unstressed. If the 2 vowels in question belong to the two extreme ends of the scale of intrinsic duration, i.e. the stressed vowel is intrinsically very short, and the unstressed intrinsically very long, it may well happen that intrinsic duration prevails over stress, and the stressed vowel may as a result be shorter than the unstressed one. This may happen even more easily if other factors by themselves not nearly as influential as stress and intrinsic duration, happen to strengthen the 2 vowels in their trends towards extra long/short vowel duration. Instances of such words are discussed in greater detail in section 7.5 (Table 19 Ju, Ka, Pi, pp. 223–226). Other factors (besides stress and intrinsic duration) coinfluencing vowel duration are so numerous that we may miss some in our enumeration. Some have been investigated in this paper, while others not, as they would make this thesis too bulky although we are well aware of them.

7.1.4 Other factors that can influence vowel duration (cf. also Neppert & Pétursson 1986, 158–169):

1) The speaker's rate of speech. (Compare e.g. Pi's vowel durations in the nonsense series /Table 2 Pi, p. 29/ and the single word series /Tables 4 Pi, pp. 92–97/ with his vowel durations in the sentence series /Table 11 Pi, pp. 171–178/; Pi's vowel durations in the nonsense series /Table 2 Pi, p. 29/ with Ju's vowel durations in the same series /Table 2 Ju, p. 23 and p. 31/).

2) Syllabic structure: whether a syllable consists of a vowel only or of a consonant and vowel, V or CV; whether a syllable is open or closed. (See Tables 2 Ju, 2 Ka, 2 Pi, pp. 23, 26, 29).
3) Phonotactic conditions:*
   a) The manner of articulation of the consonant following the vowel. A vowel e.g. is longer before a fricative than before a plosive. (Compare e.g. the durations of /a/ in *páse* and *čáka* in Chapter 5.) Vowels tend to be shortest between two voiceless plosives (Tables 11 Ju, 11 Ka, 11 Pi, pp. 155–178).
   b) Voicedness of the consonant following the vowel: A vowel is longer before a voiced consonant than before a voiceless. This lengthening effect is not as strong in Slovene as in English. Compare e.g. Ju, Ka, Pi 620 *rúda* with 621 *rúti* in Tables 4 Ju, 4 Ka, 4 Pi, pp. 81, 91, 93.
   c) The influence of a preceding consonant on a vowel: its manner of articulation, its duration, its voicedness. This influence is weaker than (a) and (b) but it exists in Slovene just as in other languages.
4) The length of the word (isochronic conditioning). The duration of stressed /i/, e.g. in words of different length in Table 18 Ju, Ka, Pi, p. 222.
5) Sentence position of the word with the vowel under study: initial, medial or final; when final, the type of nucleus on which the word occurs; or does the word form a tone group of its own (See e.g. pp. 138, 144, 149; 226).
6) The influence of word accent (e.g. in Ju's oxytones pp. 31–32, Fig. 16b Ju, p. 111; in expected minimal pairs Table 15 Ju, p. 208).
7) The influence of tone-contour (e.g. in oxytones, pp. 61, 68, 73).
8) Type of stress – normal, emphatic, contrastive (pp. 187–194).
9) Dialectal background of the speaker (e.g. Sn's problems with Ju's vowel durations, p. 64).
10) Idiosyncratic characteristics of a speaker (e.g. the different relationships of the 3 speakers between stressed and prestressed vowels in the nonsense series, pp. 31–32).

*Data on these have been collected in this investigation in the nonsense series but have not been evaluated yet. Phonotactic influences on vowel duration have been studied by Peterson & Lehiste (1960), Delattre (1962), House (1961), Fischer-Jørgensen (1955, 1964), Lehiste (1970) etc.

Since vowel duration is not phonologically relevant in the type of Slovene studied in this investigation, since it is not an independent variable but depends on all kinds of factors, vowel duration is highly unstable. There is much more homogeneity as to vowel duration between the 3 English informants (material not used in this paper) although they come from different parts of England than between the 3 Slovene informants, all 3 living in Ljubljana and using SS as spoken in Ljubljana.

7.1.5 The Slovene vowel system would thus appear as follows:

stressed					unstressed				
i				u	i				u
	ẹ	ə	ọ			e	ə	o	
	e		o						
		a					a		

Fig. 63. The Slovene vowel system

We have thus 8 vowel phonemes in SS of which all 8 can appear in stressed position, and 6 in unstressed because close /ẹ/ and /ọ/ can appear only in stressed position.

7.1.6 Another consequence of the fact that length is not phonologically relevant is that we have no short and long accented syllables, but just accented. There is no short and long circumflex accent on oxytones, but just a circumflex accent. The so called "short circumflex" was only a phonetic term anyhow as its counterpart, a "short acute" on oxytones does not exist. More important is the fact that in this way we do away with such an anomaly as a "short acute" on barytones which has been introduced into SSKJ explicitly for /ə/ on account of its extra short duration. /ə/ is short, agreed, but it is shorter than the other vowels only on account of its short intrinsic duration which is a phonetic quality. It can, however, change its duration, i.e. become longer when stressed, be affected by an open syllable position etc. just as other vowels, though its duration range is smaller and consequently its changes are smaller (GP 7, p. 22). When in an open accented syllable it becomes too long for an /ə/ it tends to change in Slovene as spoken in Ljubljana into /e/ CF. SSKJ *stèza* [stə̀za] changes into [stéza], a form which is not accepted in SSKJ.

7.1.7 So far the following aspects of vowel duration have been dealt with: intrinsic duration, duration depending on position (i.e. syllable structure), durations of prestressed and poststressed vowels and the duration relationship between stressed and prestressed vowels in the nonsense series (pp. 19–32). In the single word series we studied vowel duration in connection with accent type and tone contour (pp. 61, 68, 73, 76–77, 104). The duration changes due to emphatic (and contrastive) stress were dealt with on pp. 187–194 and the duration differences in expected accentual minimal pairs on pp. 199, 204–205, 206–210.

The present chapter contains sections on:

7.2 vowel duration in Slovene oxytones,
7.3 on the duration of the vowel /ə/,
7.4 duration relationship between stressed and prestressed vowels in
7.4 actual Slovene words,
7.5 some words from the single word series in which unstressed vowels
7.5 are longer than stressed,
7.6 a short passage on the influence of nucleus type on vowel duration.

7.2 VOWEL DURATION IN SLOVENE OXYTONES

According to traditional grammar the only position in which vowel length is unpredictable and has thus a phonological status is in oxytones, where /i, u, e, o/ and /a/ can be either long or short. This is supposed to hold for SS and with few exceptions for practically all dialects (Toporišič 1984, 52).

To see whether this rule applies to our 3 speakers there are in my corpus some expected minimal pairs or similarly structured words with expected length differences.

As the length of a vowel in Slovene depends on its quality (= intrinsic length), on its adjacent sounds (especially the following sound), on the structure of the syllable, on the length of the word and of the tone–group (in a short word it is longer) and on its position in the sentence (initial, final, on a R, F nucleus) I tried to eliminate all these factors and compared vowels of the same quality, in the same or similar surroundings (as there are not so many minimal pairs) and in the same position in words and sentences of similar length. In most cases the comparison is thus carried out paradigmatically, and where it is not, this is explicitly mentioned, as these examples then carry less weight.

We can safely ignore word accent here (acute – longer, circumflex – shorter) as there is no word accent distinction on short oxytones. Phonetically they are considered circumflexes. Accent distinction can occur only on long oxytones, of which the great majority in closed syllables are circumflexed anyhow, and only a minority (mostly for morphological reasons) are supposed to be acuted. There are very few verbs in my corpus and most nouns are in the nominative singular.

I

No. sona-gram	SSKJ	Duration in csecs. Ju	Ka	Pi
559	sìt* (sem te)	5.3	3.8	4.5
560	bȉk	6.8	6.0	7.1
561	lîk	7.9	6.0	6.4
595	kàd	11.3	10.2	8.7
597	ràd	15.1	8.3	4.9
598	ràk	8.7	8.3	4.5
600	slȁb	11.7	6.8	6.8
599	trâk	13.2	7.5	6.8
593	mák or mȁk	11.7	8.3	8.3
740	slâp (pada)	9.1	-	4.9
745	slȃb (padar)	8.3	5.3	4.9
665	prȃv	23.4	14.3	12.8
664	kâl	24.2	15.1	14.3
616	pȍd (= tla)	14.3	9.1	9.8
606	shôd	12.1	7.5	7.5
611	dôb	17.4	10.6	7.5
669	nòv	19.6	12.8	7.9
674	gȍl	18.9	13.5	12.8
670	sộl	21.9	12.8	10.6
675	snọ̏v	18.1	11.3	6.8

Table 16 Ju, Ka Pi. A paradigmatic comparison of vowel length in oxytones with expected length differences.

* The full context of these words is found in the single word series, pp. 258-261, 263.

II

No. sonagram	SSKJ	Duration in csecs. Ju	Ka	Pi
514	Grem jagode brât, pa konec.	7.5	6.8	8.3
522	On je moj bràt, pa čeprav je tak.	6.8	9.1	7.5
516	Ràk je verjetno.	6.8	10.6	9.8
529	Trȁk je verjetno.	10.6	10.6	8.3
739	Zapustil je lȁz in bajto.	12.8*	12.1	11.3
744	Našel je lâs v juhi.	9.1	12.8	9.1
527	Ptȉč nastaja.	6.0	6.8	6.0
517	Kîč prodaja.	6.0	4.5	5.3
515	Pet sȋt sem prodal.	3.0	3.8	6.0
521	Sȉt sem te.	4.5	5.3	4.5
530	Lep kūp gnoja na njivi.	4.5	4.5	5.3
532	Dober kûp sem napravil.	3.8(+3.0)	6.0	4.5

Table 16 Ju, Ka, Pi. A paradigmatic comparison of vowel length in oxytones in sentences with expected length differences.

* Ju makes a R nucleus here.

III

No. sonagram	SSKJ	Duration in csecs. Ju			Ka			Pi		
528	Mràz gre skozi vàs ves čàs.	10.6	9.1	9.8	8.3	9.1	3.0 (+6.0)	9.8	9.8	8.7
519	Grȃd ni gàd, pravi škràt.	12.1	12.8	11.3	10.6	10.6	8.3	9.8	9.1	9.8
	Gȁd ni grȁd, pravi škrȁt.							8.3	9.8	9.1
523	Grȗnt ni šûnt, pravi fànt.	9.1	7.5		8.3	7.5		9.1	7.5	

Table 16 Ju, Ka, Pi. A syntagmatic comparison of vowel length in oxytones in sentences

7.3 THE DURATION OF THE VOWEL /ə/ IN SLOVENE WORDS

7.3.1 Since we have few data about the vowel /ə/ in the nonsense series, and that only with Ju, we shall take a closer look at a few words in the single word series where it occurs mostly in stressed position in actual words to study its duration.

No. sonagram	SSKJ	vowel durations in csecs. Ju		Ka		Pi	
629	pə̏s	7.2		6.0		6.4	
630	və̏ndərle	6.0	6.0	5.3	3.8	4.5	3.0
631	sə̀mənj	11.3	6.4	7.9	2.3	-	-
632	səmə̏nj	8.3	9.8	3.8	4.9	3.4	5.3
634	smə̂rt smərdí	7.5	8.3	2.6	3.4	3.0	3.0
555	gə̂rd (žep)	6.0		5.3		5.3	
556	(dva) gə́rda (žepa)	9.1		5.3		5.7	

Table 17 Ju, Ka Pi. The duration of the vowel /ə/ in some single words.

A cursory comparison of vowel duration in general in nonsense words and single words shows that Ju's and Ka's vowels tend to be shorter in the single word series, and Pi's rather longer. In spite of this we can see that /ə/ in the table contains shorter durations than any other vowel in Slovene. (Cf. also the vowel durations in Tables 14 I Ju, 14 I Ka, 14 II Ka, 14 Pi A, 14 Pi B, pp. 200 and 202–205). Vowels of under 4.5 csecs. duration (whether stressed or unstressed) do not exist in the nonsense series, but are fairly common with /ə/, and that even with Pi whose vowels in this series seem to be longer. Ju's /ə/s are longest, as usual, while Ka's and Pi's are shorter and move within approximately the same duration range.

Ju's 629 *pə̏s*, though in a closed syllable, is fairly long, but still below the averaged duration of short /i/ in the corresponding position in the nonsense series. Sn (from Upper Carniola) considered it unnaturally long. In some of the other closed syllables it is even longer (632 *səmə̏nj*, 634 *smə̂rt*). As any other vowel in an open syllable also /ə/ can be lengthened in this position as in 631 in Ju's and Ka's *sə̀mənj* which is considered a short acute according to SSKJ. That the open/closed syllable distinction seems to work even in unstressed position can be seen in Ju's and Ka's 632 *səmə̏nj* with a longer prestressed /ə/ in the open syllable than in 631 *sə̏mənj*, a poststressed /ə/ in a closed syllable. If we consider *smər-* in 634 *smərdí* an open syllable (ending in the most vowellike consonant; or is it voiced /d/ as compared with voiceless /t/ that lengthens the preceding /ə/), this would explain its great duration in Ju's pronunciation, exceeding even the preceding stressed /ə/ in a closed syllable in Ka's rendering.

That Ju in his vowel durations distinguishes clearly between an open and closed syllable (cf. Ju's duration table 2 Ju in the nonsense series, p. 23), while the other two speakers less, is confirmed also in 555 *gə̂rd* versus 556 *gə́rda*.

/ə/ does not behave differently from other Slovene vowels, it simply happens to have the shortest inherent duration.

7.3.2 This fact solves the problems Slovene grammarians have had with the length of /ə/ in the last 50 years:

Breznik (1934, 37–38) considered /ə/ always short though it could appear in an acuted barytone (e.g. *stèza*) which otherwise was always long. On account of /ə/ he postulated a short accented barytone. Bezlaj (1939, 83, 97) saw that /ə/ in a short acute barytone could be longer or just as long as acuted barytones containing /í/ and /ú/. Examples from his study of 2 utterances of the same word spoken by R: *píka* 9 3/4 and 8 3/4 csecs., *dúša* 11 1/4 and 9 3/4 csecs., *stə̀za* 10 1/2 and 10 csecs. So he did away with the short acute barytone /ə/. Šolar in his review (1939, 130–131) of Bezlaj's kymographic study was definitely against /ə/ in this or any other position being considered long and argued that then also stressed /ə/ in *pə̂s* (speaker R 11 1/2 and 11 csecs., p. 71) should be considered long. Šolar had noticed the extra shortness of stressed /i/ and said that according to this line of reasoning long /í/ would have to be abolished which he considered nonsense. Rigler in SSKJ (1970, p. XXIV) followed Breznik (and Šolar) and took over from him the unsystematic short barytone acute (e.g. *stə̀za*). Toporišič (personal communication about 1974) was of the opinion that there were experimental phonetic indications that /ə/, just as all other vowels, could be long as well. In his writings however, up to the latest (1984, 1985) /ə/ is a short vowel (only the combination stressed /ə + r/ is considered long, e.g. *smə̂rt*). Majdič (1983) says that to insist on short /ə/ on a barytone (e.g. *bə̀zəg*) is anachronistic since in central Slovenia in the general spoken language for decades long /ə/ has been used in this position. Obviously Majdič noticed by ear that the longest variety of /ə/, i.e. stressed in an open syllable, was of relatively long duration.

7.4 THE DURATION RELATIONSHIP STRESSED : PRESTRESSED VOWEL IN SOME SLOVENE WORDS (Table 18 Ju, Ka, Pi, p. 222)

7.4.1 We have only 8 word groups here to see how the relationship between stressed and prestressed syllables functions in actual Slovene words as this problem has been dealt with in the nonsense words chapter. In order to have all the words said with the same intonation pattern (low R) the speakers were asked to repeat the first word of the group at the end of the sequence. The first word is thus said twice: once with a R, and once with a F. This last utterance with a F nucleus is ignored here though it is found in the table as it may be useful when we study the influence intonation has on vowel duration.

Since a syntagmatic comparison of vowel duration in a word cannot be exact as a rule because the syllables of a word are usually differently structured, a paradigmatic comparison is made between stressed and prestressed syllables on a syllable of the same structure, once stressed and twice unstressed. Vowel duration is compared in 3 words with the same root morpheme to which new syllables are added thus causing the stress to move further away from the root. We are not only interested in the duration relationship between stressed and prestressed syllables, but also in the relationship between the vowels of the 2 prestressed syllables preceding the stressed vowel which we did not study in the nonsense words as we had no words with such a structure.

7.4.2 Speaker Ju

Ju spoke these words at approximately the same speed as the nonsense words. The average value of his stressed /i/ in the longest words 9.7 csecs. happens to be the same as in the averaged duration of stressed /i/ in open syllables in the nonsense series (Table 2 Ju, p. 23). The fact that in the series of Slovene words this averaged stressed /i/ always appears in 4–syllabic words, while in the nonsense words in shorter words, could mean that the words we are studying at the moment are said with a little longer stressed vowels than in the nonsense series. The shortening effect of word length however, may be counteracted by the lengthening effect of a R and by the fact that each of the Slovene words forms its own tone group, while the nonsense words were said within a sentence. The same averaged durations of Ju's prestressed vowels that immediately precede the stressed in both series, 7.5 and 7.6 csecs. respectively, are not surprising because unstressed syllables vary less in duration than stress-ed.

The figures about the actual Slovene words are less reliable as they refer to 1 example only, but when these are averaged, they fit in with the nonsense series. In the nonsense series an unstressed vowel amounted from 50 to 70% of the stressed one, 50% of the intrinsically longest, and 70% of the intrinsically shortest; in the series under study here the corresponding figures are 55–78%, 55% referring to the relationship between 2 intrinsically long vowels, and 78% to the relationship between a relatively short realization of an intrinsically long stressed vowel (sonagram 273) and the corresponding prestressed intrinsically long vowel. Therefore the duration difference between the 2 vowels is small, i.e. the percentage of the unstressed compared with the stressed large. On the average a prestressed vowel amounts to 65% of the stressed in a disyllabic word; the longer the stressed vowel, the greater the difference between the stressed and the corresponding unstressed tends to be (cf. GP 7, p. 22).

The observation made by Bezlaj (p. 3) that if 2 unstressed vowels precede a stressed, the second, the one adjacent to the stressed vowel, tends to be longer is confirmed by Ju, Ka and Pi. The difference between the two if we compare both with the stressed one is 13% with Ju, 16% with Ka and 12% with Pi, and is thus fairly steady. We can thus safely regard this a general characteristic of SS This can also be observed syntagmatically where the 2 prestressed vowels are o the same quality (e.g. in 274 *kozorộg*). Another fact which can be observed is how vowels, especially stressed vowels, tend to be shorter the longer a word is Compare in 271 the duration of the stressed / i/ in *tisk* with the stressed /i/ in *tiskovína*. As the former is monosyllabic and the latter 4–syllabic the difference in duration shows up clearly with all 3 speakers. Vowel duration, however, tends to be much more strongly affected by +stress than by word length.

7.4.3 Speaker Ka

Ka's stressed vowels (we should bear in mind that we have only 8 cases tend to be longer than the corresponding averaged values in the nonsense series while the difference between the corresponding prestressed vowels is negligible The words in this sequence with an enumeration intonation, where each word forms its tone group, are said with a R intonation, while the nonsense words have a neutral sentence intonation as they are in the middle of a sentence.

In the nonsense series an unstressed vowel amounted from 62 to 87% of the stressed, 62 when referring to a(n inherently) long stressed vowel and 87 to a(n inherently) short one. As some of the stressed vowels in the group that we are studying now are especially long the difference between it and its corresponding unstressed counterpart is relatively large and hence the low percentage. As a consequence the percentage can vary from 43 to 81%. With Ka there is little duration fluctuation in the prestressed vowels regardless of quality (= inherent duration) and they have a fairly steady length in both series. This, however does not hold for their stressed counterparts; though the fluctuation of stressed vowels in the nonsense series is somewhat toned down in the averaged figures it is striking in the actual Slovene words as the figures refer to single words: the extreme case in the averaged series is prestressed syllable 62% of the stressed and in the Slovene words 43%.

7.4.4 Speaker Pi.

While in the nonsense series Pi spoke at an "allegro" speed and his stressed vowels were as long as Ju's unstressed, he uses the longest vowels of the speakers in this series. Because Pi has changed his rate we cannot compare this series of Slovene words with his nonsense series.

It is interesting, however, that although his vowels are longest, the relationship between stressed and prestressed vowels in 2–syllabic and 4–syllabic words is the same as with Ju (Ju 65%, Pi 66; Ju 52%, Pi 54%). Ka's relationship between stressed and prestressed vowels in 2–syllabic words is similar (60%) his percentage–rate in 4–syllabic words, however, is lower (44%) on account of some extra long stressed vowels in this series and the small duration fluctuation within the prestressed vowels.

No. sona-gram	word (stressed vowel underlined)	speaker Ju						Ka						Pi					
		duration in csecs.																	
		on low R-nucleus				on low F-n		on low R-nucleus				on low F-n.		on low R nucleus				on low F-n.	
		1	1%	2	3	1	2	1	1%	2	3	1	2	1	1%	2	3	1	2
		vowel sequence																	
271	'tisk	9.8	100			9.1		9.8	100			8.3		12.8	100			8.3	
	ti'skar	6.8	69	14.3				7.9	81	16.6				8.3	65	18.1			
	tisko'vina	5.3	45	6.8	8.7			6.0	61	6.8	7.9			7.5	59	8.3	8.7		
270	'les	12.1	100			11.3		15.1	100			8.3		12.8	100			13.2	
	le'sa	6.8	56	14.3				6.8	45	18.1				9.4	73	17.0			
	leso'vina	7.2	60	7.5	9.8			4.9	32	7.5	9.4			7.5	59	8.3	9.8		
276	'tekma	9.8	100	10.2		8.3	9.1	7.2	100	9.8		6.8	7.5	10.9	100	9.8		10.9	9.8
	te'kmujem	6.0	61	10.2	7.5			5.3	74	6.0	6.8			6.8	62	8.3	8.3		
	tekmo'valen	4.9	50	8.7	13.6			6.0	83	5.7	10.6			5.3	49	6.4	9.8		
273	mah	10.6	100			10.9		13.6	100			10.6		15.8	100			11.3	
	ma'hu	8.3	78	12.1				7.2	53	11.3				12.1	77	15.1			
	maho'vina	6.8	64	5.3	9.8			5.3	39	7.2	8.7			7.2	46	6.0	8.7		
274	'koz	16.6	100			13.6		17.4	100			12.4		14.7	100			13.6	
	ko'zay	9.1	55	20.4				7.5	43	23.0				9.1	62	22.6			
	kozo'reg	7.2	43	9.8	11.3			5.3	30	8.7	13.2			8.3	56	7.5	10.6		
275	'dogma	12.1	100	6.0		12.8	11.3	8.3	100	9.8				13.2	100	12.8		10.2	7.5
	do'gmatičen	7.5	62	9.8	4.5			6.0	72	8.3	4.9			7.2	55	12.1	5.3		
269	'dom	14.3	100			12.1		16.2	100			14.0		15.1	100			15.1	
	do'moy	9.8	69	19.6				7.9	49	17.4				10.9	72	21.1			
	domo'vina	7.9	55	6.0	10.2			3.8	23	5.3	9.1			6.8	45	9.1	10.6		
272	'uk	10.2	100			6.8		11.3	100			9.1		12.1	100			10.6	
	u'kor	6.8	67	14.3				6.8	60	17.0				7.9	65	18.1			
	uko'vina	3.8	37	8.3	10.2			4.9	43	6.8	9.1			7.5	62	10.2	9.1		
Averaged vowel duration of																			
A stressed vowels		11.9						12.4						13.4					
B prestressed vowels																			
in 2-syll. words		7.6	65					6.9	60					9.0	66				
in 4-syll. words		6.2	52					5.2	44					7.2	54				

Table 18. A paradigmatic comparison of vowel duration in stressed and prestressed syllables (the first syllable) of 1-, 2-, 3- and 4-syllabic words with stress shifted from the first syllable.

