Lexico-syntactic representations in pre-schoolers and adults: similar structure but differential susceptibility to syntactic experience

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In a nutshell…

➢ **Research Questions:**

1) Are children's syntactic and lexical representations structured similarly to adults?

2) Are children's syntactic representations affected by experience in the same way?

➢ **Key Findings:**

1) Children's abstract syntactic representations are not dependent on existing lexical representations

2) Their lexical representations are linked to syntactic representations in a way that is consistent with adult models of lexico-syntactic representation

3) Children are more strongly affected by experience than adults, consistent with error-based learning accounts.

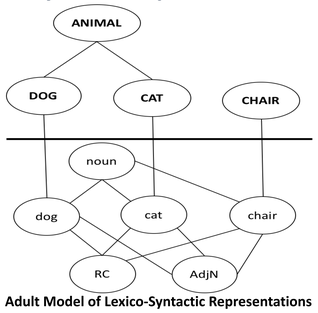
Introduction

Pre-schoolers generalize abstract syntactic structure across already known lexical items (e.g., Rowland et al., 2012).

They have a common relative clause (RC) structure they can use for both "cat" and "chair"

But what is the precise relationship between children's lexical and syntactic representations?

Adults show an increased tendency to repeat abstract syntax (*syntactic priming*) when the prime and target's lexical head is the same or semantically-related (**lexical boost**; e.g., Cleland & Pickering, 2003)



Adult Model of Lexico-Syntactic Representations

→ Suggests **single abstract syntactic representation** with a lexical component that underlies **both** *"a chair that's blue"* and *"a cat that's pink"*

Are young children's syntactic representations dependent on lexical representations? (Exp 1)

Young children's syntactic representations may not be sufficiently strong to support generalisation to newly-learned words in production tasks, (e.g., Thothathiri & Snedeker, 2008)

→Can they *immediately* **generalize** syntactic structures to unknown words?

If they can, suggests that their syntactic representations are independent of the lexicon

Are young children's syntactic representations linked to lexical representations? (Exp 2 & 3)

Lexical boost effects in children are mixed…

… Some studies show one (e.g., Branigan & McLean, 2016) but others fail to (e.g., Rowland et al., 2012)

…and have only been studied when the head is the same in prime and target

Lexical boost with the same and semantically-related heads would suggest similarly structured lexico-syntactic representations as adults

Are children more strongly affected than adults by syntactic experience? (All Exps)

Error-based learning accounts (e.g., Chang et al., 2006) assume children are **more susceptible** to learning from priming/prior experience (higher error and learning rates)

…But not observed in studies using late-acquired structures (passives)

Error-based learning predicts stronger priming in children if tested with earlier-acquired structures

Experiment 1

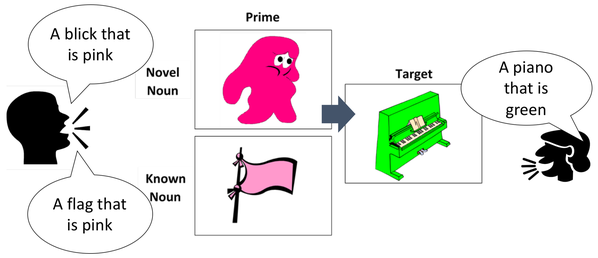
Do children spontaneously generalize syntactic structures to unknown words?

Predictions

Yes	No
• Children and adults **will** repeat structures experienced with novel and known nouns (no noun x age interaction)	• Children **will not** repeat structures experienced with novel nouns, but will for known nouns (noun x age interaction)

Method N = 20 adults, 20 3-4yo

Participants played a picture-naming "snap" game in **all** experiments (aim to find matching cards)



MANIPULATION

Prime Type

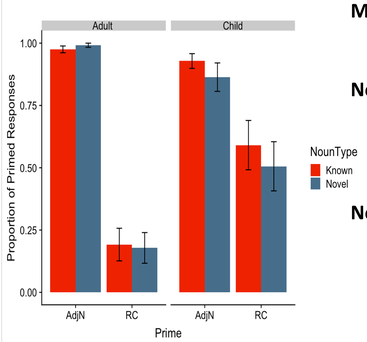
RC: *"A blick/flag that is pink"*

AdjN: *"A pink blick/flag"*

Noun Type

Novel Noun vs. Known Noun

Results



The proportion of primed responses as a function of prime type and noun type

Main effect of Prime

- More primed responses after AdjN than RC prime

No Main Effect of Noun

- Participants repeated structures regardless of whether prime noun was known or novel

