Psych 56L/ Ling 51: Acquisition of Language

Lecture 11

Lexical Development III

Announcements

Pick up your midterm & HW1 if you haven't yet

Be working on HW2 (due 2/17/11)

- Note: Remember that working in a group can be very beneficial.

What does "gavagai" mean?

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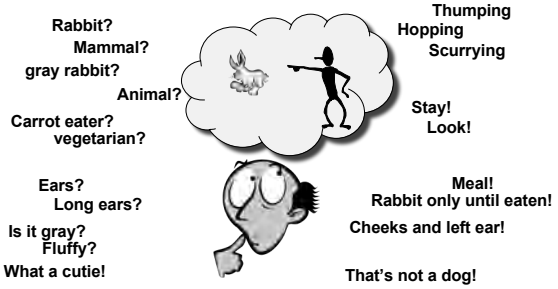
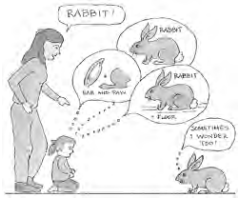


Same problem the child faces



A little more context…

“Look! There’s a goblin!”

The Mapping Problem

Even if something is explicitly labeled in the input (“Look! There’s a goblin!”), how does the child know what *specifically* that word refers to? (Is it the head? The feet? The staff? The combination of eyes and hands? Attached goblin parts?…)

Quine (1960): An infinite number of hypotheses about word meaning are possible given the input the child has. That is, the input underspecifies the word’s meaning.

So how do children figure it out? Obviously, they do….

One solution: fast mapping

Children begin by making an initial fast mapping between a new word they hear and its likely meaning. They guess, and then modify the guess as more input comes in.

Experimental evidence of fast mapping
(Dollaghan 1985, Mervis & Bertrand 1994)

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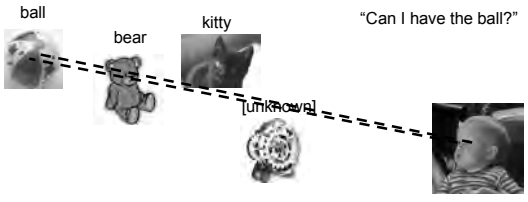

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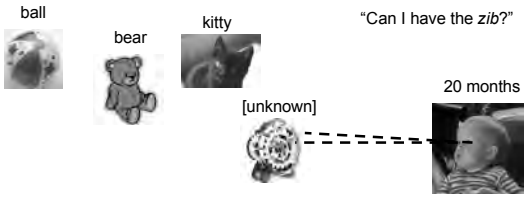
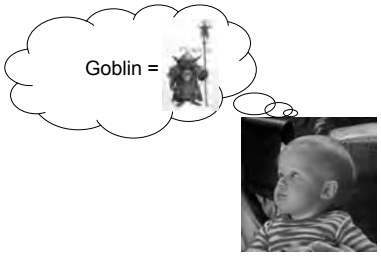


Knowing what to guess

Lexical constraints

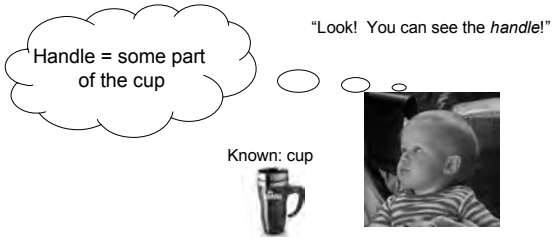
Whole-object assumption: new word refers to entire object, rather than some subset of it



Knowing what to guess

Lexical constraints

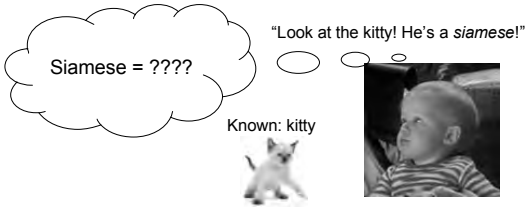
Mutual-exclusivity assumption: assume new word does not overlap in meaning with known word (can be used to overcome whole-object assumption)



