# Psych 56L/ Ling 51: Acquisition of Language

Lecture 14

Development of Complex Syntax

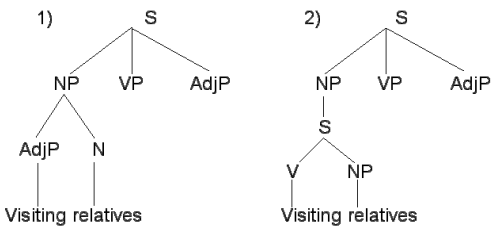
## Announcements

HW2 should be graded now — check EEE

Be working on HW3: due 12/09/14

Be working on review questions for morphology and syntax

## What sentences mean




[Relatives visiting us] [We visiting our relatives]

"Visiting relatives can be irritating."

## Passives


http://arnoldzwicky.org/2012/02/22/misfired-indirecion/

## Passives

Passives are tricky because the subject of the sentence is the "undergoer" of the action (rather than the "doer" as it is in active sentences).

Active sentence:

Sarah saved Tobey.

Subject Verb Object

Passive equivalent:

Tobey was saved by Sarah.

Subject Verb

semantically "light" verb

doer "by" phrase

## Passives

Children usually start producing passives when they are three years old.

Some example passives & the ages when they were produced:

"Do you think the flower's supposed to be picked by somebody?" (2;10)

"So it can't be cleaned?" (3;2)

"I don't want the bird to get eated." (3;7)

"She brought her inside so she won't get all stinked up by the skunk." (4;1)

## Passives

In fact, children seem to over-produce passives, applying a "passive" rule to verbs that (some) adults wouldn't make passive.

Passive rule =~ be/get + VERB + en/ed

Some example over-produced passives:

"…they won't get staled." (3;6)

"The tiger will come and eat David and then he will be died." (4;0)

"I want these pancakes to be sugared." (4;2)

"Why is the laundry place stayed open all night?" (4;3)

## Passives

Still, despite producing passives spontaneously, children seem to have persistent trouble understanding passive sentences.

Standard comprehension task:

Which of these pictures shows "The dog is bitten by the cat"?

Children under age five usually do very poorly on these tasks, getting less than 50% right (worse than guessing)! Part of the trouble is that they can't use world knowledge to help figure it out.

## Passives

Eventually, children learn to notice the more subtle signals of a passive sentence – the light verb, the participle (-en/-ed) ending, and sometimes the "doer" by phrase.

Standard comprehension task:

Which of these pictures shows "The dog is bitten by the cat"?

But it *does* take awhile…

## Silent things


http://itre.cis.upenn.edu/~myl/languagelog/archives/002155.html

Do they need people to decorate?

Typical: People are the ones doing the decorating.
Possible: People are the ones being decorated.

## Silent things

Some sentences allow other sentences inside of them:

We know something.

We know children eventually acquire language.

Here, the sentence "children eventually acquire language" acts like the direct object of the verb *know* (it's the sentence inside the main sentence, called the embedded clause or sentential complement).

## Silent things

Sometimes, certain verbs will allow partial or incomplete sentences to follow them that do not have tense (these are called non-finite clauses, and they're signaled in English by "to" before a verb):

The girl tried to save her brother.

The king hopes to win the game.

The goblins wanted to keep the boy.

The dwarf decided to help the girl.

## Silent things

| | Implied Subject |
|---|---|
| The girl ~~tried~~ [ ] to save her brother. | the girl |
| The king ~~hopes~~ [ ] to win the game. | the king |
| ~~The goblins~~ ~~wanted~~ [ ] to keep the boy. | the goblins |
| ~~The dwarf~~ ~~decided~~ [ ] to help the girl. | the dwarf |

The subject of the embedded clause (the sentence following the main verb) is implied, not overtly stated.

## More complicated silent things

Sometimes there is more than one potential noun phrase that could act as the implied subject of the non-finite embedded clause:

Jareth told Hoggle to give the peach to Sarah.

Who's giving the peach – Jareth or Hoggle?

Hoggle promised Jareth to do so.

Who promised to do so – Jareth or Hoggle?

## More complicated silent things

Sometimes there is more than one potential noun phrase that could act as the implied subject of the non-finite embedded clause:

Jareth told Hoggle to give the peach to Sarah.

Who's giving the peach – Jareth or Hoggle?
Adults say: Hoggle (Object of main clause)

Hoggle promised Jareth to do so.

Who promised to do so – Jareth or Hoggle?
Adults say: Hoggle (Subject of main clause)

## More complicated silent things

How do we test what kids think?

