Psych 56L/ Ling 51: Acquisition of Language

Lecture 10
Lexical Development II

Announcements

Review questions for lexical development available

Homework 2 assigned today 11/5/08, due 11/12/08 in class

Please pick up midterm and homework 1 if you haven't already

Finding the Words

"Look! There's a goblin!"

Goblin? Agoblin?

Speech isn't neatly divided

Word segmentation: process of dividing a stream of speech into the units that adults attach meaning to - words

lʊkðɛɪzəgablɪn = lʊk ðɛɪz ə gablɪn

Looktheresagoblin! = Look! There's a goblin!

Word segmentation is hard

Examples of real errors that children make:

Father: Who wants some mango for dessert?
səm meŋgo

Child: What's a ***semmango***?
səmmeŋgo

Word segmentation is hard

Examples of real errors that children make:

Pledge of allegiance renditions:

"…and to the flag of the United States…"
yunajtəd stets

"…and to the flag of the ***nine of states***…"
najn əv stets

"…and to the republic for which it stands…"
wɪtʃ ɪt stændz

"…and to the republic for ***witches*** stands…"
witʃəz stændz

Word segmentation is hard

Examples of real errors that children make:

Attempting Bob Dylan lyrics

"the answer, my friend, is blowin' in the wind."
ænsəɹ maj fɹɛnd iz

"the ants are my friends, they're blowin' in the wind."
æns aɹ maj fɹɛndz ðɛɹ

Some clues children use to solve it

Words recur in the sound stream - children can pick up on the regularities in the sound sequences

From *Pirate's Treasure,* written by Carol Moore

"Ten steps from the porch and twenty steps from the rose bushes," growled Bluebeard in Jimmy's dream one night. "There be treasure there! Aawrgh."

Some clues children use to solve it

The stress patterns (rhythm) of the language can also give children clues about where words start and end.

From *Pirate's Treasure,* written by Carol Moore

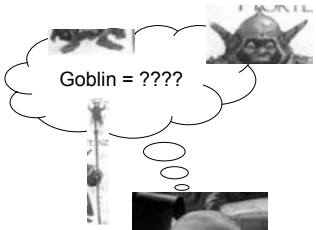
"TEN STEPS from the PORCH and TWENty STEPS from the ROSE BUshes," GROWLED BLUEBEARD in JImmy's DREAM ONE NIGHT. "THERE BE TREAsure THERE! AAWRGH."

Some clues children use to solve it

Motherese - with its exaggerated pitch, longer pauses, and shorter phrases - may help.

Figuring out the referent of a word

"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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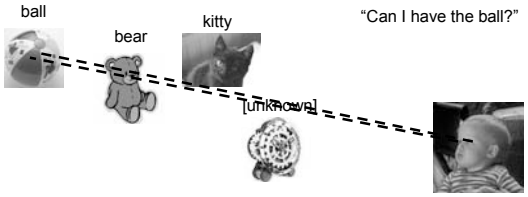

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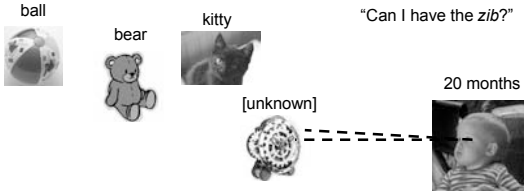
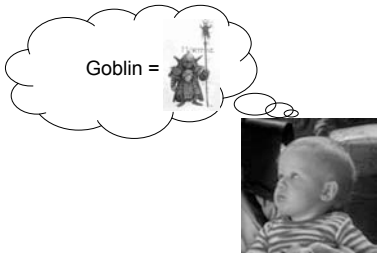


Knowing what to guess

Lexical constraints

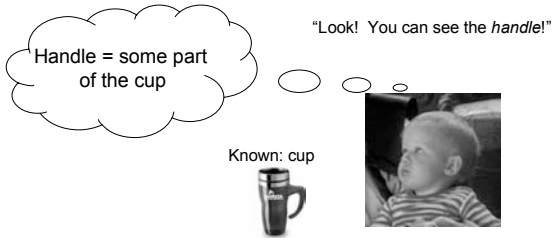
Whole-object assumption: new words refers to entire object, rather than some subset of it