7.5 SOME EXAMPLES OF A SHORTER STRESSED THAN UNSTRESSED VOWEL IN WORDS FROM THE SINGLE WORD SERIES (Table 19 Ju, Ka, Pi, p. 225)

Typical words with longer unstressed vowels than stressed pronounced s by all 3 speakers are 562 *síta*, 563 *sítast*, 583 *režím*, 668 *molîtev*, 642 *mejí*.

7.5.1 By far the most common vowel in stressed position is /i/ which on account of its short intrinsic duration in spite of the lengthening effect of stres can be outdone in length by an unstressed vowel of greatest intrinsic duration such as /a/ or /o/. This trend towards a short stressed vowel is supported by the following features: in 562, 563, 650 and 668 /i/ is followed by a voiceles plosive; in 583 and 650 /i/ is in a closed syllable. Word accent seems to play a minor role, if any at all. With acute orientated Ju we find more acutes in thi group, and with circumflex orientated Ka and with Pi more circumflexes. 64: *mejí na nas* has a shorter stressed vowel with all 3 speakers as it is intimately connected with the following 2 words. So this /i/ phonetically is not final.

The trend towards a long unstressed vowel is supported by the following features: in 562, 622, 630 and 668 it is in final position and the last is, moreover a diphthong; in 583, 589 642, 650 and 668 the prestressed vowel stands in an open syllable and is followed by a voiced consonant. The prestressed /e/ in 58: is longer also in compensation for the short preceding /r/. This also applies though to a lesser extent, to 668.

Pi has some unexpected examples: in 565 we have /i/ in both syllables and yet the stressed one is shorter. That the shortening effect of a voiceles plosive and the lengthening effect of a voiced nasal in the unstressed syllable should overrule stress lengthening is surprising. This also applies to Pi's 62: concerning /u/. Pi's stressed vowels can be the shortest of the 3 speakers, while his unstressed must have a certain minimal length to retain their identity, i.e not to be neutralised into /ə/. Hence the overlapping.

In spite of the fact that the stressed vowel in this series is shorter than the unstressed there exists no doubt whatsoever which vowel is stressed: it is always the expected stressed vowel that is perceived as stressed. Stress is the result of length and pitch (and intensity, p. 56). If one fails the other is stil there to exert its role.

7.5.2 When studying the components that make up the stress effect one should thus also study the frequencies of the vowels under stress not only their duration. (Table 20 Ju, Ka, Pi, p. 226).

One can clearly see from Table 20 that the prestressed vowel is generally slightly F (though the vowel often is too short for the F to be perceived) and is lower in pitch than the following stressed vowel which has a R somewhere in its course. Pi's prestressed vowels are not as much lower than the following stressed ones as with Ju and Ka. Ju's 650 *gajič* is an interesting case as i has quite symmetrical frequencies falling as much in the prestressed vowel as rising in the stressed. The stressed vowel, however, does not differ from the prestressed only in the direction of the contour, but it is also considerably longer (7.9–13.2 csecs.), the overall pitch of both vowels, however, is the same. The greater length and the R contour make the stressed vowel to be perceived as stressed. Even more interesting is Pi's 650 *gajȉč*. Here the prestressed syllable is both of higher pitch and of longer duration. Still, the 2nd syllable is perceived as stressed and not the 1st. In the end one comes to the conclusion that the primary distinction between prestressed – stressed is the movement of the contour, F on the prestressed vowel and R on the stressed, though, of course, the usual distinctions of a stressed vowel are greater length, higher pitch and a R somewhere in the course of its contour. Prestressed syllables, even when longer, do not have a R intonation, but a falling one, the lowest frequency point is at the end of the prestressed or at the beginning of the stressed syllable. The stressed syllable in ordinary circumstances is higher (= rising) in pitch than the prestressed if it is an oxytone. On a circumflex barytone stress and tonal peak coincide, we have thus the same situation as on an oxytone (whether this is acute or circumflex). The perception which syllable is stressed could become problematic (at least in theory) only in such an example as Ju 563 *sítast*. It is a typical acute and the tonal peak is not on the stressed but on the poststressed syllable. The stressed syllable here has neither the duration indicator, nor the pitch indicator (nor the intensity indicator) that it is stressed. Still, it is definitely perceived as stressed. One theory to explain this would be that the native speaker perceives length in terms of the intrinsic length of a vowel, not in terms of duration (= absolute length). This would mean that the intrinsically short /i/ with its 6.0 csecs. compared with the intrinsically long /a/ with its 7.2 csecs. is still perceived as longer. But what about such an example then as Ju 562 *síta* where the duration difference between the 2 vowels is much greater (6.8 – 16.2 csecs.) and the intrinsic vowel duration theory cannot explain it away. Such an example would indicate that stress on an acute barytone in spite of its delayed tonal peak and duration is perceived on the penultimate syllable. It would mean that the perception of a native speaker of Slovene is conditioned that way.

Speaker →		Ju				Ka				Pi			
No. sona-gram	word accent (SSKJ)	FoP or FoC	interpreter Lo	interpreter Sn	vowel durations in csecs.	FoP or FoC	interpreter Lo	interpreter Sn	vowel durations in csecs.	FoP or FoC	interpreter Lo	interpreter Sn	vowel durations in csecs.
562	síta	´3b	´	´	<u>6.8</u> 16.2	´3c	´	^	<u>5.3</u> 7.9	^2	^	´	<u>5.3</u> 7.2
563	sítast	´3b	´	´	<u>6.0</u> 7.2	^3	^	^	<u>4.5</u> 7.9	^1	^	^	<u>3.8</u> 7.2
630	vəndərle	^3	^	^	<u>6.0</u> 6.0 9.1	^1	^	^	<u>5.3</u> 3.8 7.2	´2c	^	^	<u>4.5</u> 3.0 6.0
650	gajȋč	-				-				R	´	^	7.5 4.9
583	režȋm	R	^	0´?	14.0 <u>7.2</u>	RF	^	^	10.2 <u>8.7</u>	RF	^	^	9.4 <u>6.8</u>
589	akǫ̑rd	-				-				L	^	0	6.8 <u>6.0</u>
668	molȋtev	^1	^	^	9.1 <u>6.0</u> 15.1	^2	^	^	7.5 <u>5.6</u> 12.4	^2	^	0	5.3 <u>4.9</u> 7.5
642	mejí	R	´	´	14.3 <u>5.3</u>	L	´	0	7.5 <u>4.1</u>	R	´	´	8.7 <u>5.6</u>
565	mȋting	-				-				^1	^	^(*)	<u>3.8</u> 4.5
622	rudnȋna	^2	^(*)	´	8.3 <u>10.6</u> 14.3	^1	^	^	4.9 <u>5.6</u> 7.2	^3	´	0´	6.0 <u>5.3</u> 7.2

Table 19 Ju, Ka, Pi. Some examples of a shorter stressed than unstressed vowel in words from the single word series.

No. sonagram	speaker	word	frequencies 1st vowel	2nd vowel	3rd vowel
583	Ju	režîm	100/93	103/123	
	Ka	režȋm	84/72	116/126/122	
	Pi	režȋm	142/116	120/140	
668	Ju	molîtev	102/96	124/172	97/81
	Ka	molîtev	88/82	91/98	x
	Pi	molîtev	137/137	131/150	144/124
622	Ju	rudnīna	104/97	103/114	113/97
	Ka	rudnīna	85/86	103/123/118	68/56
	Pi	rudnīna	122/123/116	132/142	138/131
650	Ju	gajȉč	111/96	96/111	
	Ka	gajȉč	78/73	88/106	
	Pi	gajȉč	133/121	120/126	

Table 20 Ju, Ka, Pi. Frequencies in Hz of some stressed and unstressed vowels. Unstressed vowels that are longer than stressed are underlined.

7.6 VOWEL DURATION UNDER THE INFLUENCE OF SENTENCE INTONATION (Table 21 Ju, Ka, Pi, p. 227)

A comparison of vowel duration on a (low) falling and a (low) rising nucleus in the few examples given here confirms the expected duration difference: a vowel rising in pitch tends to be definitely longer than a falling one. The averaged duration increase in this series with two speakers (Ju and Pi) amounts to +14 and to +18% respectively, and with the third (Pi) to +31% of the duration of the vowel in the same word said with a falling intonation. A larger corpus would yield more reliable data. It would also be of interest to find out if there exists, and to what extent, an interrelationship between vowel duration and degree of pitch change.

The *kráva – zdráve – trávi* examples (Ju, Ka, Pi, pp.c 138, 144, 149) of vowel duration in different sentence positions confirm the above findings They show that vowels in nucleus position generally are longer that those in initial or medial position, the latter are the shortest with all 3 speakers. They also confirm that a R nucleus has longer vowels than a F one.

No. sona-gram	speaker	Ju			Ka			Pi		
		vowel durations in csecs.								
	word	on LF nucl.	on LR nucl.	LF:LR in %	on LF nucl.	on LR nucl.	LF:LR in %	on LF nucl.	on LR nucl.	LF:LR in %
271	'tisk	9.1	9.8	108	8.3	9.8	118	8.3	12.8	154
270	'lẹs	11.3	12.1	107	8.3	15.1	182	13.2	12.8	97
276	'tẹkma	8.3	9.8	118	6.8	7.2	106	10.9	10.9	100
273	'mah	10.9	10.6	97	10.6	13.6	128	11.3	15.8	140
274	'koz	13.6	16.6	122	12.4	17.4	140	13.6	14.7	108
275	'dọgma	12.8	12.1	95	-	-	-	10.2	13.2	129
269	'dọm	12.1	14.3	118	14.0	16.2	116	15.1	15.1	100
272	'uk	6.8	10.2	150	9.1	11.3	124	10.6	12.1	114
Averaged		10.6	11.9	114	9.9	12.4	131	11.7	13.4	118

Table 21 Ju, Ka, Pi. A comparison of vowel duration on a low falling and low rising nucleus.

Chapter 8

WORD ACCENT – SUMMARY

8.1 Stress in SS entails a rise. The fundamental contour of word accent is a rise. It appears in its purest form in a neutral sentence intonation position. The stronger a word is stressed the steeper the rise in the accent domain tends to be. The rise ends in the tonal peak. This is followed by a fall:

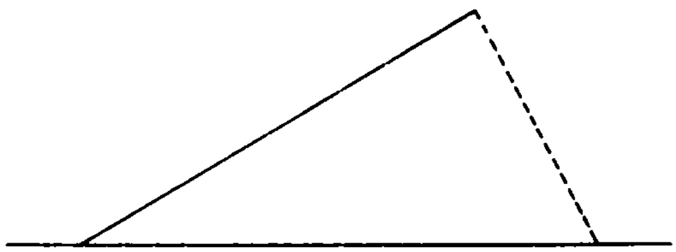

Fig. 64. The basic contour of word accent in SS.

8.2 This fall belongs to the accent domain if it is on the postaccented syllable, but is really outside its domain on the syllable following the postaccented syllable. In a finally stressed word (an oxytone) the domain of accent is the accented syllable, while in a non–finally accented word (a barytone) the accented and postaccented syllable form its domain. The difference between the circumflex accent (Accent 1) and the acute accent (Accent 2) is in the different timing of the tonal peak. A circumflex barytone has its tonal peak on the accented syllable and an acute barytone on the postaccented syllable. With accent 1 stress and tonal peak coincide, both are on the accented syllable; with accent 2 they do not, the tonal peak is not on the stressed (accented) syllable, but on the poststressed (postaccented) – (Fig. 65).

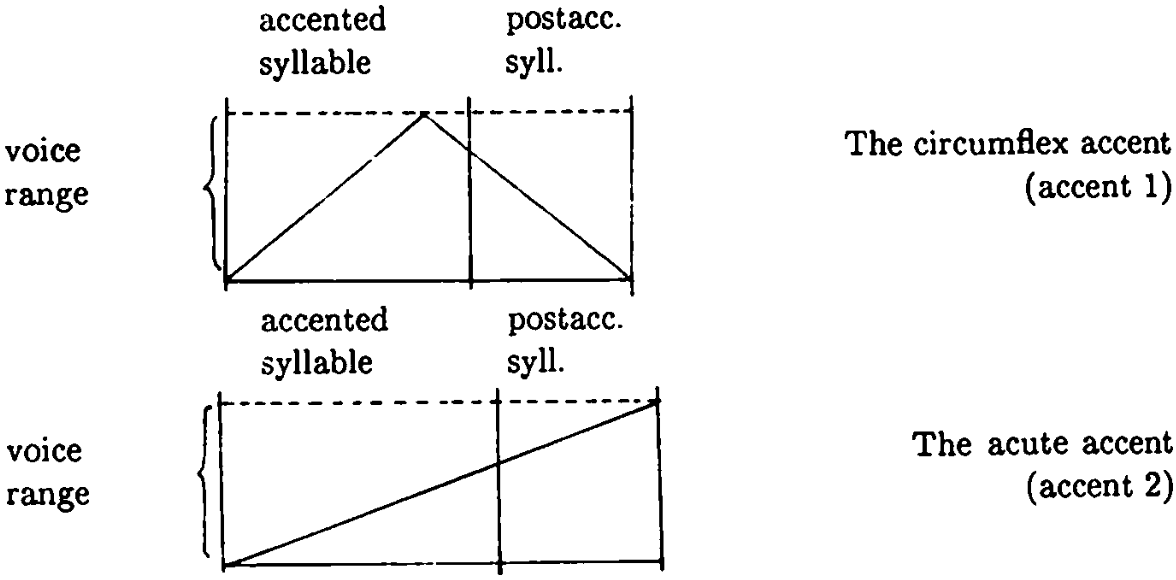

Fig. 65. Schematic contours of the circumflex and thc acute accent on a barytone.

8.3 This basic difference carries with it a number of consequences: the circumflex has a quicker and a steeper rise and the acute has a slower and thus a gentler rise. The accented vowel of a circumflexed barytone with its tonal peak on the accented syllable is of higher pitch than the accented vowel of an acuted barytone where the tonal peak is on the postaccented syllable. The relationship between accented and postaccented vowels is: accented vowel of higher pitch – postaccented vowel of lower pitch with the circumflex accent; accented vowel of lower pitch – postaccented vowel of higher pitch with the acute accent (cf. Valjavec 1897, 118; Vodušek 27; Toporišič 1968, 322 ff.).

8.4 The rise or fall can continue without any hindrance or interruption between two vowels (syllables) only if a sonorant consonant occurs between them. A voiceless consonant, especially a plosive, cuts short the contour, though "it is still there" during the articulation of the consonant and reappears at the beginning of the postaccented vowel either at higher frequencies (= jump up) with the acute accent or at lower frequencies (= jump down) with the circumflex accent. Thc longer the accented vowel with the acute accent, the less it is "in a hurry" to rise: if it is long enough it "may even have time" to fall a little before it starts to rise (a concave shape), and the fall on the accented syllable may be greater than the rise on that syllable, the overall pitch movement on the accented syllable may be negative, followed by a relatively large jump up and a rising postaccented vowel, sometimes also a falling one. The fall on a postaccented acuted barytone tends not to exceed the preceding jump up. A fundamental frequency pattern (FoP) with a concave accented syllable followed by a jump up and a rising (or slightly falling) postaccented vowel is typically acute and was always interpreted as such by both judges Lo and Sn.

8.5 An accented syllable having the circumflex accent may reach the tonal peak at the very end of the syllable or earlier; if earlier the contour of the tonic is convex. The fall starts immediately after the tonal peak, i.e. at the end of the accented vowel or a little earlier and "continues" during the articulation of the consonant, even if it is voiceless, and reappears at the beginning of the postaccented vowel at lower frequencies as a jump down. The fall continues on the postaccented vowel. An accented barytone with a relatively steeply and continuously rising tonic, a tonal peak on it and a large jump down which continues on the posttonic is a typical circumflex accent and was generally recognised as such by both Lo and Sn. A circumflex accent may start at a higher frequency than an acute, but not necessarily. The averaged pitch range within which Ju (the speaker who is most systematic) moves in his single word barytones, regardless of accent, is between about 100–108 Hz at the lower end, and 124–129 Hz at the upper end (p. 77). The delayed rise on an acuted barytone helps to keep the speaker's tonal peak within his normal voice range.

8.6 As each of the two accents has recurring patterns on barytones these have been formalized and are found on p. XXI. The jump up/jump down is considered the distinctive feature of the two accents. According to its allotonic variants the acute is divided into 3 classes, each with 3 subgroups, and the circumflex into 4 classes. The averaged figures of most of the FoPs of the 3 speakers from the single word series are on pp. 76–77 and Table 10 Ju, Ka, Pi, p. 104. See also the graphs on pp. 105–132.

8.7 The analysis given by Haugen and Joos (1952) about the phonological difference between the 2 accents in Norwegian and formalized by Ove Lorentz (1981, 177) can be applied to SS as well:

$$\text{Accent 1:} \quad \overset{\text{S}}{\begin{bmatrix} \text{1 stress} \\ - \text{ delayed tone} \end{bmatrix}} \qquad \text{Accent 2:} \quad \overset{\text{S}}{\begin{bmatrix} \text{1 stress} \\ + \text{ delayed tone} \end{bmatrix}}$$

S = syllable   Accent 1 = circumflex in SS
tone = tonal peak   Accent 2 = acute in SS

8.8 Not all the FoPs, however, have all the characteristics that were mentioned as typical of accent 1 or accent 2. FoP ˆ4 although forming the 4th class of a circumflex FoP on account of its jump down is not really a typical circumflex any more (cf. p. 72). Its accented vowel has the contour of a typical acute FoP, while the jump down is typically circumflex. If the jump down is great enough, a barytone with this pattern is jointly perceived as circumflex, otherwise not; another supportive feature for a circumflex perception in such a case is positive pitch movement of the tonic.

8.9 The possible combinations of features typical of accent 1 with those typical of accent 2 are infinite. FoPs that were properly falling throughout were classified as indeterminate (IP). Fundamental frequency is only falling in a word that is not stressed enough or has a falling nucleus intonation. If an accented word does not have all the above mentioned features typical of one accent, it is interpreted according to the features that the listener perceives as more prominent and more important, or according to the sum of features that point towards a certain accent type. Thus in certain such ambiguous utterances one interpreter may pay more attention to pitch and the other to contour. And if the former points in one direction and the latter in another, the two interpretations may differ. Borderline cases are discussed in great detail in chapters 4 and 5.

8.10 Referring to what Rigler said about preferring to study word accent live rather than recorded because imprecise realizations cannot be solved by experimental methods either (p. 7), I agree, but with the important proviso that what an apparatus *can* do, and aural perception cannot, is to show exactly what these borderline cases look like in phonetic terms, when they tend to occur and how the human mind works when trying to solve them.

8.11 Another psychologically strong influence on the perception of a less specific pattern may be expected accent. In such a case expected accent may well be decisive. As both judges have gone through the whole lexicon of Slovene and know expected accent well it can exert a strong influence in an ambiguous situation (e.g. Pi barytones on p. 71). When, however, the FoP is typical, its influence is eliminated (cf. typical acute FoPs in Ka's expected circumflex utterances and their identifications – Summary Table 6 Ka, p. 100).

8.12 We have said that accent type depends on the timing of the tonal peak in an accented word. This peak tends to appear earlier with Ka and later with Ju. Ka thus has more circumflexes and Ju more acutes. This shows up even in the type of circumflexes of the two speakers. With Ka, type ˆ1 predominates on account of its earlier peak on the tonic, and with Ju, when we have the circumflex accent, type ˆ2 with its peak at the very end of the tonic is more common than type ˆ1 (Table 10 Ju, Ka, Pi, p. 104). 64% of Ju's oxytones are only R, and 64% of Ka's RF (p. 78).

8.13 In the single word series where all the words appear in the middle of a tone group in an intonationally neutral position the fundamental frequency contours of these words appear, as already mentioned in recurring patterns. The higher or lower pitch of the accented syllable is thus only a consequence of this contour (see Fig. 65, p. 230). In words appearing in a sentence, word accent is influenced by sentence intonation, and the contour patterns typical of the acute and circumflex accent may be blurred. What may remain in sucl cases may be the higher or lower overall pitch of the accented syllable. Toporiši (1968) and Neweklowsky (1973) made their acoustic studies of word accent i1 Slovene in such a situation and thus had to pay more attention to pitch thai to contour. Rigler, as a lexicographer, made his auditive studies of word ac cent in a neutral sentence intonation position. This explains his remark to m (Dec. 13, 1984) that Toporišič had paid "too much attention to pitch and to little to contour and to other factors coinfluencing the ultimate perception o accent type". Every word has its inherent word accent pattern in the mind o its speaker which is independent of context, every word in actual use, howevei appears in context and is influenced by sentence intonation.

8.14 When Lo and Sn were asked whether they defined accent type i1 a sentence according to its actual shape (phonetically) or as e.g. the acut accent on a falling nucleus, or the circumflex accent in initial position (phonolo gically), they both stated firmly that they defined accent according to its actua shape (phonetically). In the examples of word accent in sentences, however, n constant principles as to how this was done could be detected. But the inter pretations, certainly, were not always phonetic: sometimes one way, sometime another, sometimes not accented, and differing considerably between the tw interpreters. When sentence intonation set in at the beginning of an accen domain one had the impression that the interpretation was a matter of chanc rather than choice.

8.15 Another factor influencing word accent in sentences is how deepl rooted word accent is with a speaker. Pi has smaller jumps, less specific FoP and his word accent is much more easily overpowered by, for example, sen tence intonation than with Ju. So the influence of a falling nucleus on Ju' acute barytone *trávi* sets in only on the posttonic, not on the tonic. The toni remains typically acuted, but on account of a falling nucleus is followed by jump down. The joint perception is acuted in all its utterances though the vita cue, the jump up, is missing. This interpretation, clearly, is that of an acut on a falling nucleus – phonological not phonetic. With Pi, on the other hand in the same word in the same position the sentence intonation influence set in right at the beginning of the accented syllable and the utterances are thu falling throughout: the perceptions are mostly differing between the two judge and also differing as to accent type, acuted, less distinctly acuted, circumflexed or non-accented (Table 11 Ju, p. 161; Table 11 Pi, p. 177; pp. 138–139, 149 151).

