

## Session 4pSC

Speech Communication: Speech Perception II: Intelligibility, Learning, and Audio-Visual Perception  
(Poster Session)

Michael S. Vitevitch, Chair

*Psychology, University of Kansas, Lawrence, KS 66045**Contributed Papers*

All posters will be on display from 1:00 p.m. to 5:00 p.m. To allow contributors an opportunity to see other posters, contributors of odd-numbered papers will be at their posters from 1:00 p.m. to 3:00 p.m. and contributors of even-numbered papers will be at their posters from 3:00 p.m. to 5:00 p.m.

**4pSC1. Confusability of Bengali consonants and its relation to phonological dissimilarity.** Sameer ud Dowla Khan (Linguistics, Reed College, Portland, OR, sameeruddowlakhan@gmail.com)

Language-specific consonant similarity can be measured indirectly by looking at the phoneme inventory, the lexicon (e.g. cooccurrence restrictions), or the phonology (e.g. processes that take the notion of similarity of dissimilarity into account). A more direct approach involves the use of the confusion matrix. For Bengali, thus far, consonant similarity has only been measured indirectly, through the lexicon and phonology. Previous studies (Khan 2006, 2012) claim that Bengali speakers judge the similarity of consonants in echo reduplication (similar to English doctor-schmoctor), where the initial consonant of the base is systematically replaced with a phonologically dissimilar consonant in the reduplicant. This measurement of similarity assumes a set of features assigned language-specific weights; for example, [voice] is weighted more heavily than [spread glottis], to explain why speakers treat the pair [t, th] as more similar than the pair [t, d]. But does the measurement of similarity inherent in the echo reduplicative construction correspond to the relative perceptibility of different consonant contrasts? The current study compares the relative confusability of Bengali consonants produced in noise with the claims of phonological notions of similarity associated with echo reduplication.

**4pSC2. Effects of age, hearing loss, and phonological neighborhood density on children's perceptual confusions.** Mark Vandam (Boys Town National Research Hospital, 555 North 30th Street, Omaha, NE 68131, mrk.vandam@gmail.com), Noah H. Silbert (Center for Advanced Study of Language, University of Maryland, College Park, MD), and Mary Pat Moeller (Boys Town National Research Hospital, Omaha, NE)

Age, hearing loss, and phonological neighborhood density have been shown to substantially affect the accuracy of productions in a word imitation task [VanDam, et al., 161st ASA Meeting]. Older children (7 years of age) are more accurate than younger children (4 years of age), normal hearing children are more accurate than children with mild- to severe hearing loss, and words from sparse phonological neighborhoods are produced more accurately than are words from dense neighborhoods. In an ongoing series of analyses, we extend these findings by analyzing how patterns of perceptual confusion vary as a function of age, hearing status (normal hearing versus hearing loss), and phonological neighborhood structure. Multilevel cognitive models fit to confusion data provide detailed quantitative descriptions of perceptual space and response bias and enable analysis of between- and within-group variability. Results shed light on the organization of the lexicon in young children with both normal hearing and hearing loss, and add to our understanding of the relationship between speech production and speech perception in children.

**4pSC3. Phonological neighborhood clustering coefficient influences word learning.** Rutherford Goldstein and Michael S. Vitevitch (Psychology, University of Kansas, 1415 Jayhawk Blvd., Lawrence, KS 66045, mvitevitch@ku.edu)

Network science is one approach used to analyze complex systems, and has been applied to a complex cognitive system, namely the phonological lexicon (Vitevitch, 2008). One of the measures provided by network science, termed the clustering coefficient or C, influences lexical processes such as speech production (Chan & Vitevitch, 2010) and speech perception (Chan & Vitevitch, 2009). The current study presents evidence of C influencing the process of learning new words. Participants were trained and tested on nonword-nonobject pairs over three lab sessions at one week intervals. Testing occurred immediately after training and after a one week interval. Participants were tested on a picture naming task, a two-alternative-forced-choice task, and a lexical decision task. Results show an advantage for learning new words with a high clustering coefficient. A spreading activation account is used to explain the findings.

**4pSC4. Phonological neighborhood density and vowel production in children and adults.** Benjamin Munson (Speech-Language-Hearing Sciences, University of Minnesota, 115 Shevlin Hall, 164 Pillsbury Drive SE, Minneapolis, MN 55455, munso005@umn.edu), Mary E. Beckman (Linguistics, Ohio State University, Columbus, Minnesota, MN), and Jan Edwards (Communicative Disorders, University of Wisconsin, Madison, WI)

Previous studies have shown that vowels in words with high phonological neighborhood densities (ND) are produced closer to the periphery of the vowel space than are vowels in low-ND words (Munson & Solomon, 2004; Scarborough, 2010; Wright, 2003). Different explanations for this phenomenon have been proposed. One hypothesis is that they reflect a speaker's attempt to maintain acoustic distinctiveness among similar-sounding words. If this were true, then we might expect that the effect of ND on vowel production would be smaller in children than in adults, given that children have overall smaller-sized lexicons than adults. To evaluate this, we examined the effect of ND on vowel production in children and adults. The productions were taken from the paidologos corpus (Edwards & Beckman, 2008). Preliminary analyses of the productions of 8 high-ND and 8 low-ND words by 10 2-year-olds, 10 5-year-olds and 20 adults have been completed. There are no effects of ND on vowel-space size or vowel duration for either group of children. There were strong, statistically significant effects found for the group of adults. These were in the opposite than predicted direction: low-ND words were produced with more-expanded vowel spaces than high-ND words. Analysis of a larger group of participants is ongoing [support: NIDCD 02932.]