Knowing what to guess

Lexical constraints

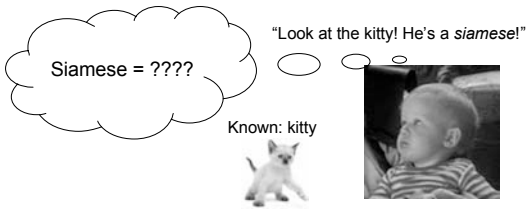
Mutual-exclusivity assumption: assume new word does not overlap in meaning with known word (can be used to overcome whole-object assumption)



Knowing what to guess

Lexical constraints

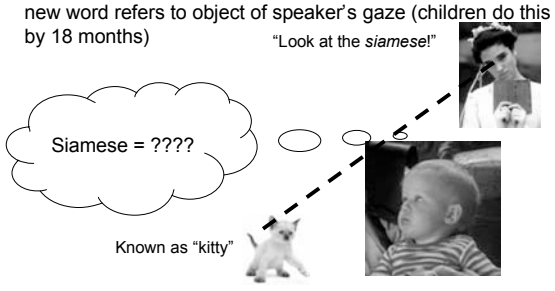
Mutual-exclusivity assumption: assume new word does not overlap in meaning with known word (can be used to overcome whole-object assumption)…not without its own problems



Knowing what to guess

Social Cues

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



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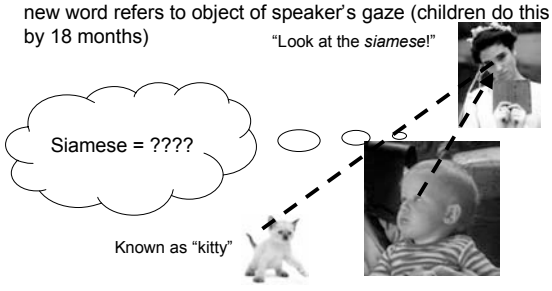

Knowing what to guess

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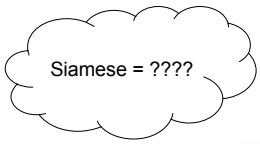
"Look at the *siamese*!"



Known as "kitty"

Knowing what to guess

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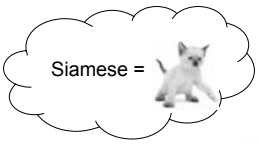

Known as "kitty"

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

Experimental evidence with 4 yr olds (Gelman & Markman 1985)

"Find the *fep* one."

Knowing what to guess

Clues from the syntactic structure

Experimental evidence with 4 yr olds (Gelman & Markman 1985)

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

Knowing what to guess

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

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Knowing what to guess

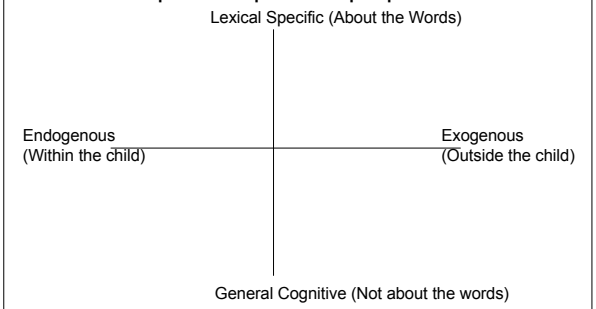
Syntactic Bootstrapping Hypothesis: primarily using the syntactic structure to get to meaning

Naigles (1990): 2 yr olds can use syntactic structure to guess word meaning, even the different 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)

