

**College of Education Internal Mini Grant
Research Progress Report**

Project Title: Nasalization Amplitude and Timing Characteristics in Individuals with Cleft Palate

Researcher & Department: Youkyung Bae, PhD, Department of Special Education / Communication Disorders

Research Progress Summary

Although there is a general consensus in the literature that the amplitude domain of nasalization has the strongest perceptual salience in identifying the velopharyngeal status (Jones, 2000), distinct timing patterns of nasalization in individuals with velopharyngeal dysfunction secondary to cleft palate have also been reported. The Nasometer (KayPENTAX™, Lincoln Park, NJ) is a computer-assisted acoustic instrument, which allows examining both the amplitude measure and the temporal characteristics of nasalization (Bae, Kuehn, & Ha, 2007). The present study examined the amplitude-timing relationships of nasalization among individuals with cleft palate.

A total of ten participants with history of cleft palate have been recruited thus far. Acoustic data were collected using the Nasometer while participants were repeating a standardized passage (i.e., Zoo Passage) and three nonsense syllables including /a za na za/, /i zi ni zi/, and /u zu nu zu/. The amplitude parameter of nasalization was based on the average nasalance scores for the Zoo Passage readings and for each nonsense syllable production. The temporal parameter of nasalization was measured based on a nasalization ratio defined as the nasalized duration to the total duration of the middle VNV sequence in the nonsense syllables.

Preliminary data based on six participants showed a moderate linear relationship ($r = .41$) between the amplitude measured from the Zoo Passage and the nasalization ratio obtained from the nonsense syllable productions. The amplitude-timing relationships of nasalization varied across different vowel contexts. For example, the entire middle VNV sequence tended to become nasalized in the high vowel /i/ and /u/ contexts, approximating the nasalization ratio of one in many instances. More variability across participants was noted in the timing characteristics for the low vowel /a/ context, where the highest degree of correspondence ($r = .56$) between the amplitude and timing characteristics of nasalization was observed.

The varying degrees of amplitude-timing relationships across different vowel contexts suggest that the high vowel contexts may be more sensitive for detecting normal vs. disordered velopharyngeal controls and that the low vowel context, with its considerable variation, may be more sensitive for capturing changes in speech outcomes within an individual. Data collection and analysis are still in progress. Part of the study will be presented at the 2012 American Cleft Palate-Craniofacial Association (ACPA) conference, San Jose, CA.

Total Budget Rewarded: \$300

Total Budget Remained: \$300

Bae, Y., Kuehn, D. P., & Ha, S. (2007). Validity of the Nasometer measuring the temporal characteristics of nasalization. *Cleft Palate Craniofacial Journal*, 44, 506-517.

Jones, D. L. (2000). The relationship between temporal aspects of oral-nasal balance and classification of velopharyngeal status in speakers with cleft palate. *Cleft Palate Craniofacial Journal*, 37, 363-369.