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Tracking forms within structures: How children learn the *wanna* facts

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THE *WANNA* FACTS

(1) [Who$_i$ do [you want [PRO to meet who$_i$]]] ?
  ✔ *wanna*

(2) [Who$_i$ do [you want [who$_i$ to meet Obama]]] ?
  * *wanna*

Traditional analysis: Phonological operation (contraction) is blocked over who, but not PRO

Acquisition puzzle (POVERTY OF THE STIMULUS):
Surface string contains neither who nor PRO; *how are these restrictions learned?*

➢ **By noticing absence of *wanna* when *want* and *to* are adjacent in certain contexts?** NO, a learner would generalize incorrectly (context is too rare)

	Who do you want to help you?		Who do you want to help?	
	want to	*wanna	want to	✔wanna
what	0	1	365	200
who	9	2	9	6

700,000 adult utterances in CHILDES[2]

➢ **Universal Grammar?** Predicts that children obey the constraint as early as can be tested; a classic finding confirmed this[1] but has since been questioned[2]

EXPERIMENT 1

24 target questions, 6 fillers. Frequency of the infinitival verb (meet in (1,2)) was matched[3] for frequency in child-directed speech[4,5]. Excluded very high frequency verbs (cf. Experiment 2).

Adults (n=15)		Older children (n=14, age 5;0–7;6)		Younger children (n=11, age 3;6–4;11)	
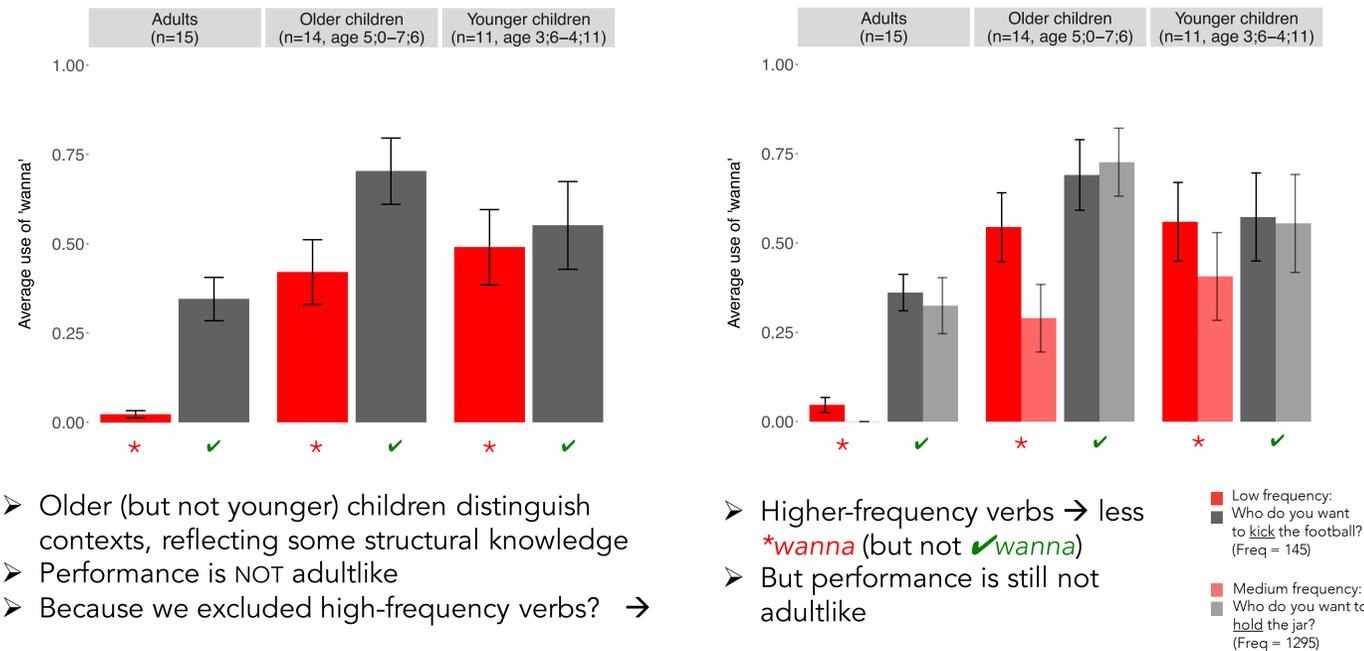
➢ Older (but not younger) children distinguish contexts, reflecting some structural knowledge
➢ Performance is NOT adultlike
➢ Because we excluded high-frequency verbs? →

Adults (n=15)			Older children (n=14, age 5;0–7;6)			Younger children (n=11, age 3;6–4;11)		

➢ Higher-frequency verbs → less *wanna (but not ✔wanna)
➢ But performance is still not adultlike

Legend:
- Low frequency: Who do you want to kick the football? (Freq = 145)
- Medium frequency: Who do you want to hold the jar? (Freq = 1295)