8.16 The influence of sentence intonation is strongest on the nucleus (I or F), less strong initially (R), and weakest in the middle of a tone group (cf Toporišič 1968, 325; Neweklowsky 1973, 112, 158).

	FoP	acute		circumflex		
	Speaker or interpreter	no. of cases	percen-tage	no. of cases	percen-tage	averaged percen-tage
	Ju	41		20		
1	Lo	34	83	18	90	87
2	Sn	39	95	9	45	70
3	Lo + Sn	33	80	9	45	63
	averaged (1 + 2)		89		68	79
	Ka	15		45		
1	Lo	15	100	38	84	92
2	Sn	13	87	39	87	87
3	Lo + Sn	13	87	34	76	82
	averaged (1 + 2)		94		86	90
	Pi	15		36		
1	Lo	11	73	21	58	66
2	Sn	12	80	8	22	51
3	Lo + Sn	11	73	7	19	46
	averaged (1 + 2)		77		40	59

Table 22 Ju, Ka, Pi. Relationship between FoPs and their interpretations as to accent type, speaker and interpreter in the single word series.

8.17 Commentary on Table 22 Ju, Ka, Pi. Ka's FoPs are clearest. Considering Lo's and Sn's separate interpretations (averaged 1 + 2 in the tables) there is 90% agreement between FoP and interpretation. Although Ka is circumflex orientated his acutes are typical, they are only fewer in number. His jumps in both accents are greatest.

This agreement falls to 79% with Ju. It is especially low with Sn's perception of Ju's circumflexes (see p. 59). An interesting feature is the only case with the 3 speakers where the percentage of perceived circumflex FoPs is higher than that of the acute, Lo 9o% versus 83%.

Pi's FoPs are least specific, agreement between the FoPs and interpretation is lowest and it falls to 59%. Pi's acutes have the features characterizing the acute accent, his circumflexes, however, are less clear. Their jumps down are not large enough, and the frequencies of the tonics do not differ from the acuted. It is easier for a native speaker of Slovene to perceive a jump up than a jump down of the same size. Acutes are obviously easier to perceive than circumflexes. With 1 exception the percentage of agreement between the FoP and interpretation is always higher with acute than with circumflex FoPs.

8.18 The difference between the acute and circumflex accent is easier to realize on a barytone than on an oxytone because of its longer accent domain: 2 syllables on a barytone, and 1 syllable on an oxytone. The interplay of duration (influencing contour), pitch, pitch movement, tonal peak (and intensity, see pp. 56–57) is easier to follow and perceive when it is distributed over a longer period of time than when all these features are telescoped into a single syllable which in actual speech more often than not is overlaid by sentence intonation as well. Besides, the most important indicator of accent type, the jump, is missing on an oxytone.

8.19 When the 4 phoneticians Logar, Rigler, Snedic and Žagar were asked whether they found accent easier to define on barytones or oxytones, three unhesitatingly said on barytones, and only one, Snedic, on oxytones. This may be due to the latter's Upper Carniolan origin where the two accents may still be very much alive on oxytones, or to her extremely acute sense of hearing, extra sensitive to pitch and contour. I certainly agree with the 3 above mentioned phoneticians that the syntagmatic parameter (tonic – posttonic) is more easily decoded by a native speaker of Slovene than the paradigmatic one with oxytones.

8.20 Of the 3 speakers only 1, Ju, can pronounce a typical acute oxytone, and that in neutral sentence intonation position. The contour of an oxytone in this position can be R, F, RF, FR, or L. As to duration a L contour tends to be shortest, followed by a F contour, R contour, and the 2 contours with a change of direction within them, FR and RF, are longest. If a vowel with a L contour is too short for its contour to be perceived and has a high enough pitch it can be perceived as circumflexed.

A vowel in neutral sentence intonation position should not be falling if accented. An accented oxytone should have a rise at some point of its contour. It should be thus R, RF or FR. A RF is typically circumflex, a FR is less common in an oxytone and is generally perceived as acuted. A R contour is common: it can be either circumflexed or acuted, depending on its duration, the steepness of its R and on its pitch. A circumflex oxytone is shorter, and on account of that its R is steeper, and it tends to end at a higher pitch than an acute, and can also begin at a higher pitch though not necessarily (see Ju's graphs of averaged acuted and circumflexed R oxytones Figs. 16a Ju and 16b Ju p. 111). On account of its shorter duration and steeper R the circumflex oxytone has to be pronounced with more energy than an acute oxytone. In connection with this one is reminded of Svend Smith, who speaking of a Danish dialect expressed the opinion that there is a difference in the innervation of the 2 accents: in the circumflex it is short and intense, in the acute long and relatively weak (Smith 1948, pp. 33–39). A circumflex oxytone can thus be either only R or RF, the former of shorter duration, and the latter longer. The duration difference between a R acute and a R circumflex oxytone is much more important than with barytones, where the jump up or down is decisive. Since the acute on oxytones is rare on root morphemes, thus has a small functional load, and basically has the same contour as a circumflexed oxytone, it is only natural that it seems to be dying out in the type of Slovene studied here – a phenomenon of which O. Broch was already aware when he said that it was often difficult to tell the two accents apart on an oxytone (1911, 325).

8.21 We consider the acute accent as the marked accent for the following reasons:

1) While with a non–finally accented circumflex, stress and tonal peak coincide on the accented syllable as in stress accent languages (e.g. English), they do not with the acute accent as we have delayed tonal peak on the postaccented syllable.
2) When an expected acute accent is replaced by a circumflex this goes unnoticed, while an expected circumflex replaced by an acute accent is immediately noticed (Rigler 1968, 196). The acute accent sounds more specific (= marked) to a native listener.
3) It is easier to identify an acute FoP than a circumflex regardless of speaker and listener. A jump up is easier to perceive than a jump down of the same size.
4) The circumflex accent is by far more common on oxytones.
5) The most common accent in recently acquired loanwords is the circumflex (Rigler 1968, 198).
6) The dialects of Styria which are non–tonematic are said to have a stress pattern which reminds one of the central Slovene circumflex and have no acute so that word accent has no phonological role (Snedic, personal communication).

The loss of the acute accent seems to be a sign of loss of tonemicity. In such a case the circumflex accent prevails. Listening to our 3 speakers Ju sounds most tonematic to a native speaker. This is so because Ju is acute orientated and uses most acutes. Ju pronounces all the expected acutes in the single word series, whether barytones or oxytones, acuted. In the very limited vocabulary in our corpus in the single word series (from 130 to 140 words, depending on the speaker) Ju pronounces all the expected acutes as typically acuted; Pi about 3/4 of the barytones, while of the few expected acuted oxytones most are considered acuted on account of expected accent; Ka however, pronounces typical acutes in only 39% of expected acute barytones, and does not really use the acute accent in oxytones.

8.22 When classifying the accent of single words Rigler was well aware that not all people speaking tonematic SS in Ljubljana would have exactly the same accent distribution. Words that his informants would pronounce with different accents he marked as ¯. Generally speaking we can say that Rigler's classification of the vocabulary of SS holds for speakers of SS in Ljubljana though not for all of them and not with all words as Rigler was well aware (1968, 195, 197) when trying to identify the distribution of the 2 accents; hence the many "allowed" variants in SSKJ. Word accent distinction is more firmly rooted with barytones than with oxytones where it seems to be disappearing. Rigler does not mention this phenomenon in SS though he speaks about the "threatened" acute oxytone in certain dialects or in certain positions in certain dialects (1980, 219).

8.23 Considering the whole accent domain of a barytone with the jump as its distinctive feature one can speak about the circumflex as a falling accent and about the acute as a rising accent in spite of the positive pitch movement of the tonic with the circumflex and the usually negative pitch movement with the acute. On oxytones however, with the one speaker Ju who still distinguishes the 2 accents properly a circumflex can be either only rising or rising–falling and an acute rising.

VOKALDAUER UND WORTAKZENT IN DER SLOWENISCHEN LITERATURSPRACHE

(Eine akustische und linguistische Untersuchung)

Zusammenfassung

Als Material dienten Tonbandaufnahmen von 3 Informanten (Ju, Ka, Pi) aus Ljubljana, die alle sonagraphiert wurden. Die Lautdauer und Frequenzmessungen im 3. und 4. Kapitel wurden mit Hilfe des Computers bearbeitet. Das ganze Material, das den Wortakzent untersucht, wurde von 2 Informanten (T. Logar und U. Snedic) perzeptuell interpretiert. Der slowenische Wortakzent wurde untersucht in einer Serie von slowenischen Wörtern in neutraler Satzposition (im 4. Kap.), in einer Serie von 4 Sätzen (die gleichen, die Toporišič zu gleichen Zwecken studierte) (im 5.Kap.), auch unter emphatischer Betonung, ferner in einer Gruppe von semantischen akzentuellen Minimalpaaren und in einer Gruppe von morphologischen Minimalpaaren (alles im 6. Kap.). Die Beschreibung der Parameter, die beim Wortakzent gemessen worden sind, befindet sich S. 56–57.

Das 3. Kapitel bildet eine geschlossene Einheit und behandelt auf Grund künstlicher Nonsensewörter die inhärente Lautdauer und Frequenz der slowenischen Vokale, die Dauerverhältnisse zwischen betonten und unbetonten Vokalen, den Einfluß der Silbenstruktur auf die Lautdauer, kurze und lange Lautdauer in der Ultima, alles in idealen Verhältnissen. Alle Ergebnisse sind numerisch und graphisch wiedergegeben.

Auf Grund der Sonagramme wurden formalisierte Grundfrequenzmuster für die Barytona (S. XXI) für beide slowenische Akzente erstellt und alle Barytona wurden danach klassifiziert. Bei den Oxytona, deren Domäne nur eine Silbe ist, braucht man nicht von Grundfrequenzmustern zu reden, sondern nur von Grundfrequenzverläufen (steigend, fallend, steigend–fallend, fallend–steigend und eben). Wenn das Grundfrequenzmuster und die Hörwahrnehmung beider Informanten übereinstimmten, wurde eine solche Realisation als typisch, typisch Zirkumflex oder typisch Akut betrachtet (S. 230–231). Noch interessanter waren die Fälle, wo sie nicht übereinstimmten: hier versuchte ich die Gründe dafür ausfindig zu machen. Die Abbildungen auf S. 105–132 sind durchschnittliche typische, weniger typische, Grenzfälle und einzelne Grundfrequenzmuster und Tonverläufe der beiden Akzente auf den Barytona und Oxytona der 3 Sprecher.

Allgemeine Beschreibung der beiden Akzente. Das akzentuierte Wort muß irgendwann in seinem Tonverlauf eine Steigung aufweisen. Wörter mit ebenen Konturen haben verhältnismäßig die meisten unterschiedlichen Interpretationen. Sie sind meistens auch von kürzester Dauer. Beim Zirkumflex ist der Tongipfel auf der betonten Silbe und beim Akut auf der posttonischen (S. 229–231). Sogleich nach dem Tongipfel setzt der Tonabfall ein. Große Aufmerksamkeit wurde dem Tonhöhensprung zwischen der betonten und posttonischen

Silbe geschenkt, da er als phonologisch relevant betrachtet wird. Der Zirkumflex erweist einen Sprung nach unten und der Akut nach oben. Ein Sprung nach oben, wenn auch gleichen Ausmaßes wie ein Sprung nach unten, wird eher bemerkt. Der Akut ist der markierte Akzent (S. 236). Die natürliche Folge der Tatsache, daß beim Zirkumflex der Tongipfel auf der betonten Silbe auftritt und beim Akut auf der posttonischen ist, daß die betonte Silbe beim Zirkumflex steiler steigt und höhere Frequenzen aufweist als beim Akut. Den Akut auf einer Ultima gebraucht nur noch ein Sprecher (Ju). Beide Akzente haben in diesem Fall einen steigenden Tonverlauf, der Zirkumflex ist nur kürzer und hat einen stärker ansteigenden Verlauf als der Akut. Daher ist es nicht verwunderlich, daß besonders bei Sprechern mit kürzeren Vokalen der Akut auf der Ultima im Aussterben zu sein scheint. Die Akzentdomäne ist bei den Oxytona kürzer, alle Eigenschaften einer Akzentart sind innerhalb einer Silbe gedrängt, beide Akzente haben die gleiche Richtung, und der Sprung, das Unterscheidungsmerkmal bei den Barytona, fehlt.

Im Zusammenhang mit dem Akzent wurden noch folgende Begriffe besprochen: die jeweilige Akzentverankerung bei den einzelnen Sprechern und der daraus folgende schwächere oder stärkere Widerstand gegen andere Einflüsse (z.B. der Satzintonation); die allgemeine Akzentorientierung des Sprechers (ist er zirkumflex- oder akutorientiert); die Akzenttypverankerung bei den einzelnen Wörtern, Akzentschwankungen (z.B. *lę̂pi – zdráve* im 5. Kap.); phonetische oder phonologische Akzentinterpretation (unter dem Einfluß der Satzintonation), etc.

Die Lautdauer der Vokale unter verschiedenem Akzent hängt vor allem davon ab, ob während des Tonverlaufs eine Änderung der Tonrichtung stattfindet (z.B. Tabelle 10 Ju, S. 104). Ein kombinierter Tonverlauf ist immer länger als ein einfacher. In Minimalpaaren, wo die Dauerverhältnisse vergleichbar sind, haben akutierte Wörter längere Vokale als zirkumflektierte (Tab. 15 Ju, S. 208). Die Lautdauer in der Ultima in der slowenischen Literatursprache, wie sie in Ljubljana gesprochen wird, ist phonologisch nicht relevant (S. 216–217). Den stärksten Einfluß auf die Lautdauer der Vokale bewirkt die Betonung, und den zweitstärksten übt die jedem Vokal inhärente Länge aus. Es gibt noch viele andere schwächere Einflüsse (S. 212–213). Die Länge ist in dieser Art des Slowenischen höchst unbeständig und ist nie eine selbständige Variable (7. Kap.). Darum gibt es im Slowenischen keinen "kurzen Zirkumflex" (z.B. *bȉk, pə̏s*) und keinen kurzen Akut auf der Penultima (*stə̀za, bə̀zəg*). Jede akzentuierte Silbe ist lang, weil sie betont ist, und die unterschiedlichen Dauerrealisierungen haben phonetischen Charakter.

O DOLŽINI SLOVENSKIH SAMOGLASNIKOV IN O BESEDNEM NAGLASU V KNJIŽNI SLOVENŠČINI

(Akustična in jezikoslovna raziskava)

Povzetek

Zbrano gradivo vsebuje serijo naravnih slovenskih besed v nevtralnem stavčnem položaju (sonagrami 557–682), serijo naravnih slovenskih besed v stavkih, pod vplivom stavčne intonacije (sonagrami 746–768), skupino besednonaglasnih pomenskih minimalnih parov (sonagrami 736–745) in skupino besednonaglasnih oblikoslovnih minimalnih parov (sonagrami 537–554), kar obravnavamo v 4., 5. in 6. poglavju. Poleg tega vsebuje gradivo še serijo umetno narejenih besed (sonagrami 335–513) v 3. poglavju, skupino oksitonov, dolžinskih minimalnih parov ali podobno zgrajenih besed s pričakovanimi razlikami v dolžini (sonagrami 514–532) in 23 primerkov (sonagrami 269–276), primernih za študij trajanja samoglasnikov v naglašenih in prednaglasnih zlogih, vse v 7. poglavju. Besedilo vsega gradiva je v dodatku na str. 252–264. Vse besedilo govorijo trije govorci Ju, Ka in Pi, ki vsi trije govorijo zborno izreko knjižne slovenščine na ljubljanski osnovi. Dva jezikoslovca, Tine Logar in Urška Snedic, slušno interpretirata besedni naglas v slovenskih besedah.

Namen raziskave je bil eksperimentalnofonetično proučiti trajanje samoglasnikov v knjižni slovenščini z več vidikov in besedni naglas tako v nevtralni stavčnointonacijski legi kot pod vplivom stavčne intonacije. Trajanje samoglasnikov in besedni naglas smo proučevali eksperimentalnofonetično s pomočjo sonagrafa, naglas slovenskih besed pa tudi slušnozaznavno.

V 3. poglavju, ki je enota zase, obravnavamo trajanje slovenskih samoglasnikov z več vidikov in njihove (inherentne) frekvence, in to na umetnih besedah. Umetne besede so zgrajene takole: 'V:CV, CV'CV:CV in CV'CV:C ter CV'CVC. Vsako besedo sestavljajo isti samoglasnik in soglasnik. Predpostavljamo, da izgovarjajo govorci te besede po slovenskem fonološkem sistemu. Na teh besedah je bilo mogoče proučevati inherentno dolžino in frekvenco posameznih slovenskih samoglasnikov v idealnih razmerah, ker je vsak samoglasnik nastopal v istih legah kot vsi ostali in smo tako lahko zanemarili vpliv sosednjih soglasnikov ter smo tudi lahko primerjali vsak samoglasnik s sosednjim. Vsak samoglasnik smo proučevali glede na to, ali je v naglašenem ali nenaglašenem zlogu, glede na zgradbo zloga (CV/VC, odprt/zaprt zlog) in v zaprtem končnem zlogu glede na dolžinsko razliko med pričakovanim dolgim in kratkim samoglasnikom. Dolžino nenaglašenih samoglasnikov smo merili posebej v tri- in dvozložnih besedah prednaglasnih in ponaglasnih zlogov. Tabele 2 Ju, 2 Ka in 2 Pi na str. 23, 26, 29 izkazujejo povprečno trajanje (v stotinkah sekunde) 7 slovenskih samoglasnikov treh govorcev (/ə/ ni sistematično obdelan). Tabele 3 Ju, 3 Ka in 3 Pi na str. 33, 36, 38 izkazujejo frekvenco (v Hz) istih samoglasnikov v istih legah. Figs. (= črteži) 3ab Ju–7ab Ju, 3ab Ka–7ab Ka, 3ab Pi–7ab

Pi na str. 40–54 grafično ponazarjajo zgornje tabele. Kot v drugih jezikih sta tudi v slovenščini inherentno trajanje in frekvenca samoglasnikov odvisna od lege jezika pri izgovarjavi posameznih samoglasnikov. Tonska višina in trajanje samoglasnikov sta komplementarna: čim višja je lega jezika, tem krajši je vokal in tem višja je njegova frekvenca; čim nižja je lega jezika, tem daljši je samoglasnik in tem nižja je njegova frekvenca. Kot da je količina energije pri izgovarjavi samoglasnika strogo omejena: če se je sprosti več v dolžino, je ostane manj za tonsko višino in obratno. Za knjižno slovenščino sta značilna posebej kratka /i/ in /u/. Grafični prikazi frekvenc naglašenih in ponaglasnih zlogov kažejo, da so frekvence pod vplivom besednega naglasa, čeprav imamo tu opraviti z umetnimi besedami, kar je najjasneje razvidno pri Ju-ju: v zaprtih zlogih ima višje frekvence (vpliv cirkumfleksa), v odprtih nižje (vpliv akuta) (gl. razpredelnici na str. 34).

Iz meritev umetnih besed izhajajo naslednja splošna načela o trajanju samoglasnikov v knjižni slovenščini:

1. Ker mora imeti vsak zlog določeno dolžino, je naglašeni (dolgi) samoglasnik najdaljši v odprtem zlogu, kadar sestavlja ta zlog sam brez predhodnega soglasnika (razpredelek 1 v tabelah).
2. Samoglasniki v prednaglasni legi so najkrajši, ker niso naglašeni in jih prekinja naslednji soglasnik (razpredelka 5 in 6 v tabelah).
3. Nenaglašeni samoglasniki v končni legi so lahko daljši in jih dejansko ni mogoče meriti. Ker ni ovire, se njihovo zvenenje lahko nadaljuje (razpredelka 7 in 8 v tabelah).
4. Inherentno kratek samoglasnik, čeprav naglašen, je lahko krajši kot inherentno dolg samoglasnik, čeprav nenaglašen. V tem primeru prevlada inherentno trajanje nad trajanjem, ki ga ima samoglasnik zaradi naglašenosti. To dejstvo je pomembno, ker razloži, zakaj je naglašeni samoglasnik v kaki besedi lahko krajši kot nenaglašeni v isti besedi (gl. str. 223–226).
5. Vsak samoglasnik, ne glede na lego jezika, mora imeti svojo najmanjšo dolžino, da je mogoče njegovo barvo jasno zaznati. Če so inherentno daljši samoglasniki blizu te meje (npr. v nenaglašenem zlogu), inherentno krajši samoglasniki ne morejo biti dosti krajši, ker bi jih sicer ne mogli jasno razumeti. Vloga inherentne dolžine postane v takem primeru zelo majhna (gl. str. 32).
6. Trajanje samoglasnikov je mogoče proučevati samo pri istem govorcu, samo njegova razmerja, ne pa absolutnega trajanja. Vsak govorec ima svoje dolžine (gl. str. 31–32).
7. Čim daljše je trajanje samoglasnikov v absolutnem merilu, tem večje so razlike v trajanju. Takó razmerje med naglašeno in nenaglašeno različico istega samoglasnika narašča, ko se jezik premika iz visoke v nizko lego, ker postajajo naglašeni (dolgi) samoglasniki daljši in daljši, medtem ko ustrezni nenaglašeni samoglasniki ne spreminjajo toliko svojega trajanja

(gl. str. 24–25, 27–28, 30–31, inherentno trajanje naglašenih in nenaglašenih samoglasnikov in njihovo razmerje za vse tri govorce).

Pri proučevanju besednega naglasa nas je zanimalo, kakšno je gibanje dolžin in frekvenc samoglasnikov v obeh slovenskih besednih naglasih in kako jih tonematično izobražen jezikoslovec tolmači. Na str. 57 (Fig. 8) so prikazani parametri, ki smo jih merili pri baritonih. Pri razstavljanju tonskega poteka v manjše dele, da bi ga formalizirali, smo to skušali napraviti tako, da bi bilo mogoče brez posebnih težav rekonstruirati potek tonske krivulje. Frekvenčni podatki o naglašenem zlogu so prvotni, vsi ostali so relativni in se nanašajo ali nanje ali drug na drugega. Na naglašenem zlogu smo merili tonsko višino na začetni in na končni točki, in v primeru, če je med tema dvema prišlo do zasuka v smeri, tudi v tej točki. Srednji podatek o frekvenci na naglašenem samoglasniku torej pomeni ali povprečno frekvenco med obema skrajnima točkama (ki je ali pa ni dana, kjer ni prišlo do zasuka), ali pa pomeni zasuk. Ta točka je potem pomembna, ker pove, ali je krivulja naglašenega zloga konveksna ali konkavna. Poleg tega smo merili razliko v tonski višini med obema skrajnima točkama (pitch movement). Ta je lahko ali pozitivna ali negativna. Vendar je strmina naraščanja ali padanja odvisna tudi od trajanja samoglasnika. Zato smo merili tudi trajanje naglašenega in ponaglasnega samoglasnika. Ista pozitivna višinska razlika npr. povzroči na krajšem samoglasniku bolj strmo naraščanje, na daljšem pa strmino ublaži. Posebej pomemben je bil za nas višinski skok (jump) med naglašenim in ponaglasnim samoglasnikom. Mnenja smo, da je fonološko relevanten, ker določa naglasni tip. Skok navzgor pomeni akut, skok navzdol cirkumfleks. Laže je zaznati skok navzgor kot enako velik skok navzdol. Laže je Slovencu dojeti akut kot cirkumfleks.

