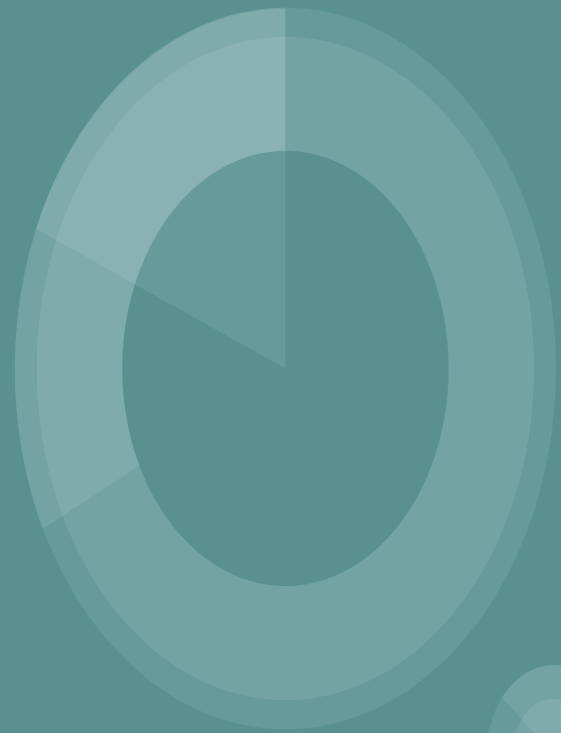


Language Acquisition

Grusha Prasad

Johns Hopkins University



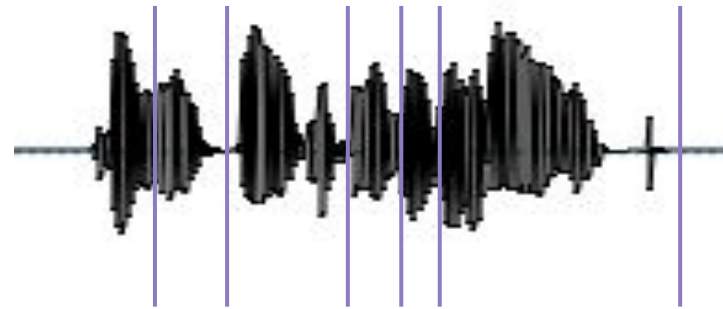


What does language comprehension entail?

What does language comprehension entail?



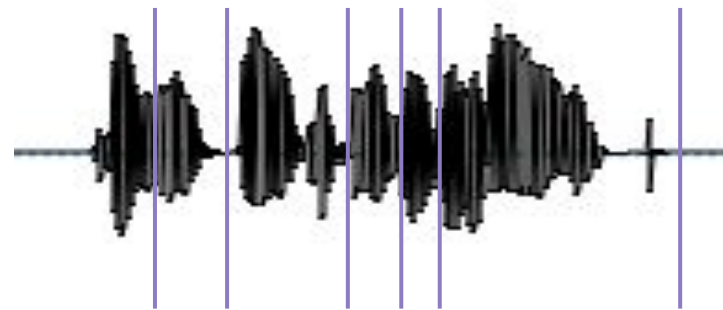
What does language comprehension entail?



can you pass me the bottle

What are the words? (Phonology)

What does language comprehension entail?

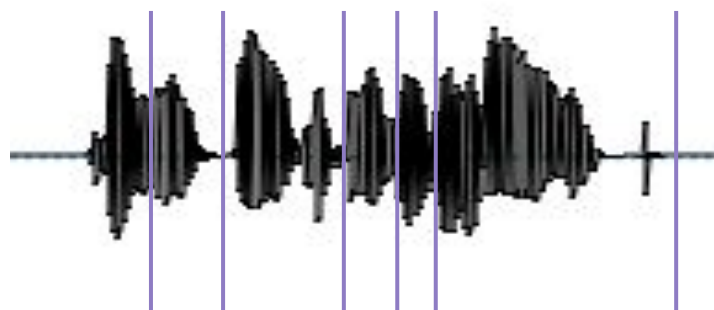


can you pass me the bottle

What are the words? (Phonology)

What do the words mean? (Lexical semantics)

What does language comprehension entail?