EXPERIMENT 2

12 target questions, 6 fillers, extremely high-frequency infinitival verbs

Older children (n=14, age 5;0–7;4)		Younger children (n=10, age 3;9–4;9)	
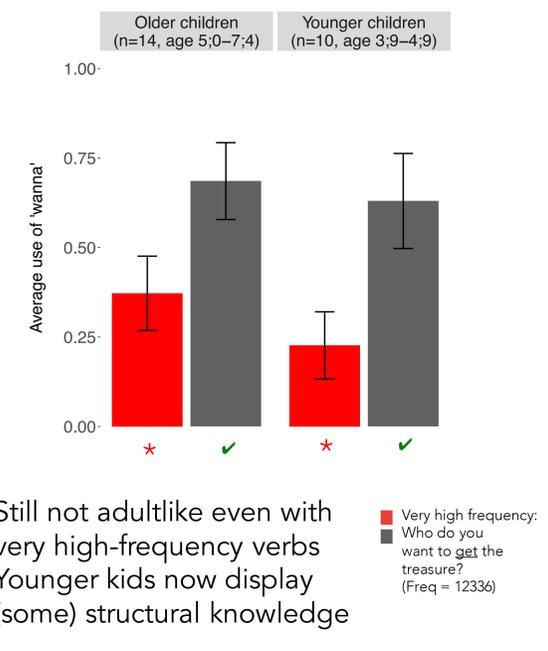
➢ Still not adultlike even with very high-frequency verbs
➢ Younger kids now display (some) structural knowledge

Legend:
- Very high frequency: Who do you want to get the treasure? (Freq = 12336)

Learning process: Associate lexical items (WANT, WANNA) with constructions (cf. C. Chomsky, 1969)

Information from from underlined declaratives (1a) and (2a) is sufficient

(1) Control
  a. [I want [PRO to meet Obama]]   ✔want to ✔wanna
  b. [Who do you want [PRO to meet]] ?

(2) Subject infinitival
  a. [I want [Heidi to meet Obama]]   ✔want to *wanna
  b. [Who do you want [who to meet Obama]] ?

**One of many late-acquired lexical restrictions on infinitival constructions[6]**

(3) a. I want to talk to the alien
  ✔ PROMISE ✔ WANT
  * APPEAR   ✔ WANNA
  ✔ HOPE
  * TELL

  b. I appeared to talk to the alien
  * PROMISE ✔ WANT
  ✔ APPEAR   ✔ WANNA
  * HOPE
  * TELL

(4) a. I told him to talk to the alien
  * PROMISE ✔ WANT
  * APPEAR   * WANNA
  * HOPE
  ✔ TELL

  b. I promised him to talk to the alien
  ✔ PROMISE * WANT
  * APPEAR   * WANNA
  * HOPE
  * TELL

PROCEDURE (EXPERIMENTS 1 & 2)

- Elicited production paradigm modified from the original *wanna* study[1] with full-sentence prompts[2]
- Participants ask questions to help a shy new student understand what the other kids are doing

Narrator: Sarah is ready to work on her science project. I think Sarah wants to build something. Ask Sarah what she wants to build.
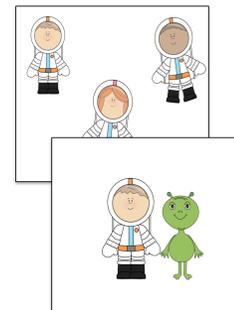*Target: What do you want to build?* ✔wanna
Sarah: A volcano!
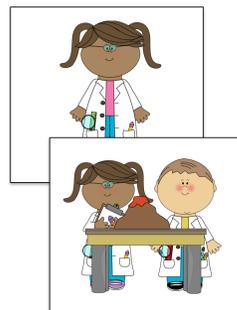
Narrator: Look at the volcano that Sarah and Nate built!

Narrator: The astronauts will pick one kid to talk to the alien. I think Zoe wants one of these kids to talk to the alien. Ask Zoe who she wants to talk to the alien.
Target: Who do you want to talk to the alien? *wanna
Zoe: Nate!

Narrator: There's Nate talking to the alien!

Clipart: http://www.mycutegraphics.com/

CONCLUSIONS

➢ **Empirical: Children's use of *wanna* is NOT adultlike** – even at age 7, and even preceding the highest frequency verbs in child-directed speech
➢ **Theoretical: An input-driven learning account IS feasible**, once we adopt a new perspective on the problem
➢ PoS puzzles depend on a specific view of the learning process; changes in our view of how learning might occur can turn a PoS puzzle into a solvable acquisition problem

REFERENCES

[1] Crain, S., & Thornton, R. (1998). *Investigations in Universal Grammar: A guide to experiments on the acquisition of syntax and semantics.* Cambridge, MA: The MIT Press. [2] Zukowski, A., & Larsen, J. (2011). Wanna Contraction in Children: Retesting and Revising the Developmental Facts. *Language Acquisition, 18*(4), 211–241. [3] Jurafsky, D., Bell, A., Gregory, M., & Raymond, W. D. (2000). Probabilistic Relations between Words: Evidence from Reduction in Lexical Production. In J. Bybee & P. Hopper (Eds.), *Frequency and the emergence of linguistic structure.* [4] Li, P., & Shirai, Y. (2000). *The acquisition of lexical and grammatical aspect.* Berlin & New York: Mouton de Gruyter. [5] MacWhinney, B. (2000). *The CHILDES project: The database.* Mahwah, NJ: Lawrence Erlbaum. [6] Chomsky, C. (1969). *The acquisition of syntax in children from 5 to 10.* Cambridge: MIT Press.

ACKNOWLEDGEMENTS