Rapid Word Learning Under Uncertainty via Cross-Situational Statistics

Based on Yu & Smith (2007)

Introduction

Main Question:

- How can humans learn word-referent pairs in ambiguous contexts?
- Can cross-situational statistics help solve the indeterminacy problem?

Why It's Interesting:

- Real-world word learning involves many ambiguous contexts.
- Challenges the traditional focus on single-trial constraints.

Why We Care:

- Explores mechanisms behind robust vocabulary development in children and adults.

Background Literature

Previous Research:

- Fast mapping through attentional, social, and linguistic cues in single trials (e.g., Baldwin, 1993; Smith, 2000).
- Computational models suggest cross-situational learning is plausible (e.g., Siskind, 1996; Vogt & Smith, 2005).

Gap:

- Limited systematic investigation of human learners' ability to use cross-situational statistics.

Methods: Overview

Participants:

- 38 university students.

Stimuli:

- Pictures of uncommon objects paired with pseudowords.

Task:

- Identify word-referent mappings across ambiguous trials.

Methods: Experimental Design

Learning Conditions:

- **2×2 Condition:** 2 words and 2 objects (4 associations per trial).
- **3×3 Condition:** 3 words and 3 objects (9 associations per trial).
- **4×4 Condition:** 4 words and 4 objects (16 associations per trial).

Procedure:

- Visual objects displayed on a screen; pseudowords played via audio.
- Forced-choice test after training: Match words to referents.