Carol Chomsky 1969: testing 5 to 10-year-old children

After making sure children understood the meaning of *promise*, she asked them to act out sentences like the following:

"Bozo *tells* Donald to hop up and down. Make him do it."
Who's hopping? Adults: Donald

"Bozo *promises* Donald to hop up and down. Make him do it."
Who's hopping? Adults: Bozo

## More complicated silent things

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"Bozo *tells* Donald to hop up and down. Make him do it."
Who's hopping? Adults: Donald
Kids: Donald

"Bozo *promises* Donald to hop up and down. Make him do it."
Who's hopping? Adults: Bozo
Kids: Donald
Initial child strategy: Pick nearest potential subject.

## More complicated silent things

How do we test what kids think?

Kids must eventually learn that *promise* does not behave like *tell* – the implied subject of the embedded clause is the subject of the main clause, not the object of the main clause. They may learn this through repeated exposures to *promise.*

"Bozo *tells* Donald to hop up and down. Make him do it."
Who's hopping? Adults: Donald
Kids: Donald

"Bozo *promises* Donald to hop up and down. Make him do it."
Who's hopping? Adults: Bozo
Kids: ~~Donald~~ **Bozo!**

## More complicated silent things

Sentences that have both an implied subject and implied object.

The girl is *afraid* to see .

Who/what is doing the seeing (subject of see)?

Who/what is being seen (object of see)?

## More complicated silent things

Sentences that have both an implied subject and implied object.

The girl ~~is *afraid*~~ to see .

Who/what is doing the seeing (subject of see)?
The girl.

Who/what is being seen (object of see)?

## More complicated silent things

Sentences that have both an implied subject and implied object.

The girl ~~is *afraid*~~ to see .

Who/what is doing the seeing (subject of see)?
The girl.

Who/what is being seen (object of see)?
Something unspecified.

## More complicated silent things

Sentences that have both an implied subject and implied object.

The girl ~~is *afraid*~~ to see .

Who/what is doing the seeing (subject of see)?
The girl.

Who/what is being seen (object of see)?
Something unspecified.
This sentence means approximately something like
"The girl is afraid to see (something)."

## More complicated silent things

Sentences that have both an implied subject and implied object.

The girl is *easy* to see .

Who/what is doing the seeing (subject of see)?

Who/what is being seen (object of see)?

## More complicated silent things

Sentences that have both an implied subject and implied object.

The girl ~~is *easy* to see~~ .

Who/what is doing the seeing (subject of see)?

Who/what is being seen (object of see)?
The girl.

## More complicated silent things

Sentences that have both an implied subject and implied object.

The girl ← is *easy* [ ] to see [ ].

Who/what is doing the seeing (subject of see)?
Someone not mentioned.

Who/what is being seen (object of see)?
The girl.

## More complicated silent things

Sentences that have both an implied subject and implied object.

The girl ← is *easy* [ ] to see [ ].

Who/what is doing the seeing (subject of see)?
Someone not mentioned.
This sentence means the same thing as
"It is easy (for someone) to see the girl."

Who/what is being seen (object of see)?
The girl.

## More complicated silent things

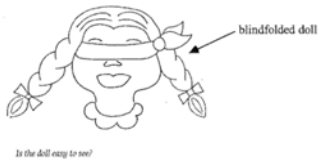
Sentences that have both an implied subject and implied object.

The girl ← is *easy* [ ] to see [ ].

How can we tell what children's interpretations are for these kinds of sentences?

## More complicated silent things

Carol Chomsky 1969

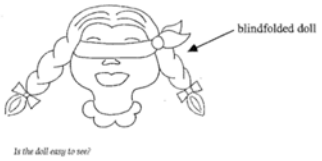



"Is the doll easy to see?"

Adults say yes, since the doll is in plain sight. What do children say?

## More complicated silent things

Carol Chomsky 1969



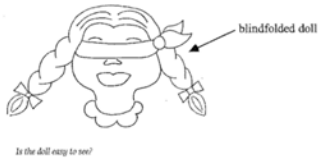

"Is the doll easy to see?"

Some say yes:

Ann C. (8;8): "Easy"
Experimenter: "Could you make her hard to see?"
Ann C: "In the dark."

## More complicated silent things

Carol Chomsky 1969



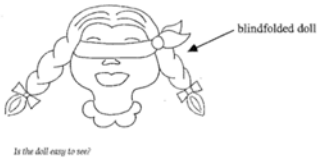

"Is the doll easy to see?"

