

When the gostak distims the doshes: novel verb learning from novel nouns

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Introduction

- To learn the meaning of a new verb, toddlers make use of the linguistic context in which it appears.
- For example, they map novel verbs appearing in transitive sentences (e.g., *John lörps Susie*) to causative events (e.g., boy spins girl) (e.g., Naigles, 1990).
- Though called syntactic bootstrapping, this ability has been tested in studies that provide semantic as well as syntactic information to the verb's meaning. For example, the verb's arguments are labeled with descriptive noun phrases that provide useful information about the participants involved in the event.
- Here we ask whether toddlers can learn verbs from syntax alone, even if there are no familiar content words in the sentence that provide insight into the verb's semantics.
- To achieve this, we present novel verbs surrounded by novel nouns (e.g., *The dax lörp the stipe*).
- Because pilot results suggested that having too many novel words in a sentence was challenging for toddlers, we first familiarized them to the novel nouns in conversations, allowing them to parse them out from the speech stream and assign them a grammatical category.
- Critically, the sentences provided virtually no semantic information as to the identity of the referent, e.g., whether animate or inanimate (e.g., "The dax is over there") (Graf, Ferguson, & Waxman, 2013).

Participants & Design

Participants: 35 toddlers (25.0 to 29.9 months, mean age 28.5 months); data collection in progress, target N = 40

Three novel verb trials, each consisting of:

- Noun Familiarization:** 2 novel nouns are presented, one at a time, to indicate the part of speech and either its location (e.g., far away) or a physical property (e.g., small).
- Syntactic Familiarization:** novel verb presented in one of two contexts
 - Transitive, e.g.,
The boy is going to lörp the girl, or
 - Intransitive (conjoined-subject), e.g.,
The boy and the girl are going to lörp
- Test:** 2 simultaneous dynamic video scenes
 - a causative action
 - a synchronous action

At test, toddlers hear, e.g., "Where's lörping?" Eye gaze is recorded (Tobii T60XL).

Sample Stimuli



NOUN FAMILIARIZATION

(dialogues same across conditions)

Actor A	Actor B
Guess what? I saw the dax.	Really? You saw the dax?
Yes, the dax is far away.	Oh yes, the dax is far away.
Guess what? I found the stipe.	Really? You found the stipe?
Yes, the stipe is very small.	Oh yes, the stipe is very small.

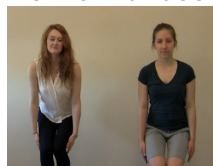
SYNTACTIC FAMILIARIZATION

(dialogues different across conditions)

Transitive Condition	
Actor A	Actor B
Hey! Let's talk about the dax and the stipe.	Yes, let's talk about the dax and the stipe.
Yesterday, the dax lörp the stipe.	Oh really? The dax lörp the stipe?
And today, the dax will lörp the stipe again!	Wow, the dax will lörp the stipe again.
Intransitive Condition	
Actor A	Actor B
Hey! Let's talk about the dax and the stipe.	Yes, let's talk about the dax and the stipe.
Yesterday, the dax and the stipe lörp.	Oh really? The dax and the stipe lörp?
And today, the dax and the stipe will lörp again!	Wow, the dax and the stipe will lörp again.

TEST (identical across conditions)

SYNCHRONOUS



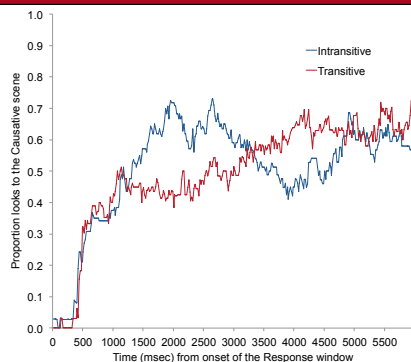
CAUSATIVE



Baseline window:
Look! Wow!

Response window:
Where's lörping?

Results



Based on prior work, we predicted that toddlers would show a preference for the causative scene within 1-3 seconds from the onset of the Response window (Arunachalam, 2013). Contrary to our predictions, toddlers in the Transitive condition do not show a preference for the causative scene in the 1- to 3-second time window. Instead, in this time window toddlers in the *Intransitive* condition show a slight preference for the causative scene ($M = .57$, $SD = .16$; compared to chance $t(16) = 1.8$, $p = 0.09$).

Although we do not have an explanation for this unexpected finding (we welcome your suggestions!), it may be related to animacy (Pozzan et al., 2012). Toddlers in the *Intransitive* condition showed the strongest preference for the causative scene on the two trials on which both actors in the test scenes were animate.

Additional data collection will be needed to understand the locus of the observed trend.

Conclusions

Our goal was to test whether syntactic information alone, without the semantic contribution of co-occurring noun phrases, would be sufficient to guide young word learners to map a novel verb to a referent.

Our results thus far suggest that is not. Toddlers in the Transitive condition did not show a preference for the causative scene within the time window expected based on previous research. Contrary to our predictions, toddlers in the Intransitive condition may show such a preference, although no statistically significant differences have resulted.

If the current trend is borne out when our sample is complete, it will suggest that toddlers require semantic information in the surrounding linguistic context to succeed at syntactic bootstrapping.

References

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