

Quiz 6

Q1. Animal language

Kanzi, the bonobo, was kept in a room separated from his sister Panbanisha. He was shown some yogurt that Panbanisha could not see. He then made some vocalizations that she could hear in the other room, and she used her lexigram-based keyboard (that both apes were trained to use) to point to the symbol for yogurt.

- (a) Which characteristics of the faculty of language, in its broad sense, can be inferred as present in the communication between the two apes? Which could be considered absent? (4 marks)
- (b) Which characteristics of the faculty of language, in its narrow sense, can be inferred as present in the communication between the two apes? Which could be considered absent? (4 marks)
- (c) Can you minimally expand the communication between the two apes, such that the characteristics you've previously identified as missing are also present in the exchange? (2 marks)

Q2. Pig on the box

My little daughter emitted her first non-trivial sentence around 20 months of age. It was 'piggy box upar neenu', referencing a piggy-bank lying side down on a cardboard box. What makes the sentence non-trivial is that it could not have been learned from a simple stimulus-symbol mapping, such as the simpler sentences she was using before, 'mumma aayi', 'moon hai' etc. Let's say that the formal grammar underlying my daughter's utterance had the form

$S \rightarrow XS$

$S \rightarrow v$

$X \rightarrow nX$

$X \rightarrow pX$

where n is a subset of nouns she knew { doggy, piggy, cow, sheep}, v is the set of verbs she knew {aaya, gaya, hai, neenu} and p is the set of prepositions she knew {upar, andar, paas}.

- (a) Where would this grammar lie in the Chomsky hierarchy? (2 marks)
- (b) Can you construct a 3 word, a 5 word, and a seven word sentence using this grammar? (6 marks)
- (c) Could a sentence without a verb be formed using this grammar? If not, how would you modify this grammar to make that possible? (4 marks)
- (d) Would you expect my daughter to be able to say the sentence 'Piggy upar doggy paas hai' assuming she possesses this grammar? Why or why not? What about the sentence, 'Cow upar doggy upar cow doggy piggy paas hai'? Why or why not? (8 marks)

** For this question, non-Hindi speakers are free to ask their neighbors for translations, if they want. But translation is fundamentally not needed to answer the question.*

Q3. Identification in the limit

- (a) What does identifiability in the limit mean in the context of language learning? (6 marks)
- (b) Can you prove that the class of all finite languages is identifiable in the limit using only positive evidence? (8 marks)
- (c) Mark Gold proved that recursive languages could not be learned ILL using only positive evidence. What constraints could this result impose on children's ability to acquire natural language? (6 marks)

Q4. Language in action

"Fine! Don't do your homework. And never speak to me again." - mother scolding a child

- (a) What is the truth-conditional interpretation of this statement? (2 marks)
- (b) What is the empiricist interpretation of this statement? (2 marks)
- (c) What is the speech acts-based interpretation of this statement? (2 marks)
- (d) What is the pragmatist interpretation of this statement? (2 marks)
- (e) The rational speech acts model assumes that speakers choose their words to be maximally informative to the listener. Can you model this exchange between the mother and the child as a rational speech act? Assume whatever referents and vocabulary you want, the context is the context of being scolded for not doing homework. Pragmatically, you might want to have a strong prior on the referent 'do your homework' for this context. (12 marks)