However, more than a third say no.

Eric (5;2): "Hard to see."
Experimenter: "Will you make her easy to see?"
Eric: "Okay." (He removes the blindfold.)

## More complicated silent things

Carol Chomsky 1969




"Is the doll easy to see?"

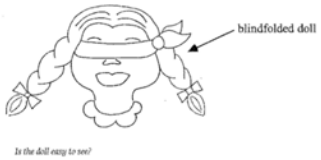
Child misinterpretation:

"Is the doll ~~easy~~ to see ~~[ ]~~?"

(Mis)Interpretation: "Is it easy for the doll to see (something)?"

## More complicated silent things

Carol Chomsky 1969




"Is the doll easy to see?"

Child misinterpretation:

"Is the doll ~~easy~~ to see ~~[ ]~~?"

Children probably need more exposure to these kinds of constructions (*is easy to*, *is hard to*, …) in order to learn the correct interpretation.

## Learning more complicated silent things

Becker, Estigarribia, & Gylfadottir 2012: The animacy of subjects may help distinguish these constructions from each other. When children hear inanimate subjects (like "apple") used many times with a construction, they assume the subject is the implied object.

"Is the apple greppy to see?"

4- to 7-year-old children's interpretation:

"Is the apple ~~greppy~~ ~~to see~~ ?"

→ Is it easy for someone unspecified to see the apple?
This works well for real constructions like *simple*, *difficult*, *tough*, *easy*, ….

## Pronouns

Pronouns are energy-saving devices that allow us to refer to someone or something (whose identity we know) without using a name (like "Sarah" or "Jareth") or other noun phrase (like "the girl" or "a very impressive goblin king").

Sarah thought that she could save her brother.

Jareth was surprised the girl summoned him, and resolved to show her he was a very impressive goblin king.

## Pronouns

Young children seem to know how to use pronouns – they like to use them if a preceding noun has already established what they refer to.

Imitation task results with 2 ½ and 3-year-old children (Lust 1981):

Experimenter says a sentence with two names:
"Because Sam was thirsty, Sam drank some soda."

Child replaces second name with a pronoun:
"Because Sam was thirsty, he drank some soda."

## Pronouns

Young children seem to know how to use pronouns – they like to use them if a preceding noun has already established what they refer to.

Imitation task results with 2 ½ and 3-year-old children (Lust 1981):

Experimenter says a sentence with a pronoun before a name:
"Because he was thirsty, Sam drank some soda."

Child replaces name and pronoun so the name comes first:
"Because Sam was thirsty, he drank some soda."

## Trickier pronouns

Reflexive pronouns have different forms than "plain" pronouns

| | | | |
|---|---|---|---|
| myself | me, I | herself | she, her |
| yourself | you | itself | it |
| himself | he, him | ourselves | we, us |
| themselves | they, them | | |

## Trickier pronouns

Reflexive pronouns behave differently than "plain" pronouns: they are interpreted differently

Jareth thought that Hoggle tricked himself.

Jareth thought that Hoggle tricked him.

## Trickier pronouns

Reflexive pronouns behave differently than "plain" pronouns: they are interpreted differently

Jareth thought that Hoggle tricked himself.
= Jareth thought that Hoggle tricked Hoggle.

Jareth thought that Hoggle tricked him.
= Jareth thought that Hoggle tricked Jareth.

## Trickier pronouns

Reflexive pronouns behave differently than "plain" pronouns: they are interpreted differently

Jareth thought ~~that~~ {Hoggle ~~tricked~~ himself.}
must refer to NP in same clause

Jareth ~~thought~~ {~~that Hoggle tricked~~ him.}
must not refer to NP in same clause, but can refer to NP in different clause

Rule: Reflexive pronouns must refer to a noun phrase inside the same clause while regular pronouns must not.

## Trickier pronouns

How can we test when children learn this distinction?

Act-Out Task:

"Donald thinks that Mickey Mouse scratched himself. Show me what Mickey did."

"Donald thinks that Mickey Mouse scratched him. Show me what Mickey did."

## Trickier pronouns

How can we test when children learn this distinction?

Act-Out Task:

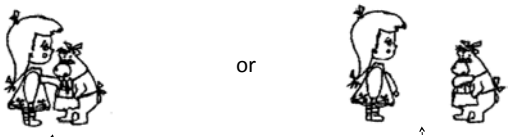
"Donald thinks that Mickey Mouse scratched himself. Show me what Mickey did."
(Action: Mickey scratches Mickey)

"Donald thinks that Mickey Mouse scratched him. Show me what Mickey did."
(Action: Mickey scratches Donald)

## Trickier pronouns

How can we test when children learn this distinction?