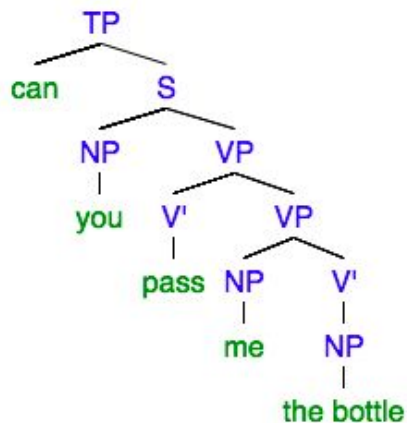


can you pass me the bottle

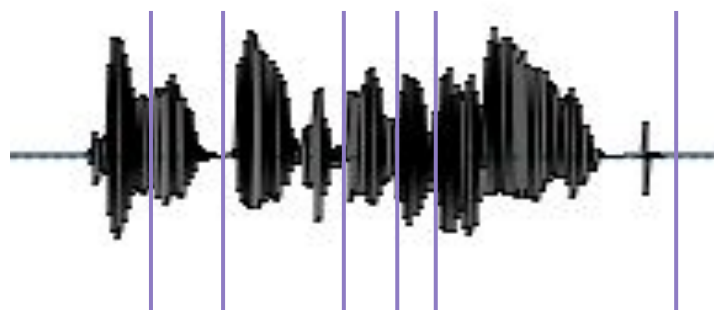
What are the words? (Phonology)

What do the words mean? (Lexical semantics)

How do the words combine? (Syntax)



What does language comprehension entail?



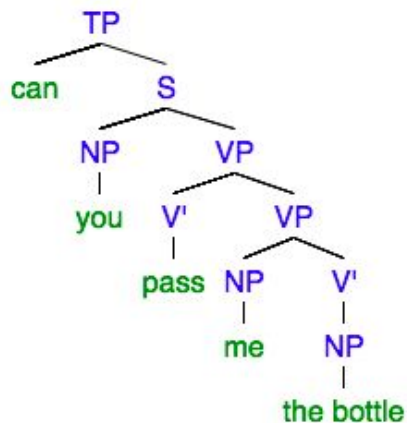
can you pass me the bottle

What are the words? (Phonology)

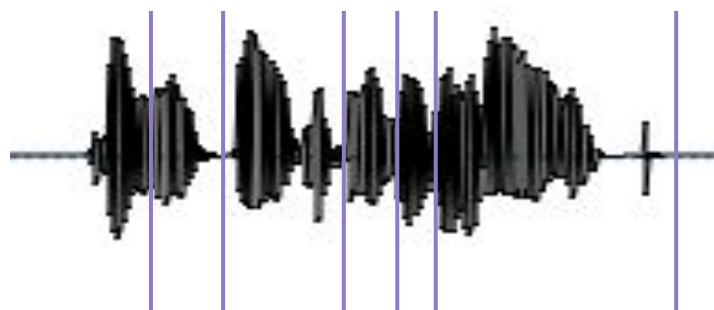
What do the words mean? (Lexical semantics)

How do the words combine? (Syntax)

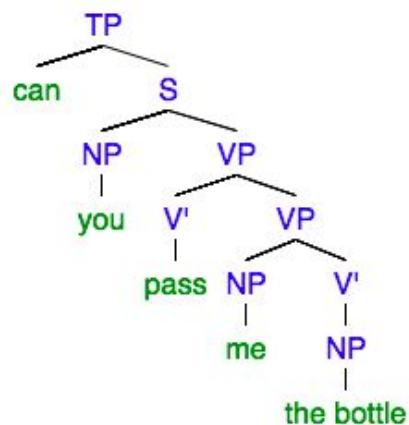
What does the sentence mean? (Semantics)



