



Listener & player evaluations of violins made from composites

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In this presentation I will give an overview on how the thinking about envelope cues has evolved in the past decades. I will focus the presentation on masking conditions with a random noise masker and a tonal signal. Historically, those conditions have been analyzed in terms of the change in energy introduced by the addition of the signal. Data analysis based on such an energy detection lead to the concepts of critical bands and critical ratios, where signal thresholds were measured in bandpass noises of varying bandwidths. Thresholds of signals being placed in a spectral notch of a bandstop noise led to the auditory filter concept and the ERB scale. Energy detection models were challenged in the 1980's by a range of paradigms. Random variations (level rove) of the noise level from interval to interval render the energy cue much less effective, but human thresholds remain nearly unaffected, suggesting the use of additional cues. This observation has motivated the use of envelope-based cues, including the mean envelope slope value (Richards, 1992), in tone-in-noise detection. Secondly, in profile analysis with narrowband stimuli, the profile changes in the modulation spectrum derived from the stimulus envelope were proposed as a cue (Green et al., 1992). And finally, in masking experiments with harmonic complex tone maskers, the waveform changes enabled by choosing different phase values for the individual components emphasized the role of changes in the envelope structure instead of changes in the overall energy. In this talk, I will present a unified framework, in which results from these different paradigms can be understood by a detection process making use of the same detection cues.