

UC Merced

Proceedings of the Annual Meeting of the Cognitive Science Society

Title

Differences in Implicit vs. Explicit Grammar Processing as Revealed by Hierarchical Weibull Modeling of Reaction Times

Permalink

<https://escholarship.org/uc/item/5ft5c4wf>

Journal

Proceedings of the Annual Meeting of the Cognitive Science Society, 42(0)

Author

Abugaber, David

Publication Date

2020

Copyright Information

This work is made available under the terms of a Creative Commons Attribution License, available at <https://creativecommons.org/licenses/by/4.0/>

Peer reviewed

Differences in Implicit vs. Explicit Grammar Processing as Revealed by Hierarchical Weibull Modeling of Reaction Times

David Abugaber

University of Illinois at Chicago, Chicago, Illinois, United States

Abstract

Artificial language studies using reaction time-based measures have suggested grammar learning even in participants without awareness of underlying grammatical rules (Leung & Williams, 2011; Batterink, Reber, & Paller, 2014). However, traditional linear analyses of reaction times might not capture qualitative differences between participants with/without conscious rule awareness (Rouder, Lu, Speckman, Sun & Jiang, 2005; Rousselet & Wilcox, in press). In a partial replication of one study (Batterink et al., 2014), participants were exposed to pseudoword articles that were predictive of an accompanying English noun's living/non-living status. Linear analyses showed that both rule-aware and rule-unaware participants exhibited slowdowns to rule-violating trials, indicating grammar learning. Hierarchical Weibull distribution analyses suggested that rule-unaware and rule-aware participants differed in the underlying cognitive mechanisms involved: rule-violating trials affected the processing architecture for both groups but only affected processing speed for rule-aware participants. These results illustrate the potential of yet-underused distribution-modeling approaches for second language psycholinguistics.