What does language comprehension entail?



can you pass me the bottle



What are the words? (Phonology)

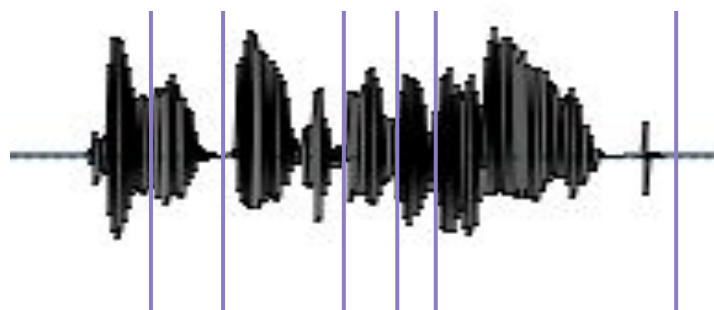
What do the words mean? (Lexical semantics)

How do the words combine? (Syntax)

What does the sentence mean? (Semantics)

Why was the sentence uttered? (Pragmatics)

What does language comprehension entail?



can you pass me the bottle

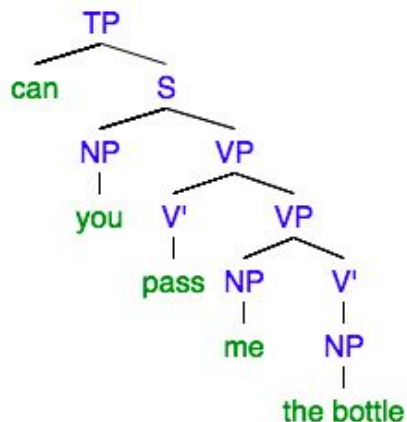
What are the words? (Phonology)

What do the words mean? (Lexical semantics)

How do the words combine? (Syntax)

What does the sentence mean? (Semantics)

Why was the sentence uttered? (Pragmatics)





How do kids learn language?



How do kids learn language?



Innate

Experience driven

How do kids learn language?



Innate

Experience driven

How do kids learn language?



Innate

All linguistic knowledge is hard-coded into the brain when we are born

Experience driven

We are born as blank slates and we learn everything from experience

How do kids learn language?



Innate

All linguistic knowledge is hard-coded into the brain when we are born

We can learn new words and languages!

Experience driven

We are born as blank slates and we learn everything from experience

Babies in different environments end up with the same language!

How do kids learn language?



Innate

All linguistic knowledge is hard-coded into the brain when we are born

We can learn new words and languages!

Experience driven

We are born as blank slates and we learn everything from experience

Babies in different environments end up with the same language!

What biases are we born with? Are they domain-specific or domain-general?

The background is a solid orange color. In the top-left corner, there are three vertical bars of varying heights, each composed of several overlapping rounded rectangular segments. In the bottom-right corner, there are four vertical bars of increasing height from left to right, also composed of overlapping rounded rectangular segments.

What biases are we born with?

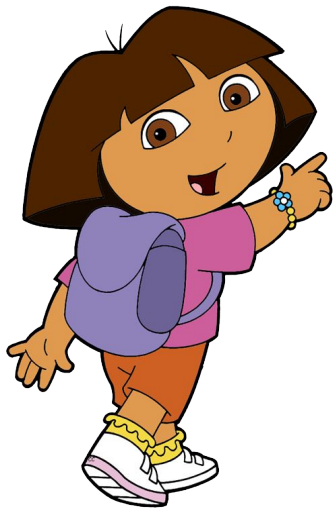
Word learning: Return of Gavagai



Assume that the kid has never seen such a bottle before and has not heard the word “bottle” before

Word learning: Return of Gavagai

That is a
bottle



What are the possible interpretations
for the word “bottle”?

Word learning: Return of Gavagai

That is a
bottle



What are the possible interpretations
for the word “bottle”?

