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Authors

Luthra, Sahil

Magnuson, James

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Cumulative response probabilities: Estimating time course of lexical activation from single-point response times

Sahil Luthra

University of Connecticut, Storrs, Connecticut, USA

James Magnuson

University of Connecticut, Storrs, Connecticut, USA

Abstract: An aim of research on spoken word recognition is to characterize the influence of various lexical characteristics (e.g., word frequency, neighborhood size) on lexical access. Dynamics can be coarsely estimated from single-point measures like naming or more directly assessed using time course measures like fixation proportions over time in the visual world paradigm (e.g., Tanenhaus et al., 1995). We propose that cumulative response probabilities (CRPs) over time may allow a new characterization of the activation dynamics of lexical access from single-point measures. We assume that the timing of responses in a naming task reflects probabilistic sampling of underlying continuous activation dynamics that can be recovered by CRPs. We applied CRP analyses to visual word recognition data collected for 40,481 words from 472 participants (the English Lexicon Project; Balota et al., 2007) and report initial efforts to validate this new approach.