

LSci 51/Psych 56L:
Acquisition of Language

Lecture 19

Development of syntax III

Announcements

Be working on HW5: due 11/25/19

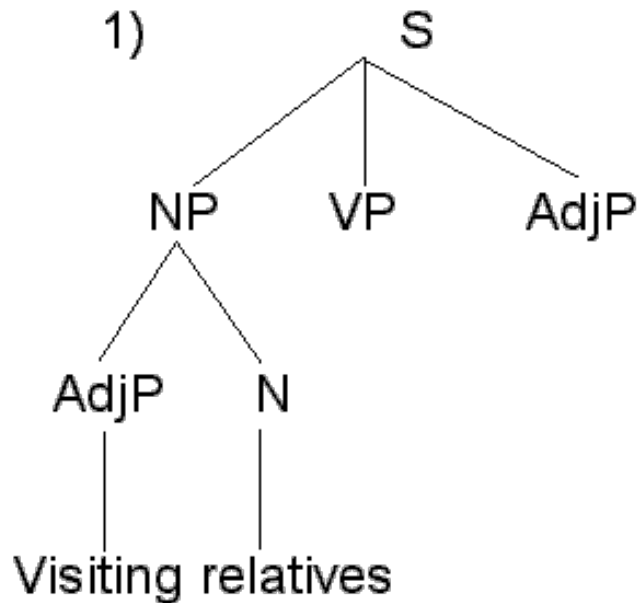
Be working on review questions for morphology and syntax

Please fill out course evaluations for this class!

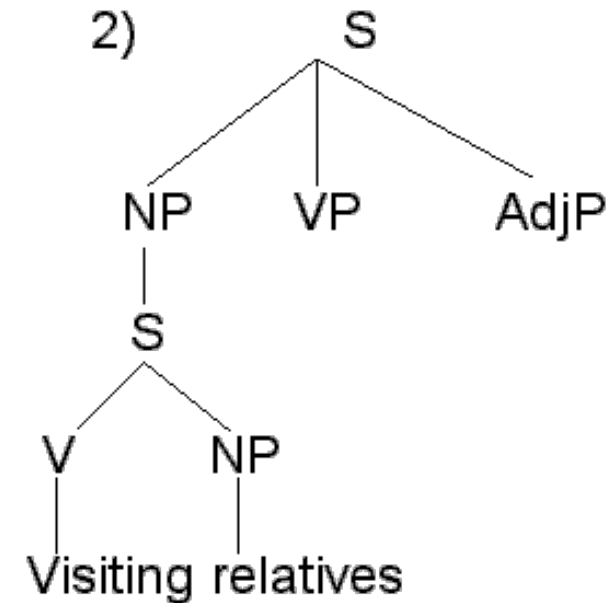
Consider taking more language science classes in the future (LSci)!

What sentences mean

“Visiting relatives can be irritating.”



[Relatives visiting us]



[We visiting our relatives]

Passives



<http://arnoldzwick.org/2012/02/22/misfired-indirecion/>

Passives

<http://www.thelingspace.com/episode-39>

<https://www.youtube.com/watch?v=NJ5ILNBabGc>

1:59 - 4:45



Passives

Passives are tricky because the subject of the sentence is the “done-to” of the action (rather than the “doer” as it is in active sentences).

Active sentence:

Sarah saved Toby.

Subject Verb Object

Passive equivalent:

Toby was saved by Sarah.

Subject Verb

semantically “light” verb

doer “by” phrase

Passives

English-speaking 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 eaten**.” (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 some passive sentences.

Standard comprehension task with
reversible passive:

Hoggle was hugged by Sarah.



reversible passive:
Makes sense either way, so kids
can't rely on world knowledge

Passives

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

Standard comprehension task with
reversible passive:



5 years old

✓ Hoggle was *pushed* by Sarah.

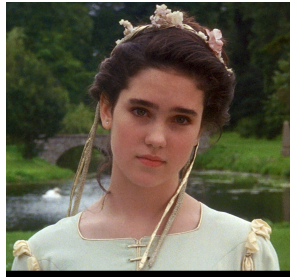
✗ Hoggle was *remembered* by Sarah.



Passives

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

Nguyen & Pearl 2018, 2019: This seems like it has to do with the **semantic features** of the verbs. Certain features are more salient at different ages.