Pri pregledovanju krivulj osnovne frekvence smo ugotovili, da se vzorci pri baritonih pri akutu in cirkumfleksu ponavljajo in smo zato napravili stiliziran pregled vzorcev osnovne frekvence (FoP – fundamental frequency pattern, gl. str. XXI), po katerem smo potem označili vse naglašene besede v tabelah (v tabelah z osnovnimi podatki 4 Ju, 4 Ka, 4 Pi na str. 80–97, 11 Ju, 11 Ka, 11 Pi na str. 155–178). Krivulje, ki jih nikakor ni bilo mogoče nikamor uvrstiti, smo označili IP (= indeterminate pattern, nedoločljiv vzorec).

Tako je bilo na podlagi akustične klasifikacije in slušnozaznavnega tolmačenja mogoče ugotoviti, kakšen je tipičen cirkumfleks/akut (opis obeh na str. 230–231). Če sta se akustična klasifikacija in percepcijsko tolmačenje obeh interpretatorjev ujemali, smo tako realizacijo imeli za tipično. Z ugotovitvijo, kaj je tipično, ni bilo težav. So pa realizacije naglašenih besed, kjer interpretatorja isti vzorec pojmujeta različno. Taki vzorci niso tipični, ker niso dovolj izraziti, ali pa ker imajo nekatere lastnosti obeh akcentov (npr. premajhen skok navzdol; krivuljo akuta in tonsko višino cirkumfleksa). V tem primeru bo interpretator tolmačil vzorec po tem, čemur pripisuje večjo pomembnost, ali pa po tem, kakšen akcent pričakuje. Pričakovani akcent ima lahko pri interpretaciji v dvomljivih primerih pomembno vlogo. Možno pa je tudi, da se ne bo mogel odločiti. Če pa je vzorec tipičen, ni pričakovani akcent prav nič pomemben. V 4. in 5. poglavju se podrobno ukvarjam tudi z manj izrazitimi ali pa mešanimi vzorci in skušam dognati, zakaj je prišlo do različnih slušnozaznavnih klasifikacij. Črteži Fig. 9 Ju – Fig. 56 Pi na str. 105–132 prikazujejo povprečne vrednosti tipičnih besednih akcentov, manj tipičnih in mejnih primerov – takih, ki jih oba interpretatorja dosledno drugače tolmačita – ter grafe posamičnih vzorcev baritonov in tonske krivulje oksitonov za vse tri govorce.

Pri oksitonih namreč ni treba govoriti o vzorcu, ampak samo o tonski konturi (fundamental frequency contour – FoC), ker tu ni skoka. Tonska krivulja je lahko naraščajoča, padajoča, naraščajoča–padajoča, padajoča–naraščajoča ali ravna. Enako kot pri baritonih mora tudi akcentuiran oksiton v nevtralni stavčnointonacijski legi nekje v svoji akcentski krivulji naraščati. Tonska krivulja cirkumflektiranih besed je lahko naraščajoča–padajoča ali samo naraščajoča. Tonska krivulja akutiranih besed je naraščajoča in v redkih primerih padajoča–naraščajoča. Samo padajoča ali ravna krivulja v nevtralni intonacijski legi pomeni prešibko naglašen ali prekratek (ker je premalo naglašen?) samoglasnik. Besede s padajočo ali pa ravno krivuljo imajo največ neenotnih interpretacij. Naraščajoča krivulja torej lahko pomeni cirkumfleks ali akut. Grafični prikaz njunih razlik je razviden iz Fig. 16a Ju in 16b Ju na str. 111. V prvem primeru gre za povpreček jasno in manj jasno slušno dojetih cirkumfleksov/akutov, v drugem primeru samo za jasno slušno dojete.

Pri baritonih ima dolžina naglašenih samoglasnikov le manjšo vlogo. Jasno so razvidne dolžinske razlike, pogojene z naglasom, le pri minimalnih parih (tabela 14 Pi, str. 204–205; tabela 15 Ju, 15 Ka, 15 Pi, str. 208–210), sicer so pa v glavnem odvisne od poteka tonskih krivulj: krivulje z zasukom so daljše kot tiste, ki ne menjajo smeri (tabela 10 Ju, Ka, Pi, str. 104). Pri oksitonih pa je razlika v dolžini pri obeh naglasih izredno pomembna in prevzema takorekoč vlogo skoka, ki ga pri oksitonih ni. Oba naglasa imata namreč naraščajočo krivuljo, razlika v dolžini pa povzroča različno strmino naraščanja. Ker sta tako akutirani kot cirkumflektirani oksiton naraščajoča, ni nič čudnega, da ju govorci, ki samoglasnike bolj kratko izgovarjajo, na oksitonih ne ločijo več v svojem izgovoru. Tako zna samo eden od naših treh govorcev, Ju, izgovarjati tipične akutne oksitone v nevtralni stavčni poziciji.

Laže je razbrati naglas pri baritonih, kjer imamo več pokazateljev in so ti razporejeni na dva zloga, medtem ko se na oksitonih vse dogaja na enem zlogu, ki nima skoka in je običajno še pod udarom stavčne intonacije. Pri baritonih namreč utegne vpliv stavčne intonacije nastopiti šele na ponaglasnem zlogu in ne že na naglašenem, kar je odvisno od zasidranosti besednega naglasa pri posameznih govorcih. Ju je usmerjen v akut (vsi pričakovani akuti so uresničeni kot akuti in del pričakovanih cirkumfleksov je akutiran), Ka v cirkumflekse, Pi pa ima najmanj izrazite vzorce osnovnih frekvenc (ker ima najmanjše skoke; Ka ima največje in zato največ enotnih slušnih interpretacij – gl. tabelo 22, str. 234). Pregledne tabele 5 Ju – 8 Ju, 5 Ka – 8 Ka, 5 Pi – 8 Pi na str. 98–10 prikazujejo razmerja med pričakovanim naglasom in interpretiranim naglason med pričakovanim naglasom, naglasnimi vzorci in interpretiranim naglason med pričakovanim naglasom, naglasnimi konturami in interpretiranim nagla som in potrjujejo pravkar izrečene trditve.

Ju zveni najbolj tonematično, ker ima največ akutov (akut je označe naglas), in njegov besedni naglas se najbolj "upira" vplivu stavčne intonacij medtem ko je pri Pi-ju naglas najšibkeje zasidran in ga najlaže preplavijo vpli stavčne intonacije (tabele 12 Ju, Ka, Pi, str. 179–181).

V naglašenih besedah v stavku vzorci osnovne frekvence (FoP) in osno vne konture (FoC) niso več tako jasno razvidni; najmočnejši vpliv ima stavčn jedro (nucleus) in za tem začetna lega v stavku, ki pospešuje akut; padajoč stavčno jedro pospešuje cirkumfleks, naraščajoče akut (gl. tabele 12 Ju, Ka Pi, str. 179–181). Dostikrat ostane od prvotnega vzorca (oziroma konture) še tonska višina, medtem ko je kontura povsem zabrisana, zlasti pri oksitonil Zaznavanje takega naglasa na jedru je lahko fonetično ali fonološko (gl. np str. 138–139, 144 itd.). Zato je "čisti" besedni naglas laže proučevati v nevtraln legi (v stavku), tako kot ga proučuje leksikograf slušno, da ugotovi vsaki besed inherentno pripadajoči naglas, in ne v stavku, čeprav nastopajo v vsakdanjen življenju besede v vseh legah v stavku in pride do večnega medsebojnega vpl vanja besednega naglasa in stavčnega poudarka s pripadajočo intonacijo.

Ker je v tonematični slovenščini ton povezan z naglasom (a pitch accen language, str. 15–17), a nista nujno sinhrona kot pri jakostnem naglaševanju je pričakovati, da bo pod okrepljenim poudarkom – v emfazi – besedni nagla v besedah v stavku najbolje ohranjen; vendar to ni nujno, ampak je odvisn od splošne zasidranosti besednega naglasa pri posameznem govorcu, ter nastop laže na baritonih kot na oksitonih, ki se teže "branijo" vplivu stavčne intonaci (tabele 13 Ju, 13 Ka, 13 Pi, str. 192–194). Tako zaznavata Lo + Sn pri Ju-j pričakovani naglas v glavnem pri vseh besedah v vseh legah, vloga besedneg naglasa je pod emfatičnim poudarkom okrepljena. Pri Ka-ju se kaže manjša po vezanost naglasnega tipa z neko besedo, da ne izgovarja pričakovanega naglasa kjer za to ni vzroka (gl. npr. sonagrama 760, 761); nadalje je razvidno, d njegova splošna cirkumfleksijska usmerjenost zmaga nad pričakovanim akcen tom, če jo podpira stavčna lega (padajoče jedro). Pri Pi-ju se kaže njegov velika odvisnost od stavčne intonacije: v začetni legi ima v emfazi same akut (razen 766), na padajočem jedru same cirkumflekse, medtem ko ima v nevtraln – srednji legi v glavnem pričakovani akcent (izjema 761). Glavni pokazatel emfaze, kot sem jih dojela, so v tabelah podčrtani. V emfazi je vse potencirano dolžina, frekvence, vse je bolj razgibano in izrazito, zato so neenotne interpre tacije mnogo redkejše.

Akut imamo za označeni naglas (gl. str. 236) med drugim iz naslednjih vzrokov:

1. Medtem ko pri cirkumfleksu sovpadata naglas in tonski vrh kot pri jezikih z jakostnim naglaševanjem, je pri akutu naglas ločen od tonskega vrha, ki nastopa šele na ponaglasnem zlogu.
2. Če v besedi nadomestimo cirkumfleks z akutom, je to opazno, medtem ko cirkumflektirana beseda namesto akutirane ne moti preveč (Rigler 1968, 196).
3. Laže je identificirati akutni vzorec osnovne frekvence kot cirkumflektiranega. Skok navzgor je laže zaznati kot enako velik skok navzdol.
4. V oksitonih je cirkumfleks mnogo bolj običajen kot akut.
5. V novejših izposojenkah je cirkumfleks bolj pogost (Rigler 1968, 198).

Formaliziran prikaz obeh akcentov je na str. 230 (Fig. 65). Besedni naglas mora nekje v toku svoje krivulje naraščati. Bistvena razlika med akutom in cirkumfleksom je v tem, kje krivulja doseže tonski vrh – ali na naglašenem ali na ponaglasnem zlogu. Druge lastnosti obeh akcentov so naravna posledica te lastnosti. Tonsko območje obeh naglasov pri posameznem govorcu teži za tem, da je za oba naglasa enako (gl. str. 77 in tabelo 10 govorca Ju, str. 104). – Ker je pri cirkumfleksu tonski vrh dosežen na naglašenem zlogu, torej prej, je treba ta naglas izgovoriti z več energije (z več "zaleta") (gl. o Svendu Smithu str. 236), da se prej doseže tonski vrh, in je krivulja naglašenega zloga zato bolj strma in tonsko višja. Takoj za tonskim vrhom (ne glede na to ali je prav na koncu naglašenega zloga ali malo prej) začne ton padati. Če je prej, pride do konveksne konture naglašenega zloga. Padec se nadaljuje v skoku navzdol in na ponaglasnem zlogu. Pri akutu se naglas in tonski vrh razhajata: naglas je na naglašenem zlogu, tonski vrh pa na ponaglasnem. Zato naglašeni zlog tonsko počasneje in zložneje narašča. Če je malo daljši, celo prej nekoliko pade, preden se začne dvigati (konkaven), zato da ne prekorači svojega tonskega območja. – Fonološki obrazec za tonematični naglas, kot sta ga postavila Haugen in Joos za norveščino in ga je formaliziral O. Lorentz (gl. str. 231), velja torej tudi za slovenščino.

Nekaj ugotovitev glede dolžine vokalov v naravnih slovenskih besedah: Nobeden od treh govorcev ne razlikuje sistematično med pričakovanimi dolgimi in kratkimi vokali na oksitonih (tabele 16 Ju, Ka, Pi, str. 216–217). Dolžina v knjižni slovenščini z ljubljansko osnovo ni fonološko relevantna. Prozodično se samoglasniki delijo v naglašene in nenaglašene. Če so naglašeni, so dolgi, če so nenaglašeni, so kratki. Dolg samoglasnik ni samostojna spremenljivka, ampak je posledica naglasa. Najmočnejši vpliv na dolžino samoglasnika ima naglas, sledi mu inherentna dolžina. Ostali vplivi so manjši in so našteti na str. 212–213. Ker je trajanje samoglasnika povsem nesamostojno, odvisno od najrazličnejših vplivov, je v tovrstni slovenščini zelo labilna zadeva (gl. str. 214).

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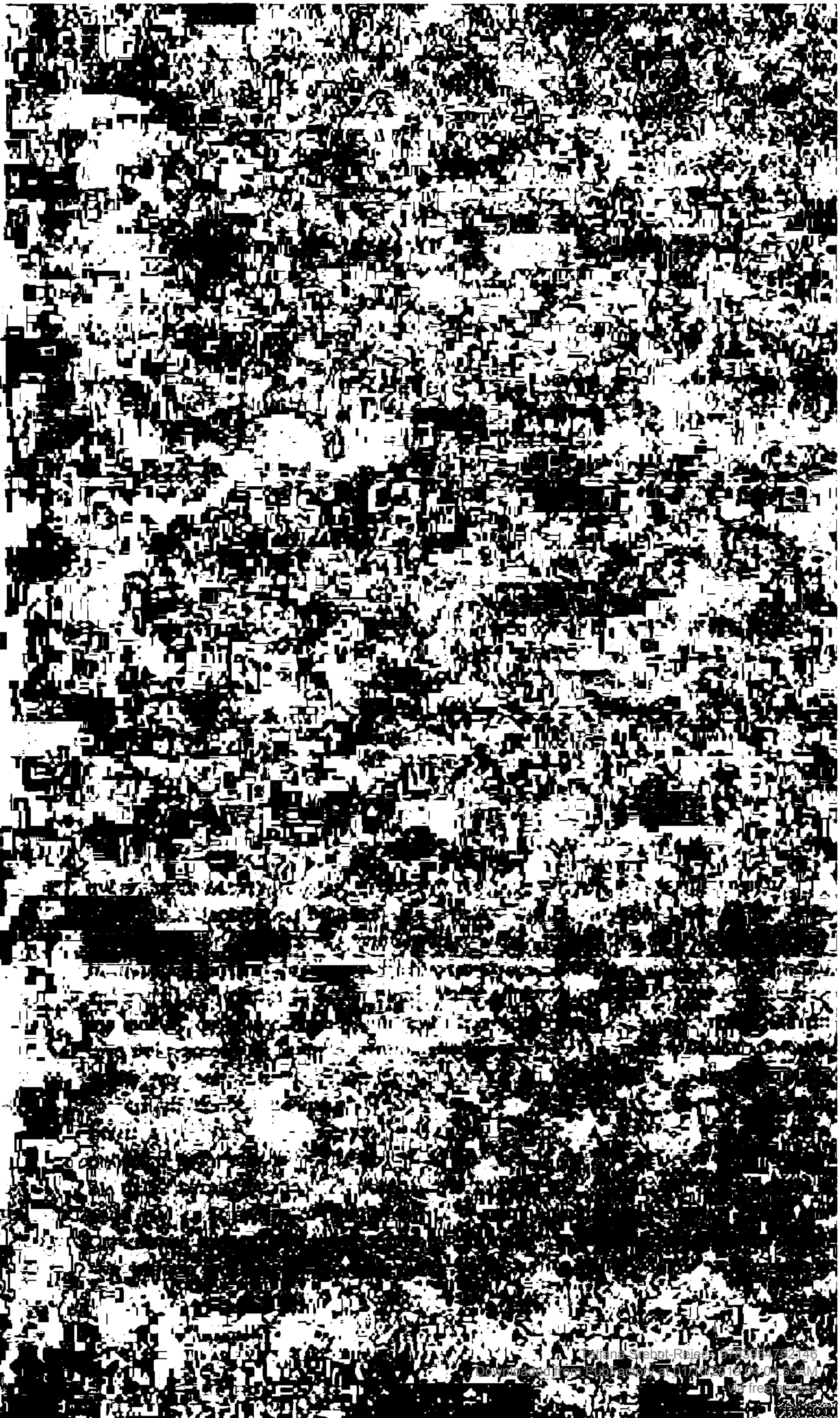
– V knjižni slovenščini nimamo kratkega akuta na /ə/-ju. /ə/ je krajši, ker inherentno kratek, kar je fonetična, ne fonološka lastnost. Položajno pa je s veda /ə/, če je naglašen, daljši, kot če je nenaglašen; tudi je lahko – tako k vsi drugi samoglasniki – v zaprtem zlogu krajši kot v odprtem. Če postane odprtem naglašenem zlogu predolg za /ə/, kaže v ljubljanski slovenščini težn preiti v /e/ (npr. *stéza*), kar ni sprejeto v SSKJ. V zaprtem zlogu se to tovrstnem govoru ne dogaja (npr. *pə̏s*). – Tudi ni t.i. "kratkega cirkun fleksa" na oksitonih. – Tabela 18 Ju, Ka, Pi, str. 222, kaže dolžinska razmer med naglašenimi in prednaglasnimi samoglasniki: (a) če imamo več prednagla nih zlogov, dolžina prednaglasnih samoglasnikov narašča z bližino naglašenem zlogu. (b) čim daljša je beseda, tem krajši so samoglasniki. (c) Paradigmatsk primerjava dolžine naglašenega samoglasnika v enozložni besedi z dolžinan istega sedaj prednaglasnega samoglasnika v dvo- in štirizložnih besedah pokaž da znaša v dvozložnici prednaglasni samoglasnik pri Ju-ju in Pi-ju 65 oz. 66 naglašenega vokala in v štirizložnici 52 oz. 54% naglašenega samoglasnika.



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CORPUS

Chapter 3 - NONSENSE WORDS (sonagrams 335–513)

The symbols above the vowels in this series do not mark word accent but only stress and length (´ = stressed, long; ` = stressed, short; é, ó = stressed, long, close vowel; ê, ô = stressed, long, open vowel).

1) (po vzorcu "si sìt")*

335 reci pipìp enkrat, ne dvakrat
336 reci bibìb enkrat, ne dvakrat
337 reci titìt enkrat, ne dvakrat
338 reci didìt enkrat, ne dvakrat
339 reci kikìk enkrat, ne dvakrat
340 reci gigìg enkrat, ne dvakrat
341 reci sisìs enkrat, ne dvakrat
342 reci zizìz enkrat, ne dvakrat
343 reci šišìš enkrat, ne dvakrat
344 reci žižìž enkrat, ne dvakrat
345 reci čičìč enkrat, ne dvakrat
346 reci džidžìdž enkrat, ne dvakrat
347 reci ninìn enkrat, ne dvakrat
348 reci lilìlj enkrat, ne dvakrat
349 reci rirìr enkrat, ne dvakrat

2) (po vzorcu "zapíti")

350 reci pipípi trikrat, ne dvakrat
351 reci bibíbi trikrat, ne dvakrat
352 reci titíti trikrat, ne dvakrat
353 reci didídi trikrat, ne dvakrat
354 reci kikíki trikrat, ne dvakrat
355 reci gigígi trikrat, ne dvakrat
356 reci sisísi trikrat, ne dvakrat
357 reci zizízi trikrat, nc dvakrat
358 reci šišíši trikrat, ne dvakrat
359 reci žižíži trikrat, ne dvakrat
360 reci čičíči trikrat, ne dvakrat
361 reci džidžídži trikrat, ne dvakrat

*In English: Follow the model "si sìt"

362 reci niníni trikrat, ne dvakrat
363 reci lilíli trikrat, ne dvakrat
364 reci riríri trikrat, ne dvakrat

3) (po vzorcu "zapít")

365 reci titít enkrat, ne dvakrat
366 reci didíd enkrat, ne dvakrat
367 reci sisís enkrat, ne dvakrat
368 reci zizíz enkrat, ne dvakrat
369 reci čičíč enkrat, ne dvakrat
370 reci džidžídž enkrat, ne dvakrat
371 reci ninín enkrat, ne dvakrat
372 reci lilílj enkrat, ne dvakrat

4) (po vzorcu "pekèt")

373 reci tetèt enkrat, ne dvakrat
374 reci dedèd enkrat, ne dvakrat
375 reci sesès enkrat, ne dvakrat
376 reci zezèz enkrat, ne dvakrat
377 reci čečèč enkrat, ne dvakrat
378 reci džedžèdž enkrat, ne dvakrat
379 reci nenèn enkrat, ne dvakrat
380 reci lelèlj enkrat, ne dvakrat

5) (po vzorcu "škrpête")

381 reci tetête trikrat, ne dvakrat
382 reci dedêde trikrat, ne dvakrat
383 reci sesêse trikrat, ne dvakrat
384 reci zezêze trikrat, ne dvakrat
385 reci čečêče trikrat, ne dvakrat
386 reci džedžêdže trikrat, ne dvakrat
387 reci nenêne trikrat, ne dvakrat
388 reci lelêle trikrat, ne dvakrat

6) (po vzorcu "napét")

389 reci tetét enkrat, ne dvakrat
390 reci dedéd enkrat, ne dvakrat
391 reci sesés enkrat, ne dvakrat
392 reci zezéz enkrat, ne dvakrat

393 reci čečéč enkrat, ne dvakrat
394 reci džedžédž enkrat, ne dvakrat
395 reci nenén enkrat, ne dvakrat
396 reci lelél enkrat, ne dvakrat

7) (po vzorcu "napéte")

397 reci tetéte trikrat, ne dvakrat
398 reci dedéde trikrat, ne dvakrat
399 reci sesése trikrat, ne dvakrat
400 reci zezéze trikrat, ne dvakrat
401 reci čečéče trikrat, ne dvakrat
402 reci džedžédže trikrat, ne dvakrat
403 reci nenéne trikrat, ne dvakrat
404 reci leléle trikrat, ne dvakrat

8) (po vzorcu "teh têt")

405 reci tetêt enkrat, ne dvakrat
406 reci dedêd enkrat, ne dvakrat
407 reci sesês enkrat, ne dvakrat
408 reci zezêz enkrat, ne dvakrat
409 reci čečêč enkrat, ne dvakrat
410 reci džedžêdž enkrat, ne dvakrat
411 reci nenên enkrat, ne dvakrat
412 reci lelêl enkrat, ne dvakrat

