Replication of Rapid Word Learning Under Uncertainty via Cross-Situational Statistics by Yu & Smith (2007, Psychological Science)

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Introduction

Choice of Experiment

I chose to replicate the experiment conducted by Yu and Smith (2007) because it aligns well with my research interests in cognitive development and language acquisition. More specifcally, their research focus on how learners can use cross-situational statistical evidence to learn word-referent mappings provides effective guidance for exploring how children and adults navigate uncertain learning environments and how they apply cognitive strategies to solve complex language learning tasks.

Stimuli, Procedures, and Potential Challenges

The stimuli required for this experiment includes 54 unique pseudowords generated by a computer program and 54 images of uncommon objects (e.g., facial sauna, canister). These pseudowords and images are used to create various conditions where participants must learn word-referent pairs. Participants are exposed to different settings seperately by varying the number of words and images presented together in each trial. For example, in the 2x2 condition, participants see two objects and hear two pseudowords, while in the 4x4 condition, they are exposed to four words and four objects. Over multiple trials, the participants are expected to track the co-occurrences of the words and objects to learn the correct pairings.

There are two main potential challenges in conducting this experiment. First, managing the high number of trials while ensuring participants' sustained attention throughout the task can be difficult. Long tasks with many trials may lead to respondent fatigue, which could significantly affect their performance and the reliability of the data. Implementing breaks or designing the experiment to be engaging without overwhelming participants will be essential to maintaining focus and minimizing dropout rates. Secondly, generating suitable pseudowords that maintain linguistically sound requires careful consideration. The pseudowords should not only resemble natural language closely enough to be easily processed by participants, but also remain unfamiliar to prevent prior associations. This balance should be achieved to make sure that the learning of word-referent mappings in the experiment truly reflects cross-situational learning rather than familiarity with word forms.

Repository Link

https://github.com/YawenD283/yu2007

Original Paper Link

https://journals.sagepub.com/doi/10.1111/j.1467-9280.2007.01915.x