5 years old

carry, push, kiss

+actional

✓ *Hoggle was pushed by Sarah.*

✗ *Hoggle was remembered by Sarah.*

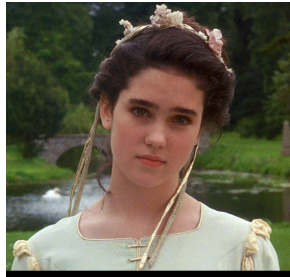
+mental state

forget, know, believe



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.



“Hoggle **was** remembered **ed** **by** Sarah”

But it *does* take awhile...(sometimes up till 9 years old!)

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.

Verbs with silent subjects

<https://www.youtube.com/watch?v=SYoYNeaSYrU>

<http://www.thelingspace.com/episode-52>



Especially 6:02 - 7:02

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?



More complicated silent things

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Jareth told **Hoggle** to give the peach to Sarah.

Who's giving the peach – Jareth or Hoggle?

Adults say: **Hoggle** (Object of main clause)



More complicated silent things

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Adults say: Hoggle (Object of main clause)

Hoggle promised Jareth to do so.

Who promised to do so – Jareth or Hoggle?



More complicated silent things

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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.”

More complicated silent things

How do we test what kids think?

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

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

“Bozo *promises* Donald to hop up and down. Make him do it.”

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

“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

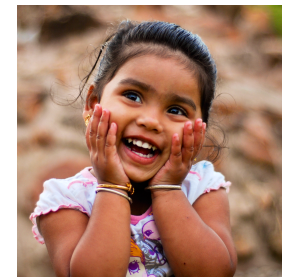
Kids: Donald

“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* and other verbs that behave the same way.



“Bozo *tells* Donald to hop up and down. Make him do it.”

Who’s hopping? Adults: Donald

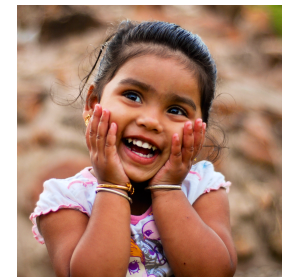
Kids: Donald

“Bozo *promises* Donald to hop up and down. Make him do it.”

Who’s hopping? Adults: Bozo

~~Kids: Donald~~

Bozo!

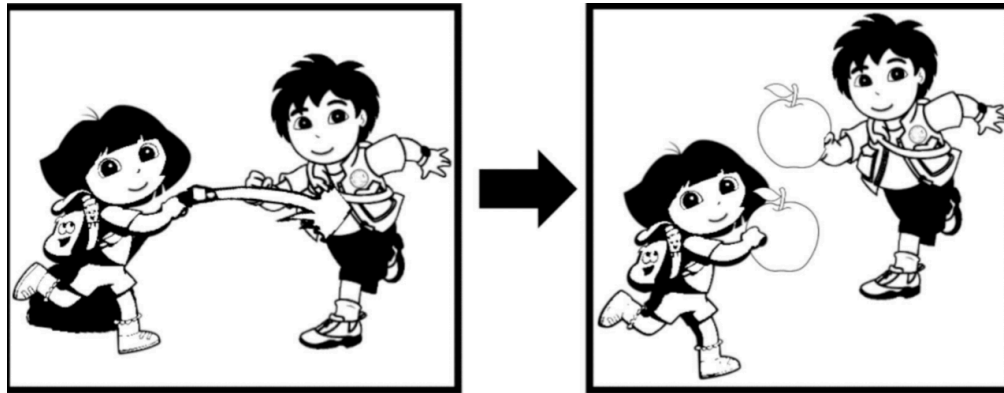


More complicated silent things

Another example of implied subjects

Gerard, Lidz, Zuckerman, & Pinto 2018

“Dora washed Diego before eating a red apple.”



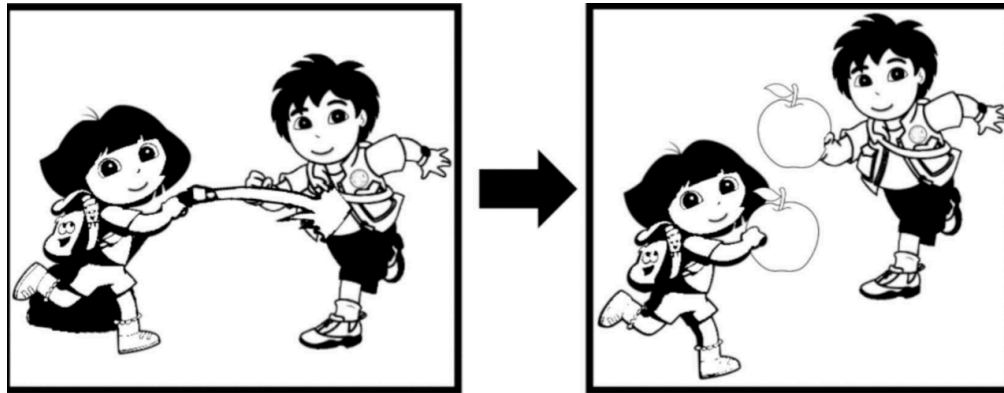
Who ate a red apple?