9) (po vzorcu "čokàt")

413 reci tatàt enkrat, ne dvakrat
414 reci dadàd enkrat, ne dvakrat
415 reci sasàs enkrat, ne dvakrat
416 reci zazàz enkrat, ne dvakrat
417 reci čačàč enkrat, ne dvakrat
418 reci džadžàdž enkrat, ne dvakrat
419 reci nanàn enkrat, ne dvakrat
420 reci lalàlj enkrat, ne dvakrat

10) (po vzorcu "čokáta")

421 reci tatáta trikrat, ne dvakrat
422 reci dadáda trikrat, ne dvakrat
423 reci sasása trikrat, ne dvakrat
424 reci zazáza trikrat, ne dvakrat
425 reci čačáča trikrat, ne dvakrat
426 reci džadžádža trikrat, ne dvakrat
427 reci nanána trikrat, ne dvakrat
428 reci laléla trikrat, ne dvakrat

11) (po vzorcu "ta tát")

429 reci tatát enkrat, ne dvakrat
430 reci dadád enkrat, ne dvakrat
431 reci sasás enkrat, ne dvakrat
432 reci zazáz enkrat, ne dvakrat
433 reci čačáč enkrat, ne dvakrat
434 reci džadádž enkrat, ne dvakrat
435 reci nanán enkrat, ne dvakrat
436 reci lalálj enkrat, ne dvakrat

12) (po vzorcu "pokòp")

437 reci totòt enkrat, ne dvakrat
438 reci dodòd enkrat, ne dvakrat
439 reci sosòs enkrat, ne dvakrat
440 reci zozòz enkrat, ne dvakrat
441 reci čočòč enkrat, ne dvakrat
442 reci džodžòdž enkrat, ne dvakrat
443 reci nonòn enkrat, ne dvakrat
444 reci lolòlj enkrat, ne dvakrat

13) (po vzorcu "z lepôto")

445 reci totôto trikrat, ne dvakrat
446 reci dodôdo trikrat, ne dvakrat
447 reci sosôso trikrat, ne dvakrat
448 reci zozôzo trikrat, ne dvakrat
449 reci čočôčo trikrat, ne dvakrat
449a reci džodžôdžo trikrat, ne dvakrat (only Pi)
450 reci nonôno trikrat, ne dvakrat
451 reci lolôlo trikrat, ue dvakrat

14) (po vzorcu "z dobróto")

452 reci totóto trikrat, ne dvakrat
453 reci dodódo trikrat, ne dvakrat
454 reci sosóso trikrat, ne dvakrat
455 reci zozózo trikrat, ne dvakrat
456 reci čočóčo trikrat, ne dvakrat
457 reci džodžódžo trikrat, ne dvakrat
458 reci nonóno trikrat, ne dvakrat
459 reci lolólo trikrat, ne dvakrat

15) (po vzorcu "lepôt")

460 reci totôt enkrat, ne dvakrat
461 reci dodôd enkrat, ne dvakrat
462 reci sosôs enkrat, ne dvakrat
463 reci zozôz enkrat, ne dvakrat
464 reci čočôč enkrat, ne dvakrat
465 reci džodžôdž enkrat, ne dvakrat
466 reci nonôn enkrat, ne dvakrat
467 reci lolôlj enkrat, ne dvakrat

16) (po vzorcu "povsód")

468 reci totôt enkrat, ne dvakrat
469 reci dodód enkrat, ne dvakrat
470 reci sosós enkrat, ne dvakrat
471 reci zozóz enkrat, ne dvakrat
472 reci čočóč enkrat, ne dvakrat
473 reci džodžódž enkrat, ne dvakrat
474 reci nonón enkrat, ne dvakrat
475 reci lolólj enkrat, ne dvakrat

17) (po vzorcu "nakúp")

476 reci tutút enkrat, ne dvakrat
477 reci dudúd enkrat, ne dvakrat
478 reci susús enkrat, ne dvakrat
479 reci zuzúz enkrat, ne dvakrat
480 reci čučúč enkrat, ne dvakrat
481 reci džudžúdž enkrat, ne dvakrat

482 reci nunún enkrat, ne dvakrat
483 reci lulúlj enkrat, ne dvakrat

18) (po vzorcu "na kúpu")

484 reci tutútu trikrat, ne dvakrat
485 reci dudúdu trikrat, ne dvakrat
486 reci susúsu trikrat, ne dvakrat
487 reci zuzúzu trikrat, ne dvakrat
488 reci čučúču trikrat, ne dvakrat
489 reci džudžúdžu trikrat, ne dvakrat
490 reci nunúnu trikrat, ne dvakrat
491 reci lulúlu trikrat, ne dvakrat

19) (po vzorcu "obùt")

492 reci tutùt enkrat, ne dvakrat
493 reci dudùd enkrat, ne dvakrat
494 reci susùs enkrat, ne dvakrat
495 reci zuzùz enkrat, ne dvakrat
496 reci čučùč enkrat, ne dvakrat
497 reci džudžùdž enkrat, ne dvakrat
498 reci nunùn enkrat, ne dvakrat
499 reci lulùlj enkrat, ne dvakrat

20)

500 reci spet íti trikrat, ne dvakrat
501 reci spet ídi trikrat, ne dvakrat
502 reci spet éte trikrat, ne dvakrat
503 reci spet éde trikrat, ne dvakrat
504 reci spet ête trikrat, ne dvakrat
505 reci spet êde trikrat, ne dvakrat
506 reci spet áta trikrat, ne dvakrat
507 reci spet áda trikrat, ne dvakrat
508 reci spet ódo trikrat, ne dvakrat
509 reci spet óto trikrat, ne dvakrat
510 reci spet ôto trikrat, ne dvakrat
511 reci spet ôdo trikrat, ne dvakrat
512 reci spet údu trikrat, ne dvakrat
513 reci spet útu trikrat, ne dvakrat

Chapter 4 – ACCENT IN SINGLE WORDS IN NEUTRAL SENTENCE INTONATION POSITION (sonagrams 557–682)

The words as given to the speakers had no word accent marking. Even if accent had been marked they would not have been able to follow it (cf. p. 8) since it is not within their conscious sphere. Where stress position could have been doubtful or where two stress variants were expected word stress was marked.

557 reci tọki dvakrat, ne trikrat
558 reci rekli sta dvakrat, ne trikrat
559 reci sit sem te dvakrat, ne trikrat
560 reci bik enkrat, ne trikrat
561 reci lik enkrat, ne trikrat
562 reci sita dvakrat, ne trikrat
563 reci sitast dvakrat, ne trikrat
564 reci mistik enkrat, ne trikrat
565 reci miting enkrat, ne trikrat
566 reci ena, dve, tri dvakrat, ne trikrat
567 reci sij enkrat, ne trikrat

568 reci ti si kriv enkrat, ne trikrat
569 reci eksport enkrat, ne trikrat
570 reci matematika dvakrat, ne trikrat
571 reci džem enkrat, ne trikrat
572 reci center enkrat, ne trikrat
573 reci egocentričen enkrat, ne trikrat
574 reci met (krogle) enkrat, ne trikrat
575 reci med (sladek) enkrat, ne trikrat
576 reci meden enkrat, ne trikrat
577 reci memorandum enkrat, ne trikrat
578 reci cement enkrat, ne trikrat
579 reci meč (sablja) enkrat, ne trikrat
580 reci meča dvakrat, ne trikrat
581 reci pet metel enkrat, ne trikrat
582 reci medel dvakrat, ne trikrat
583 reci režim enkrat, ne trikrat
584 reci Amerika dvakrat, ne trikrat

585 reci hud alarm enkrat, ne dvakrat
586 reci hud akt enkrat, ne dvakrat
587 reci nič aktiven enkrat, ne dvakrat
588 reci hud aktivist enkrat, ne dvakrat

589 reci hud akord enkrat, ne dvakrat
590 reci pač astma dvakrat, ne trikrat
591 reci hud astmatik enkrat, ne dvakrat
592 reci katalog enkrat, ne dvakrat
593 reci mak enkrat, ne dvakrat
594 reci maki dvakrat, ne trikrat
595 reci kad enkrat, ne dvakrat
596 reci v kadi dvakrat, ne trikrat
597 reci rad enkrat, ne dvakrat
598 reci rak enkrat, ne dvakrat
599 reci trak enkrat, ne dvakrat
600 reci slab enkrat, ne dvakrat

601 reci moto dvakrat, ne trikrat
602 reci notoričen enkrat, ne dvakrat
603 reci dogmatik enkrat, ne dvakrat
604 reci domena dvakrat, ne trikrat
605 reci godi mi dvakrat, ne trikrat
606 reci shod enkrat, ne dvakrat
607 reci mimohod enkrat, ne dvakrat
608 reci kọt enkrat, ne dvakrat
609 reci ne kod ne kam enkrat, ne dvakrat
610 reci doba dvakrat, ne trikrat
611 reci dob enkrat, ne dvakrat
612 reci pọt enkrat, ne dvakrat
613 reci hud oficial enkrat, ne dvakrat
614 reci pač opera dvakrat, ne trikrat
615 reci pač operacija dvakrat, ne trikrat
616 reci pod (=tla) enkrat, ne dvakrat

617 reci budizem enkrat, ne dvakrat
618 reci na kùp enkrat, ne dvakrat
619 reci pet rut enkrat, ne dvakrat
620 reci ruda dvakrat, ne trikrat
621 reci dve ruti dvakrat, ne trikrat
622 reci rudnina dvakrat, ne trikrat
623 reci ni miru dvakrat, ne trikrat
624 reci rum enkrat, ne dvakrat
625 reci luk enkrat, ne dvakrat
626 reci luka dvakrat, ne trikrat
627 reci produkt enkrat, ne dvakrat
628 reci hura dvakrat, ne trikrat

629 reci pəs enkrat, ne dvakrat
630 reci vəndərle dvakrat, ne trikrat
631 reci 'səmənj enkrat, ne dvakrat
632 reci sə'mənj enkrat, ne dvakrat
633 reci truden enkrat, ne dvakrat
634 reci smrt smrdi dvakrat, ne trikrat

635 reci glej enkrat, ne dvakrat
636 reci glejte dvakrat, ne trikrat
637 reci smejoč enkrat, ne dvakrat
638 reci imej enkrat, ne dvakrat
639 reci na seji dvakrat, ne trikrat
640 reci pet sej enkrat, ne dvakrat
641 reci sejna dvakrat, ne trikrat
642 reci meji na nas enkrat, ne dvakrat

643 reci kraj dvakrat, ne trikrat
644 reci kraji dvakrat, ne trikrat
645 reci rajni dvakrat, ne trikrat
646 reci pajek enkrat, ne dvakrat
647 reci pet bajt enkrat, ne dvakrat
648 reci pri bajti dvakrat, ne trikrat
649 reci Bajda dvakrat, ne trikrat
650 reci gajìč enkrat, ne dvakrat
651 reci nekaj trikrat, ne dvakrat
652 reci zdaj trikrat, ne dvakrat
653 reci daj to trikrat, ne dvakrat

654 reci v boj trikrat, ne dvakrat
655 reci boji trikrat, ne dvakrat
656 reci bojevnik enkrat, ne dvakrat
657 reci bojler enkrat, ne dvakrat
658 reci loj trikrat, ne dvakrat
659 reci lojitev enkrat, ne dvakrat
660 reci lo'jar enkrat, ne dvakrat
661 reci 'pokoj trikrat, ne dvakrat

662 reci avto trikrat, ne dvakrat
663 reci avdion enkrat, ne dvakrat
664 reci kal [kau] trikrat, ne dvakrat
665 reci prav trikrat, ne dvakrat
666 reci avtentičen enkrat, ne dvakrat

667 reci sem šel trikrat, ne dvakrat
668 reci molitev trikrat, ne dvakrat
669 reci nov trikrat, ne dvakrat
670 reci sol trikrat, ne dvakrat
671 reci sold [soud] enkrat, ne dvakrat
672 reci soldat [soudat] enkrat, ne dvakrat
673 reci soldaščina [souda-] trikrat, ne dvakrat
674 reci nag in gol trikrat, ne dvakrat
675 reci snov trikrat, ne dvakrat
676 reci teološki trikrat, ne dvakrat

677 reci bajer enkrat, ne dvakrat
678 reci raja trikrat, ne dvakrat
679 reci pleje trikrat, ne dvakrat
680 reci pava trikrat, ne dvakrat
681 reci mavrica trikrat, ne dvakrat
682 reci greje trikrat, ne dvakrat

Chapter 5 – WORD ACCENT IN SENTENCES UNDER THE INFLUENCE OF SENTENCE INTONATION (sonagrams 746–768)

746 Krave se pasejo po lepi travi, konji pa v detelji.
747 Starček čaka pomladi, šolar pa počitnic.
748 Krava se pase po lepi travi.
749 Starček čaka zdrave pomladi.
750 Krava se pase po travi.
751 Tak junak se ne vda, ker ve, da bi bilo zastonj.
752 Zvečer se dan konča in gremo spat.
753 Tak junak se ne vda.
754 Zvečer se dan konča
755 ***Krava**** se pase po lepi travi.
756 Krava se ***pase*** po lepi travi.
757 Krava se pase po ***lepi*** travi.
758 Krava se pase po lepi ***travi***.
759 ***Starček*** čaka zdrave pomladi.
760 Starček ***čaka*** zdrave pomladi.
761 Starček čaka ***zdrave*** pomladi.
762 Starček čaka zdrave ***pomladi***.
763 ***Tak*** junak se ne vda.
764 Tak ***junak*** se ne vda.
765 Tak junak se ne ***vda***.

---

*pronounced with emphatic stress

766 *Zvečer* se dan konča.
767 Zvečer se *dan* konča.
768 Zvečer se dan *konča*.

Chapter 6 – WORD ACCENT CONTINUED

6.2 ACCUSATIVE AND INSTRUMENTAL SG. (sonagrans 537–554)

Ju, Ka:

537 Vidim pito, ne pa kravo.
538 Reci s pito dvakrat, ne trikrat.
539 Vidim kravo, ne pa pito.
540 Reci s kravo dvakrat, ne trikrat.
545 Vidim peto, ne pa nogo.
546 Reci s peto dvakrat, ne trikrat.
547 Vidim nogo, ne pa peto.
548 Reci z nogo dvakrat, ne trikrat.
549 Vidim mulo, ne pa vrbo.
550 Reci z mulo dvakrat, ne tr'krat.
551 Vidim vrbo, ne pa mulo.
552 Reci z vrbo dvakrat, ne trikrat.
553 Vidim loko, ne pa sovo.
554 Reci z loko dvakrat, ne trikrat.

Pi:

537 Vidim pito, ne pa kravo.
538 Reci s pito, ne pa s kravo.
539 Vidim kravo, ne pa pito.
540 Reci s kravo, ne pa s pito.
545 Vidim peto, ne pa nogo.
546 Reci s peto, ne pa z nogo.
547 Vidim nogo, ne pa peto.
548 Reci z nogo, ne pa s peto.
549 Vidim mulo, ne pa vrbo.
550 Reci z mulo, ne pa z vrbo.
551 Vidim vrbo, ne pa mulo.
552 Reci z vrbo, ne pa z mulo.
553 Vidim loko, ne pa sovo.
554 Reci z loko, ne pa s sovo.

6.3 FIVE EXPECTED MINIMAL PAIRS (sonagrams 736–745)

736 Reci on leta trikrat, ne dvakrat.
737 Reci ni pisma trikrat, ne dvakrat.
738 Reci Peter 'kosi doma trikrat, ne dvakrat.
739 Zapustil je laz in bajto.
740 Reci slap pada trikrat, ne dvakrat.
741 Reci tri leta trikrat, ne dvakrat.
742 Reci tri pisma trikrat, ne dvakrat.
743 Reci trije kosi perila trikrat, ne dvakrat.
744 Našel je las v juhi.
745 Reci slab padar trikrat, ne dvakrat.

Chapter 7 – VOWEL DURATION CONTINUED

Words not found here are from the single word series and are in Ch. 4.

7.2 VOWEL DURATION IN SLOVENE OXYTONES

514 Grem jagode brat, pa konec.
515 Pet sit sem prodal.
516 Rak je verjetno.
517 Kič prodaja.
519 Grad ni gad pravi škrat.
521 Sit sem te.
522 On je moj brat, pa čeprav je tak.
523 Grunt ni šund pravi fant.
527 Ptič nastaja.
528 Mraz gre skozi vas ves čas.
529 Trak je verjetno.
530 Lep kup gnoja na njivi.
532 Dober (na)kup sem napravil.

7.3 THE DURATION OF THE VOWEL /ə/ IN SLOVENE WORDS

555 grd žep
556 dva grda žepa

7.4 THE DURATION RELATIONSHIP STRESSED : PRESTRESSED VOWEL IN SOME SLOVENE WORDS (sonagrams 269–276)

269	dom	domov	domovina	dom
270	les	lesa	lesovina	les
271	tisk	tiskar	tiskovina	tisk
272	uk	ukor	ukovina	uk
273	mah	mahu	mahovina	mah
274	koz	kozav	kozorog	koz
275	dogma	dogmatičen	dogma	
276	tekma	tekmujem	tekmovalen	tekma

SELECTED SONAGRAMS

3 wide-band sonagrams of the word *memorândum* (577) as spoken by Ju, Ka, Pi, suitable for the measurement of sound duration (pp. 266–268).

3 narrow-band sonagrams (magnified) of the word *memorândum* (577) as spoken by Ju, Ka, Pi, suitable for the measurement of sound frequency. Examples of circumflexed barytones (pp. 269–271).

3 wide-band sonagrams of the word *matemátika* (570) as spoken by Ju, Ka, Pi (pp. 272–274).

3 narrow-band sonagrams (magnified) of the word *matemátika* (570) as spoken by Ju, Ka, Pi. Examples of acuted barytones (pp. 275–277).

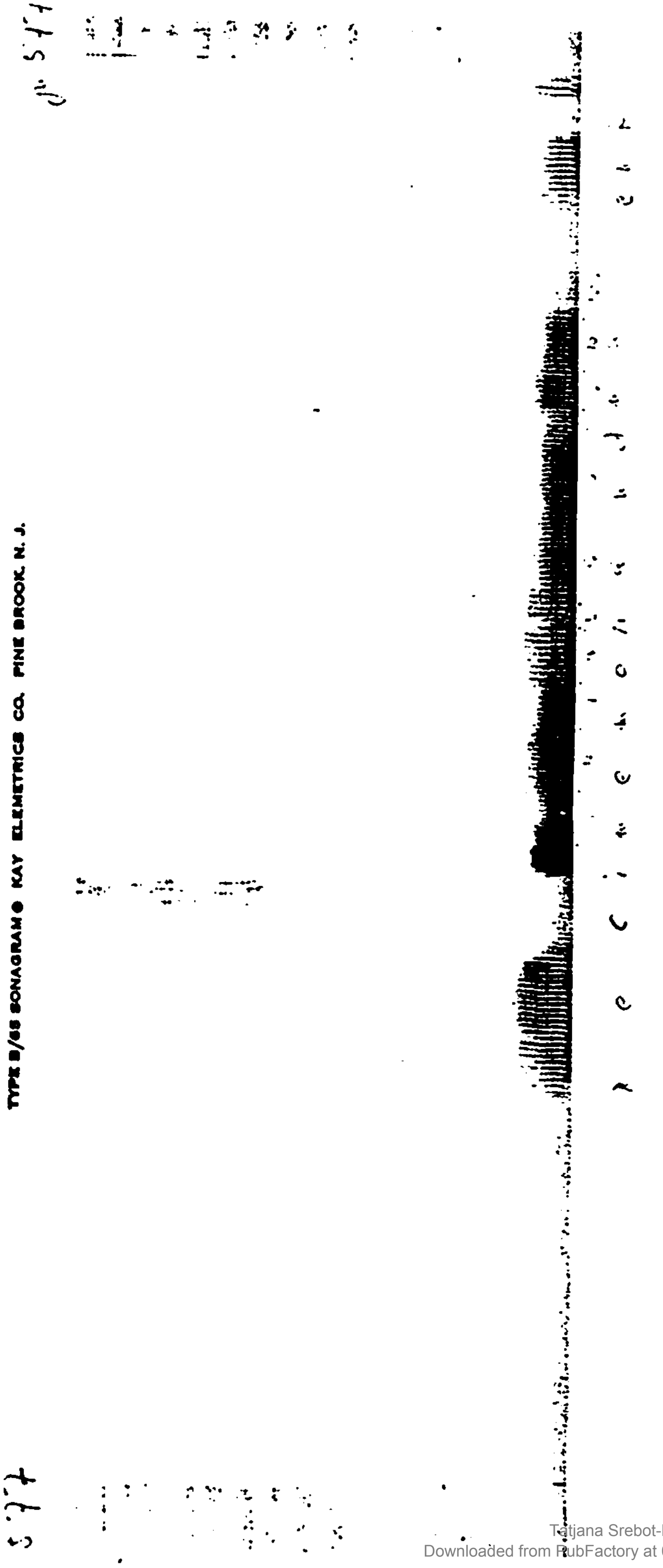
3 narrow-band sonagrams of the word *kráva/e* in initial sentence position as spoken by Ju:
- normally stressed (748),
- contrastively stressed (746),
- emphatically stressed (755) (pp. 278–280).

3 narrow-band sonagrams of the word *zdráve* in medial position as spoken by Ka:
- normally stressed and acuted (762),
- normally stressed and circumflexed (749),
- emphatically stressed and circumflexed (761) (p. 281).

2 narrow-band sonagrams of the minimal pairs *lẹ́ta* - *lệta* (736, 741) as spoken by Ju (p. 282).

2 wide-band sonagrams (magnified) of the words *ptȉč* - *kìč* (527, 517) with expected duration differences, as spoken by Pi (pp. 283–284).

