

2018 Newsletter



**Language
Acquisition Lab**

MIT Language Acquisition Lab

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Do Children Understand the Implications of the Word *Even*?

Yadav Gowda and Elise Newman, Graduate Students

Even is a word that contains information called a “presupposition.” That is, information that is not present in the literal meaning of the sentence, but is assumed to be true. For instance:

- (a) John went to the party.
- (b) *Even* John went to the party.
- (c) *Even* John didn’t go to the party.

In (b), the contribution of *even* is that John is unlikely to go to the party. However, in (c), *even* indicates that John is actually likely to go to the party. We want to know if children understand this difference, and if they are better at interpreting *even* in one of those contexts over the other. Following work by Kim, 2012, we created stories with three characters, where one character was more likely than the others to be able to perform the action of the story, while another character was less likely. We then named a character in the story and asked the child to identify which character it was.



Even Benny was able to reach an apple. Who is Benny?

Initial results show that children at age 3 are guessing in both positive and negative contexts, but at age 4 they can interpret *even* in negative contexts almost as well as adults. Positive contexts seem to lag behind until at least age 5. We are interested in why this might be and are planning a follow-up study using the word *especially* to investigate the connection between polarity (negative vs. positive) and the inference that the character is likely or unlikely to perform the action.

How do Children Interpret the Word *Only*?

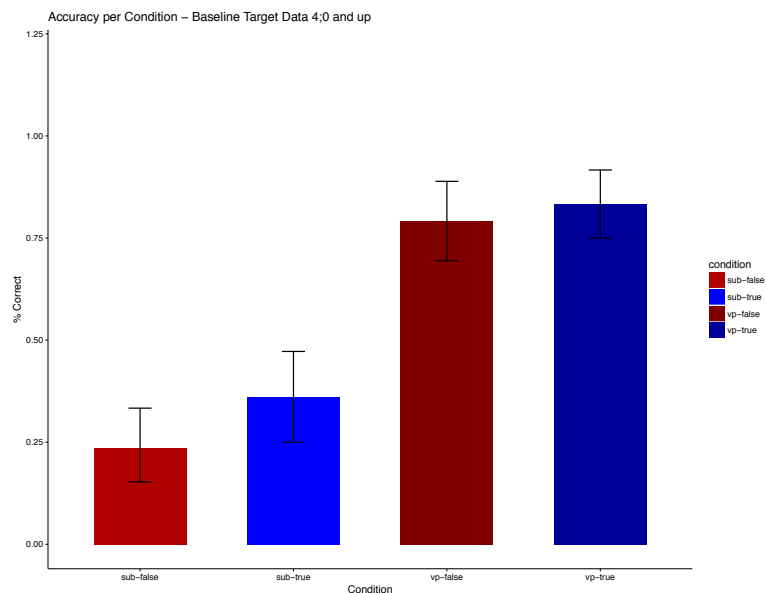
Dr. Martin Hackl, Principal Investigator

Only is a complicated word. When you say (a) below, you exclude the possibility that anyone else got ice cream. When you say (b), you deny that it got any other treats. This means that adults must construct sets of possible alternatives in their minds in order to interpret sentences containing *only*. In addition, these sets of alternatives are situated on a scale, where higher numbers of animals or treats are more highly-ranked. *Only* excludes members of a scale which are more highly-ranked than what is asserted.

- (a) Only the rabbit got ice cream.
- (b) The rabbit only got ice cream.

Previous research by Notley, Zhou, Crain and Thornton (1999) has shown that children often interpret *only* as being attached to the verb phrase of a sentence, even when it is attached to the subject. That is, they often interpret both (a) and (b) as (b). We replicated and expanded on this experiment. Each picture is designed so that when (a) is true, (b) is false, and vice-versa. A puppet makes a guess with a sentence like either (a) or (b). We ask children ages 4-6 to tell the puppet whether it is right about the picture, or being silly. Since (a) and (b) have opposite truth values, interpreting (a) in a non-adult-like way indicates that they have interpreted it as (b).

In the original version of this experiment, we replicated the findings that children even up to age 6 are much more adult-like in interpreting sentences like (b) (the two bars on the right) than (a) (the two bars on the left). They interpret (a) in an adult-like way about 25% of the time, while they interpret (b) in an adult-like way about 75% of the time.



