Psych156A/ Ling150
Winter 2009
Homework 3: Phrases, Poverty of the Stimulus & Learning Biases
Or "The Language Adventures of Sigmund von Hacklestein, part 3"

Remember to write your full name and University ID number on your assignment. If you collaborate with other students in the class, please make sure to indicate who you worked with.

(64 points total, +4 bonus points possible)

(1) Sigmund has been studying yet more details of the Guin language. This time, he's trying to figure out what words make up the phrases of Guin. Here are some data that he's gathered:

Known categories: A, B, C

The transitional probability of the sequence AB is 0.20.
The transitional probability of sequence BC is 1.0.
The transitional probability of sequence AC is 0.80.

Answer the following questions, based on these data:

(a) Would the kind of transitional probability learner that Thompson & Newport (2007) believe in be likely to think that AC is a phrase? Why or why not? [2 pts]
(b) Would the kind of transitional probability learner that Thompson & Newport (2007) believe in be likely to think that BC is a phrase? Why or why not? [2 pts]
(c) Would the kind of transitional probability learner that Thompson & Newport (2007) believe in be likely to think that AB is a phrase? Why or why not? [2 pts]
Bonus [+4 if correct]: Is ABC likely to be a phrase in Guin? Why or why not? (Hint: How do optional categories change transitional probabilities? Can you think of any categories in English that might have these transitional probabilities?)

(2) Consider the following three sentences:

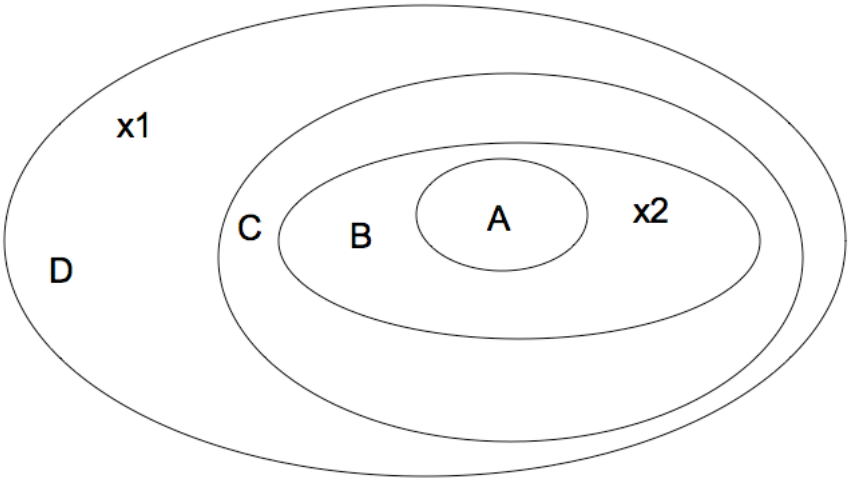
(i) The king will turn into an owl.
(ii) The king will turn into an owl which can fly away.
(iii) The king who can fall in love will turn into an owl.

(a) For each of the rules below, indicate the yes/no question that would be created from each of these sentences (i-iii) by using that rule. [15 pts]

- "move the third word to the front"
- "move the fourth word to the front if it's a verb or auxiliary verb"
- "move the first auxiliary verb to the front"
- "move the last auxiliary verb to the front"
- "move the main clause auxiliary verb to the front"

(b) For each sentence (i-iii), indicate which of the rules listed in part (a) actually produced the correct yes/no question for English. [6 pts]
(c) Which rule(s), if any, work(s) for all the sentences (i-iii)? Is this the rule that young children seem to use, according to Crain & Nakayama (1987)? [2 pts]
(d) Which of the rules in (a) would be classified as structure-dependent? [2 pts]
(e) Suppose that children only encounter simple yes/no questions (such as "Will the king turn into an owl?"). Why would it be difficult for them to decide that yes/no questions in English are formed with a structure-dependent rule? (Hint: consider your answers to (a)-(d).) [2 pts]
(f) Why do the results from Crain & Nakayama (1987) support the idea of children having prior knowledge about yes/no question formation rules, assuming children only encounter simple yes/no questions like the one in (e)? [3 pts]

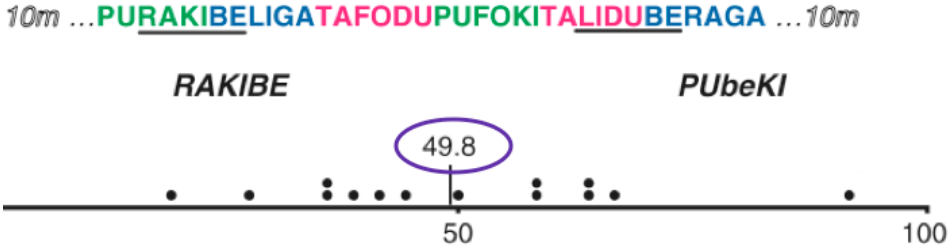
(3) Below is a schematized picture representing four different generalizations children might make: A, B, C, and D. Sample data points children might encounter are represented by x1 and x2.



(a) Will a child who makes generalization D think that data point x2 is in the language? Why or why not? [2 pts]
(b) Will a child who makes generalization B think that data point x1 is in the language? Why or why not? [2 pts]
(c) Using the figure above, give a specific example where one generalization is a subset of another. [1 pt]
(d) What is the situation that creates a Subset Problem, and why is it actually a problem for children learning language? Using the example you gave in (c), explain when the Subset Problem would occur. (Hint: Think about what initial choice children would make, and what situation would make this initial choice problematic. Also, note that the Subset Problem is *not* the same as the Subset Principle.) [6 pts]
(e) Would choosing generalization D when generalization A is actually correct be an example of the Subset Problem? Why or why not? [2 pts]

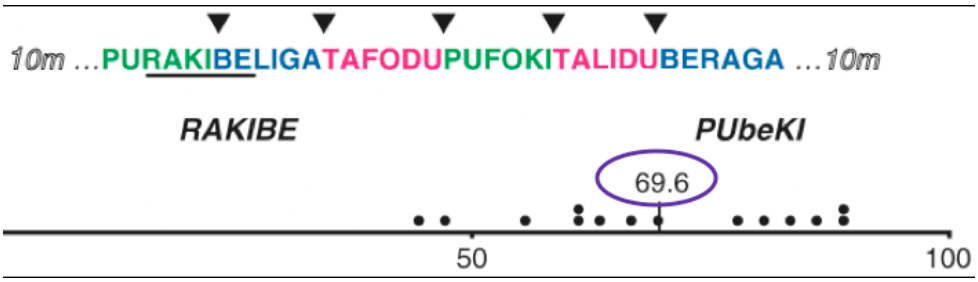
(f) What is the Subset Principle, and why does it solve the Subset Problem? Using the example you gave in (c), explain how the Subset Principle works. [6 pts]

(4) Playing with Peña et al. (2002)
(a) Consider the result from the second experiment in the Peña et al. (2002) study, which is schematized below.



Does this indicate that adults noticed the structural generalization? How do you know? [2 pts]

(b) Consider the result from the third experiment in that study, which is schematized below.



Does this indicate that adults noticed the structural generalization? How do you know? [2 pts]

(c) What was the crucial change in experimental design between experiments 2 and 3 that caused the different in results? [1 pt]
(d) What was the motivation for making this change? That is, why did the experimenters think that this particular change would lead to different results than they had gotten before? [4 pts]