

The Spectral Analysis of Sinhalese Vowel

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The objective of this study is to examine the traditional description of vowel articulation with their formant characteristics of instrumental analyses.

Findings:

1. Vowels /ɪ:/ and /ɛ:/ do not differ in FI. It is possible to say, that they have the same degree of closeness; they are in fact the most closed vowels since they have the lowest FI among all the long vowels;
2. Vowel /ɔ:/ is the most open, its FI is the highest; vowels /ε:/ and /o:/ do not differ in FI and hence have the same degree of closeness, but not that much as vowels /ε:/ and /ɛ:/
- their first formant is 448-363 Hz, but /ɪ:/ and /ɛ:/ have lower FI :284-240 Hz;
3. Vowel /ɛ:/ follows vowels /ε:/ and /o:/ in the degree of closeness;
4. Sinhalese long vowels are characterized by four degrees of rise, on the basis of the acoustic characteristics:
Closed -/ɪ:/ and /ɛ:/; Half-closed -/ε:/ and /o:/;
Half-open -/ɛ:/; Open -/ɔ:/.
5. According to frequency values of the second formant, long vowels differ in the following manner: front vowels with a high second formant, for example, /ɪ:/- (2648 Hz), /ε:/ - (2575 Hz), /ɛ:/ - (2101 Hz) and retreated vowels -/ɔ:/, /o:/, /ɛ:/ have a lower FII (1215 Hz, 478 Hz, and 417 Hz accordingly).
6. According to frequency values of the first formant of short vowels, the most closed are vowels ɪ ← their FI is 279 and 262 Hz, that is almost equal. Also nearly the same were FI frequencies for vowels / / and / o/, it is the next lower degree of closeness of vowels (their FI is 478 and 345 Hz accordingly). Vowels ↔ □, by their average data, are equally open vowels.
7. Values of the second formant testify that the most protruded vowels are /ɪε and more retreated are o □ thus vowel / / appeared most backward and the most protruded in the group of short vowels was /□ /.
8. In frequency values short and long monophthongs almost do not differ.
9. In frequency values diphthongs differ from monophthongs in the second components.
10. According to the acoustic classification the Sinhalese vowels may be characterized as

follows:

Compact vowels- /□ :/, /□ /;

Low - /ɛ:/, /ɛ/, /o:/, /o/;

Flat - /ɛ:/, /ɛ/, /o:/, /o/;

diffusive- /ɪ:/, /ɪ/, /ε:/, /ε/, /ɛ:/, /ɛ/;

high - /ɪ:/, /ɪ/, /ε:/, /ε/, /ɛ:/, /ɛ/;

simple- /□ ⊃/, /□ /, /ɪ ⊃/, /ɪ /, /ε:/, /ε/, /ɛ ⊃/, /ɛ /;

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