More complicated silent things

Another example of implied subjects

Gerard, Lidz, Zuckerman, & Pinto 2018

“Dora washed Diego before ??? eating a red apple.”



Ask participants to color the appropriate apple red.

Who ate a red apple?

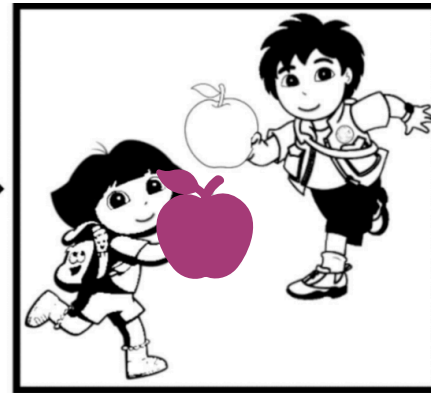
More complicated silent things

Another example of implied subjects

Gerard, Lidz, Zuckerman, & Pinto 2018

Adults: Dora

“Dora washed Diego before ??? eating a red apple.”



Adults all color
Dora's apple red.

Who ate a red apple?

More complicated silent things

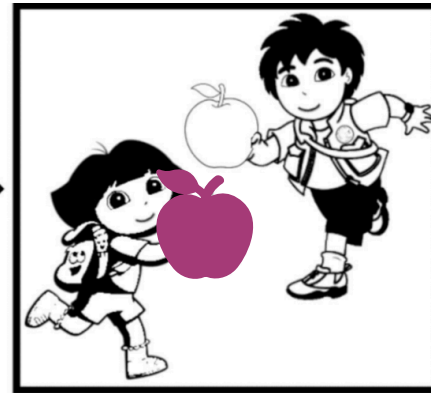
Another example of implied subjects

Gerard, Lidz, Zuckerman, & Pinto 2018

Adults: Dora

4 and 5-year-olds: Dora

“Dora washed Diego before ??? eating a red apple.”



Children age 4 to 5 mostly do, too.

Who ate a red apple?

More complicated silent things

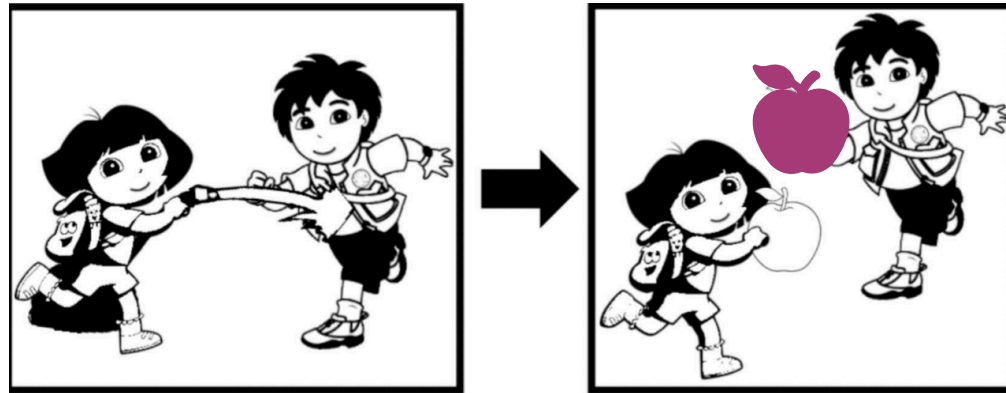
Another example of implied subjects

Gerard, Lidz, Zuckerman, & Pinto 2018 **Adults:** Dora

4 and 5-year-olds (less cognitive demand): Dora

4 and 5-year-olds (more cognitive demand): Diego

“Dora washed Diego before ??? eating a red apple.”



Who ate a red apple?

But in tasks that are **more cognitively demanding**, the same-aged children often behave as if they think **Diego** did.