Table

Bottle cap

Blue things

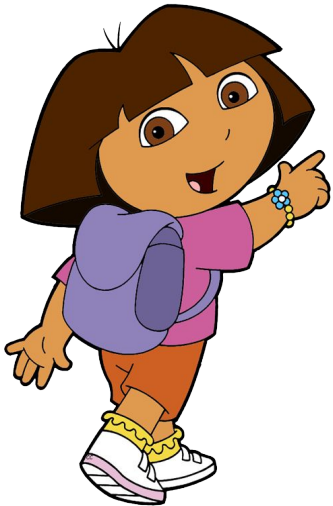
Plastic things

Water

Bottle

Word learning: Return of Gavagai

That is a
bottle



What are the possible interpretations
for the word “bottle”?

Table

Bottle cap

Blue things

Plastic things

Water

Bottle

What kinds of biases might allow the kid to pick the correct interpretation?

Word learning: Return of Gavagai



What are the possible interpretations for the word “bottle”?

Table

New object = new word

Bottle cap

Talk about whole objects

Blue things

Plastic things

Talk about objects and not substances in “That is a ___” frame

Water

Bottle

What kinds of biases might allow the kid to pick the correct interpretation?



Novelty bias (mutual exclusivity)

New words likely refer to objects without a label than to objects with a label.

Novelty bias (mutual exclusivity)

New words likely refer to objects without a label than to objects with a label.

“Show me dax”



Which object are the kids likely to pick?

Novelty bias (mutual exclusivity)

New words likely refer to objects without a label than to objects with a label.

“Show me dax”



Which object are the kids likely to pick?

Is there some confound?

Novelty bias (mutual exclusivity)

New words likely refer to objects without a label than to objects with a label.

“Show me ~~dax~~ one”

How does this address
the confound?



Which object are the kids likely to pick?

Is there some confound?

Novelty bias (mutual exclusivity)

New words likely refer to objects without a label than to objects with a label.

“Show me ~~dax~~ one”

How does this address
the confound?



Why is it important that they tested kids?

Which object are the **kids** likely to pick?

Is there some confound?



