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Modeling Long-Distance Cue Integration Strategies in Phonetic Categorization

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Abstract

Language temporally unfolds, with relevant cues arriving at different moments in time. For comprehension to be optimal, listeners must maintain gradient representations of cues in order to integrate with later-arriving cues. Several studies have established during speech perception listeners integrate cues that occur far apart in time. There are several proposals about how restricted this is, but there's little rigorous work establishing and testing models of long-distance cue integration strategies. We take a first step at addressing this gap by formalizing four different models of how listeners use cue information during real-time processing, testing them on two perception experiments. In one experiment, we find support for optimal integration of cues. In another, more attention-taxing experiment, we find evidence in favor of a strategy that avoids maintaining detailed representations of cues in memory. These results represent a first step toward understanding how listeners change their cue integration strategies across contexts.