More complicated silent things

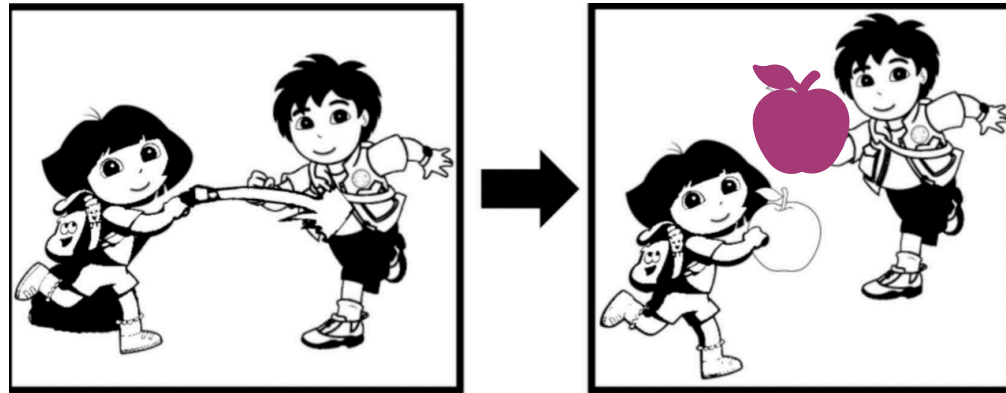
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4 and 5-year-olds (less cognitive demand): Dora

4 and 5-year-olds (more cognitive demand): Diego

“Dora washed Diego before ??? eating a red apple.”



Who ate a red apple?

So, part of the issue is that young children **have adult-like knowledge** of how to interpret implied subjects, but they **sometimes can't deploy that knowledge effectively** (as in more cognitively demanding tasks).

More complicated silent things

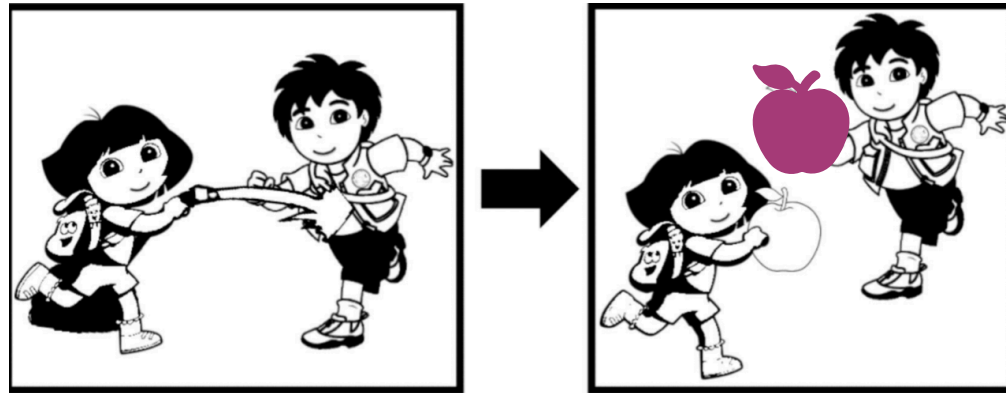
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4 and 5-year-olds (less cognitive demand): Dora

4 and 5-year-olds (more cognitive demand): Diego

“Dora washed Diego before ??? eating a red apple.”



Who ate a red apple?

Development in this case seems to involve **developing processing abilities**, not developing knowledge.

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.

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.

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.

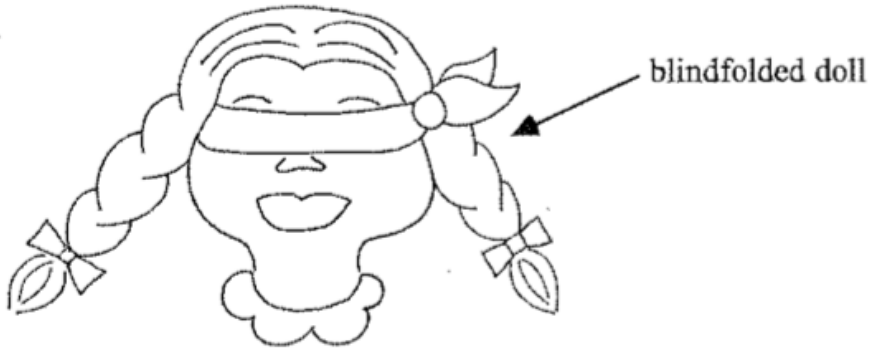
The girl ← is easy [] to see [] .

