ing, adults with similar language backgrounds exhibit significant individual differences in their ability to learn difficult non-native speech sounds [Polka (1991); Pruitt, Strange, Polka, & Aguilar (1990)]. Neurophysiologic changes due to learning are also reflected in the mismatch negativity (MMN) response and are indicative of the effects of training [Naatanen *et al.* (1993) and Kraus *et al.* (1995)]. The present experiment included two groups of six normal-hearing monolingual American-English speakers. The experimental group was trained to identify a voiced, unaspirated, dental stop consonant. The control group received no training on the dental. Electrophysiologic responses were measured for both groups in response to the dental and alveolar contrasts using a perceptual mapping procedure. Training improved the experimental group's ability to perceive the non-native contrast. Training effects were also reflected in the MMN response, as observed by increased duration and decreased onset latency.

3pSC24. The interaction of location with acoustic scale in concurrent speech recognition. David T. Ives, Martin D. Vestergaard, and Roy D. Patterson (Dept. of Physio., Development and Neurosci., Univ. of Cambridge, Downing St., Cambridge CB2 3EG, UK)

Location and acoustic scale cues have been shown to have a significant effect on the recognition of speech in multispeaker environments. The interaction of these two cues is less well understood. In this study, subjects are presented with two triplets of concurrent speech syllables with similar temporal envelopes, and asked to recognize a specific target syllable. The task was made more or less difficult by changing the location of the distracting speaker, the scale difference between the two speakers and the relative level of the two speakers. Scale differences were produced by changing the vocal tract length and glottal pulse rate of resynthesized speech: 32 scale differences were used. Location cues were produced by convolving heat-related transfer functions with the stimulus. The target speaker was located directly to the front of the listener and the distracting/masking speaker located from one of five locations (0, 4, 8, 16, 32 deg) on the 0 deg horizontal plane. Target-to-masker ratios of 0 and −6 dB were used. The results show that direction and scale differences cues do interact and this interaction is greatest when directional and speaker scale cues are small. [Research supported by the U.K. Medical Research Council (G0500221, G9900369).]

3pSC25. Does training improve consistency of roughness judgments in a matching task? David A. Eddins (Dept. of Otolaryngol., Univ. of Rochester, 2365 S. Clinton Ave., Rochester, NY 14618, David_Eddins@URMC.Rochester.edu), Rahul Shrivastav, and Sona A. Patel (Univ. of Florida, Gainesville, FL 32611)

Shrivastav *et al.* [J. Acoust. Soc. Am. **119**(5), 3340 (2006)] reported a matching task in which a square wave modulated sawtooth wave (signal) was matched to a series of vowels (standards) to estimate the magnitude of roughness in voices. Results suggested that listeners found it difficult to isolate roughness from other voice quality dimensions such as breathiness. In the present experiment, a brief training session was added prior to the matching task to ensure that listeners were attending to variations in roughness alone. This training consisted of a rank-ordering task in which listeners sorted the 34 test samples of the vowel /a/ in ascending order of roughness. For feedback, these rankings were compared to the rankings made by expert listeners. This criterion was used to ensure that all participants understood the dimension of voice quality under study. Listeners who met a specific eligibility criterion completed a modulation matching task to familiarize them with the matching task itself. Finally, thresholds for the roughness matching task were obtained and compared to thresholds obtained without training. The extent to which task-related training can help listeners make perceptual judgments for specific dimensions of voice quality will be discussed.

3pSC26. Masking release at low sensation levels. Peggy Nelson, Elizabeth Anderson Crump, Yingjiu Nie, and Michelle Hawkinson-Lewis (Dept. of Speech-Lang.-Hearing Sci., Univ. of Minnesota, 164 Pillsbury Dr. SE, Minneapolis, MN 55455, peggynelson@umn.edu)

