information on speech recognition in noise. One hundred and twenty sentences in which final word varied in predictability, i.e., high versus low semantic context, and which were produced in conversational and clear speech by one female and one male talker were embedded in noise. Twenty children between 5 and 12 years of age participated in a sentence-in-noise perception test. The goal was to examine the level of signal clarity needed to take advantage of the contextual information for children with cochlear implants compared to children with normal hearing. This research will allow us to explore the interaction between lower-level sensory and higher-level cognitive factors that affect speech processing in these two target groups of children.

10:15—10:30 Break

10:30

4aPP6. Duration of point vowels in four- and five year olds with hearing aids and cochlear implants. Mark VanDam, Dana Ide-Helvie, and Mary Pat Moeller (Ctr. for Childhood Deafness, Boys Town Natl. Res. Hosp., 555 N 30th St., Omaha, NE 68131)

Advances in hearing science have dramatically reduced the age of identification of hearing loss (HL) and improved intervention strategies, especially amplification methods. As a result, children with HL have earlier, better auditory access. How this early auditory experience affects language and speech abilities is not fully understood. This study addresses one aspect of speech production looking closely at point vowel duration. Although typically longer in children with HL and younger children, vowel duration has not been examined in early identified children with HL, and possible influence of device type (cochlear implant or hearing aids) is unclear. This study examines point vowel duration at four- and five-year-olds among children with normal hearing, cochlear implants, and hearing aids. Children produced /æ, ɑ, i, u/ in words modeled by the experimenter in a live-voice, listen-and-repeat format. As expected, results indicate that children with HL and younger children produced longer vowels. Results also indicate that effects are likely driven by high vowels in all children, and children with cochlear implants and hearing aids perform similarly, despite less auditory experience in the group with cochlear implants. Results have implications for developmental models and possible clinical applications. [Work supported by NIH /NIDCD Grant Nos. T32-DC00013 and R01-DC006681.]

10:45

4aPP7. A large-scale study on meaning-oriented auditory training with single versus multiple talkers. Nancy Tye-Murray (CID at Washington Univ. School of Medicine, 825 S. Taylor Ave., St. Louis, MO 63110, MurrayN@ent.wustl.edu), Mitchell Sommers, and Joe Barcroft (Washington Univ., St. Louis, MO 63130)

In their research review, Sweetow and Palmer (2002) concluded that the question of whether auditory training can be effective remains largely unanswered, primarily due to numerous methodological flaws in previous investigations. In light of this situation, we initiated a large-scale study to assess the benefits of auditory training while controlling for many of the methodological limitations pointed out by Sweetow and Palmer. The study also was designed to assess the effectiveness of using activities that are meaning-oriented while comparing the impact of two versions of the program—single-talker and multiple-talker. Participants include both hearing-aid users and cochlear implant recipients. Participants complete 12 1-h lessons during training. Each lesson includes spoken input at a variety of levels of linguistic analysis, including word, sentence, and discourse. Data will be presented for the two test groups. Analyses of both traditional (e.g., phoneme and word discrimination) and novel (perceptual effort) assessments indicate that the auditory training program is effective. Initial comparison of the single- and multiple-talker training conditions suggest that for the multiple-talker testing conditions, which most closely simulate real-world speech perception demands, training with multiple talkers is generally better than single-talker training.

11:00

4aPP8. Effects of reducing speech audibility on signal-to-noise-ratio loss for hearing-impaired listeners. Peggy B. Nelson, Yingjiu Nie, Elizabeth Crump Anderson, and Bhagyashree Katare (Dept. of Speech-Lang.-Hearing Sci., Univ. of Minnesota, 164 Pillsbury Dr. SE, Minneapolis, MN 55455, peggynelson@umn.edu)

Listeners with sensorineural hearing loss show reduced benefit from fluctuating compared to stationary maskers and experience apparent signal-to-noise-ratio loss when compared to listeners with normal hearing. Previously [Nelson *et al.* ASA Baltimore (2010)] we tested normal-hearing and hearing-impaired listeners at similar reduced audibility levels. Listeners with normal hearing and hearing loss were presented IEEE sentences at a range of overall levels (from 30 to 80 dB sound pressure level), signal-to-noise ratios, and low-pass filter settings, resulting in a range of signal AIs that varied from 0.1 to 0.95. For the normal-hearing listeners, there was a very systematic relationship between AI and performance; the relationship between AI and performance was less systematic for listeners with hearing loss. In the current project we tested each listener over a wide range of AIs and report the change in performance with increasing AI for individual listeners with normal hearing and hearing loss. Implications for hearing aids will be described. [Work supported by NIDCD R01-DC008306.]

11:15

4aPP9. A lumped parameter mechanical model of tensor tympani muscle contraction of the middle ear. Philip P. Garland, Fawaz M. Makki, Ross W. Deas, Robert B. Adamson, Jeremy A. Brown, and Manohar L. Bance (SENSE Lab., Dalhousie Univ., 1276 South Park St., Rm. 3189, Halifax, NS, Canada)

The role of the tensor tympani (TT) muscle of the middle ear is not well understood, and there is a long history of the implied, but unproven, part it plays in various inner ear disorders, particularly Meniere's disease. In order to gain an improved understanding of the effect of TT contraction, a lumped parameter mechanical model of the middle ear including the TT has been developed. This model uses a previously developed lumped parameter model of the middle ear ossicular chain along with experimentally obtained visco-elastic material model for the TT in order to predict the changes in the acoustic impedance of the middle ear experienced when the TT is contracted. Qualitatively, the results of the computer model agree quite well to similar laser Doppler vibrometer measurements from various cadaveric temporal bones where TT contraction has been simulated using force loading.

11:30

4aPP10. Middle ear reflectance in various middle disease states. Manohar Bance, Phillip Garland, Adamson Robert, and Brown Jeremy (3184 Dickson Bldng., VGH Site, QEII HSC, 1278 Tower Rd., Halifax, NS B3H 2Y9, Canada)

Many middle ear conditions are difficult to diagnose based on inspection of the eardrum, tympanometry, and audiometry. Most appear as a simple conductive hearing loss. We report findings using wideband middle ear reflectance measurements in a range of middle ear and inner ear conditions, particularly looking for evidence of middle ear involvement in some traditionally inner ear conditions such as Meniere's disease.