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Slopes of psychometric functions for forward-masked tones with and without a suppressor

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The compressive nonlinearity defined by the basilar membrane (BM) input-output (I/O) function is evident in the slopes of psychometric functions for forward-masked tones. A suppressor tone may reduce compression by linearizing the compressive portion of the BM I/O function, or reduce cochlear gain without affecting the value of maximum compression. The present study compared slopes of psychometric functions obtained for a fixed low-level signal in the presence of a variable masker with or without a suppressor gated with the masker. Thresholds and psychometric functions were obtained for four normal-hearing listeners using a 2I-AFC task. The sinusoidal signal was a low-level 4-kHz tone (0-ms steady state, 2-ms $\cos^2$ ramps) masked by a sinusoidal masker (100-ms steady state, 2-ms $\cos^2$ ramps). The maskers were either on frequency (4 kHz) or off frequency (2.2-kHz) and were presented at masker-signal intervals of 20-100 ms. Initial analyses suggest that as masker levels increase, the slopes of psychometric functions become increasingly shallow (on-frequency masker) or remain relatively steep (off-frequency masker). The effect of a suppressor on the slopes of the psychometric functions appears to be minimal. Results will be discussed in the context of a cochlear model of peripheral nonlinearity.