

# Language

<https://classesv2.yale.edu/portal/>

- Go to “Announcements”
  - minor change to syllabus
  - note-taking opportunity
  - Pinker reading is on p. 97
  - only 9 reading responses needed

The girl thinks that the house is big

Language

## Language

- Basic facts about language
- What do all languages share?
- How does language develop?
- Language and communication in non-humans

## Basic facts about language

“Man has an instinctive tendency to speak, as we see in the babble of our young children, while no child has an instinctive tendency to bake, brew, or write”

## Basic facts about language

- Every human society has language

Cultural innovation?

No -- creation of language in a single generation  
pidgin --> creole (creolization)

- Every normal human has language

## What do all languages share?

- Creative:

We can create and understand sentences we never heard before

How many grammatical sentences under 20 words?

About 1,000,000,000,000,000,000,000,000,000

How do we do it?

Abstract and unconscious rules

What do all languages share?

The pig is eager to eat

What do all languages share?

The pig is easy to eat

What do all languages share?

The pig is easy to eat

Bill knew that John liked him

What do all languages share?

The pig is easy to eat

Bill knew that John liked him

What do all languages share?

The pig is easy to eat

Bill knew that John liked himself

What do all languages share?

The pig is easy to eat

Bill knew that John liked himself

What do all languages share?

SYNTAX

I

MORPHOLOGY

I

PHONOLOGY

What do all languages share?



## Phonology

- Basic sounds (and signs)
- Languages choose different subsets
- No real boundaries between words; children have to learn to segment speech as part of language learning

## Phonology, cont. Children's problems with segmentation

“I’ll never be your pizza burnin’”

“A girl with colitis goes by”

“The ants are my friends; they’re blowing in  
the wind”

“Our father with Bart in heaven; Harold be  
they name ... Lead us not into Penn  
Station”

She's the kind of girl you read about in

\_\_\_\_\_

Newsweek magazine

New Wave magazines

Usually saved by top-down processing

## Morphology

A neat trick:

Ferdinand de Saussure: "the arbitrariness of the sign"

Morphemes: smallest meaningful unit, e.g.,

Single morphemes: Dog, complain

Many morphemes: Dogs, complained

dog + s, complain + ed

How many morphemes does the average English speaker know?

About 60,000

## Syntax

Another neat trick:

Willhelm Von Humboldt:

“infinite use of finite media”

-- a combinatorial system

-- not exclusive to language -- music, DNA

The infinity mechanism: Recursion

## Syntax, cont.

- A simple language

Nouns = Fred, Barney, Wilma

Verbs = Thinks, Likes

Sentence = Noun + Verb + Noun

e.g., “Fred likes Wilma”

How many sentences?

## Syntax, cont.

- A simple language

Nouns = Fred, Barney, Wilma

Verbs = Thinks, Likes

Sentence = Noun + Verb + Noun

e.g., “Fred likes Wilma”

How many sentences?  $3 \times 2 \times 3 = 18$

- A more complicated language

Nouns = Fred, Barney, Wilma

Verbs = Thinks, Likes

1) Sentence = Noun + Verb + Noun

2) Sentence = Noun + Verb + Sentence

Sentence = Noun - Verb - Sentence

Fred - Thinks Sentence

Noun Verb Noun

Barney likes Wilma

How many sentences?

$3 \times 2 \times (3 \times 2 \times (3 \times 2)) \dots$  infinity!

John hates cheese

My roommate heard a rumor that John hates cheese

It disturbed Mary when I told her that my roommate  
heard a rumor that John hates cheese

I was amazed that it disturbed Mary when I told her  
that my roommate heard a rumor that John hates cheese

Professor Bloom devoted way too much of his lecture talking about how I was amazed that it disturbed Mary when I told her that my roommate heard a rumor that John hates cheese

It really bothered me that Professor Bloom devoted way too much of his lecture talking about how I was amazed that it disturbed Mary when I told her that my roommate heard a rumor that John hates cheese

Ambiguous sentences =  
Different rules to interpret the  
same string of words

“I once shot an elephant in my pajamas.

