ADDENDA ET CORRIGENDA

1.3 If, for instance, a language such as Turkish possesses the grave flat /u/, the grave plain /ɨ/, the acute flat /y/ and the acute plain /i/, the distinction of /u/ and /i/ is optimal, since grave and flat as well as acute and plain possess a common denominator - a downward or upward shift of the formants, respectively. The combination of grave and plain or of acute and flat has no common denominator and hence is not optimal.

2.2 Further experimental work is necessary before a conclusive solution of the problem of the vocalic and consonantal features can be given. The attempt to reduce these two features to a mere difference in their respective source functions appears to us now as somewhat of an oversimplification. We tentatively suggest the following definitions of the acoustical properties of these features:

Phonemes possessing the vocalic feature are acoustically characterized by the presence of formants with small damping and hence with a relatively narrow band width. Phonemes possessing the consonantal feature are acoustically characterized by a broadening, reduction and fusion of formants and formant regions due to zeros, high damping or transient variations of formant frequencies.

On the perceptual level Stumpf defined vowels as speech sounds with distinct chromaticity (ausgeprägte Färbung) and consonants as speech sounds without distinct chromaticity. In the diffuse vowels the chromaticity and in the compact consonants the achromaticity is attenuated (cf. 2.4233). Thus the optimal contrast is presented by a compact vowel and a diffuse consonant.

2.413 and 2.4233 Through the kindness of Dr. F. S. Cooper we have received the diagram of the experiment in Haskins Laboratories and thus we may give a more exact interpretation. The "schematic stop was judged by a large majority of the subjects," to be [k] when endowed with frequencies similar to the second formant of the following vowel. Otherwise, this stop was recognized as [p] or [t] depending upon whether or not its frequencies were lower than the second formant of [i].

2.431 The French syllabic [i] and non-syllabic [i] are phonemically opposed to each other as tense /i/ and lax /i/ (cf. Reference (34), Chapter 2). The sum of the deviations of the formants of the syllabic vowel is greater than that of the corresponding non-syllabic vowel.

	F_1	F_2	F_3	$\Sigma\Delta f$
Neutral Position (G. de Saussure)	520	1560	2600	
ai /ai/ "ai"	**270**	**2000**	**3200**	
Δf	**250**	**440**	**600**	1290
ail /ai/ "garlic"	**410**	**1930**	**3000**	
Δf	**110**	**370**	**400**	880

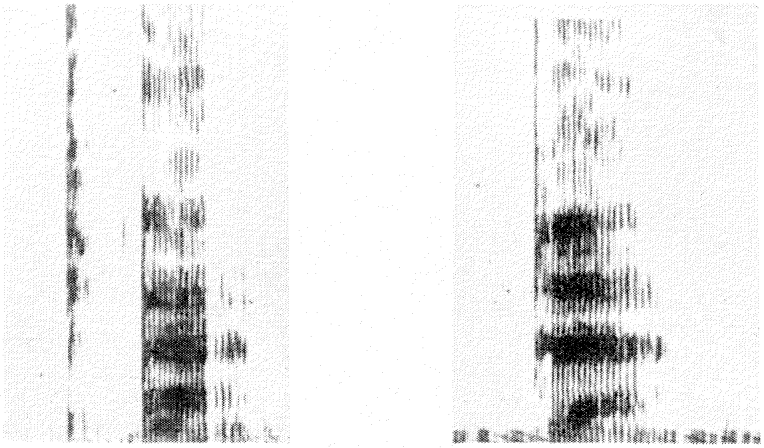

Fig. 1: Checked (glottalized) vs. unchecked consonant. Circassian: /pʾa/ "place" - /pa/ "be out of breath!" In the checked consonants the closure is abrupt and is followed by a period of silence.

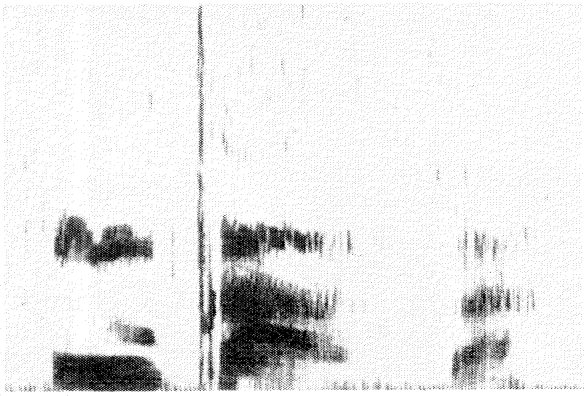

Fig. 2. Dental click. Xhosa: inkcaza "comb." The spectrogram clearly shows the two successive explosions (dental and velar).

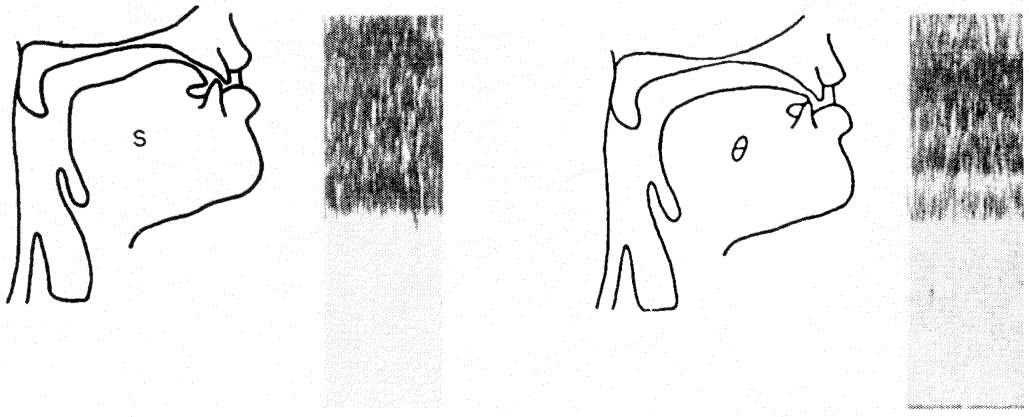

Fig. 3. Strident vs. mellow constrictives. English /s/ - /θ/. The spectrograms show the separation of formant regions in the mellow /θ/ which is not apparent in the spectrogram of the strident /s/. In the articulation profiles we can see the more complicated obstacle of strident /s/ where the air flow breaks against the edges of the lower teeth, while in the production of /θ/ the lower teeth are covered by the tongue.