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Proceedings of the Annual Meeting of the Cognitive Science Society

Title

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Permalink

https://escholarship.org/uc/item/9271g359

Journal

Proceedings of the Annual Meeting of the Cognitive Science Society, 41(0)

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Publication Date

2019

Peer reviewed

Do You Need More than Two Subjects: Using Cognitive Modeling to Make Accurate Predictions for Individual Subjects

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Abstract

In experimental research, large numbers of participants are used to average out individual differences in the data. However, differences in task performance may be largely due to two factors; lack of task training, and different micro-strategies. We implement a methodology that removes the effect of these factors, requires only 23 participants, and still produces large amounts of data. Other studies have been published using a similar methodology (Cousineau & Shiffrin, 2004; Gray & Boehm-Davis, 2000). Our study is a revision of previous research using a mobile game (West et al., 2018). Participants are trained extensively on the game to ensure they are experts. The study includes a predictive cognitive model and the game-design is based on an apparent micro-strategy. We hypothesize that the same micro-strategies under identical conditions, should produce identical results across participants and the model. Suggesting the model may exist in the mind of human experts.