The Role of Effort in Novel Word and Grammar Learning Leah Brainin¹, Geetha Samy¹, Amy S. Finn², Carla L. Hudson Kam³, & Marc F. Joanisse¹

LBRAININ@UWO.CA

Introduction

Compared to children, adults excel at tasks involving higherorder cognitive processes. Grammar learning is an exception.

Adults' more mature cognitive processes may come with costs by interfering with grammar learning.

- Depleting cognitive resources improved phoneme combination learning (Smalle et al., 2021).
- Inhibiting frontal cortex regions facilitated implicit morpheme learning (Smalle et al., 2017), syntax learning (Uddén et al., 2008), and statistical learning (Ambrus et al., 2020).

Compared to passive listening, effortfully trying to learn:

- Improved novel word learning.
- Hindered grammar learning (Finn et al., 2014).

Objective Use reaction time (RT) methods to compare passive vs. effortful learning effects on word and grammar learning outcomes.

The Artificial Language

Statistical learning with grammar

| Category A | Category B | Category C | 6 train |
|------------------------|---------------------------------------|------------------------------|--|
| CV CV | CV VC | CV CVC | disylla |
| poi — zuh ree — jow | Trained Word tay – ook sow – ob | ds lee — gef vay — niv | 3 phor define gramn catego |
| Untrained Words | | | Gramr |
| deh – kaw | moi – ig | foo – bup | catego $\overrightarrow{A \rightarrow B}$ |
| C: consonant | | | |
| V: vowel | | | |

RT methods can be used to measure both word segmentation and grammar generalization. Word segmentation: RT 2nd syllable < 1st syllable. • Grammar: RT grammatical < ungrammatical.

¹ Department of Psychology, Western University ² Department of Psychology, University of Toronto ³ Department of Linguistics, University of British Columbia



Discussion

Adults' advantage in vocabulary learning may in part be due to greater engagement with more mature attentional mechanisms. Compared to standard forced-choice tests, RT effect size differences may be too small to capture an interaction. **Future Directions**: Develop a child-friendly task to examine developmental differences in learning effects \rightarrow better understand whether different learning mechanisms drive age-dependent language learning differences.



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Results

Significant difference in baseline RT between groups. *t*(58) = 2.33, *p* = .023, *d* = .603

- Main effect of target position. F(1, 58) = 6.54, p = .013, $\eta^2_{\ p} = .101$
- No main effect of group. F(1, 58) = 2.31, p = .134• No interaction.
- F(1, 58) = 1.13, p = .293

- Main effect of grammaticality. F(1, 58) = 8.28, p = .006, $\eta_{p}^{2} = .125$
- No main effect of group. F(1, 58) = 2.64, p = .11
- No interaction. F(1, 58) = .002, p = .962

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