4 wide-band sonagrams (magnified) of the words *'tisk, ti'skar, tisko'vina, 'tisk.* (271) as spoken by Pi. A paradigmatic comparison of vowel duration in stressed and prestressed position; on a low rising and on a low falling nucleus (pp. 285–286).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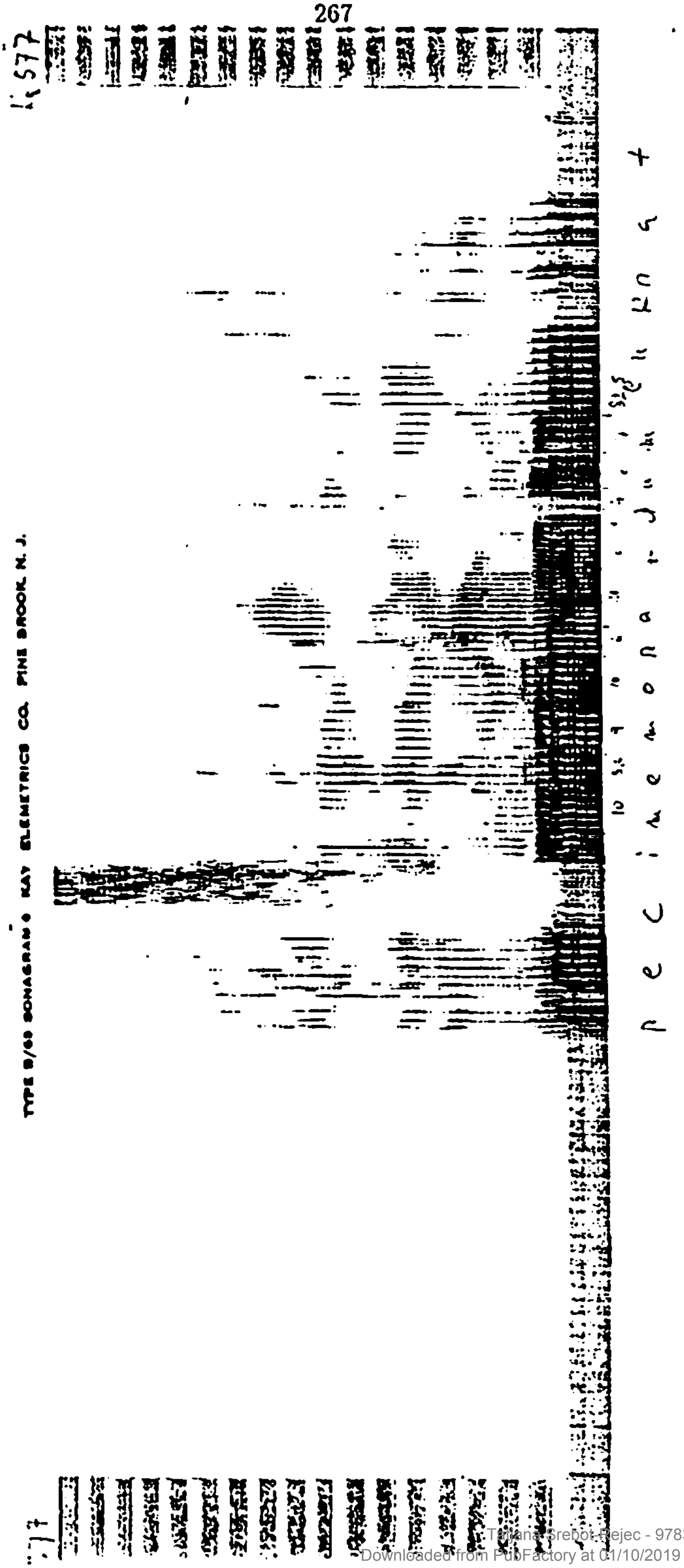
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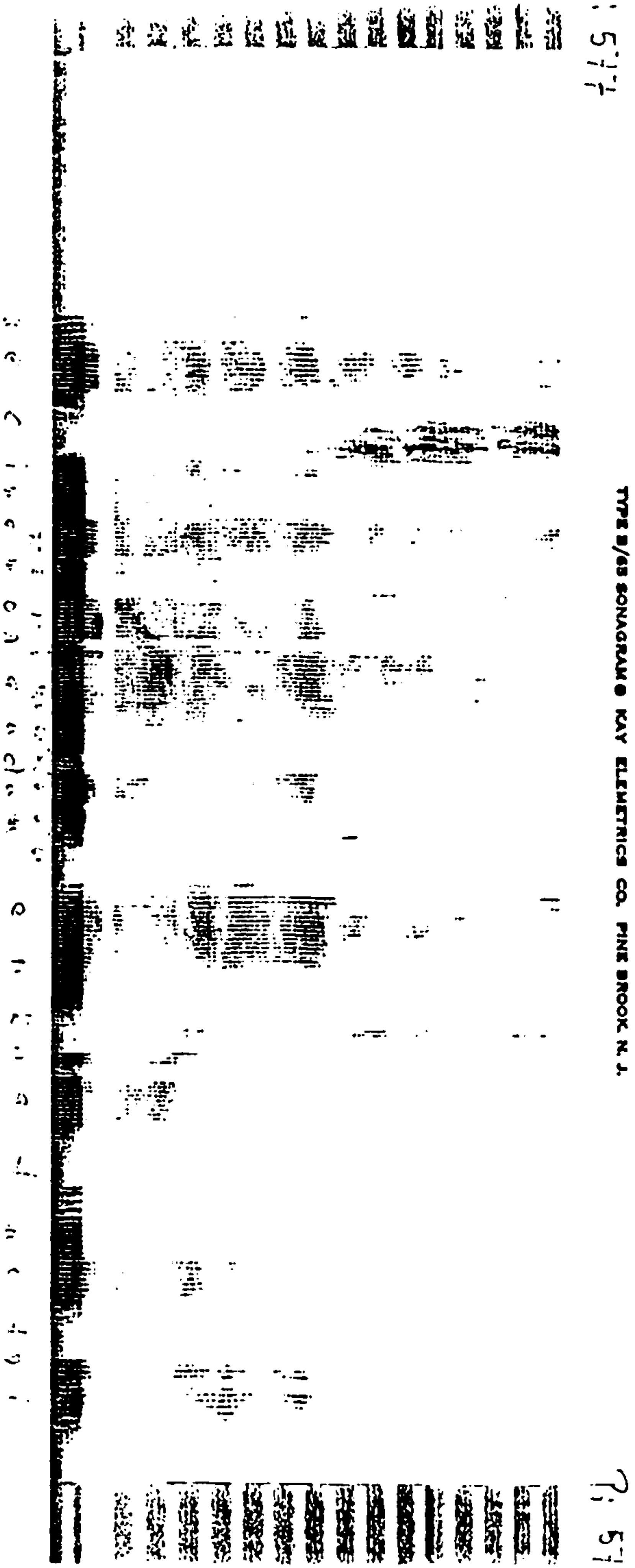
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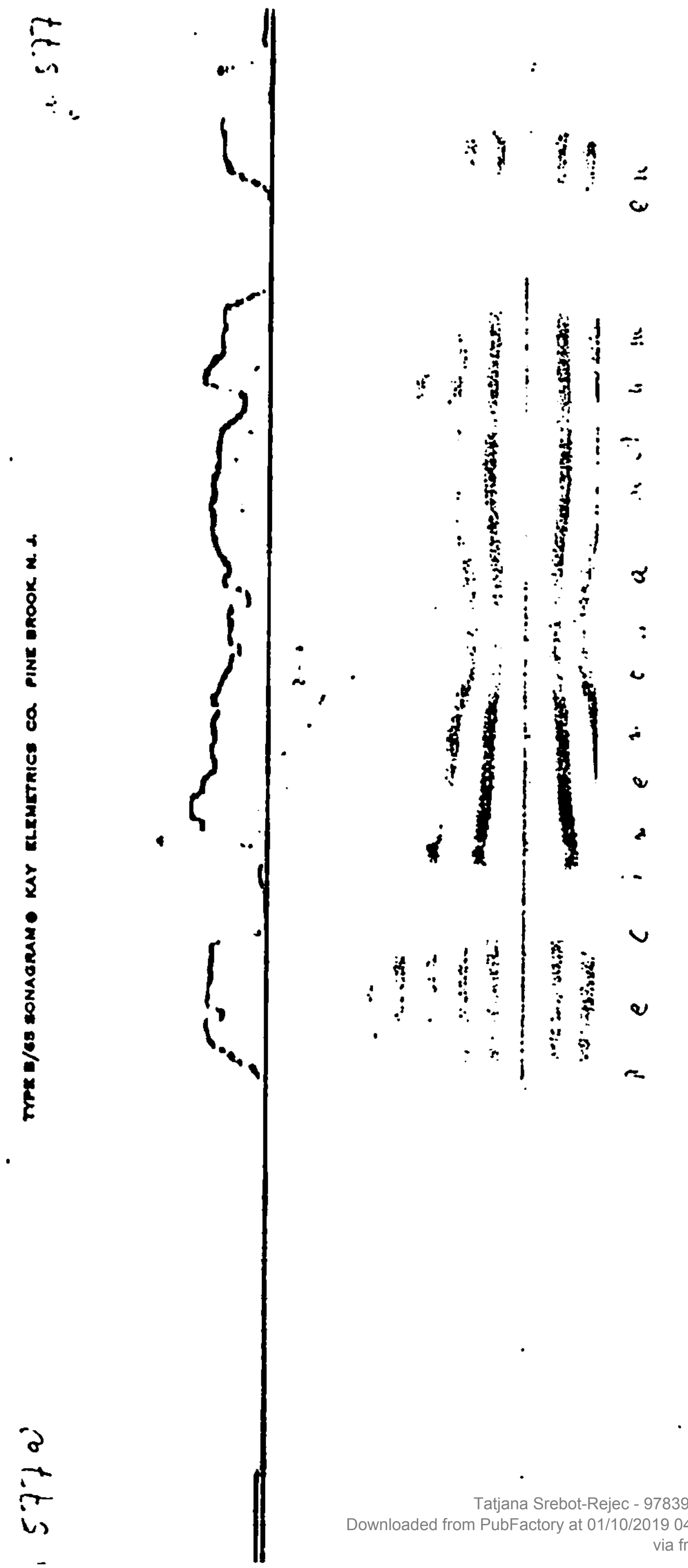
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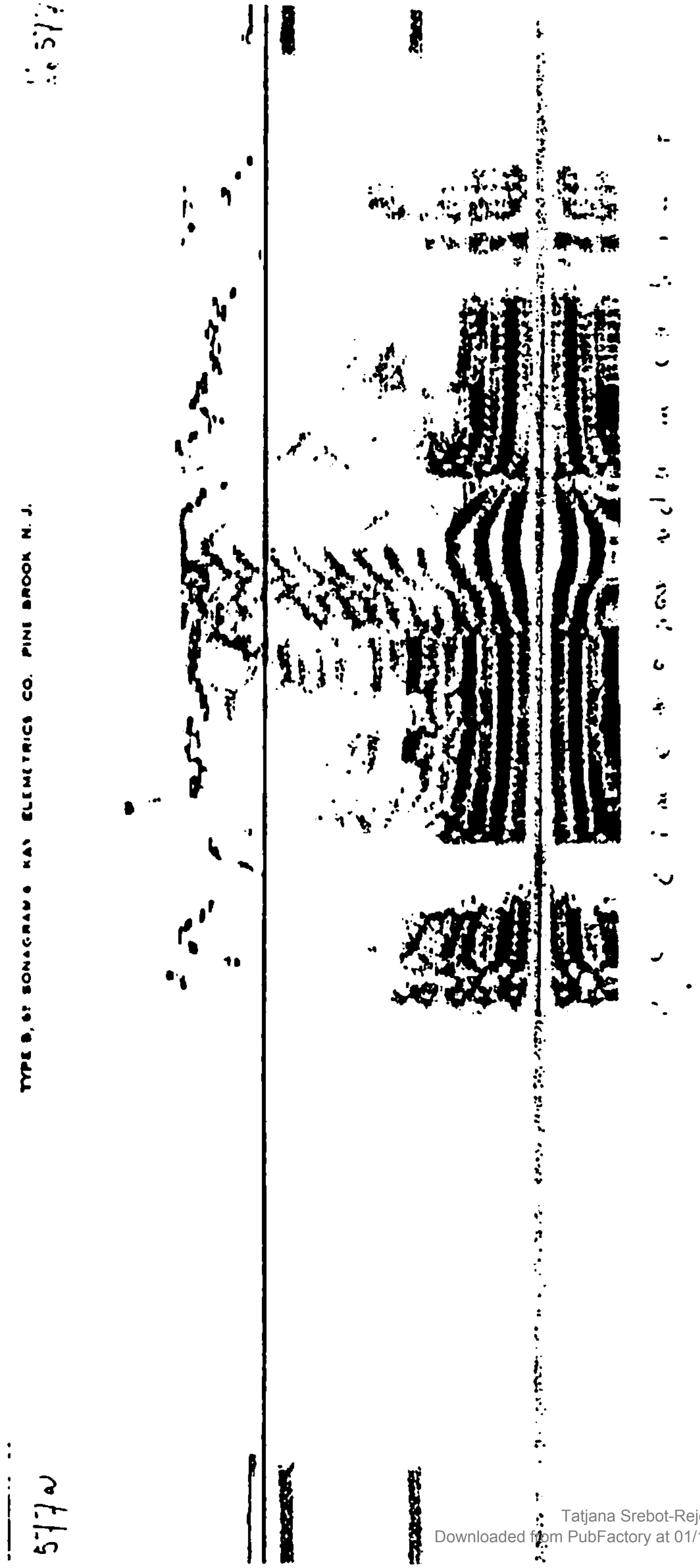
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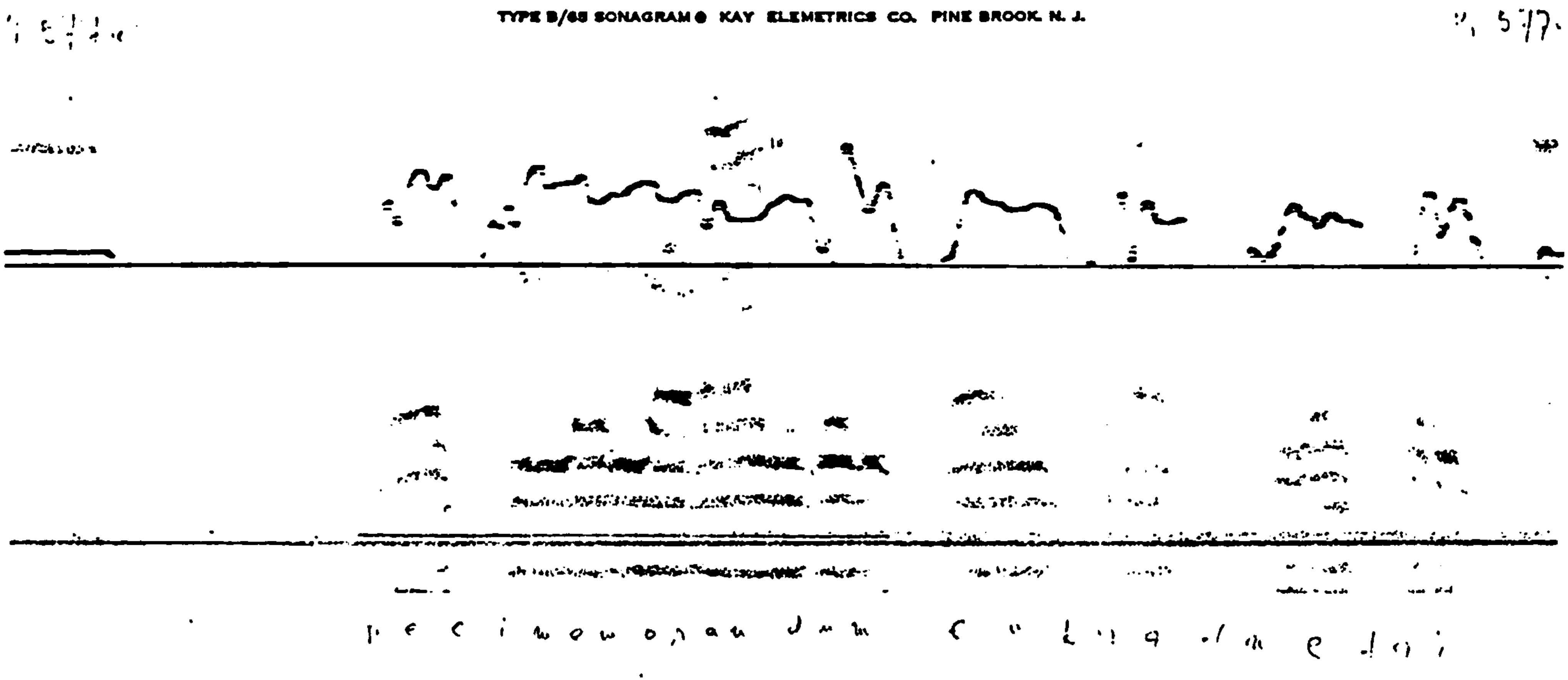
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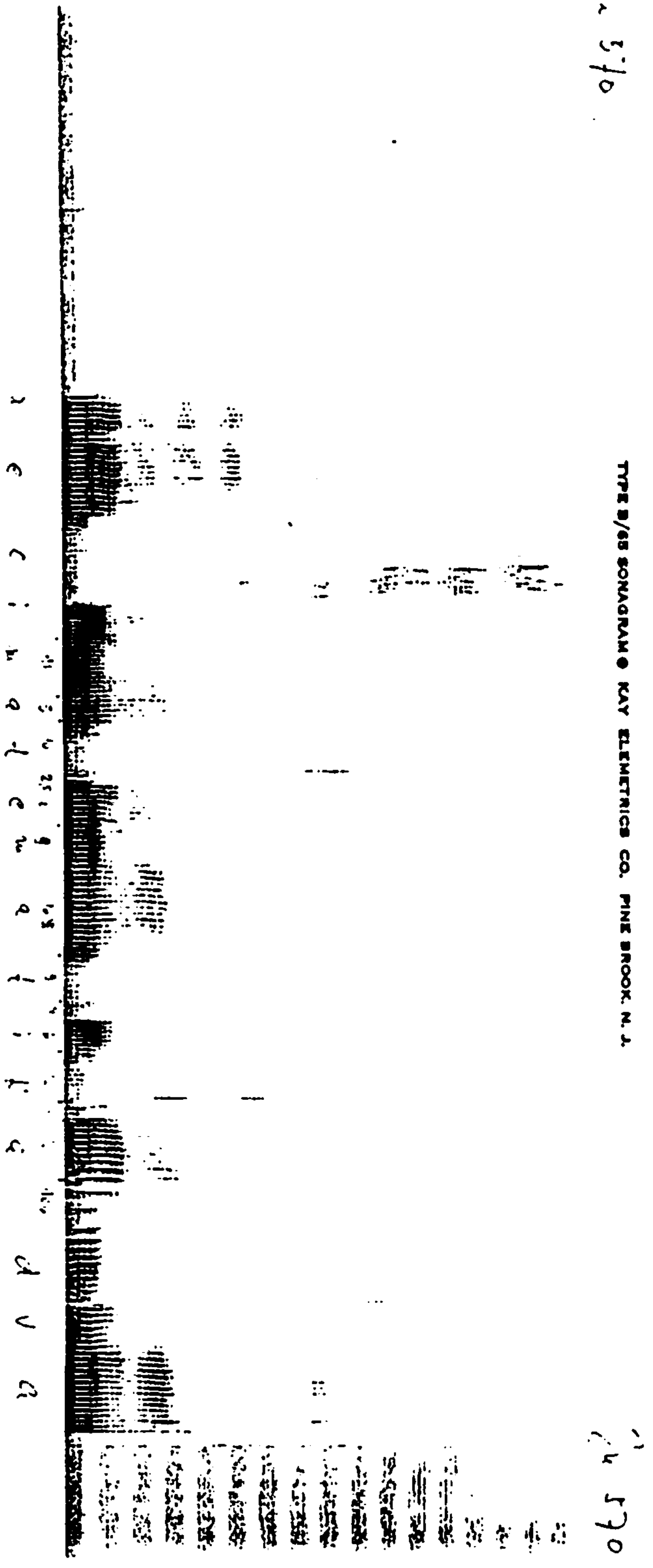
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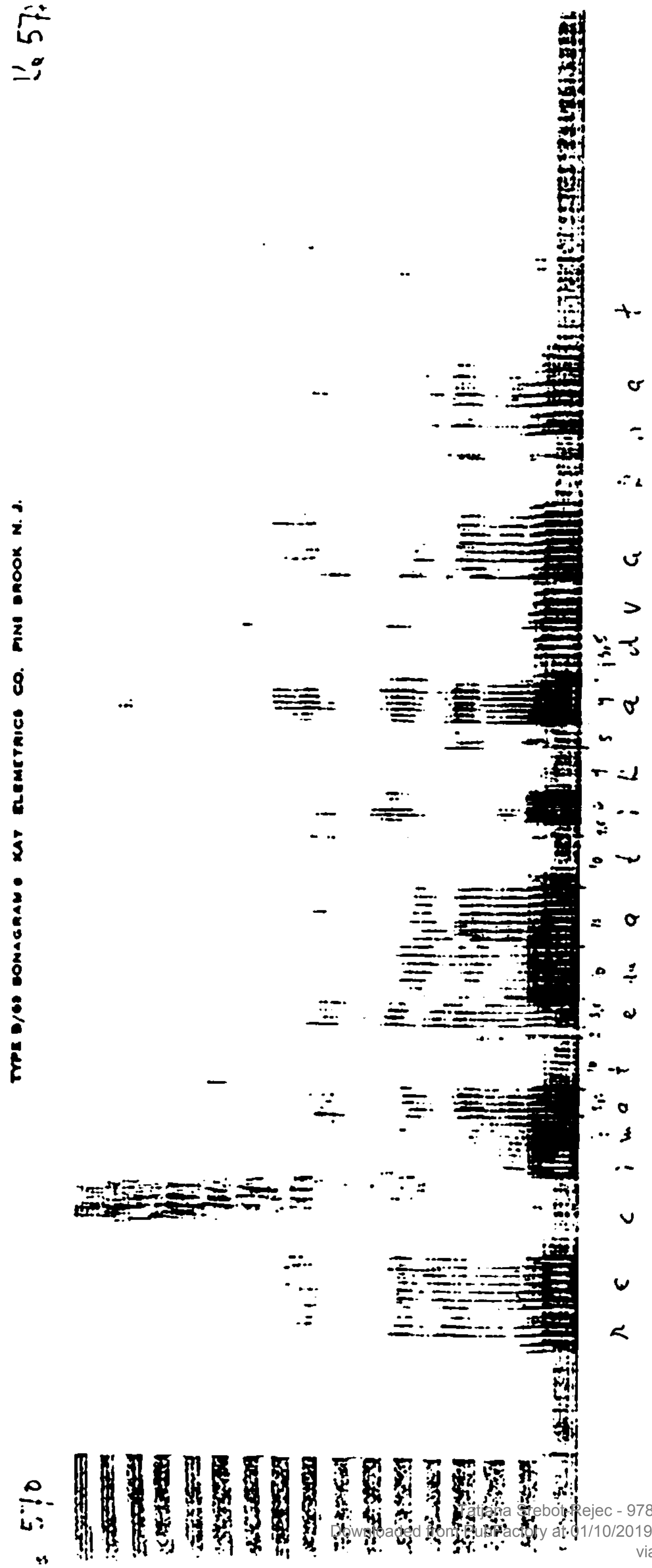
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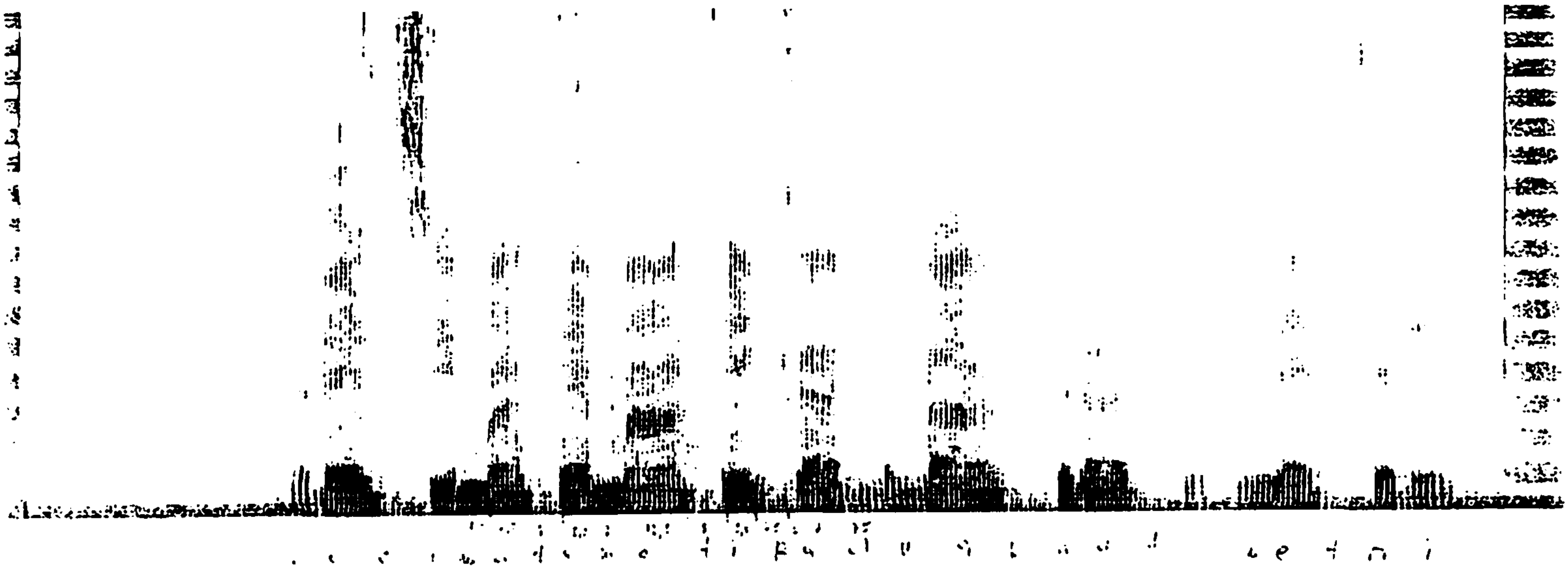

