

skills in a hierarchy of tasks ranging from discrimination of minimal paired words to connected discourse tracking. Aspects of the subject's speech production skills were evaluated by obtaining ratings from a group of teachers of the hearing impaired, who viewed a videotape of the child during syllable production and connected discourse tracking with and without the device. Results of speech reception testing indicated that the device allowed good discrimination of minimal paired words based on manner contrasts, but poor discrimination based on place contrasts. During tracking, lipreading-pulse-tactile aid conditions were superior to lipreading alone. Results of the speech production evaluation showed that syllable identification was better and ratings on several aspects of speech production were higher under tactile aid conditions. [Work supported by NIH.]

4:29

**J8. Tactile reception of fingerspelling and sign language.** C. M. Reed, L. A. Delhorne, and N. I. Durlach (Research Laboratory of Electronics, Massachusetts Institute of Technology, Cambridge, MA 02139)

Previous work on tactile speech reception by deaf-blind individuals has focused on the Tadoma method [Reed *et al.*, *J. Acoust. Soc. Am.* 77, 247-257 (1985)]. Two additional methods of tactile communication, both of which are adaptations of methods designed for the visual sense but are used extensively within the deaf-blind community, are tactile fingerspelling and tactile signing. The goal of the current research was to document the communication abilities of highly experienced deaf-blind users of tactile fingerspelling and tactile signing. Experiments were conducted to determine reception accuracy for sentence-level materials as a function of rate of presentation for each of the two methods. The results of these experiments will be compared to those obtained for visual reception of fingerspelling and signing as well as to results obtained through the Tadoma method of tactile speech communication. [Work supported by NIH.]

4:41

**J9. Stress contrast perception by the hearing impaired: Auditory, tactile, auditory-tactile.** Janet Reath Schoepfin and Nancy S. McGarr (Speech and Hearing Sciences, Graduate School and University Center, City University of New York, New York, NY 10036)

The perception of stress contrasts in deaf subjects was assessed under three conditions—auditory only, tactile only, and combined auditory-tactile. Test stimuli were three disyllables generated in a two-stage process: multiple repetitions of each disyllable were produced by a normally hearing speaker using normal or exaggerated stress on either the first or second syllable; the averaged acoustic values for peak amplitude, vowel duration, and peak fundamental frequency for each disyllable were then resynthesized and manipulated to create a stimulus set containing none, one, two, and three of the acoustic cues denoting stress. Subjects were asked to indicate whether stress occurred on the first or second syllable for each stimulus item. Performance was above the level of chance in all three conditions. In the exaggerated stress production mode, performance in

the tactile condition exceeded performance in the auditory condition for those stimulus items containing a frequency cue. [Work supported by #NS-17764.]

4:53

**J10. Reliability of individual differences in lipreading.** Marilyn E. Demorest (Department of Psychology, University of Maryland Baltimore County, Catonsville, MD 21228), Lynne E. Bernstein, and Silvio P. Eberhardt (Speech Processing Laboratory, Department of Electrical and Computer Engineering, Johns Hopkins University, Baltimore, MD 21218)

Evaluation of the benefits of sensory aids requires stimulus materials whose psychometric characteristics are known. Generalizability theory was applied to data from two experiments to estimate measurement error arising from different materials, different talkers, and practice. Stimulus materials consisted of CID sentences and CV nonsense syllables produced by a male and a female talker and stored on video laserdisk. In experiment I, 104 normal-hearing subjects lipread the CID sentences in a single test session. Results indicate that there are substantial individual differences in lipreading performance among subjects, but that there are also systematic differences among sentences and among talkers that must be taken into account in interpreting test performance. In experiment II, 15 normal-hearing subjects who participated in an intensive training protocol involving vibrotactile supplements to lipreading were given pre- and posttests on the CID sentences and on the CV syllables. Individual differences in performance on sentences were highly stable over the training period, suggesting relatively uniform improvements due to training. Reliability over time was lower for the CV syllables and correlations between the CV and sentence materials were weak both at the pretest and posttest. [Work supported by NIH.]

5:05

**J11. The use of tactile aids with deaf-blind children.** Barbara Franklin (Department of Special Education, San Francisco State University, San Francisco, CA 94132)

This paper will present the results of the first year of a 3-year study designed to compare the effects of a 2-channel (Tactaid II) and a 16-channel (Tacticon) aid on expressive and receptive communication skills of deaf-blind children. The Tactaid vibrators are worn on the wrist and the Tacticon is worn as a belt of electrical stimulators on the abdomen. Six children, ranging in age from 22 months to 18 years, from the San Francisco Bay area are participating in the study. A total of three communicative behaviors will be selected for each child (e.g., number of purposeful vocalizations). A single-subject design will be used to compare their communication behaviors in three experimental conditions—no device (control), 2-channel device, and 16-channel device. Only one behavior will be observed at a time, resulting in three separate sub-studies per child. This paper will present the results of Sub-Study # 1. Despite the tactile defensiveness often exhibited by deaf-blind children, the participants have been tolerating both devices. [This research is being supported by U.S. Dept. of Educ. Grant #G008630416.]