A quick map of the proposals



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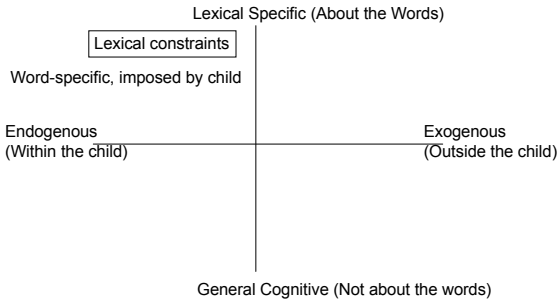

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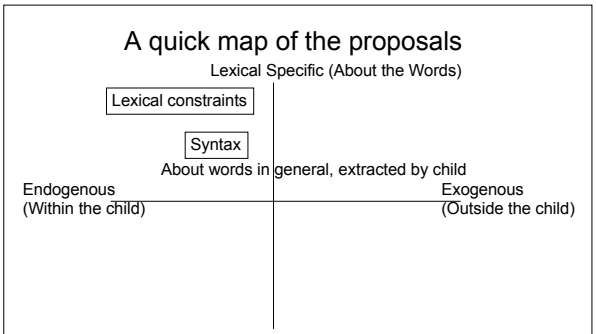

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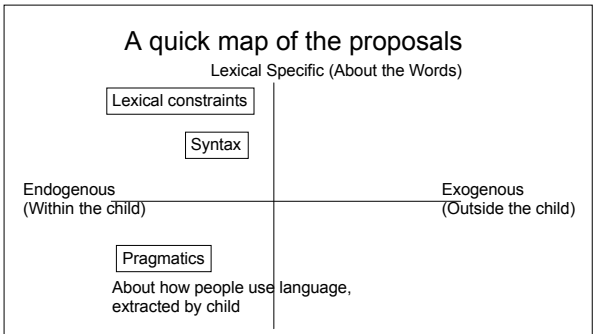

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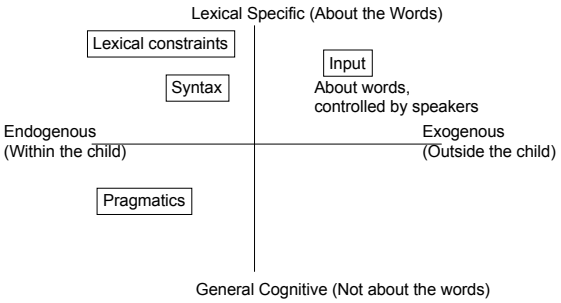

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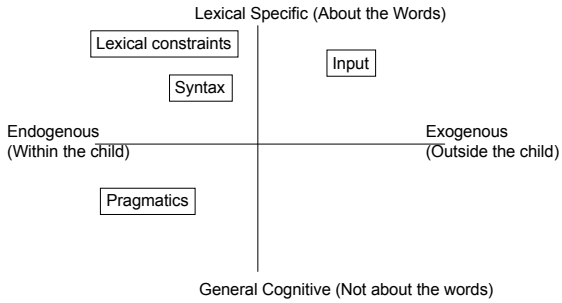

In general, all theories assume a large component having to do with words specifically or that something inherent to the child contributes significantly.

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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"couch hole"

Words != Concepts

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

Ex:

vs.

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Ex:

vs.

English — fingers — *digits*

Spanish — dedos — toes

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Ex:

vs.

Limb is foot
Attached to end of limb
Limb is hand

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Spanish

dedos

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 (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 (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 (1978)

"a blue tray"

"a *chromium* tray"

Note: none of the children new 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

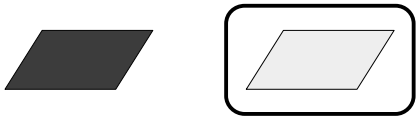
Ex: Fastmapping experiment by Carey (1978)

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

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 (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 (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 (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 (1978)

5 weeks later…

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

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

"I don't know"

[other previously unused color term like "gray"]

Lexical Development Recap

Part of what children have to figure out is where the words are in fluent speech.

Then, 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 benefit from a number of different sources of information, including properties of motherese, knowledge of syntactic structure, social knowledge, and pragmatic biases.

Questions?