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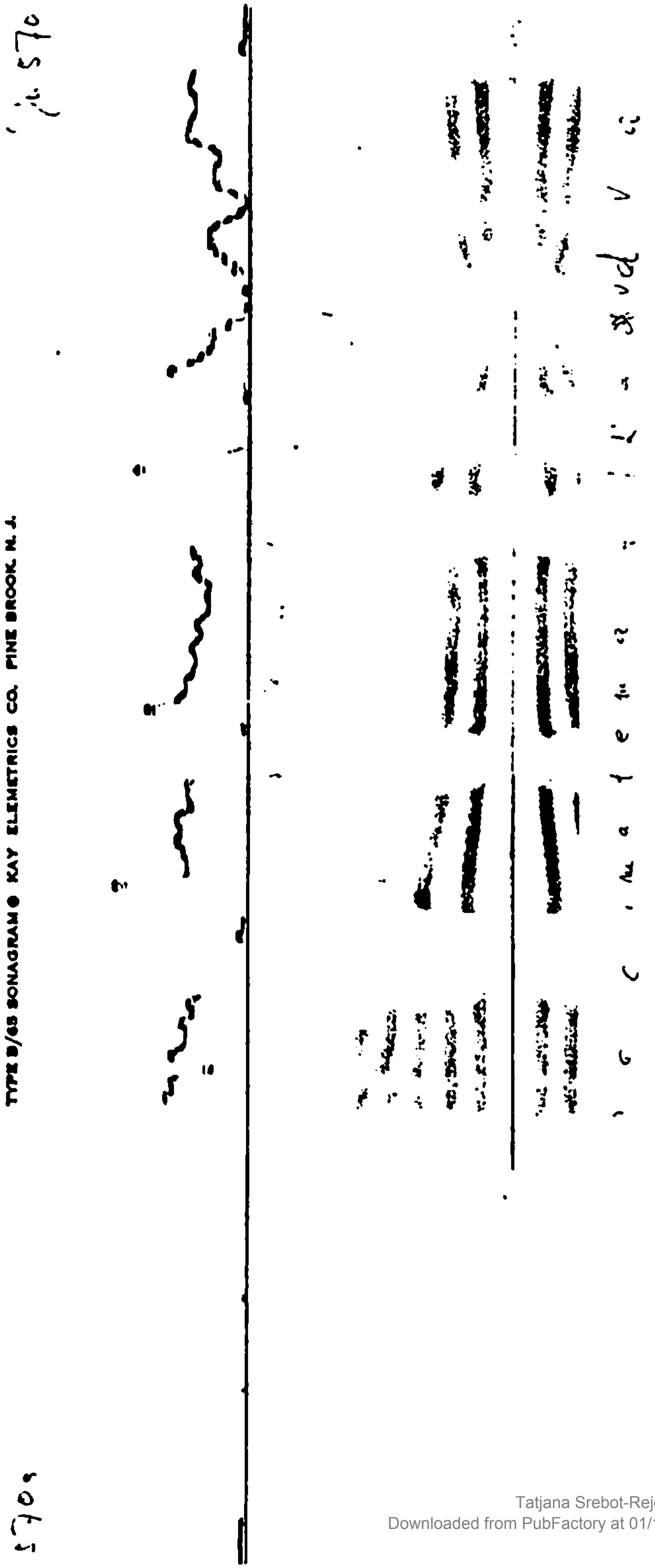
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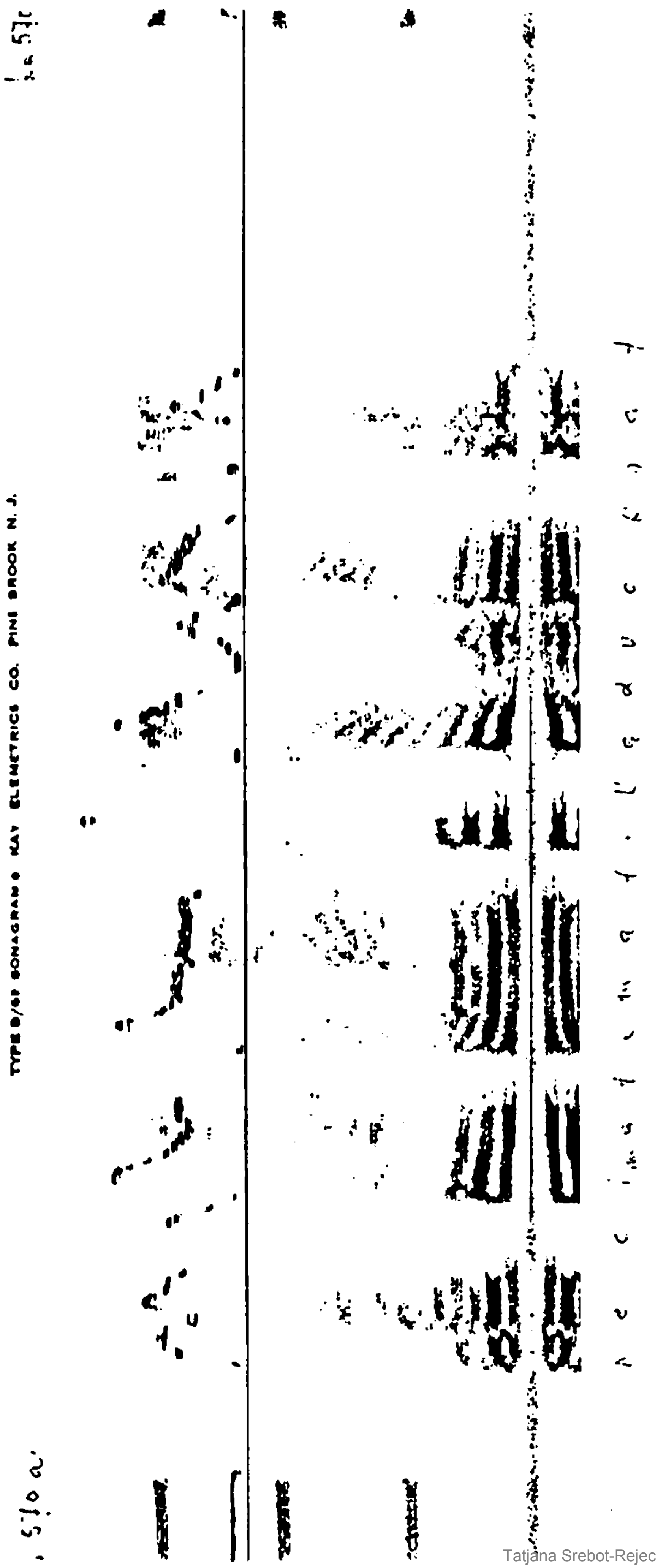
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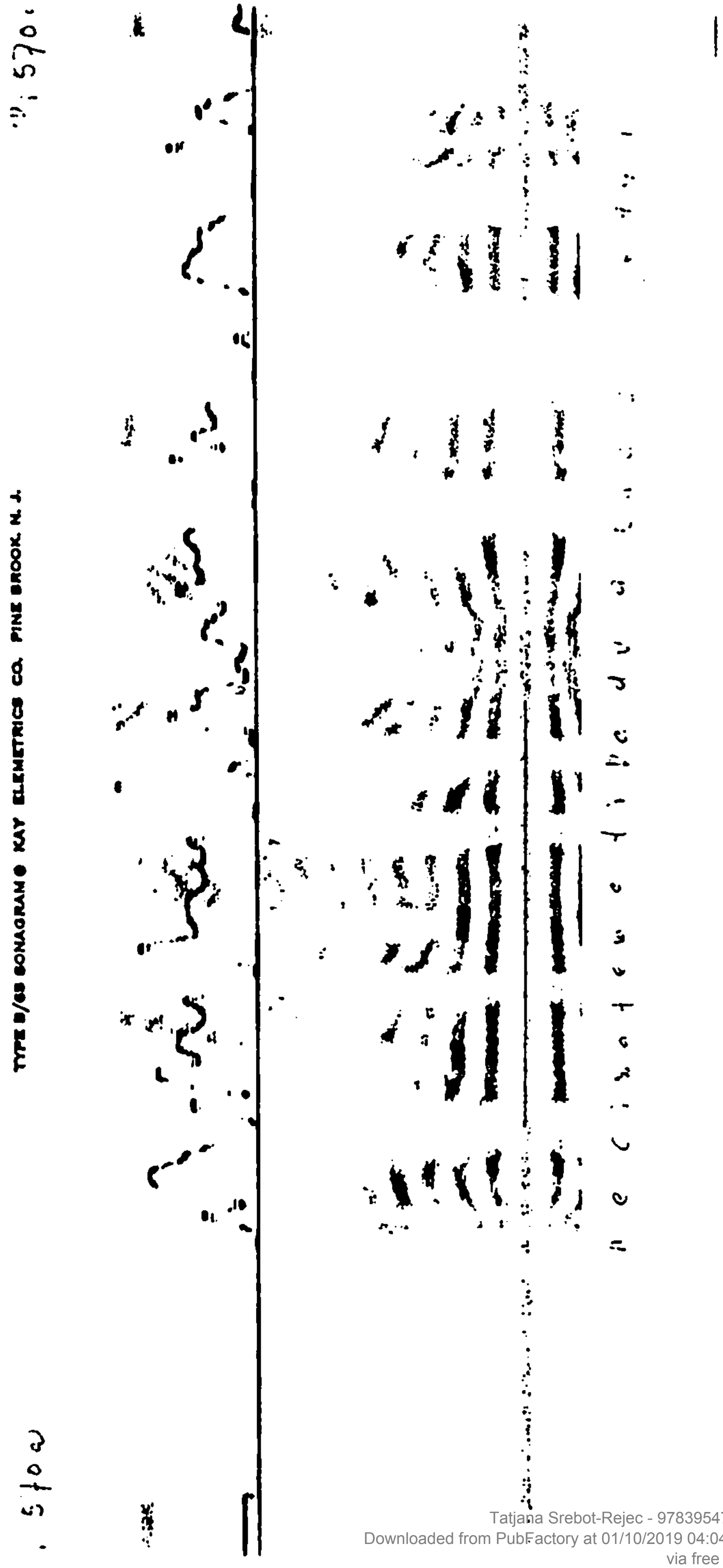
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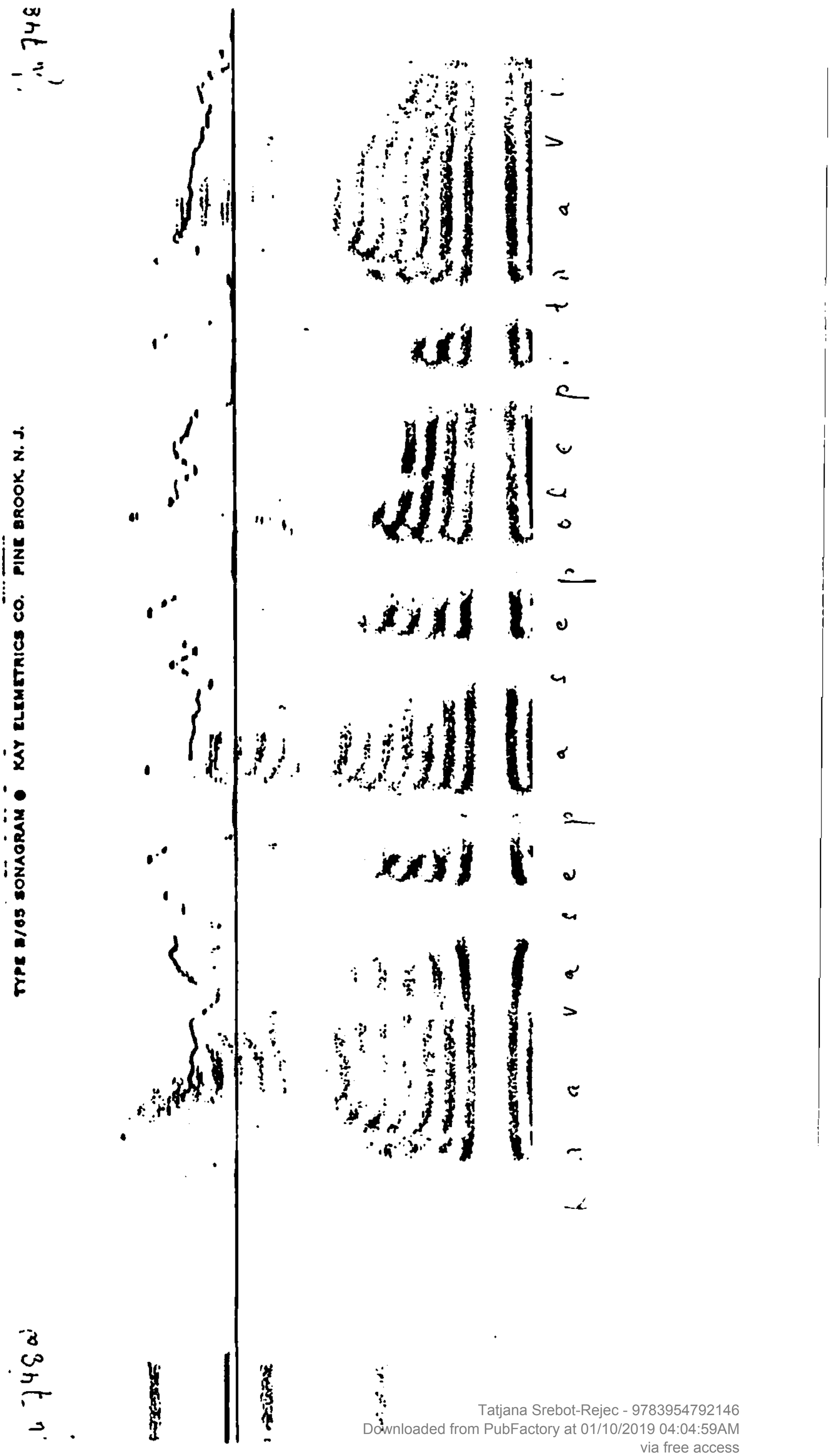
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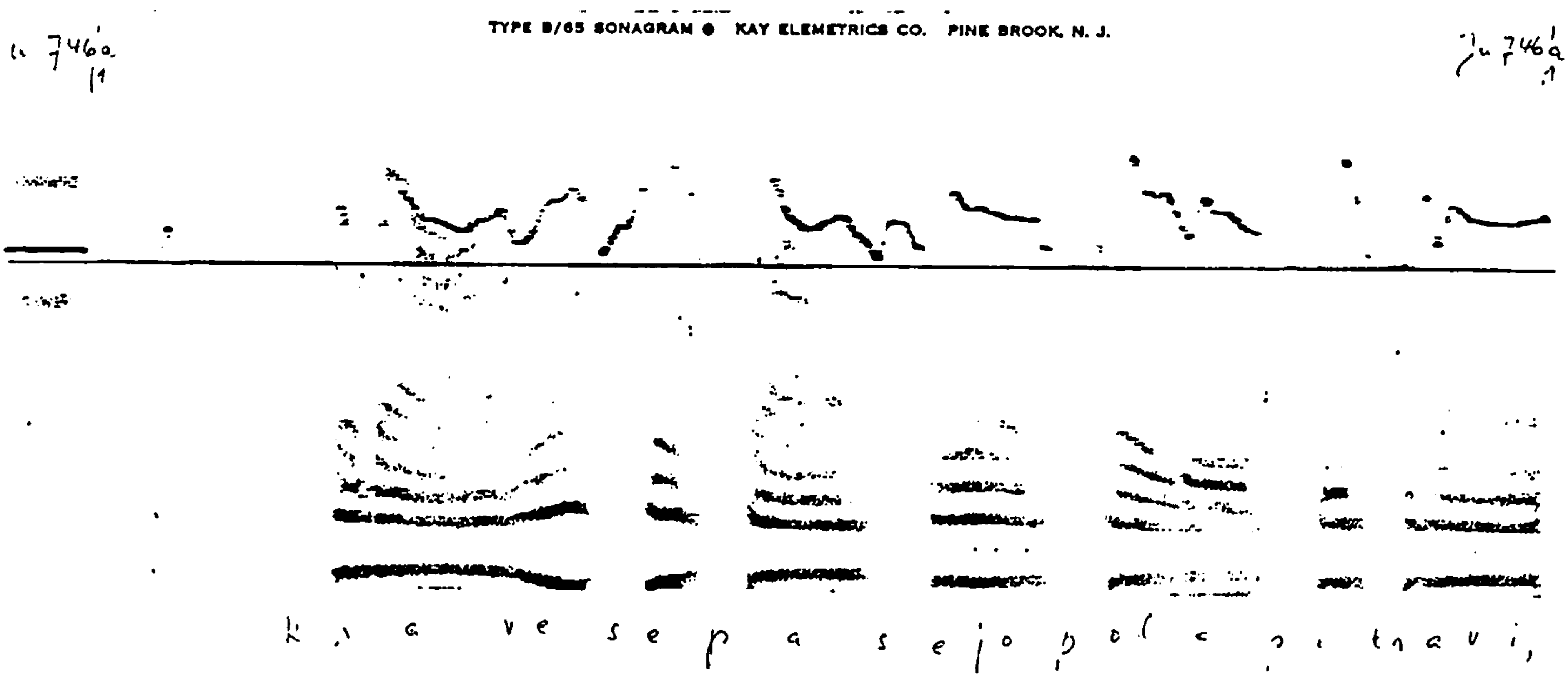

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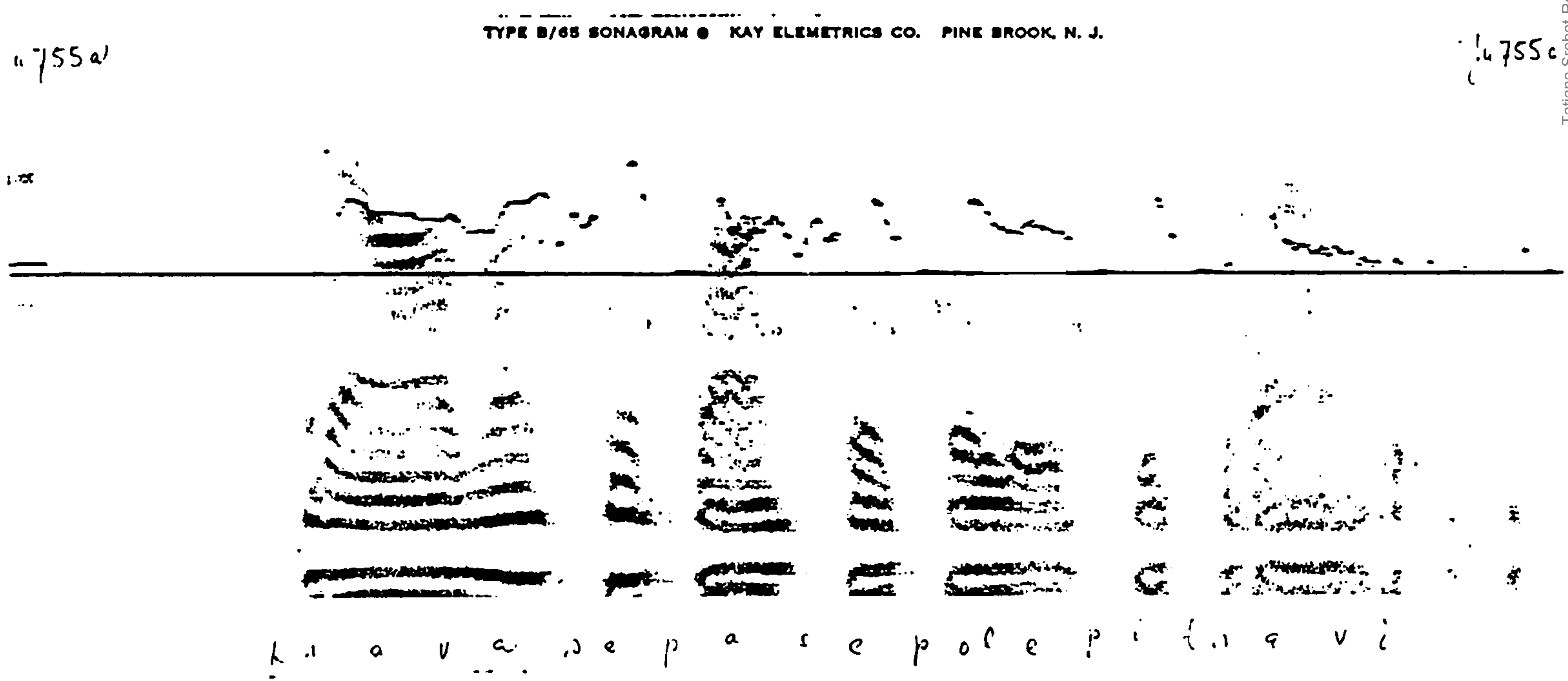
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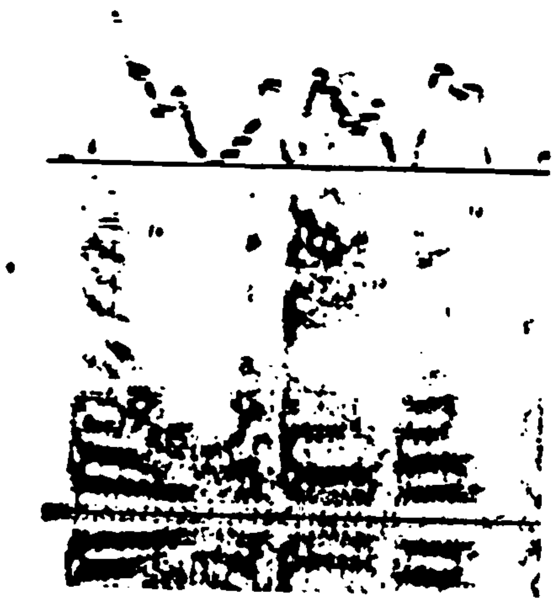
Ka 762



