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

lukdezagoblin = luk dez a goblin

Looktheresagoblin! = Look! There’s a goblin!
Word segmentation is hard
Examples of real errors that children make:

Father: Who wants some mango for dessert?

Child: What’s a semmango?

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.”

Pledge of allegiance renditions:
“…and to the flag of the United States…”
“…and to the flag of the nine of states…”
“…and to the republic for which it stands…”
“…and to the republic for witches stands…”

Some errors children make:

Examples of real errors that children make:

“…and to the flag of the United States…”
“…and to the flag of the nine of states…”
“…and to the republic for which it stands…”
“…and to the republic for witches stands…”

“the answer, my friend, is blowin’ in the wind.”
“the ants are my friends, they’re blowin’ in the wind.”

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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.

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*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!"

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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Knowing what to guess

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

Goblin =
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)

  
  - Handle = some part of the cup
  
  
  Known: cup

  “Look! You can see the handle!”

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

  - Siamese = ????

  Known: kitty

  “Look at the kitty! He’s a siamese!”

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)

  Siamese = ????

  Known as “kitty”

Knowing what to guess

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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 =

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

"Find the fep one.

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

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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 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
Lexical Specific (About the Words)

Endogenous
(Within the child)

Exogenous
(Outside the child)

General Cognitive (Not about the words)

Lexical constraints
Word-specific, imposed by child

Syntax
About words in general, extracted by child

Pragmatics
About how people use language, extracted by child

Endogenous
(Within the child)

Exogenous
(Outside the child)

General Cognitive (Not about the words)
A quick map of the proposals

Lexical Specific (About the Words)
- Lexical constraints
- Syntax
- Input (About words, controlled by speakers)

Endogenous (Within the child)
Exogenous (Outside the child)
- Pragmatics

General Cognitive (Not about the words)

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
Words != Concepts

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

“couch hole”

Words != Concepts

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

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

Ex:

vs.

English fingers toes

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Spanish dedos
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Ex:

- English: fingers vs. toes
- Spanish: dedos vs. digits

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Ex:

- Limb is foot
- Attached to end of limb
- Limb is hand
- English: fingers vs. toes

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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?”

“red”
“yellow”
“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."

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?"

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

“red”  “yellow”  “green”  ???  “blue”

“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 greenish 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?