2pPP31. Factors influencing the auditory and cross-modal attentional blink. Adelbert W. Bronkhorst, Marieke van der Hoeven (TNO Human Factors, Kampweg 5, 3769 DE Soesterberg, The Netherlands, adelbert.bronkhorst@tno.nl), Jan Theeuwes, Erik van der Burg, and Thomas Koelewijn (Vrije Univ., 1081 BT Amsterdam, The Netherlands)

When an observer has to report two targets (T1 and T2) embedded in a stream of distracters, an attentional blink can occur. This is the degradation in performance for T2 when T1 and T2 are presented sufficiently close in time (within about 500 ms). The attentional blink paradigm has been extensively used within the visual domain as a tool to study bottlenecks in the processing of sensory information. Several studies have shown that an attentional blink can also occur during auditory or cross-modal presentation. However, these blinks are smaller and more stimulus dependent than visual blinks. In our research we have found a robust blink when T1 and T2 are tones embedded in distracters tones, but no blink when T2 is replaced by a visually presented letter among different distractor letters. The cross-modal blink is also absent when both T1 and T2 are digits. We do find a clear cross-modal blink when a visual T1 with increased difficulty (three letters or a word) is combined with a T2 consisting of a spoken letter. Our results indicate that there are modality-specific as well as amodal bottlenecks and that the latter occur when stimuli are processed on a verbal or semantic level.

2pPP32. Reproducible maskers reveal similar mechanisms predicting multiple-burst-same and multiple-burst-different informational masking conditions. Robert H. Gilkey (Wright State Univ., Dayton, OH 45435), Christine R. Mason, and Gerald Kidd, Jr. (Boston Univ., Boston, MA 02215)

Gilkey, Mason, and Kidd [J. Acoust. Soc. Am. **109**, 2468 (2001)] found that although informational masking has typically been thought to depend more strongly on the variability in the ensemble of masking stimuli presented across trials, trial-by-trial performance was strongly related to the specific masker waveform presented on each trial. Moreover, hit and false-alarm rates to individual masker stimuli under multiple-burst-same (MBS) conditions were well predicted by the patterns of energy in those stimuli. Hit and false-alarm rates under the multiple-burst-different (MBD) condition were more difficult to predict. This paper reports on further efforts to model those data. The results indicate that performance under both MBS and MBD conditions can be predicted using a linear combination of envelope statistics computed from seven narrow frequency bands surrounding the 1000-Hz signal frequency. MBS responses are related to the average height of the envelope in these bands and MBD responses are related to the standard deviations of the envelopes. [Work supported by NIH/NIDCD.]

2pPP33. The application of the equal energy hypothesis (EEH) to interrupted, intermittent, and time-varying non-Gaussian noise exposures. Roger P. Hamernik, Wei Qiu, and Robert I. Davis (Auditory Res. Lab., State Univ. of New York at Plattsburgh, 101 Broad St., Plattsburgh, NY 12901)

Industrial data and animal research show that non-Gaussian (nonG) noise exposures are more hazardous to hearing than energy equivalent Gaussian (G) exposures. A statistical metric, kurtosis $[b(t)]$, was shown to order the severity of noise-induced trauma following a nonG exposure relative to an energy and spectrally equivalent G exposure. Four groups of chinchillas were exposed to one of four different nonG interrupted, intermittent, and time-varying (IITV) noise paradigms over 19 days at an Leq=103 dB(A) SPL, with $b(t)=25$ or 50. Each daily exposure consisted of two 4.25-h periods with an hour break. Each 4.25-h exposure was interrupted for 15 min and each 5-day sequence was separated by a 2-day break. Each daily IITV exposure followed one of two different SPL temporal patterns that varied between 90 and 108 dB(A). All IITV exposures produced a toughening effect that did not alter the degree of noise-induced trauma. NonG noise produced as much trauma as a G exposure at 110 dB. Despite very different temporal paterrns for the $b(t)=50$ exposures, trauma was the same. Thus within a common class [i.e., the same Leq and $b(t)$] of nonG, IITV exposure, the EEH may apply. [Work supported by NIOSH.]

2pPP34. The application of statistical learning models to the prediction of noise-induced hearing loss. Wei Qiu, Jun Ye, and Roger P. Hamernik (Auditory Res. Lab., State Univ. of New York at Plattsburgh, 101 Broad St., Plattsburgh, NY 12901)

Three powerful nonlinear statistical algorithms [a support vector machine (SVM), radial basis function network (RBFN), and regression tree] were used to build prediction models for noise-induced hearing loss (NIHL). The models were developed from an animal (chinchilla) database consisting of 322 animals exposed to 30 Gaussian and non-Gaussian noise conditions. The inputs for the models were either energy or energy plus kurtosis. The models predict inner hair cell (IHC) loss, outer hair cell (OHC) loss, and postexposure threshold shift (PTS) at 0.5, 1, 2, 4, and 8 kHz. The models incorporating both energy and kurtosis improved the prediction performance significantly. The average performance improvement for the prediction of IHC loss was as much as 55%, for OHC loss it was 66% and for PTS, 61%. The prediction accuracy of SVM and RBFN with energy plus kurtosis for all three outputs (predictions) was more than 90% while for the regression tree model it was more than 85%. Energy is not a sufficient metric to predict hearing trauma from complex (non-Gaussian) noise exposure. A kurtosis metric may be necessary for the prediction of NIHL. [Research supported by NIOSH.]

2pPP35. The development of models for the prediction of noise-induced hearing loss. Wei Qiu, Jun Ye, and Roger P. Hamernik (Auditory Res. Lab., State Univ. of New York at Plattsburgh, 101 Broad St., Plattsburgh, NY 12901)

Three statistical learning models were developed to predict noise-induced hearing loss (NIHL) from an archive of animal noise exposure data, which contains 936 chinchillas exposed to various noise environments. The following models were constructed: (*i*) A support vector machine model with a nonlinear radial basis function kernel. (*ii*) A multilayer perceptron network model and (*iii*) a radial basis function network model. In addition to frequency-specific energy metrics, noise exposure parameters and biological metrics such as kurtosis, noise type, and pre/postexposure hearing thresholds were used as inputs to the model. There were several indices of auditory trauma at specific audiometric test frequencies that were to be predicted by the models: e.g., noise-induced permanent threshold shift, percent outer hair cell loss, and percent inner hair cell loss. The average prediction accuracy for the three models was better than 80%. These results demonstrate the feasibility of developing such models for the prediction of NIHL in humans. [Research supported by NIOSH.]

2pPP36. Noise-induced hearing loss from non-Gaussian equal energy exposures. Robert I. Davis, Wei Qiu, and Roger P. Hamernik (Auditory Res. Lab., State Univ. of New York at Plattsburgh, 101 Broad St., Plattsburgh, NY 12901)

Data from several different exposures [Hamernik *et al.*, J. Acoust. Soc. Am. **114**, 386–395 (2003)] showed that, for equivalent energy [Leq =100 dB(A)] and spectra, exposure to a continuous, non-Gaussian (nonG) noise produces greater hearing and sensory cell loss in the chinchilla than a Gaussian (G) noise. The statistical metric, kurtosis, could order the extent of the trauma. We extend these results to Leq=90 and 110 dB(A), non-Gaussian noises generated using broadband noise bursts, and band-limited impacts within a continuous G background noise. Data from nine new experimental groups with 11 or 12 chinchillas/group will be presented. Evoked response audiometry established hearing thresholds and surface preparation histology quantified sensory cell loss. There were clear