Acoustic characteristics of vowels and plosives/affricates of Mandarin-speaking hearing-impaired children

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This article presents the results of an acoustic analysis of vowels and plosives/affricates produced by 45 Mandarin-speaking children with hearing impairment. Vowel production is represented and categorized into three groups by vowel space size calculated with normalized F1 and F2 values of corner vowels. The correlation between speech intelligibility and language abilities assessed by the level of word comprehension and the complexity of sentence structure is statistically significant. Vowel space grouping is correlated with speech intelligibility and spike percentage of plosives/affricates production. The generalized linear model analysis also shows that the level of word comprehension and the degree of hearing loss are the two most significant factors in predicting speech intelligibility. The statistical results suggest that the interplay of acoustic characteristic and speech ability is complex.