No Noun X Age Interaction

- Children and adults showed same tendency to repeat structures irrespective of whether encountered with novel or known nouns

Age X Prime Interaction

- Children more likely to produce primed response after RC prime than adults

EXP 1 MAIN FINDINGS:

1) **Children are as likely to repeat structures involving a novel as a known noun, suggesting their syntactic representations are independent of the lexicon**
2) **Children are more strongly affected by syntactic experience than adults**

Experiments 2 & 3

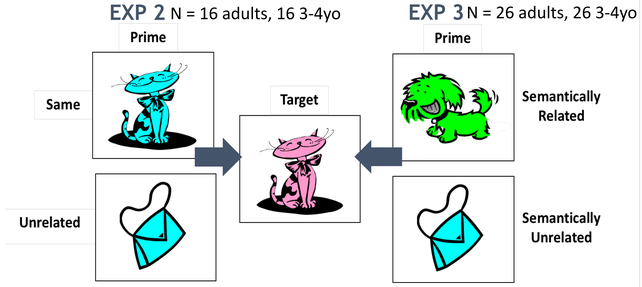
Are children's lexical representations linked to their syntactic representations?

Predictions

Yes	No
• Children and adults will be more likely to repeat structures for same/semantically related nouns than unrelated nouns (main effect of noun, no noun x age interaction)	• No difference in children's repetition of structure between same/semantically related nouns and unrelated nouns (no main effect of noun, noun x age interaction)

Method

EXP 2 N = 16 adults, 16 3-4yo **EXP 3** N = 26 adults, 26 3-4yo



MANIPULATION

Prime Type

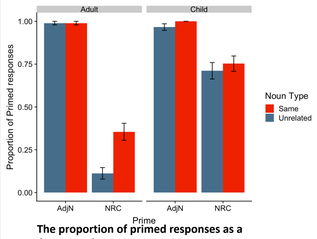
RC: *"A cat/square that is blue"* *"A dog/square that is green"*

AdjN: *"A blue cat/square"* *"A green dog/square"*

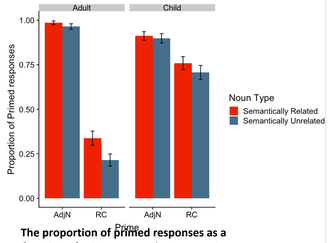
Noun Type

EXP 2: Same vs. Unrelated Noun **EXP 3:** Semantically Related vs. Semantically Unrelated

Results



The proportion of primed responses as a function of prime type and noun type in Experiment 2



The proportion of primed responses as a function of prime type and noun type in Experiment 3

Main Effect of Prime (Exp 2 & 3)

- As in Exp 1, more primed responses after AdjN than RC prime

Main Effect of Noun (Exp 2 & 3)

- Participants more likely to repeat structure when noun was same/semantically related than when it was unrelated (lexical boost)

No Noun X Age Interaction (Exp 2 & 3)

- No age differences for lexical boost effect

Age X Prime Interaction(Exp 2 & 3)

- Children more likely to produce primed response after RC prime than adults

EXP 2 & 3 MAIN FINDINGS:

1) **Children show a lexical boost, even with semantically related heads, suggesting their lexical and syntactic representations are linked**
2) **Children are more strongly affected by syntactic experience than adults (replicating Experiment 1)**

Conclusions

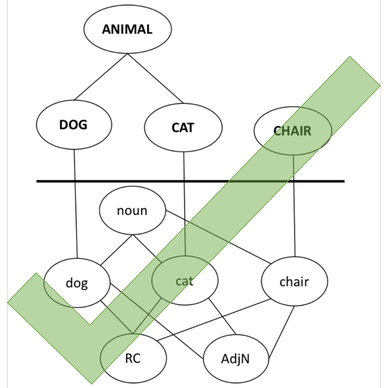
Are children's lexico-syntactic representations structured similarly to adults?

Children were just as likely to repeat structures for novel and known prime nouns…

→Syntax **independent** from lexicon

… Children show lexical boost effect for both the same and semantically related nouns

→Syntax **linked** to lexicon



Are children more strongly affected by syntactic experience than adults?

Children were more likely to repeat structures for more complex syntax (RCs) than adults…

→ **Novel** evidence that children are **more strongly** affected by syntactic experience than adults, **consistent** with error-based learning

References

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