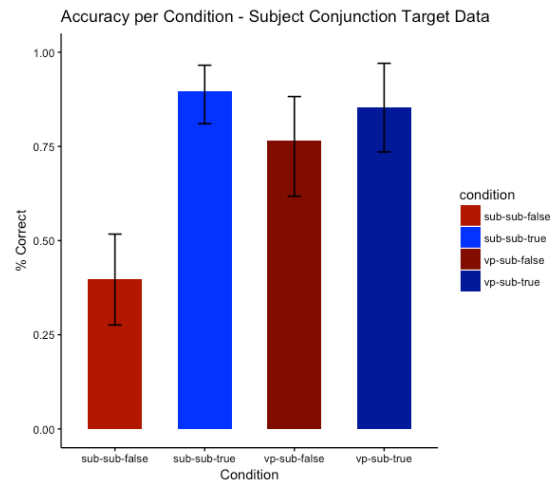
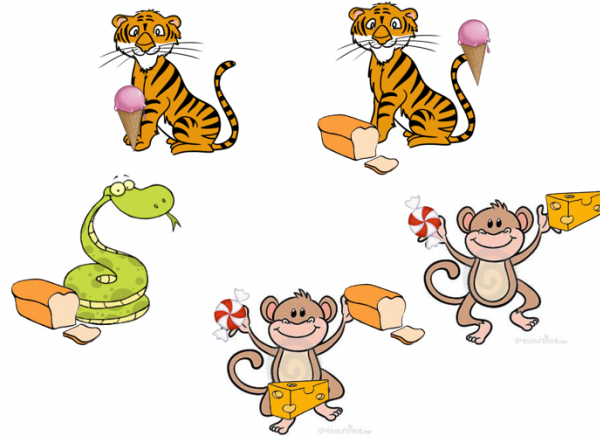
Study Variations

Having the baseline study, we can now use it as a control study. We created variants which tweak various things about the stimulus sentences so that we can compare them to the baseline. We have so far run a numeral phrase variant (“Only one of the animals”), a conjunction phrase variant (“Only the cat and the dog”), a plural variant (“Only the cats”) and most recently, a numeral + plural variant:

- (c) Only two of the animals got cheese.
- (d) Two of the animals only got cheese.

Some of these tweaks have resulted in changes from the original results. For instance, having a conjunction in the subject, as in, “Only the cat and the dog got cheese.” results in much higher rates of adult-likeness for subject-only sentences, even though these sentences seem more complicated than the baseline sentences without “and the dog”. This leads us to hypothesize that the interpretation of *only* may hinge on attracting focus to the right part of the sentence, and that *only* may fall into a class of words similar to conjunctions, and that this method may be able to tell us how words like *only* and *and* are processed in the brain, and what other words may be like them.

We are not yet done collecting data for our most recent variant of the *Only* study, and there may be more to come, as we learn more about *only* and words like it. We thank you for your continued support!



Following All of the Instructions

Athulya Aravind, Graduate Student

We can use language not only to communicate new information, but also to mark what we are already taking for granted. For instance, in the sentence "Sue likes the scarf that she bought", the fact that there is a scarf that Sue bought is felt to be old information already taken for granted, whereas the fact that Sue likes it feels like the core new information. Depending on the grammatical form of the sentence, different things are felt to be taken for granted, even when involving the same words.

- (1) If the hat that you give him is blue, then you also have to give him a scarf.
- (2) If you give him a scarf, then the hat that you give him has to be blue.

This is a property associated with words like *the* and *that*, which come with a special type of meaning called **presuppositions**—old, background information that everyone already agrees upon.

We are interested in whether children can distinguish between presuppositional meanings from new information. We are designing a study in which one experimenter gives a second experimenter a set of instructions about how to dress up a doll, such as (1) or (2), and the child will evaluate whether the second experimenter did a good job following instructions.



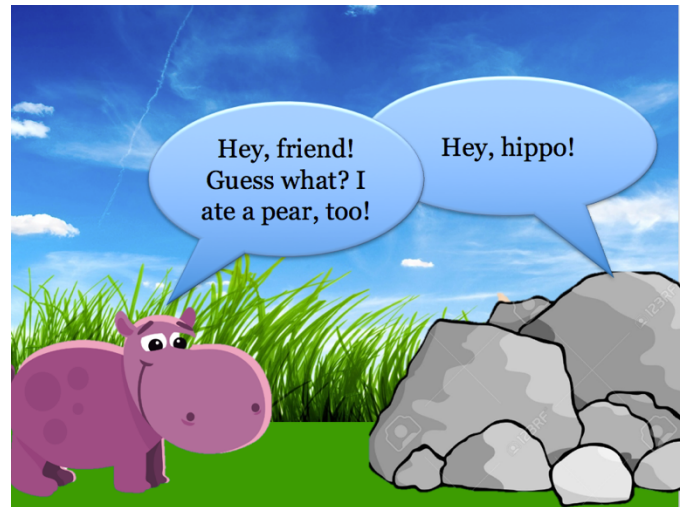
In one of the experimental trials with instructions like “If the hat that you give him is blue, then you also have to give him a scarf.”, the second experimenter will give the doll *neither* a hat *nor* a scarf. But by using *the*, the instructions convey that it’s not up for debate whether or not there is a hat, so adult speakers believe the experimenter failed to follow instructions in (1). In contrast, they are happy to accept the same end-result when the instructions are (2). We are interested in whether children show similar judgments. We are looking forward to finding out how children view presuppositional information!