Comprehension Task (Chien & Wexler 1990):
"Here's a picture of Mama Bear and Goldilocks."




"Is Mama Bear touching her?"
Children who understand plain pronouns will answer

YES NO

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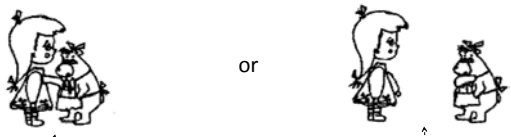


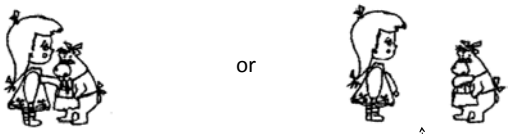

"Is Mama Bear touching herself?"
Children who understand reflexive pronouns will answer

NO YES

## Trickier pronouns

Children between the ages of 3 and 5 years old often do fairly well on the interpretation of reflexive pronouns.

"Here's a picture of Mama Bear and Goldilocks."



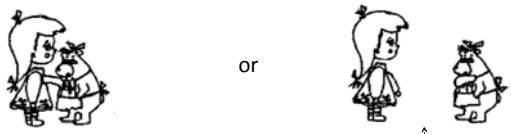

"Is Mama Bear touching herself?"

NO YES

## Trickier pronouns

However, these same children seem to have trouble with plain pronouns – they'll interpret them as reflexive.

"Here's a picture of Mama Bear and Goldilocks."




"Is Mama Bear touching her?"

NO YES

## Trickier pronouns

Interestingly, even though children mistakenly interpret plain pronouns as reflexive, they don't seem to make this mistake in their own productions.

Bloom et al. (1991): Looking at 100,000 spontaneous utterances of three children, beginning at age 2.

*me* and *myself* were used correctly 95% of the time.

This suggests that children know the distinction between some reflexive and plain pronouns (as evidenced in their own productions), but they have trouble making this distinction for the pronouns tested in the experiments. Perhaps the experiments aren't good at really getting at children's knowledge? (Conroy et al 2009 suggest that previous results are due to experimental artifact.)

## Trickier pronouns

Lukyanenko, Conroy, & Lidz 2013 experimental demonstration:
2.5-year-olds also realize some facts about how to interpret plain pronouns in relation to reflexive pronouns and names.

She's patting Katie
= One girl patting another one

She's patting herself
= One girl patting her own head

## Trickier pronouns

Evidence for incomplete knowledge? Children do seem to have trouble using plain pronouns in ways that make it easy to understand what these pronouns refer to.

An excerpt from a four-year-old's description of a picture:

"…she's sitting on the seat airplane…she's giving something to a girl, now she's looking at a book…now she's putting the thing up high."

So what's the problem with this description?

## Trickier pronouns

Evidence for incomplete knowledge? Children do seem to have trouble using plain pronouns in ways that make it easy to understand what these pronouns refer to.

An excerpt from a four-year-old's description of a picture:

"…she's sitting on the seat airplane…she's giving something to a girl, now she's looking at a book…now she's putting the thing up high."

So what's the problem with this description? The first *she* refers to a girl and the second she refers to a woman. This would be a bit strange for an adult to say, unless there was some indication that the second she is different (perhaps by pointing at the new referent).

## The problem of assuming knowledge of a pronoun's referent

*Alice in Wonderland*, Chapter 12, by Lewis Carroll

They told me you had been to her,
And mentioned me to him:
She gave me a good character,
But said I could not swim.

He sent them word I had not gone
(We know it to be true):
If she should push the matter on,
What would become of you?

## The problem of assuming knowledge of a pronoun's referent

*Alice in Wonderland*, Chapter 12, by Lewis Carroll

I gave her one, they gave him two,
You gave us three or more;
They all returned from him to you,
Though they were mine before.

If I or she should chance to be
Involved in this affair,
He trusts to you to set them free,
Exactly as we were.

## The problem of assuming knowledge of a pronoun's referent

*Alice in Wonderland*, Chapter 12, by Lewis Carroll

My notion was that you had been
(Before she had this fit)
An obstacle that came between
Him, and ourselves, and it.

Don't let him know she liked them best,
For this must ever be
A secret, kept from all the rest,
Between yourself and me.

