Implicit learning of semantic information depends on contextual cues
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Introduction
- Implicit learning supports many aspects of language learning: word (Saffran et al., 1996), grammar (Reber, 1967), syntax (Saffran, 2001)
- Meanings of words such as determiners and grammatical categories are proposed to be learned through abstraction across memory instances (Bloom, 2000)
- Implicit learning provides a framework for such learning. However, form-meaning associations might be constrained by availability of grammatical concepts (Leung & Williams, 2012)
- Grammatical concepts that represent apparent features (e.g., animacy) may be more available for implicit learning than those requiring computations (e.g., relative size) (Culbertson et al., 2017)
- Study aim was to investigate learning of a connection between a grammatical form (i.e., articles) and a meaning with potentially low availability/of low salience (i.e., relative size)
- Research Questions:
  - Is a meaning contrast of low salience supported by vast real-world knowledge (really) difficult to learn implicitly?
  - Can implicit learning of a meaning contrast with low saliency be supported/influenced through the use of highly salient contextual cues?

Method

Stimuli
- Explicit rule: Four determiner-like words are used to classify nouns according to animacy value
- Implicit rule (not told to participants): Determiner usage also correlated with size information

Experiment 1 (N = 21)
- Conditioned on real-world knowledge (e.g., a cow is big, and a pen is small)
- Uniform picture size

Experiment 2 (N = 20)
- Conditioned on depicted size (e.g., visually big or small)

Training
- Expose to objects with noun phrase, and had to repeat and translate the phrase (e.g., “ji cow, animate cow”)

Testing
- Determine which object was named by the noun phrase
  - 3 testing blocks: grammatical accurate, implicit rule violation (ungrammatical), grammatical accurate

Analysis
- Control trial (grammatical) vs. Violation trial (ungrammatical)
- Hear: “ne fork” (ne/small pairing)  Hear: “ul fork” (ul/big pairing)

Results

<table>
<thead>
<tr>
<th>Experiment 1</th>
<th>Experiment 2</th>
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<tr>
<td>Preliminary analysis: Control blocks</td>
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<td>No significant differences between accuracy and response times, t(20) &lt; 0.33, p &gt; .05, both cases</td>
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<tr>
<td>Control 1: M = 2315 ms, error = 2.4%</td>
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<tr>
<td>Control 2: M = 2303 ms, error = 2.4%</td>
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Given that control blocks were similar, data was averaged across the two blocks, and these composites were used in all remaining analyses.

Test Phase: Response times

Exp. 1 replicated previous findings in which no there was no learning. In contrast, Exp. 2 showed a significant increase in reaction time in the Violation trials, indicating participants are learning the implicit rule.

Post-hoc Analysis: Unaware Participants

Results did not change, t(15) < 2.11, p > .05, learning effect remained significant, t(14) = 3.41, p < .01, η² = 0.44, response times

In Exp. 2, implicit learning occurred even when participants were unaware of the hidden regularities.

References

Contact Information

Author #1, Theresa Pham: No conflict of interest; Author #2, Joel Kang: No conflict of interest; Author #3, Alisha Johnson: No conflict of interest; Author #4, Lisa Archibald: No conflict of interest

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