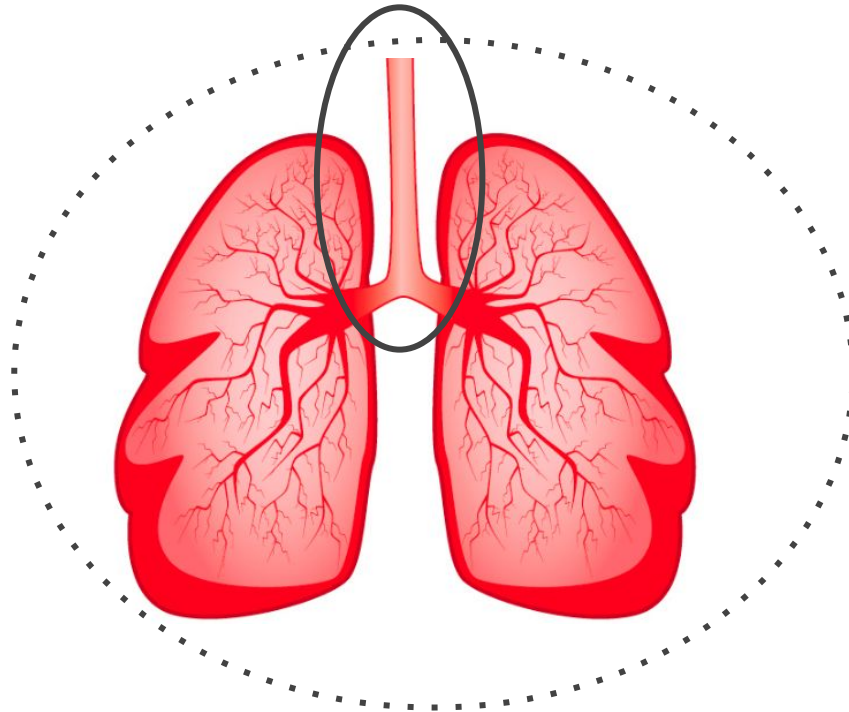
Whole object bias

People tend to talk about whole objects, and not parts of objects

Whole object bias

People tend to talk about whole objects, and not parts of objects

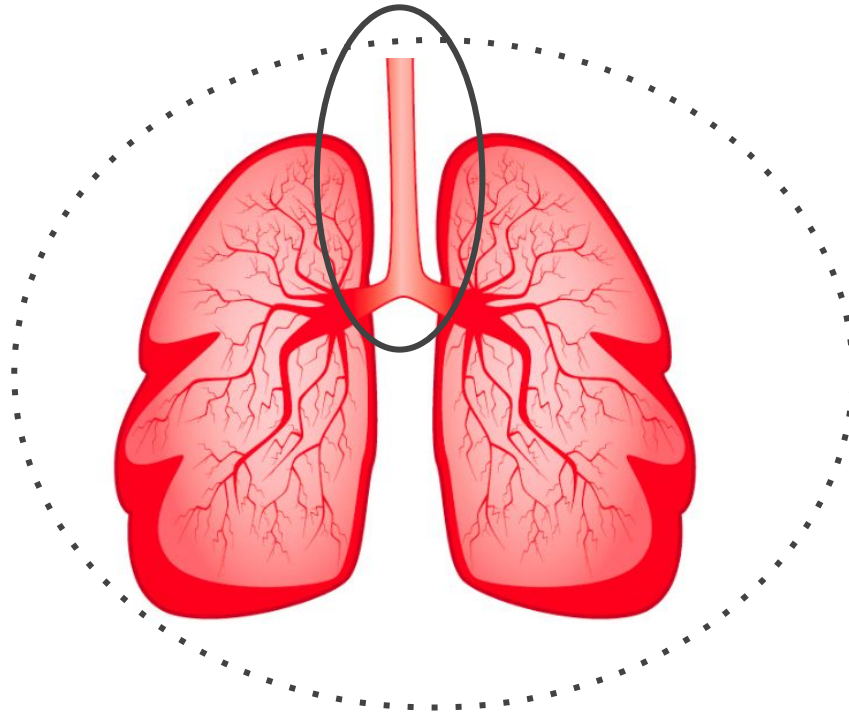
“Which one is the lungs?”



Whole object bias

People tend to talk about whole objects, and not parts of objects

“Which one is the lungs?”