## Quantifiers

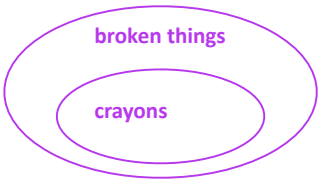
Quantifiers are words that express quantities, like *a, some, every, none,* and *most*.

"We have words whose meanings make reference to specific quantities (*1, 2, 3,*...), to approximate quantities (*a few, several*), to existence (*some, any*), to universals (*every, all*), and to comparisons among quantities (*more, most*). " - Lidz 2014

## Quantifiers

Quantifiers are words that express quantities, like *a, some, every, none,* and *most*.

"Quantifiers like *every*, *some*, or *most*, also require representing a relation between two sets. For example, when we say "every crayon is broken," we are expressing a relation between the set of crayons and the set of broken things such that the former is a subset of the latter…" - Lidz 2014




## Quantifiers

Quantifiers are words that express quantities, like *a, some, every, none,* and *most*.

"The first problem is simply one of abstraction…they are not tied to concrete referents and can be applied to any noun, with only a few constraints…In addition, their meanings are highly contextually defined. Even a single phrase like *every girl* will pick out a different set of girls and a different number of girls depending on whether the context of discourse is the people in my class or the people in my family." - Wagner 2010

## Quantifiers

Quantifiers are words that express quantities, like *a, some, every, none,* and *most*.

"A final, and perhaps more difficult problem posed by quantifiers is the fact that their interpretation also depends on the scope they take in a sentence. Scope itself is often ambiguous and does not depend on the linear order of elements in a sentence." – Wagner 2010

## Quantifiers

Quantifiers are words that express quantities, like *a, some, every, none,* and *most*.

When two (or more) quantifiers are in a sentence, they interact semantically to determine the sentence's meaning, based on the scope of each quantifier.

Everyone saw a movie last night.

## Quantifiers

Quantifiers are words that express quantities, like *a, some, every, none,* and *most*.

When two (or more) quantifiers are in a sentence, they interact semantically to determine the sentence's meaning, based on the scope of each quantifier.

Everyone saw a movie last night (and they each enjoyed the one they saw).

scope: every >> a ("every has scope over a")
For every person p, that person saw a movie m.

Compatible with this situation:
Lisa watched *Labyrinth*, Joseph watched *Troy*, and Benjamin watched *Serenity*.

## Quantifiers

Quantifiers are words that express quantities, like *a, some, every, none,* and *most*.

When two (or more) quantifiers are in a sentence, they interact semantically to determine the sentence's meaning, based on the scope of each quantifier.

Everyone saw a movie last night (and they all thought it was great).

scope: a >> every ("a has scope over every")
For a movie m, every person saw m.

Compatible with this situation:
Lisa, Joseph, and Benjamin watched *Labyrinth*.

## Quantifiers

Children's preferences for scope (Lidz & Musolino 2002)
Children find it easier to interpret scope relations that match the linear order (isomorphic). Adults can more easily get the interpretation that does not match the linear surface order (non-isomorphic).

Everyone saw a movie last night.

Children prefer this interpretation (isomorphic):
scope: every >> a ("every has scope over a")
For every person p, that person saw a movie m.

As opposed to this one (non-isomorphic):
scope: a >> every ("a has scope over every")
For a movie m, every person saw m.

## Quantifiers

Children's preferences can be changed (Viau, Lidz, & Musolino 2010)
If children are primed with the non-isomorphic interpretation, they can more easily access the non-isomorphic interpretation in other sentences.


Everyone saw a movie last night.
Primed with context that supports this one (non-isomorphic):
scope: a >> every ("a has scope over every")
For a movie m, every person saw m.

Every horse didn't jump over the fence.
More likely to get this one (non-isomorphic):
scope: n't >> every ("n't has scope over every")
It is not the case that every horse jumped over the fence.

## Quantifiers

Testing children: Picture task (Roeper & DeVilliers 1991)

"Is every child riding a horse?"

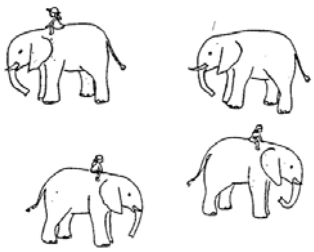
every >> a
("For every child c, c is riding a horse.")

a >> every
("For a horse h, every child is riding h.")

Children as young as three answer "yes", showing they understand either interpretation.