Do Children Know What to Take For Granted, and When?

Athulya Aravind, Graduate Student

Certain words, "presuppositional words", are appropriate in a conversation if some associated piece of information – the presupposition – is already shared knowledge among all conversation participants. A sentence like "I ate an apple, too" should be used only when the listener also knows that something else had been eaten previously. Moreover, when it is clear that piece of information is already shared knowledge – e.g. if the listener *knows* that the speaker had eaten an orange before – adults strongly prefer to use presuppositional words ("I ate an apple, too" vs. "I ate an apple") rather than not use them. We ask when children come to know these conversation rules.

In one task, we ask: when someone uses a sentence like "I ate a pear, too", do children expect that they are talking to someone who already knew that an apple had been eaten before? This task tests whether they can keep in mind the different levels of knowledge that each of the characters has about the situation. Hippo has two friends, one of whom saw him eat an apple, and the other of whom did not. We ask children which friend they think is visiting Hippo, hidden behind that rock.



In another task, we ask: given a listener who knows that an orange had been eaten before, do children show a preference to use e.g. "I ate an apple, too" as opposed to "I ate an apple"? That is, do they use presuppositions whenever they can, like adults? This was a production study, where instead of asking children which character is being talked to, we had them produce what they thought the character would say. In between the pictures below, the lion would leave, and then we would ask children what the hippo would say to the lion's question.



...



We find that children know some of these conversation rules earlier than others! By 4 years old, children know that presuppositional words should only be used when the listener knows the presupposition already. However, they have a harder time understanding that such words *must* be used when the listener knows the presupposition.

Distinguishing Between Context Requirements for Either and Too

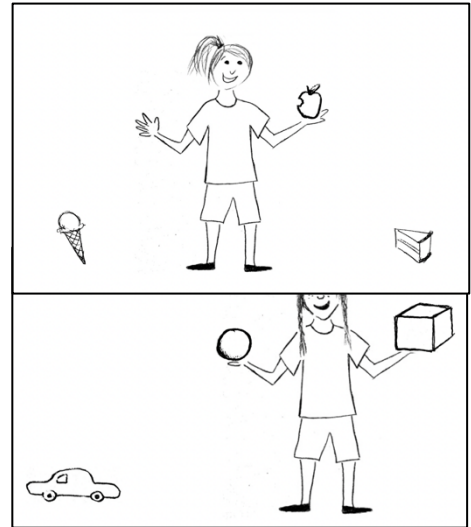
Naomi Francis, Graduate Student

Either and *too* are words which can only be used in specific contexts. *Either* can only be used in negative contexts; this is called a “Negative Polarity Item” or NPI. Other NPIs include “anymore” or “at all”.

- (1) Sam isn’t holding ice cream.
 - a. Sam isn’t holding cake, either.
 - b. *Sam isn’t holding cake, too.

By contrast, *too* can only be used in positive contexts, so it is a Positive Polarity Item or PPI. Other PPIs include “already” and “somewhat”.

- (2) Taylor is holding a ball.
 - a. *Taylor is holding a box, either.
 - b. Taylor is holding a box, too.



Corpus-based research has claimed that children learn how and when to use NPIs earlier than PPIs. We test this claim empirically by asking participants ages 3-7 to be the judge in a game between two puppets. An experimenter describes the scene, and then one puppet says a sentence like (1a) or (2a), while the other says a sentence like (1b) or (2b). The child awards a point to the puppet who “said it better”. We predict that children will have a higher rate of adultlike response in positive contexts (not using NPIs where an adult would not use them) and a lower rate in negative contexts (using PPIs where an adult would not use them) and that they should become more adultlike over time.

Preliminary results show that unexpectedly, younger children (and adults) show a distinction between the two kinds of polarity items, while older children do not. This merits further investigation! We are still collecting data and look forward to sharing our results.

To Our Research Partners:
Thank You!

Our research would not be possible without your support!



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