Knowing what to guess

Lexical constraints

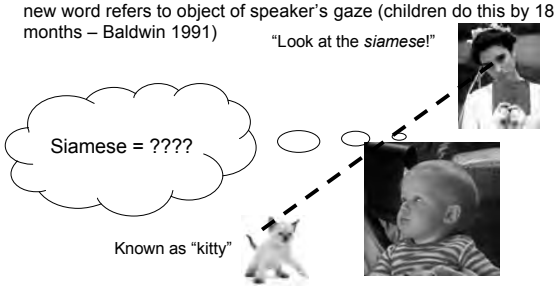
Mutual-exclusivity assumption: assume new word does not overlap in meaning with known word (can be used to overcome whole-object assumption)…not without its own problems



Knowing what to guess

Social Cues

Speakers will look at the novel thing they're talking about: assume new word refers to object of speaker's gaze (children do this by 18 months – Baldwin 1991)



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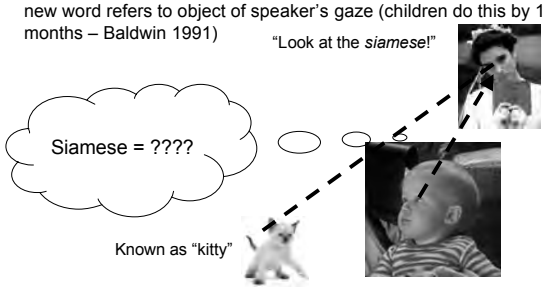

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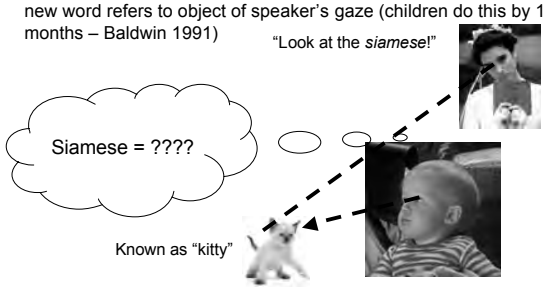

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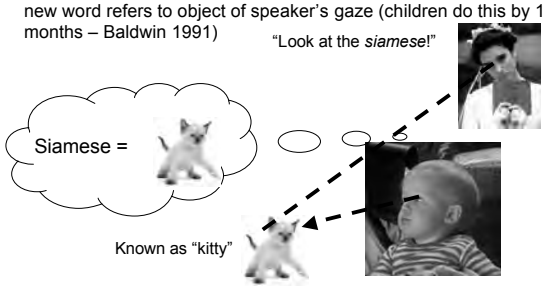


Knowing what to guess

Clues from the input

Speakers generally talk to children about the here and now (Quine's problem is not nearly so serious in child-directed speech)

"Look at the *siamese*!"

(Not "I just took her to the vet yesterday. Poor thing's been sick all of last week.")

Knowing what to guess

Clues from the input

Speakers also sometimes provide explicit correction for meaning, and provide additional information about the word's meaning.

"Can I see the bugs again?"

"Those are goblins, honey, not bugs. Goblins live in the Labyrinth and occasionally take naughty children away."

Knowing what to guess

Clues from the syntactic structure

Different grammatical categories (nouns, verb, etc.) tend to have different meanings. Once children have identified some grammatical categories (after ~18 months), they can use the syntactic structure (how words appear together) as a clue to meaning.

"Those are goblins."

goblins = noun

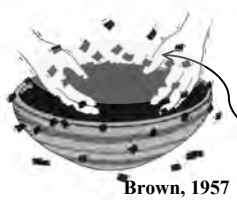
nouns = objects

goblins = 

Knowing what to guess

Clues from the syntactic structure

He's sebbing!



seb = verb

verb = action

seb

Brown, 1957

Knowing what to guess

Clues from the syntactic structure

Look – a seb!

seb = noun with "a"

noun = countable object like "bowl"

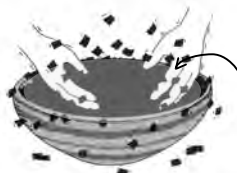
seb

Brown, 1957

Knowing what to guess

Clues from the syntactic structure

Look – some seb!



seb = noun with "some"

noun = mass substance like "stuff"

seb

Brown, 1957

Knowing what to guess

Clues from the syntactic structure

Experimental evidence with 4-year-olds (Gelman & Markman 1985)

"Find the *fep* one."