## Quantifiers

However, children seem to have trouble sometimes (Philip 1991)

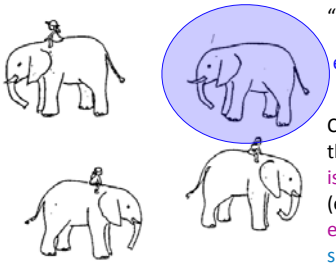


"Is every girl riding an elephant?"

every >> a

## Quantifiers

However, children seem to have trouble sometimes (Philip 1991)



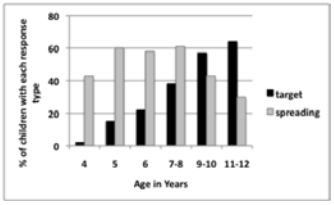
"Is every girl riding an elephant?"

every >> a

Children answer "no" – and say that this is not true because there is one elephant not being ridden! (even though every doesn't modify elephant). This is called quantifier spreading, since the quantifier "every" seems to have spread to the noun "elephant".

## Quantifiers

Quantifier spreading seems to persist for quite a long time – even up through age 12 for some children.




Roeper, Pearson, & Grace 2011
Sample of 333 children

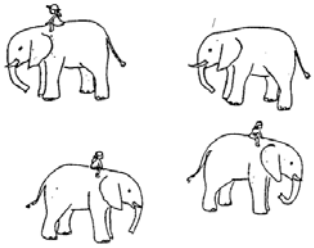
Target = adult interpretation
Spreading = quantifier spreading interpretation

## Quantifiers

One explanation of what children are thinking (Roeper, Pearson, & Grace 2011): Children may assume "every" is an adverb that modifies the entire event described by the clause.

"Is every girl riding an elephant?" → every(girl riding an elephant)?

≈ is every event here an event of a girl riding an elephant?



## Quantifiers

Even though this might seem odd to us as adult speakers, "only" behaves this way in English:

Jack needs to leave. Only he wants a hug from Lily first.

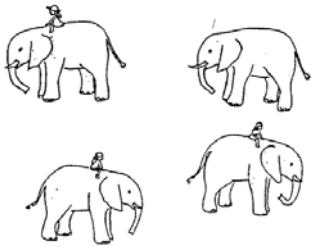
means something like

"It's just that he wants a hug from Lily first"
- → The event is only one of him wanting a hug from Lily first
- → only(he wants a hug from Lily first)

*rather than he's the only one that wants a hug*
- → *only(he) wants a hug from Lily first*

## Quantifiers

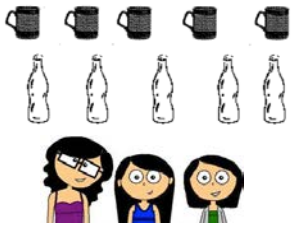
Another potential issue: Children are much more sensitive to the communicative context of a question. It's somewhat strange to ask about something that's obvious from the picture – like whether each girl is riding an elephant.



## Quantifiers

A more context-friendly setup (Crain et al. 1996)

Story: A mother talks with her two daughters about whether they should drink soda or hot cider after skiing. The girls express a preference for soda, but are persuaded by their mother's example to have cider.

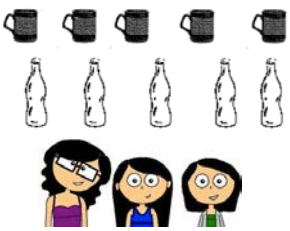


"Did every skier drink a cup of apple cider?"

(Not apparent from the picture what happened – children have to recall from the story what happened.)

## Quantifiers

Crain et al. 1996: Children between the ages of three and five years old responded "yes" (just like adults would). This suggests that some of young children's previous issues with interpreting these kinds of questions may stem from an issue in the experimental setup. Specifically, children are sensitive to the pragmatics of asking a question (don't ask if it's obvious). If a question violates this rule, children search for an alternative meaning for the question.



"Did every skier drink a cup of apple cider?"

(Not apparent from the picture what happened – children have to recall from the story what happened.)

## Recap

Children must learn to interpret sentences that contain constructions that can be difficult to interpret just by using simple strategies, such as passives and sentences with implied subjects and implied objects.

Pronouns can also be difficult, since there are different rules of interpretation for plain pronouns and reflexive pronouns.

Quantifiers are also more difficult since they can interact with each other to form the interpretation of a sentence. In many cases, the meaning of the sentence is ambiguous since more than one interpretation is possible.

Sometimes, the errors children make seem to reflect a genuine lack of knowledge. Other times, they may be due to experimental design, rather than an actual lack of knowledge.

# Questions?

You should be able to do all the review questions for morphology & syntax, and up through question 6 for HW3.