

Language and Mind

Lesson 3: Monday, 22 October 2007

Announcements

(none)

Language Acquisition

Semantic and Lexical development

- overextension - applying a word to a superordinate class (bow-wow for all four-legged animals, daddy for all men)
- underextension - applying a word to a subordinate class (car only for child's toy car)
- complexity hypothesis - the morphological/semantic complexity of a word determines how early it may be acquired (e.g., to/into/out of; concrete vs. abstract usages of words; spatial vs. temporal concepts)

Two examples:

- Ken's video of "batta"
- Ricky's story of "musi"

Show/explain examples and then ask students to decide what these are examples of.

Summary

1. babbling - until 10 mos
2. one-word stage - 1 to 1.5 yrs
3. two-word stage - 1.5 to 2 yrs
4. telegraphic stage - 2 to 3 yrs
5. acquisition of function words, overgeneralization - 3 to 4 yrs
6. adult grammar - 5 yrs.

Theories of acquisition

First consider two theories of learning: Imitation theory and reinforcement theory. Briefly describe these two and explain the differences between them. Then, have students discuss some aspects of human development which can be explained by each of these theories.

Possibilities:

- Imitation Theory: How to open a door
- Reinforcement Theory: How to walk/run

Imitation Theory

Children learn by imitating parents. Poverty of the stimulus makes this very difficult. How do children produce novel utterances?

Reinforcement Theory (Behaviorism)

Like Pavlov's dogs, good behavior rewarded, bad behavior penalized. So language behavior is developed. It turns out that children's so-called bad-behavior is not penalized, yet they learn language anyway.

Universal Grammar

There is something innate about language. The innate nature of language has two features, it accelerates our learning, and it also constrains our learning. There are some language errors that one might make, yet children never do.

Innateness of language

Why do humans communicate with such rich language while other animals do not? Is language innate in humans?

Humans vs. other animals

Do animals (non-humans) communicate? The answer should be YES.

Do animals (non-humans) have language? The answer is more controversial, but probably not. One example is the lack of ambiguity in animal "language". Second is the lack of recursion (example: right-embedding of relative clauses)

Can animals (non-humans) learn language? The answer is very controversial. We'll look at this more later in this course (I hope).

Brain-body Mass Ratios

Assumption: we have language because we're intelligent (we speak because we were intelligent enough to develop a speech system).

An early theory was that brain size determined intelligence

One theory is that brain-body mass ratio is related to intelligence.

- adult humans - 2%
- adult chimps - 1%

Animals like whales and dolphins have larger ratios than other animals. Which may explain why they seem more intelligent.

But these ratios can be very confusing.

	Brain (kg)	Body (kg)	Ratio
Human, age 13.5	1.35	45	1:34
Dwarf, age 12	0.4	13.5	1:34
Chimp, age 3	0.4	13.5	1:34

Also, recent evidence suggests whales and dolphins have larger brains for temperature regulation.

Lateralization

Experiment: dichotic listening task

1. Get volunteers for experiment; try (covertly) to get some left-handed and some right-handed participants
2. Have them do the procedure one at a time.
3. Collate the results on the board
separate into left-right ear words

Left	Right
dog	drink
cat	food
book	school
chair	street
desk	town
house	king
moon	north
cup	park
floor	toy
sun	zoo

4. Ask students to analyze the results
If there are any differences across participants, why?

Hopefully, results will generally show that words in the right ear are more accurately recalled. Further, anyone who shows an even distribution, or shows left-ear dominance are also left-handed.

Conclusion: Left side of brain controls language. However, interesting other evidence shows that if, instead of words, music is played, music in left ear is recalled better.

Brain damaged patients

So what happens with if the left brain gets damaged? Do people lose the ability to speak?

- Adults who suffer damage to the left side of the brain often suffer some language loss, quite often permanently.
- Children who suffer damage to the left side of the brain can often recover.

Subjects with no known brain damage

Handedness	Speech representation		
	Left	Bilateral	Right
Right	96%	0%	4%
Left (ambi)	70%	15%	15%

Subjects with early left-hemisphere brain damage

Handedness	Speech representation		
	Left	Bilateral	Right
Right	81%	7%	12%
Left (ambi)	28%	19%	53%

Critical Period

Is there a critical period for language acquisition? Let's look at some data from deprived children to see what evidence there is. Give handout from Field, 2003, p. 99 (originally from Skuse, 1994).

1. Students look over the data.
2. Students ask any questions about words/phrases they do not understand.
3. Students decide whether or not there is evidence of a critical period; and if so, what its range is.
4. Elicit and discuss.

Discuss possibility that there may be more than one critical period. That is, that there are critical periods for each feature of language learning. For instance, it could be that the phonological system is fixed after the first critical period (0-2 years), but that syntactic features don't become fixed until after the second critical period (10-16 years).

Conclusion

So, it does seem that our brains are somewhat prewired for language, unlike other animals. And further, that human children are some predisposed to learn language easily and effortlessly. Does this mean that language is an innate part of the human mind?

Homework

Read about "The innateness Hypothesis".