Previous results have shown that listeners with sensorineural hearing loss (SNHL) obtain about half of the masking release of their normal-hearing (NH) counterparts. When speech is amplified sufficiently, listeners with SNHL may score like NH listeners in quiet and in steady noise, yet may obtain only half of the expected release from gated noise. We hypothesize that some of that deficiency may occur because of the impaired listeners' low speech sensation levels, which results in decreased usefulness of the speech signal in the noise dips. In the current study, NH listeners were tested for their recognition of IEEE sentences in quiet, in steady noise, and in gated noise with the speech presented at varying sensation levels. At low levels (10–15 dB SL), NH listeners scored nearly 100% correct in quiet. In steady noise (at −10 dB signal-to-noise ratio) scores for low-level stimuli were also similar to those obtained at higher SLs. However, at low SLs in gated noise, NH listeners demonstrated less masking release than expected, suggesting that audibility of speech in the dips of noise is important for masking release even when performance in quiet and in steady noise seems optimized. [Work supported by NIH 5R01DC008306.]

3pSC27. Listening to natural versus cell phone speech on multiple simultaneous tasks. Srinivasan Nirmal Kumar (Dept. of Special Educ. and Commun. Disord., Barkley Memorial Ctr., Univ. of Nebraska-Lincoln, Lincoln, NE 68583) and Carrell Thomas (Univ. of Nebraska-Lincoln, Lincoln, NE 68583)

In typical listening environments, attention is often divided and may have different effects on automatic and controlled processes. Automatic processing is a fast, parallel process not limited by short-term memory, requires little subject effort, but requires extensive consistent training to develop. Controlled processing is a comparatively slow, serial process limited by short-term memory, requires subject effort, and little training to develop [Schneider and Shiffrin (1977)]. In the present study a methodology was developed to examine effects of controlled and automatic distracters on the perception of distorted speech. Specifically, perception of natural and cell phone speech was investigated while listeners performed simultaneous visual and motor tasks. Young, normal-hearing native speakers of English were presented with SPIN sentences [Kalikow *et al.* (1977)] in a background of multitalker babble [Bilger *et al.* (1984)] using natural and cell phone speech. Prior to the start of the experiment, participants had been trained on visual task using either consistent mapping technique or varied mapping technique. Word recognition scores, pursuit rotor performance, and visual task performance were compared for natural and cell phone speech. The relationship between consistently mapped and variably mapped distracters on perceptual and behavioral performance provides information necessary for more detailed models relevant to real-world environments.

3pSC28. Seeing a speaker's face helps stream segregation for younger and elderly adults. Alexandra Jesse (Max Planck Inst. for Psycholinguistics, Wundtlaan 1, 6525 XD Nijmegen, The Netherlands, Alexandra.Jesse@mpi.nl) and Esther Janse (Utrecht Inst. of Linguist. OTS and Max Planck Inst. for Psycholinguistics, Nijmegen, The Netherlands)

Listening to a speaker while hearing one or more competing speakers in the background can be a challenging task, especially for elderly adults. We show that younger and elderly listeners (above the age of 65) with varying degrees of age-related hearing loss benefit in stream segregation and speech processing from seeing the target speaker talk in addition to hearing an audio mix of a target and a competing speaker. This audiovisual benefit was found for response accuracy and speed in a phoneme monitoring task, where participants indicated by button press the occurrence of given target phonemes in the monitored speech of the target speaker. The audiovisual benefit was larger for younger than for older adults, despite their equivalent performance on auditory-only trials and in an off-line phoneme lip-reading task. Better lip-reading performance, however, predicted a larger audiovisual benefit. The audiovisual benefit was found for both highly visible phonemes (/p/) and poorly visible phonemes (/k/), but was modulated in its size by segmental visibility. The audiovisual benefit therefore arises from local segmental visual information but is also at least partially driven by audiovisual synchrony information that aids in attending to the target speaker.

3pSC29. The eyes' footprints on the ears: An investigation of short-term speech intelligibility change. Jing Liang (Dept. of Psych. and Ctr. for Cognit. and Social Neurosci., Univ. of Chicago, 5848 S Univ. Ave., Chicago, IL 60637, liang@uchicago.edu), Steven L. Small, and Howard C. Nusbaum (Univ. of Chicago, Chicago, IL)

Although observation of mouth movements improves auditory speech perception, the extent to which visual information aids speech perceptual learning and affects subsequent audio-only speech perception remains