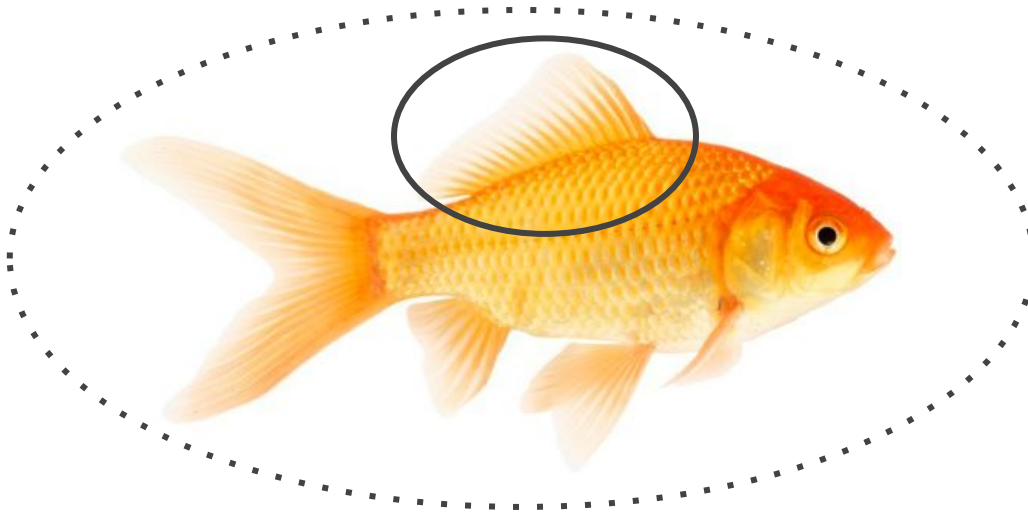


Kids picked the whole object more often

Whole object bias

People tend to talk about whole objects, and not parts of objects

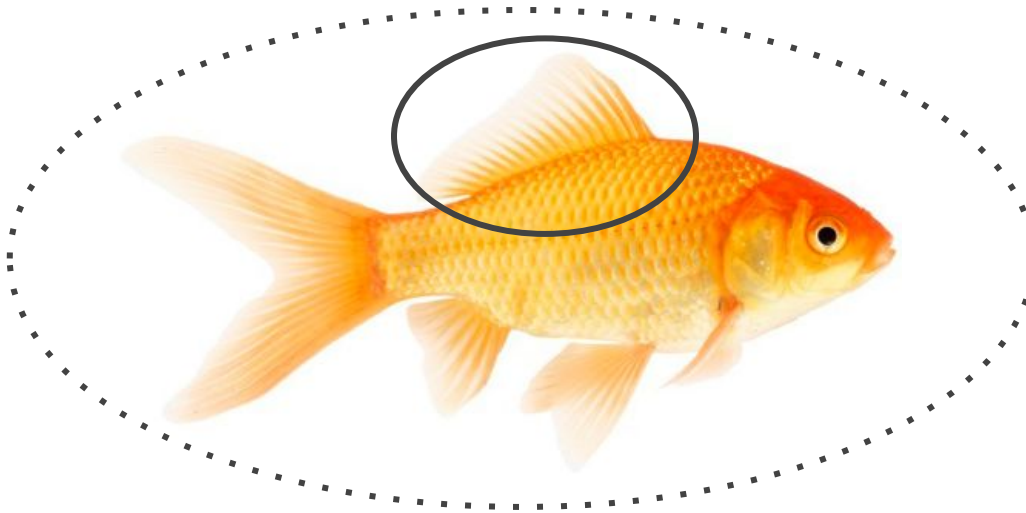
“Which one is the dorsal fin?”



Whole object bias

People tend to talk about whole objects, and not parts of objects

“Which one is the dorsal fin?”



Kids picked the whole object more often

Why is this this result expected?



Syntactic bootstrapping

Kids use the structure of the sentence to learn word meaning

Syntactic bootstrapping

Structure of a sentence can tell us about the meaning of a word

“The girl is gorging the boy”



Which action are the kids likely to pick?

Syntactic bootstrapping

Structure of a sentence can tell us about the meaning of a word

“The girl is gorpung the boy”

“Gorping” is a
transitive verb



Which action are the kids likely to pick?

Syntactic bootstrapping

Structure of a sentence can tell us about the meaning of a word

“The girl and the boy are gorpig”



Which action are the kids likely to pick?

Syntactic bootstrapping

Structure of a sentence can tell us about the meaning of a word

“The girl and the boy are gorping”

“Gorping” is an
intransitive verb



Which action are the kids likely to pick?

Are the biases

- **Domain-specific** (useful only for language learning)?

OR

- **Domain-general** (useful for other types of learning)?



Biases we've looked at so far



Biases we've looked at so far

- New words likely refer to objects without a label than to objects with a label.
- People tend to talk about whole objects, and not parts of objects.
- Structure of a sentence can tell us about the meaning of a word.



Biases we've looked at so far

- New words likely refer to objects without a label than to objects with a label.
- People tend to talk about whole objects, and not parts of objects.
- Structure of a sentence can tell us about the meaning of a word.

Which of these biases are domain-specific and which of them are domain-general? Why?



Biases we've looked at so far

- New words likely refer to objects without a label than to objects with a label.
- People tend to talk about whole objects, and not parts of objects.
- Structure of a sentence can tell us about the meaning of a word.

Which of these biases are domain-specific and which of them are domain-general? Why?

Remember LAD? Can you think of that as a bias? If yes, is it domain specific or domain general?