Social factors contextualizes the initial learning of a new word order

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Abstract

The Weird Word Order task (Akhtar, 1999) allows one to study how children might acquire a new word order. Previous work suggested that children do not easily generalize a new word order in this task. A new version of the task was created that seemed to make it easier to elicit a new word order, but the developmental pattern in the new task did not match earlier results. A second study compared the new task with the earlier studies, and found that the social features of the new task (the interlocutor's native language and the child's motivation for communication) played a role in their generalization abilities.

Generalization of a new word order

- The Weird Word Order task (WWO) teaches a child to use a novel word order like "Tamming Big Bird the truck" to describe a novel action.
  - Testing involves showing the novel action with different participants. A child can use the novel word order as in "Tamming Elmo the car" or they can change it to the canonical English order as in "Elmo tamming the car"

- Children are reluctant to use novel order in this task (See Figure 1)
  - Akhtar (1999) found that after 80 models of a new order and 20 elicitation questions, novel orders never exceeded 4 matches per child.
  - Reason 1: Child does not want to use a non-English word order with an English-speaking experimenter.
  - Reason 2: Child has no motivation to describe a scene that the experimenter has already seen.

- Can we make a task where it is easier for children to use the novel word order? Robot WWO task
  - Use a robot interlocutor that only understands WWO structure.
  - Use sticker search task, where communication with robot is the only way to achieve the desirable goal of finding stickers.

Japanese and Weird Word Order Language

Japanese language (verb-final, particles are optional)

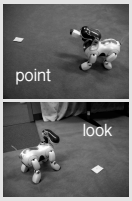
apple point ("ringo yubisashite", point at the apple)

apple look ("ringo mite", look at the apple)

Novel WWO language

point apple "yubisashite ringo"

look apple "mite ringo"



Experiment 1: Developmental Patterns in Robot WWO Task

- Previous WWO studies found that children were more likely to revert to the word order of their native language more when they were older and with familiar verbs (Abbot-Smith, et al. 2001; Akhtar,1999; Matthews, et al., 2005). These results suggest that the child's syntactic representations are strengthened by their experience with their native language.
- To replicate these findings in this new task, we varied verb-type and age of the child.
  - Verb-type: novel (pate, dote) and familiar verbs (yubisashite, mite)
  - Age of child: 3 and 4 years of age
  - Design: both factors varied between subjects, 40 mono-lingual Japanese children.

Task

- Warm-up: Demonstrated robot will point or look when commanded with novel WWO utterance (e.g., ,"yubisashite ringo", point apple)
- Practice trial 1: Experimenter commanded robot to find the first sticker on a sticker card. Both verbs were used.
- Practice trial 2: Experimenter prompted child to command the robot with "Tell the dog" and "Tell the dog about the X" (X is the sticker object). Then experimenter demonstrated the command and the robot performed the action.
- 6 Test trials: Test trials started with the same prompts as in Practice Trial 2, but after the first two prompts, the child is asked "Which is better, yubisashite or mite?". Then prompted with the verb three times.

Coding

"yubisashite X" "mite X" -> VERB-OBJECT (novel WWO order)

"X yubisashite" "X mite" -> OBJECT-VERB (Japanese order)

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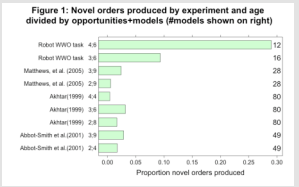
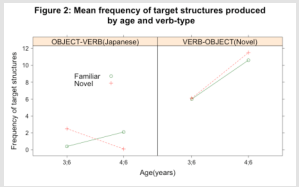
Results Experiment 1

- The proportion of novel structures produced per model and elicitation question was higher in the Robot WWO task than in previous studies (Figure 1).
- Generalization of WWO in this task is easier, because interlocutor prefers WWO order and production of WWO order allows child to achieve their own goals.





- The developmental pattern does not match previous studies (Figure 2). Japanese OBJECT-VERB structures do not increase over development and are not more likely with familiar Japanese verbs (proportion OBJECT-VERB, verbtype * age, all p's > 0.3)
- Changing the task and interlocutor radically changed the pattern of results that were found. Next experiment explores why.

Experiment 2: Social Factors in WWO Task

- Compared new task (WWO-Command) with version that is similar to previous WWO studies. Still uses robot search task, but the child must *describe* the robot's actions to the experimenter who speaks same language (Same-Description).
- To identify if children model the language abilities of the robot, tested condition where robot is shown to understand both WWO and Japanese orders (Both-command).

	WWO-Command	Same-Description	Both-Command
			Robot does actions in response to Japanese commands
Warm-up period + practice	Robot does point and look actions when it hears VERB-OBJECT language		
Test	Child commands robot	Experiment commands robot and child describes afterwards.	Child commands robot

30 Japanese children participated (average age 4;6). Task condition was varied between subjects.

Results Experiment 2

- Children produced a greater proportion of utterances with the novel order when commanding the robot to find stickers, then when describing the robot's action to a Japanese experimenter (WWO-Command vs. Same-Description, $t(27) = 3.65$, $p < 0.02$)

- Children produced marginally fewer novel orders when talking to a robot that they believed also understood Japanese (WWO-Command vs. Both-Command, $t(27) = 1.73$, $p = 0.09$).
- Task and interlocutor influenced the ability of children to generate utterances with novel objects in a novel word order. Same-Description condition yielded few novel word orders, as in previous studies which used a same language interlocutor.
- Children were sensitive to the language abilities of their interlocutor, but this effect was weaker.

Conclusion

- Children can quickly learn a new word order from relatively few models and generalize it to novel arguments.
- Changes over development are not simply due to input-based changes in the strength of representations, but rather could reflect changes in factors related to social understanding.

References

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