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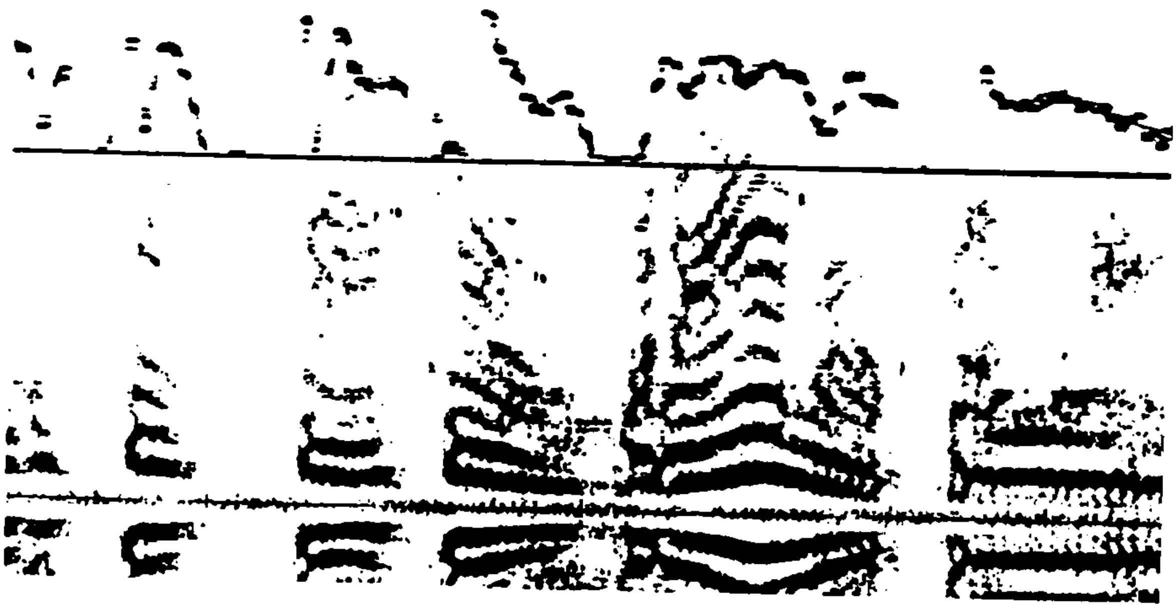

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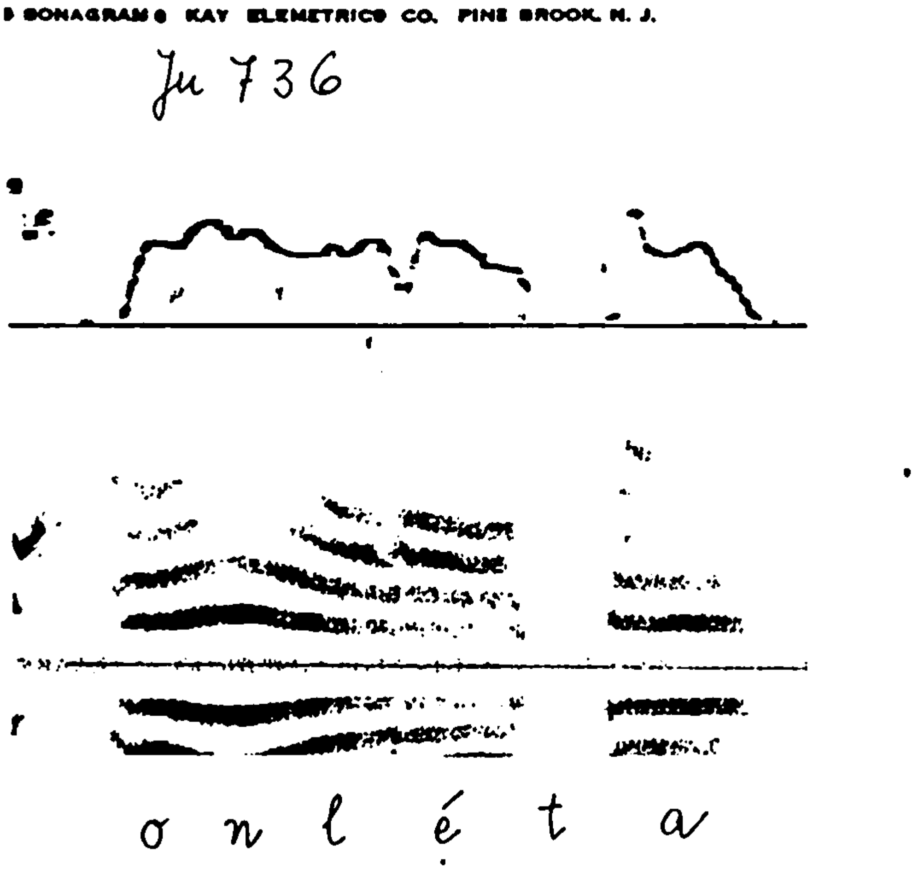
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Ju 736
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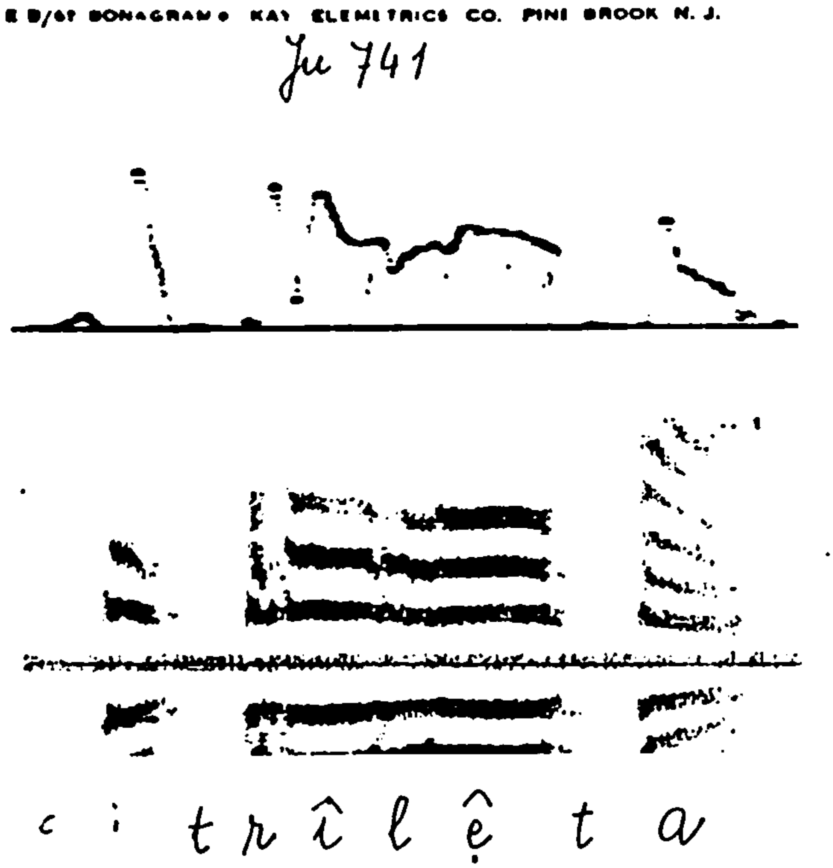
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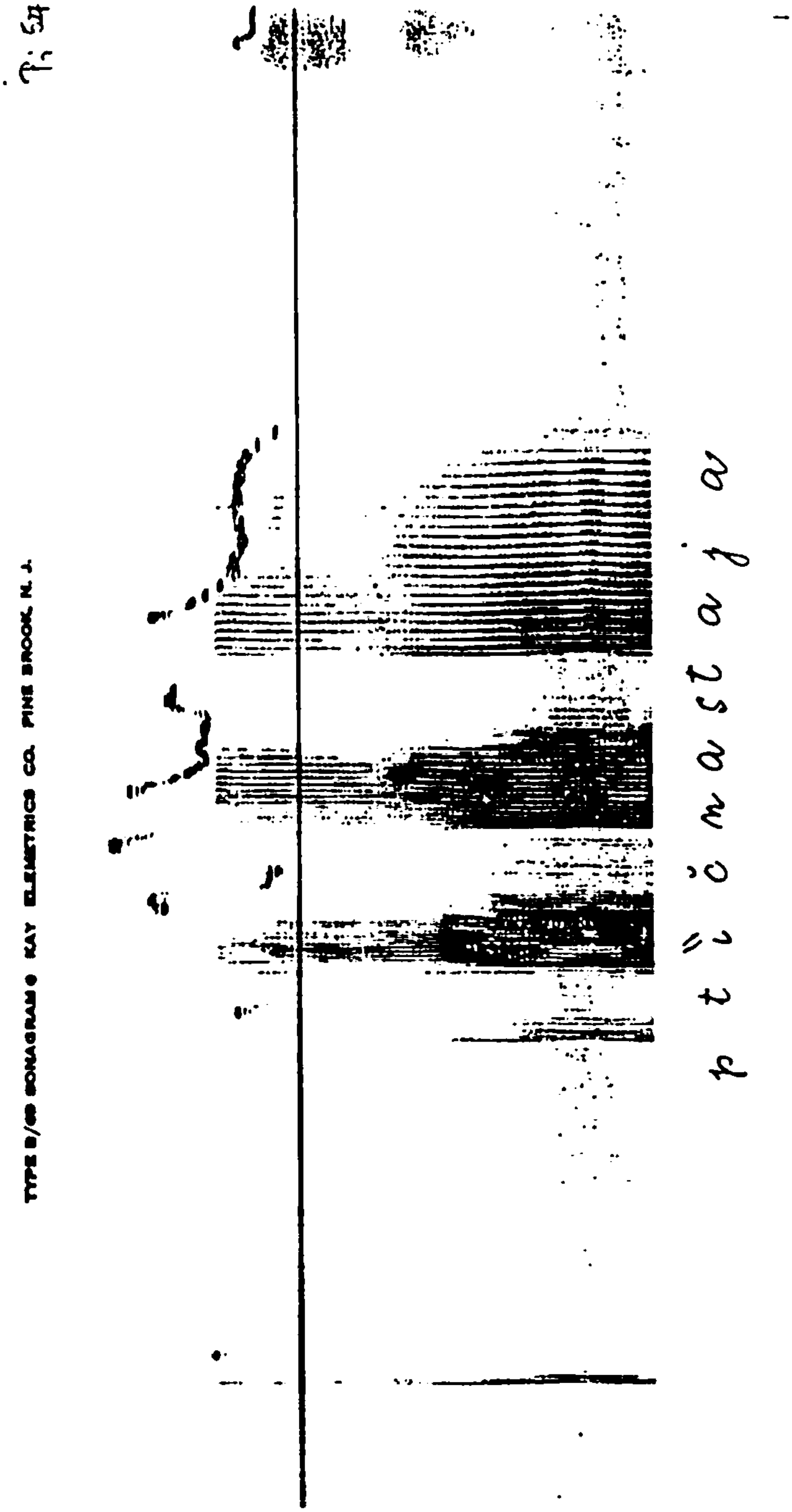
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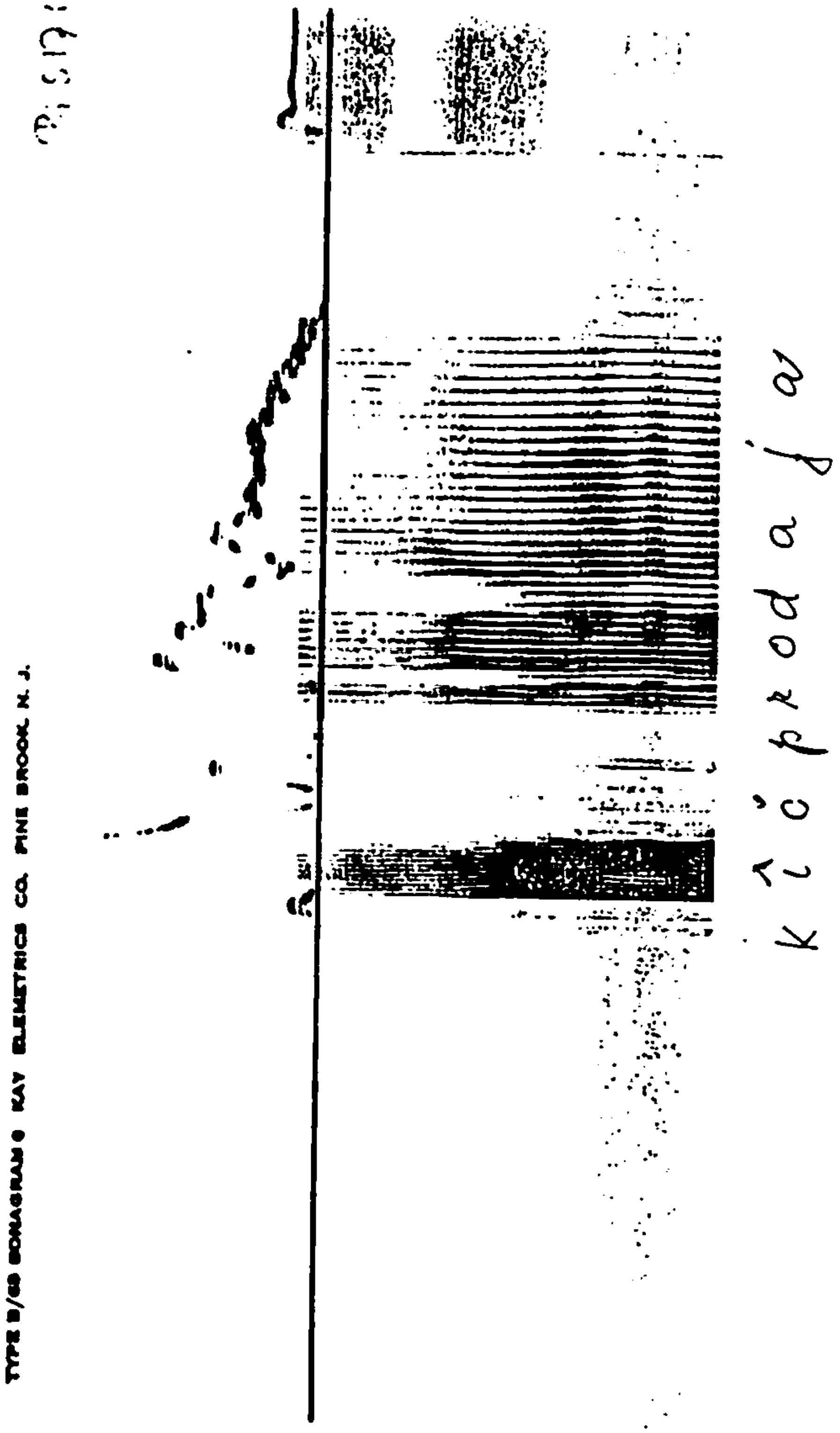

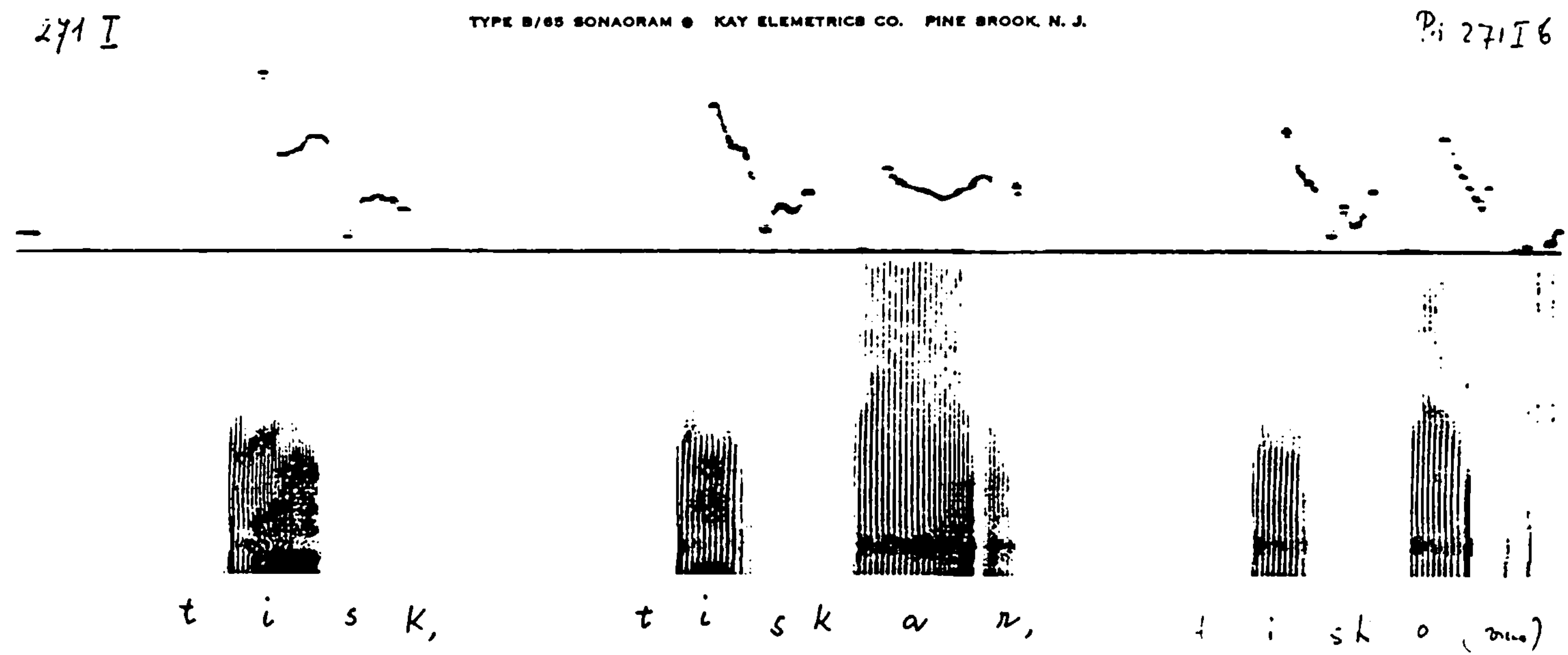
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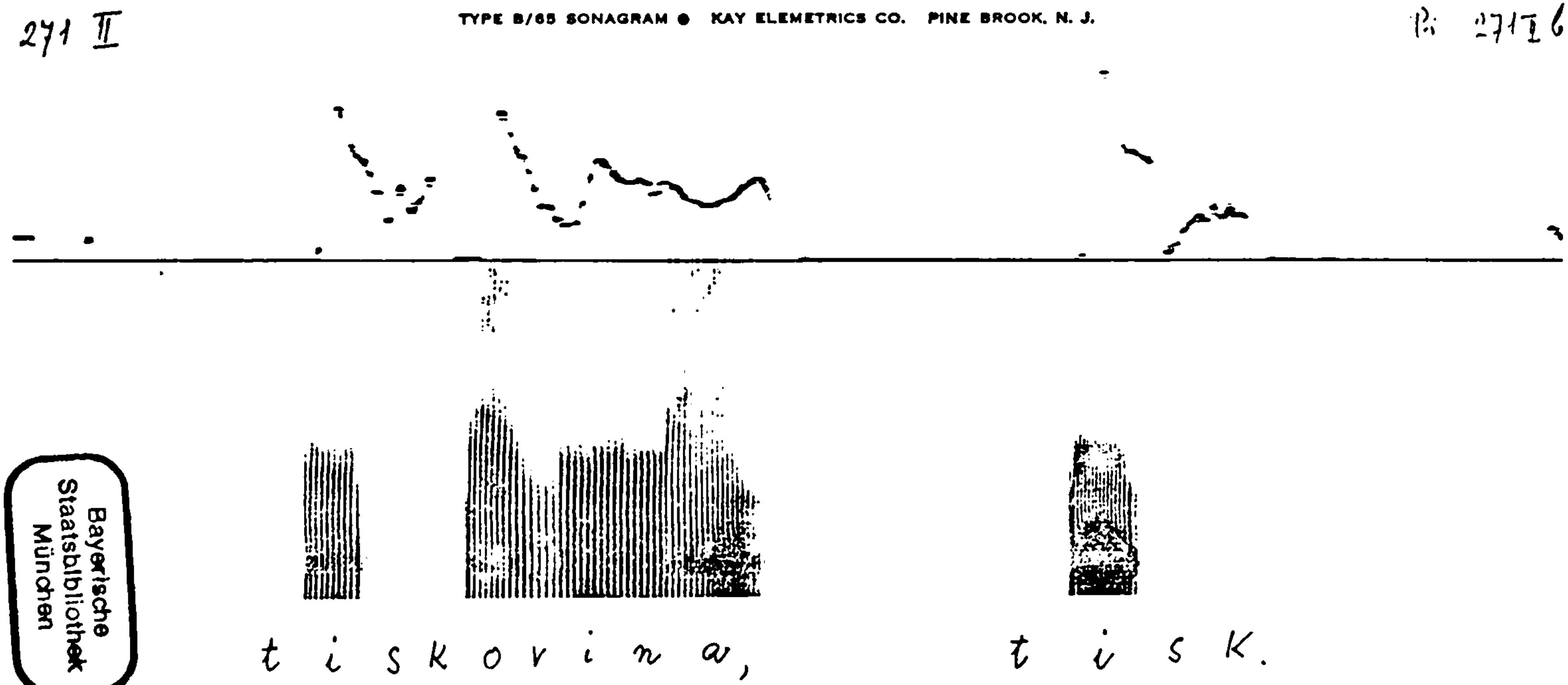
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271 I b
tiskovina, tisk.

S L A V I S T I S C H E   B E I T R Ä G E

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