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Temporal integration functions of amplitude modulation depth discrimination: can multiple-looks model explain this?

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Lee and Bacon (1994) applied a multiple looks model (Viemeister and Wakefield, 1990) as a mechanism of AM depth discrimination when the carrier and the modulator were presented at the same time (gated condition). The model provided a reasonable prediction, but the performance (d') was underpredicted when the number of modulation cycles changed from two to four. They speculated that onset information loss due to gating with two modulation cycles lead to a greater improvement with four modulation cycles. Following this, one would expect that AM depth discrimination can be better predicted by the multiple-looks model for the condition where there is no loss of modulation information at onset. This study compared psychometric functions of AM depth discrimination with different modulation cycles for the gated and onset-only conditions (carrier was presented for 250 ms prior to the modulation to preserve onset information). The slop of the psychometric functions with two modulation cycles was shallower than those with greater modulation cycles for the gated condition, while the slop of the psychometric functions was similar for all modulation cycles for the onset-only condition. The data will be discussed with multiple looks model. [This work was supported by NIDCD Grant No. R03 DC06605-02.]