How it got into my pajamas, I’ll never know”

-- Groucho Marx

Shot an elephant in my pajamas

Ambiguous sentences =  
Different rules to interpret the  
same string of words

“I once shot an elephant in my pajamas.

How it got into my pajamas, I’ll never know”

-- Groucho Marx

Shot [an elephant] [in my pajamas]



Ambiguous sentences =  
Different rules to interpret the  
same string of rules

“I once shot an elephant in my pajamas.

How it got into my pajamas, I’ll never know”

-- Groucho Marx

Shot [an elephant in my pajamas]

More ambiguous sentences

Complains about NBA Referees growing ugly

Kids make nutritious snacks

No one was injured in the blast, which was  
attributed to the buildup of gas by one town  
official

General arrested for fondling privates

Let him have it

Where does all this knowledge  
come from?

## Language development as growth

“No one would take seriously the proposal that the human organism learns through experience to have arms rather than wings, or that the basic structure of particular organs results from accidental experience. [Language] proves to be no less marvelous and intricate than these physical structures .. Why, then, should we not study the acquisition of a cognitive structure like language more or less as we study some complex bodily organ?”

## Language development as learning

Phonemes

e.g. l/r distinction

Morphemes

e.g.,

Syntax

e.g., how you would say that Bill hit John?

## Language development: Some basic facts

- All normal children
- Specific impairments
- No feedback or training
  - cross-cultural evidence
  - Western children

## Language development: The timetable

Birth - 4 months

Preference for melody  
of own language

Sensitive to all  
phonemes

## Language development: The timetable

About 7 months

Babbling

## Language development: The timetable

About 12 months

First words --  
Objects, actions,  
properties

Some sensitivity to  
word order

## Language development: The timetable

About 18 months

Learning words faster

2 word sentences

Function morphemes  
{“in”, “of”, “a”, “the”}  
gradually appear

## Language development: The timetable

Past puberty

Outside the “critical  
period” -- learning  
more difficult, rarely  
if ever fully  
successful

Do other animals possess the  
same sort of language?

(and if not, can they learn it?)

## Non-human communication systems

A finite list of calls

## Non-human communication systems

A continuous analog signal

## Non-human communication systems

Random variations on a theme

## Non-human communication systems

No phonology, morphology, syntax

No arbitrary names

No recursive syntax



What about primates trained by humans?

Heated debate over abilities of trained primates

- Few ‘words’, learned slowly through extensive training
- Very limited ordering; no recursion
- Highly repetitious

## Typical chimpanzee utterances, after several years of training

- Nim eat Nim eat
- Drink eat me Nim
- Me gum me gum
- Tickle me Nim play
- Me eat me eat
- Me banana you banana me you give
- Banana me me eat
- Give orange me give eat orange me eat orange

## Why would anyone expect chimpanzees to learn human language?

After all, nobody expects human babies to learn how to dance like bees, sing like birds, or hoot like vervet monkeys

## Why would anyone expect chimpanzees to learn human language?

1. Chimps are so smart!

True -- but more is needed for learning language than general smartness (consider genetic disorders)

## Why would anyone expect chimpanzees to learn human language?

2. Chimps are our nearest evolutionary relatives

True -- but humans split from chimps 5-10 million years ago; plenty of time for specialized brain structures to evolve

## Other topics in the psychology of language

- Language in the brain
- Neurological and cognitive nature of language disorders
- Language perception and production
- Reading
- Bilingualism and multilingualism
- Language and thought

## Language and Thought

- Is language necessary for abstract thought?
  - studies of non-linguistic creatures, such as babies and chimps
- Does the language you learn change the way you think?
  - studies of speakers of different languages, e.g., Korean vs. English

## Reading Response #2

- What do you think about the relationship between knowing syntax and being intelligent? (Do you think that learning syntax makes you smart? Or being smart makes it possible to learn syntax? Both? Neither?). Take a position and defend it with evidence from lecture and from the readings.