recognition of speech structure in the auditory cortex and interference with auditory processing of phonetic stimuli, acquired by training. In the phonetic task, the left inferior frontal gyrus was specifically activated implicating this area in phonetic processing.

1pSC11. Perceptual metathesis of obstruent clusters. Matthew J. Makashay (Dept. of Linguist., Ohio State Univ., 222 Oxley Hall, 1712 Neil Ave., Columbus, OH 43210, makashay@ling.ohio-state.edu)

This study examined acoustic and perceptual cues of obstruent clusters in order to test the hypothesis that metathesis can be a process that maintains identification of the consonants involved. In an auditory lexical decision task, there were effects of both optimality of cues, and lexical frequency of clusters. Nonword targets were created by metathesizing medial obstruent clusters in English words (e.g. [nækpɪ n] for *napkin*). For the clear listening level group, there was a slow rejection of nonword targets with optimal clusters that occur with higher frequency in the lexicon. For the speech reception threshold group, nonword targets with optimal clusters were more likely to be perceptually metathesized and realized as words than nonword targets with nonoptimal clusters were, presumably because subjects are more likely to hear both consonants in optimal clusters. Clusters with fricatives and stops were less likely to be perceptually metathesized than clusters containing only stops, since the continuity of manner features in a stop cluster hinders perception of consonant order. Whether some listeners are more adept than others in the ordering of temporal acoustic events will be investigated as well. [This material is based upon work supported under a National Science Foundation Graduate Fellowship.]

1pSC12. Flexibility of acoustic cue weighting in children's speech perception. Catherine Mayo, Alice Turk (Dept. of Theoretical & Appl. Linguist., Univ. of Edinburgh, Edinburgh EH8 9LL, UK), and Jocelynne Watson (Univ. of Edinburgh, Edinburgh EH9 1UW, UK)

Nittrouer and colleagues [Nittrouer, J. Phonetics **20**, 1–32 (1992); Nittrouer and Miller, J Acoust. Soc. Am. **101**, 2253–2265 (1997); Nittrouer *et al.*, Percept. Psychophys. **62** (2000)] have found that in identifying certain syllable contrasts, young children make more use of syllable–internal formant transitions (relative to other available acoustic cues) than do older children and adults. The evidence for this change in the degree to which listeners weight, or use, certain cues comes predominantly from studies of fricative contrasts (e.g., /sV/–/ʃV/, /sV/–/stV/, /Vs/–/Vʃ/). The current study tests the flexibility of children's weighting of acoustic cues by examining cue weighting across a wider range of phonetic contexts. In particular, this study attempts to determine whether children's focus of perceptual attention can be led away from transitions in contexts where such cues are relatively less salient. Additionally, the study tests children's ability to identify phonemes in an extreme situation, in the complete absence of transitional information. [Work supported by Wellcome Trust.]

1pSC13. Backward masking in speech perception by children and adults. Joan Sussman and Elizabeth Laczi (Dept. of CDS, Univ. at Buffalo, 105 Cary Hall, 3435 Main St., Buffalo, NY 14214, jsussman@acsu.buffalo.edu)

The current investigation measured discrimination and identification of tone-noise and [b]-[a] stimuli by adults, children with normally developing language, and children with language impairment. The children were aged 4–6 years. These tasks were chosen instead of the more traditional two alternative forced choice (2AFC) technique because it was believed possible that task difficulty influenced previous results (e.g., Wright *et al.*, 1997). The stimuli in the current set of experiments had longer tones (40 ms) than prior studies but used higher masker levels (52 dB spectrum level). However, results showed that all the participants discriminated the stimuli containing the tone or [b] signal significantly above chance, contrary to previous findings. More difficulty was found in the identification task, similar to prior backward masking results. [Supported by an Individual Development Award, NYS/UUP.]

1pSC14. Overt visual attention in spoken sentence perception. Charissa R. Lansing (Dept. of Speech and Hearing Sci., Univ. of Illinois at Urban-Champaign, 901 S. Sixth St., Champaign, IL 61820, crl@uiuc.edu) and George W. McConkie (Beckman Inst., Univ. of Illinois at Urbana-Champaign, Urbana, IL 61801)

People's eye movements and performance accuracy were recorded as they attempted to understand sentences spoken by two talkers under two conditions: vision only and vision plus low-intensity sound. Percent word-correct scores were higher for the vision-plus-sound than for the vision-only presentation and for the male compared to the female talker. Eye movement records showed a tendency to gaze at the talker's eyes when the talker was not speaking, but to shift the gaze to the mouth and make long eye fixations when the talker was speaking, particularly under vision-only conditions and for the female talker. In a task requiring verbatim word identification, people with average speech-reading proficiency direct their gaze to the talker's mouth most of the time during the talker's speech production, contrary to the finding of Vatikiotis-Bateson, Eigsti, Yano, and Munhall (1998), and they produce very long eye fixations. For these people, the gaze is drawn to the mouth, not by facial motion alone, but also on some other basis that is assumed to be prior knowledge of the location of critical visual cues, with an accompanying suppression of saccadic activity. [Work supported by NIH-NIDCD Grant DC02250.]

1pSC15. Limits of sentence identification in gated and continuous noise. Peggy B. Nelson, Su-Hyun Jin, and Arlene Earley Carney (Dept. of Commun. Disord., Univ. of Minnesota, 164 Pillsbury Dr. SE, Minneapolis, MN 55455)

Listeners with normal hearing sensitivity are able to take advantage of temporal dips in fluctuating noise. Their word identification in gated noise is better than identification in continuous noise. The limits of this ability are not well understood. Young adult listeners with normal hearing sensitivity were tested for their understanding of speech in gated and continuous noise at a variety of signal-to-noise ratios (SNRs) and gate frequencies from 2–32 Hz. Stimuli were digitized IEEE and CID sentences spoken by 10 talkers (5 male and 5 female). Pseudorandom noise was generated with the same long-term spectrum as the speech. Sentences were presented at an overall level of 65 dB SPL, with noise at +16-, +8-, 0-, −8- and −16-dB SNR. Listeners' responses were scored for the number of keywords correct. Results showed that at −16-dB SNR of continuous noise, listeners were unable to repeat any keywords. Gate frequencies of 4 and 8 Hz resulted in the greatest keyword identification. Performance decreased at the slowest gate frequency for IEEE sentences and at fastest gate frequencies for all sentences. Results will be discussed in terms of listeners with hearing loss and cochlear implants. [Work supported by NIDCD.]

1pSC16. Spatial distribution of early reflections and speech intelligibility. Yang-Ki Oh (Mokpo Natl. Univ., Mokpo, Chonnam 534-729, South Korea), Dae-Up Jeong (Chonbuk Natl. Univ., Jeonju, Chonbuk 561-756, South Korea), Se-Jin Doo (Dong-Ah Broadcasting College, Ansung, Kyonggi, South Korea), Hee-Won Lee (Seoul Natl. Univ. of Technol., Seoul, South Korea), Chul-Min Choi, Lai-Hoon Kim (Seoul Natl. Univ., Seoul, South Korea), and Il-Doo Ko (Seoul Natl. Univ. of Technol., Seoul, South Korea)

The strong early reflections and short delay times have been known to improve the intelligibility of speech heard in rooms. D50 and C80, the most frequently used physical parameters, were developed taking this fact into consideration. However, these monaural parameters have limited applications for the practical design of rooms because of their lack of spatial