Knowing what to guess

Clues from the syntactic structure

Experimental evidence with 4-year-olds (Gelman & Markman 1985)

"Find the *fep* one."

the__ one = adjective
adjective = property (like spotted)
fep =~ spotted

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"Now find the *fep*."

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noun = object
fep =~ new object that's more familiar

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Knowing what to guess

Syntactic Bootstrapping Hypothesis: primarily using the syntactic structure to get to meaning

Naigles (1990): 2-yr-olds can use syntactic structure to guess aspects of word meaning, even the difference between transitive and intransitive verbs

Transitive: The rabbit is gorping the duck.
(expectation: rabbit is doing something to the duck)

Intransitive: The rabbit and the duck are gorping.
(expectation: rabbit and duck doing actions separately)

Learning Semantic Organization

Words != Concepts

Words and concepts do not map one-to-one.

Lexical gaps: concepts that have no words associated with them

"couch hole" = gap between couch cushions child has to be careful to avoid when walking across the couch

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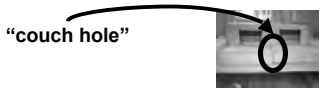

Words != Concepts

Words and concepts do not map one-to-one.

Words pick out some, but not all, conceptually available distinctions

Ex:

vs.

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Limb is foot
Attached to end of limb
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How the input can help

Children can use input to figure out which aspects of meaning are lexicalized in the language

Ex: Fastmapping experiment by Carey & Bartlett (1978)

"What colors are these?"

How the input can help

Children can use input to figure out which aspects of meaning are lexicalized in the language

Ex: Fastmapping experiment by Carey & Bartlett (1978)

"red" "yellow" "green" "green" "blue"

How the input can help

Children can use input to figure out which aspects of meaning are lexicalized in the language

Ex: Fastmapping experiment by Carey & Bartlett (1978)

"a blue tray"

"a *chromium* tray"

Note: none of the children knew either the word "olive" as a color or the word "chromium" as a property

How the input can help

Children can use input to figure out which aspects of meaning are lexicalized in the language

Ex: Fastmapping experiment by Carey & Bartlett (1978)

"Bring me the chromium tray; not the blue one, the chromium one."

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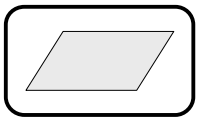
Ex: Fastmapping experiment by Carey & Bartlett (1978)



Children learned to give the olive tray.

How the input can help

Children can use input to figure out which aspects of meaning are lexicalized in the language

Ex: Fastmapping experiment by Carey & Bartlett (1978)

5 weeks later…

"What colors are these?"

How the input can help

Children can use input to figure out which aspects of meaning are lexicalized in the language

Ex: Fastmapping experiment by Carey & Bartlett (1978)

5 weeks later…

"red" "yellow" "green" ???? "blue"

Via input (contrast with blue), children figured out that "chromium" referred to a color the same way that blue does…

"I don't know"

[other previously unused color term like "gray"]

How the input can help

Children can use input to figure out which aspects of meaning are lexicalized in the language

Ex: Fastmapping experiment by Carey & Bartlett (1978)

5 weeks later…

"red" "yellow" "green" ???? "blue"

…and also that the dark green-ish color had a different name from "green"

"I don't know"

[other previously unused color term like "gray"]

Lexical Development Recap

Children have to figure out what concept a word refers to. Not all concepts are picked out by words. Languages tend to differ on which concepts they pick out.

Children may have different learning strategies they use when hearing a word for a first time, such as the whole-object assumption and mutual-exclusivity assumption. While these are helpful, they may lead to errors sometimes.

Children may benefit from a number of different sources of information, including social knowledge and knowledge of syntactic structure.

Questions?

You should be able to do all the questions on HW2 and all the review questions for lexical development.