Language

What is it good for?
Where did it come from?

Why Have Language?

communication?

thought?

previously:

Jerry Fodor II:
The Language of Thought

Taking a lot of concepts from the theory of language, Fodor argued that *thought* is structured much like *language*, or that thought *is* language

The thought "I would like a pie" has structure much like the sentence "I would like a pie".

Thought and Language

Complex thoughts are built of simpler parts in structured compositions

Could you have a thought like this without language?

Mentalese

If three of us sneak in the back, we can steal at least a bag of apples without getting caught

Fodor coined the term "Mentalese" to refer to the inner language of thought.

Are your language-like thoughts in English?

Are they in your voice?

Do they have an accent?

Do you hear a voice when you read?

More questions to you

- What is a thought?

- Are thoughts necessarily expressed in words?

- Do words allow you to think things you could not otherwise think?

- How much of your mental life is 'thought'?

The Language of Thought Hypothesis takes
a specific, strong, view of what language is,
and how it is related to thought and to cognition

Language of Thought Hypothesis suggests that *mental processes* are *computational processes* defined over *representations*

Representations are things that *stand for something.* They *symbolize, depict,* or are *about* external things

Much of the *computational theory of mind* is concerned with identifying the *kinds of representations* used in thought.

More later . . .

We will return to the relationship between "inner" speech and "outer" speech later, when we consider the development of the child.

Language is a tool for
solving problems

Even the simple use of labels can
radically change a problem

Consider the case of Sheba and the treats as recounted in Boysen et al. (1996). Sheba (an adult female chimpanzee) has had symbol and numeral training: She knows about numerals. Sheba sits with Sarah (another chimp), and two plates of treats are shown. What Sheba points to, Sarah gets. Sheba always points to the greater pile, thus getting less. She visibly hates this result but can't seem to improve. However, when the treats arrive in containers with a cover bearing numerals on top, the spell is broken, and Sheba points to the smaller number, thus gaining *more* treats.

Sheba

The use of numerals seems to have freed Sheba from the direct link between seeing and doing.

Evolution of Language: Why? When? How?
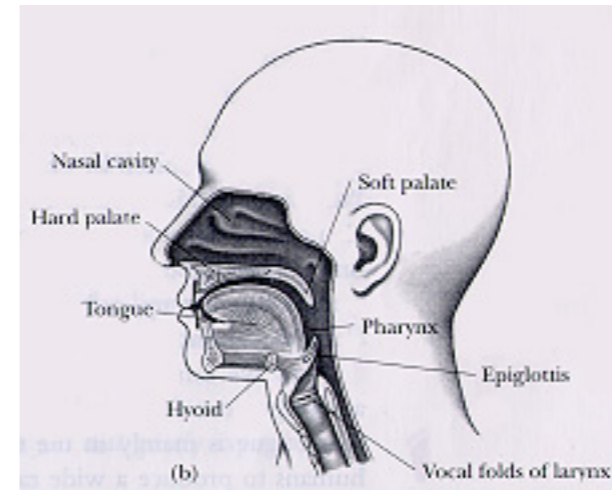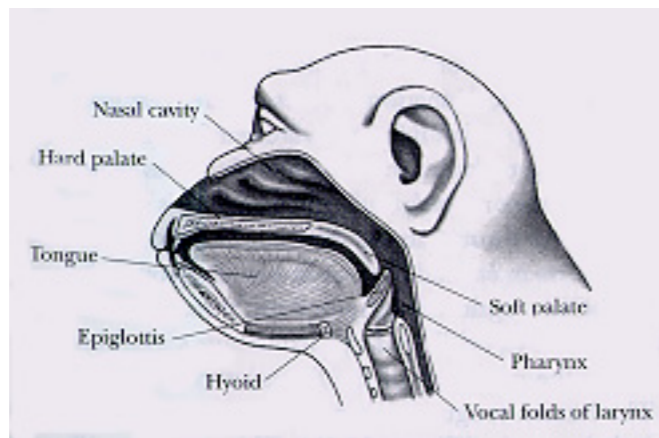
What data? How might we study this?

In 1866, the French Academy of Science banned theories about the Evolution of Language. Why?

For science to work, we need to be able to distinguish between plausible and implausible stories. We need to reach consensus.

In the absence of empirical evidence, it seemed that there was no principled way to sort out the very many theories, hypotheses, and stories.

But perhaps we can do more than nothing:

Preadaptation: What structures and abilities needed to be in place for language to appear?

What part of your body is there for the purposes of language?

Does the brain treat speech sounds like other sounds, or are they "processed" differently?

Computational approaches include simulation of interactions among societies of simple communicating agents

Genes?

If language is what makes us "human" (is it?), might there be a genetic story to tell? Could we find a gene that we have, but apes don't, that might be held responsible?

Short answer: No! Genetic variation between us and the apes is minimal.

Also, our understanding of genetics has moved on from the simple idea that we could link a complex phenomenon in the organism to a single gene, or a few genes.

Genes?

Longer answer: No!, But there is one interesting avenue we have been exploring.

The KE family were identified in England. Over 3 generations, many, but not all, members of the family exhibited a rather rare language problem: Developmental Verbal Dyspraxia.

The pattern of inheritance perfectly matched that predicted by standard Mendelian genetics, with a single gene at fault. The gene is Fox-P2

Fox-P2 and Language

Fox-P2 is found in all mammals. It varies slightly from species to species, and there are slight differences between Fox-P2 in Chimpanzees and in Humans.

A single mutation on Fox-P2 is responsible for the deficits seen in the KE family.

But but but:

Those affected have many related symptoms, including cognitive deficits. So it is not a "gene-for-language".

Some more on Fox-P2

In mice, birds, bats, humans, Fox-P2 influences the healthy development of brain and lungs.

Small wonder, then, that speech and language (and animal vocalisation) are affected if it is altered.

A word of caution:

In their eagerness for simple answers to hard questions, many initial reports on Fox-P2 and KE were very very misleading, making erroneous claims about finding "the language gene". No such gene exists.