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



More complicated silent things

Carol Chomsky 1969



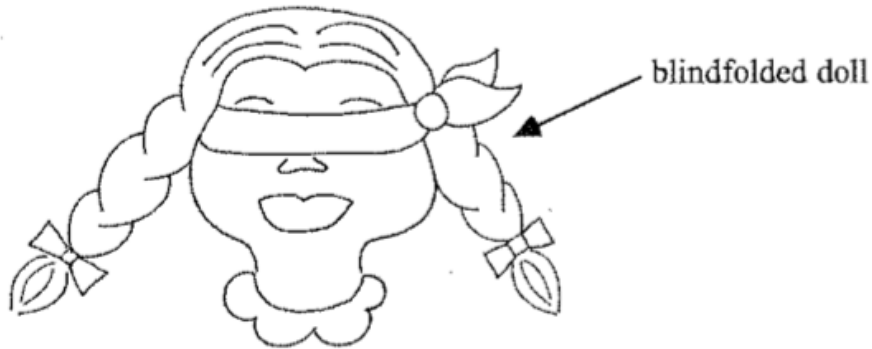
“Is the doll easy to see?”

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?”

Is the doll easy to see?

Some say yes:

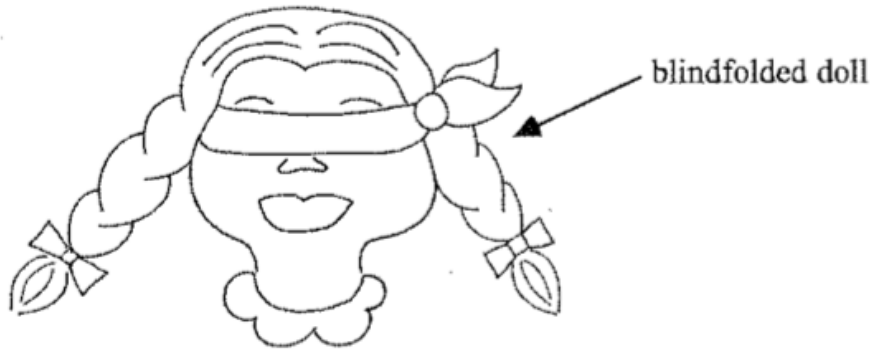
Ann C. (8;8): “Easy”

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?”

Is the doll easy to see?

However, more than a third say no.

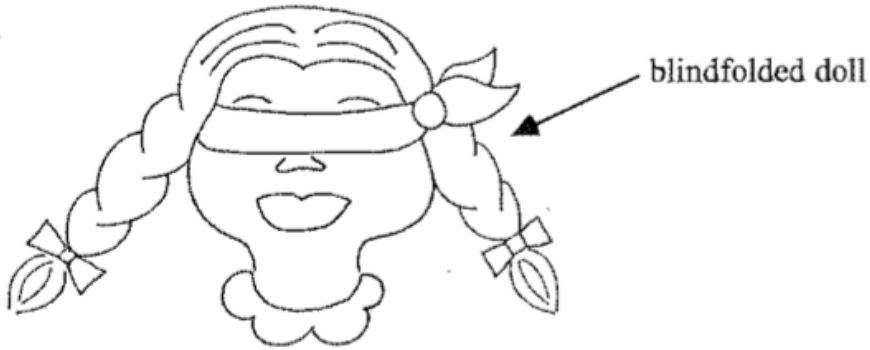
Eric (5;2): “Hard to see.”

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?”

Is the doll easy to see?

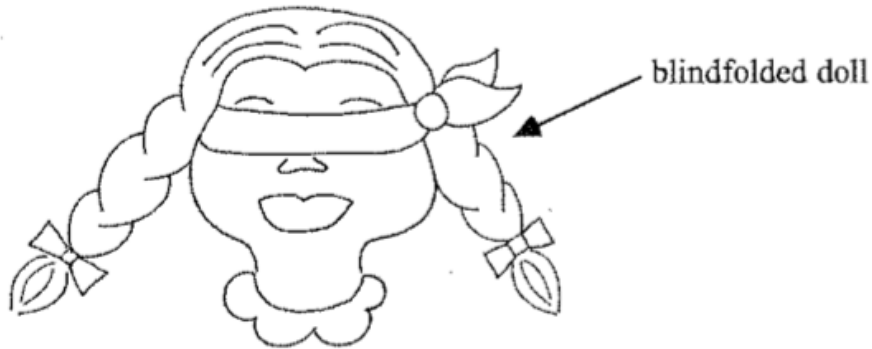
Child misinterpretation:

“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?”

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

Sentences that have both an implied subject and implied object.

The girl ← is easy □ to see □.

