Word Learning in Linguistic Context: Processing and Memory Effects  
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BACKGROUND

Children use linguistic context to distinguish word meanings (i.e., syntactic bootstrapping):
- Transitive and intransitive sentences (Naigles, 1990)
- Mass and count nouns (Bloom & Kelemen, 1995)

Syntactic bootstrapping isolates word meanings when non-linguistic cues are insufficient
- Distinguishes between syntactic structures
- Conveys role assignments

How does real-time processing of complex sentences affect children's use of syntactic bootstrapping?
- PP-attachment: Fail to revise misinterpretations after linguistic cue (Trueswell et al., 1999)
- Passives: Apply agent-first bias, fail to revise after past participle/by-phraso (Huang et al., 2013)
- Decreased accuracy in final interpretations

Hypotheses about how children's sentence processing affects their syntactic bootstrapping:
- Hypothesis 1: syntactic bootstrapping only when children understand syntactic construction
- Hypothesis 2: attempt bootstrapping always, based on incremental interpretation of utterance

Current study presented 5-year-olds with novel words embedded in passives (complex) and actives (simple)
- Agent-first bias weakened for familiar pronoun NPs, compared to full NPs (Huang et al., 2013)
- Passives: weaker agent-first bias removes need to revise, improves accuracy of interpretation
- Varied agent-first bias by placing novel ("blicket") or familiar nouns ("seal") as NP1s

METHOD

Participants: 40 English-speaking children (M_age = 5.4)
- Novel NP1 condition (n=20)
- Novel NP2 condition (n=20)

Procedure:
- Eye-tracking during fast mapping task
  - Familiarization phase
  - Test phase
  - Recall task
  - Presented with likely agents and themes
  - Asked to point to novel word again

Design: 2 Novel Word Position x 2 Construction Type
- Position: Novel NP1 vs. NP2 (between subjects)
- Construction: Passive vs. Active (within subjects)

FAMILIARIZATION PHASE

Show familiar object chasing Likely Theme
- Introduce familiar object ("Look at the seal!")
- Introduce novel objects ("Look at these!")
- Show Likely Agent chasing familiar object
- Show familiar object chasing Likely Theme

TEST PHASE

Recall: Presented with pairs of novel objects for each trial and asked, "Which one is the blicket?"

RESULTS

Accuracy of fast-mapping

- Novel NP1: Passive vs. Active
- Novel NP2: Passive vs. Active

Fixations after linguistic disambiguation

- Novel NP1 - Active vs. Passive
- Novel NP2 - Active vs. Passive

Accuracy of recall, when fast-mapping selection was incorrect

- Novel NP1: Passive vs. Active
- Novel NP2: Passive vs. Active

Accuracy of recall, when fast-mapping selection was correct

- Novel NP1: Passive vs. Active
- Novel NP2: Passive vs. Active

ANALYSES

Coding:
- Fixations/actions to novel Target ("blicket") or Competitor (other novel object) based on condition
  - Novel NP1-Passive: Target = Likely Theme
  - Novel NP1-Active: Target = Likely Agent
  - Novel NP2-Passive: Target = Likely Agent
  - Novel NP2-Active: Target = Likely Theme

Fixation: Preference for Target vs. Competitor
- Passive: Target minus Competitor (> 0 is better)
- Active: Competitor minus Target (< 0 is better)

Action: % of correct Target selections

Recall: % of selections that match original actions

SUMMARY

Successful syntactic bootstrapping requires efficient processing of linguistic cues during comprehension
- Processing challenges lead to interpretative failures that interfere with word learning
- Over time, misinterpretations generate ambiguity of word meanings within caregiver input
- May generate individual variation in vocab size

CONCLUSIONS

Processing challenges lead to memory interference
- Incomplete revision during learning phase may lead to multiple hypotheses for word meaning
- Even when correct interpretations are mentioned after learning, incorrect ones may linger