

both a standard 2-cc and Zwislöcki-type acoustic coupler. Pearson correlation coefficients generally indicate that while measurements in the two couplers are different, the differences are systematic. Prediction equations relating electroacoustic measurements in the two couplers were generated. Several behavioral measures of speech intelligibility were recorded through the same aids in both couplers. Scores are presented and related to the systematic nature of the differences between the acoustic couplers.

G11. Current problems in binaural hearing research. H. S. Colburn, R. H. Domnitz, R. M. Stern, Jr., and N. I. Durlach (Research Laboratory of Electronics, Massachusetts Institute of Technology, Cambridge, MA 02139)

We will conduct an informal open discussion of issues related to stimulus control, choice and design of experiments, theoretical models, and general research strategy in binaural hearing. Topics to be considered include acoustical monitoring of stimuli, variability and drift in subject performance, techniques for determining the shape of binaural images, time-intensity trading, the relation of lateralization to detection, similarities and differences in current theoretical models, the inadequacy of many previous experiments to critically test and separate models, the incorporation of multiple sampling of inputs into models, and the effects of long-term previous experience in natural environments on the perception of laboratory stimuli (and the possibility of taking explicit account of such effects in the construction of models. [Work supported by NIH.]

G12. Comparison of two paradigms for measuring auditory temporal resolution. Richard A. Smiarowski (Audiology Section, V.A. Out-patient Clinic, Los Angeles, CA 90013)

The minimum perceptible separation (Δt) between two successive bursts of broad-band noise has been used as a measure of auditory temporal resolution by Plomp [J. Acoust. Soc. Am. 36, 277-282 (1964)] and Smiarowski and Carhart [J. Acoust. Soc. Am. 57, 1169-1174 (1975)]. By varying the relative level of the trailing noise burst, these investigators provided information about the time course of temporal resolution. Smiarowski and Carhart acknowledged that their temporal resolution paradigm may have given the listener a cue to the presence of an interruption (Δt) as a result of increasing the total duration of the pair of bursts by an amount equal to the Δt . The present study was designed to determine whether this total-duration factor does indeed influence temporal-resolution data. To accomplish this, temporal resolution was measured with the Smiarowski-Carhart paradigm, and an additional paradigm that maintained the same total duration of the pair of noise bursts in both the interrupted and fused presentations. The data from this experiment did not reveal any systematic difference in the time course of temporal resolution when measured with the two paradigms. It appears that the magnitude of the residual activity, rather than total duration, is the basis of listener judgment in the Smiarowski-Carhart paradigm. This data has implications for auditory persistence and the related phenomenon of forward masking. [Supported by V.A. Medical Research Project 7990-01.]

G13. Dependence of loudness growth on skirts of excitation patterns. Rhona Hellman (Laboratory of Psychophysics, Harvard University, Cambridge, MA 02138)

Loudness growth spanning a SL range of 50 dB was measured for a 100-Hz tone in a noise band 200 to 9600 Hz wide. The noise was varied in intensity along with the tone so that during a given listening session the signal-to-noise ratio remained constant at either 0 or -10 dB. Listeners judged the loudness of the tone by loudness matching, magnitude estimation, and magnitude production. The noise markedly decreased the rate of loudness growth of the tone but not the range over which loudness grows. The overall decrease in steepness of the 100-Hz loudness function was found to be greater than that previously reported at higher frequencies. It is suggested that, in contrast to similar measurements at higher frequencies, the excita-

tion spread of a 100-Hz tone to both low and high frequencies has been experimentally contained. While it appears that stimulation produced by the entire excitation pattern is necessary to obtain the expected growth rate of loudness, the loudness growth range may not depend on excitation produced by low- and high-frequency skirts. Supportive data for this hypothesis are given by measures of intensity discrimination at 100 Hz. [Work supported by NIH.]

G14. How well can audible warning devices of emergency vehicles be localized by the driver of an automobile? Richard C. Potter and Hsien-sheng Pei (Bolt Beranek and Newman Inc., Cambridge, MA 02138)

A series of direction determination experiments has been performed to evaluate the extent to which automobile drivers can locate audible warning devices of emergency vehicles. Blindfolded subjects were required to indicate the perceived position of a siren, first in an open space and, secondly, while seated in an idling automobile with the windows both open and closed. For the open-air control case, the direction of the siren was correctly indicated to be in the appropriate 45° sector for 91% of the test presentations. With the subject seated in the automobiles, the identification of the correct location fell to 37.6% with the passenger window open and 26% with the windows closed. Based on an analysis of the results and the magnitude of the errors, it is concluded that aural localization for the directional identification of emergency vehicles is not practicable. [Work supported by the Society of Automotive Engineers, Inc.]

G15. A hearing aid malfunction detection unit (HAMDU). R. J. Roeser, G. M. Gerken, and A. Glorig (University of Texas at Dallas/Callier Center for Communication Disorders, Dallas, TX 75235)

Two independent surveys were conducted to assess the performance of hearing aids worn by 290 children, fourteen years of age and less. Results from both surveys showed that between 30% and 35% of the aids evaluated were not functioning or were functioning improperly. A need exists, therefore, for some method of assessing hearing aid function in school age children. A system is described, the hearing aid malfunction detection unit (HAMDU), that electrically checks for proper operation of several aspects of hearing aid function. HAMDU is a miniature, add-on device which performs a check every half hour of hearing aid operation, and which indicates malfunction by means of a highly visible, electrically tripped, indicator. Functions checked include: battery voltage, gain, distortion and noise, and integrity of the receiver cord. In addition, the indicator will be tripped if the hearing aid is turned off. HAMDU is small, low in cost, and can be adapted to most body aids. [Supported by the NSA.]

G16. Short-term adaptation in single auditory-nerve fibers—some poststimulatory effects. R. L. Smith (Institute for Sensory Research, Syracuse University, Syracuse, NY 13210)

Adaptation was produced by CF stimuli with durations ranging from 10 to 300 msec and intensities within 60 dB above a unit's threshold. The exposure caused a decrement in the response to a CF test tone applied after the termination of the adapting stimulus. In general, the poststimulatory decrement seemed to depend on the per-stimulatory response to the adapting tone and not directly on the parameters of the adapting stimulus. For example, the decrement followed a saturating function of adapting sound intensity and was approximately proportional to the per-stimulatory firing rate. At sufficiently high test intensities, the decrement was constant and independent of test intensity, and the saturation rate produced by the test tone was reduced. These poststimulatory results are qualitatively consistent with a model previously developed to describe some per-stimulatory effects of short-term adaptation [R. L. Smith and J. J. Zwislöcki, Biol. Cybern. 17, 169-182 (1975)]. In both situations, a peripheral saturation appears to precede adaptation and limit the effects of high sound intensities.