“...the main reported finding is that children err in their interpretation of these constructions until **quite late in development**, around age 6 to 10 years (C. Chomsky 1969, Cromer 1970, i.a.). More recent investigations (Anderson 2005) have likewise found that children give at best inconsistent interpretations, and at worst consistently incorrect interpretations, **until age 5 or 6 years.**” — Becker, Estigarribia, & Gylfadottir 2012

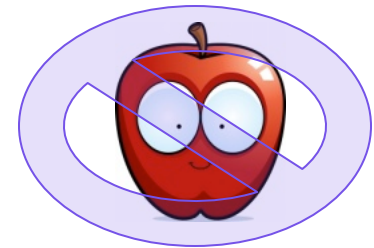
Error: (girl = implied subject) “It is easy for the girl to see someone else.”

The girl ← is easy □ to see □.

Learning more complicated silent things

Becker et al. 2012, Becker 2015: 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 could assume the subject is the implied object.

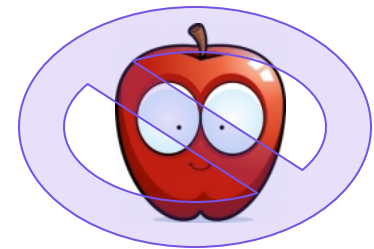
“Is the apple greppy to see?”



Learning more complicated silent things

Becker et al. 2012, Becker 2015: 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 could assume the subject is the implied object.

“Is the apple greppy to see?”



Important insight: Only adjectives like *easy* or *tough* (called *tough-adjectives* as a class) allow inanimate subjects.

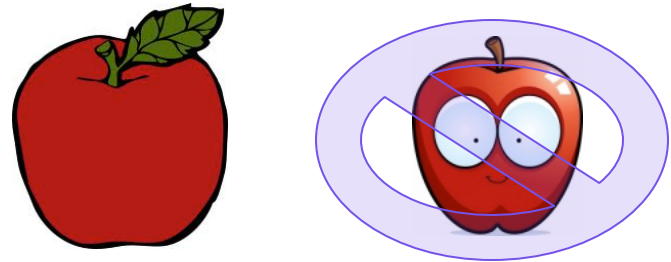
The apple is *easy* to see.

*The apple is *eager* to see.

Learning more complicated silent things

Becker et al. 2012, Becker 2015: 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 could assume the subject is the implied object.

“Is the apple greppy to see?”



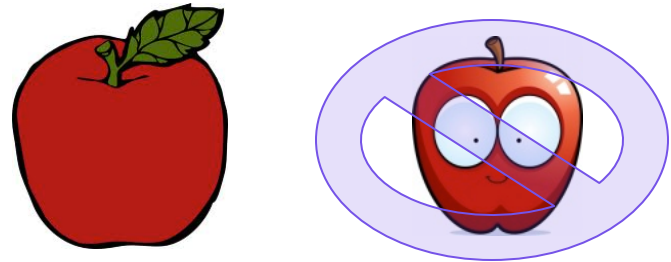
When the child encounters a new adjective with an inanimate subject like “the apple”, the child could assume it’s a *tough*-adjective like “easy”.

The apple is *greppy* to see.

Learning more complicated silent things

Becker et al. 2012, Becker 2015: 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 could assume the subject is the implied object.

“Is the apple greppy to see?”



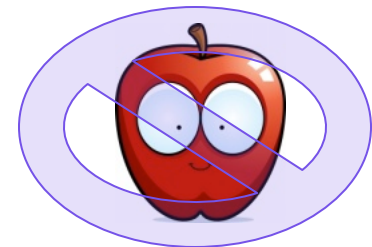
This means that the subject “the apple” is the implied object of “see”, and so the interpretation is “It is easy for someone to see the apple.”

The apple ~~is greppy~~ to see .

Learning more complicated silent things

Becker et al. 2012, Becker 2015 implications: Inanimate subjects seem to not only be a **useful cue** (based on corpus analysis of which adjectives they're used with) but also **a cue that children actually do use** to help them decide how to interpret a new word in context.

“Is the apple greppy to see?”



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.

For passives, part of the problem may be that the meaning is difficult to observe (ex: mental state verbs like *remember*), and so it's hard to tell how to interpret the passive construction when it's used.

Implied subjects and implied objects vary by the specific lexical item, and children need to use other cues (like animacy) to help them figure out whether a new lexical item will create an implied subject or implied object.

Questions?



You should be able to do up through 18 on the review questions, and up through XX for HW5.