Homework 2

You do not have to type this homework. However, if you do want to type it, you may find labeled bracketing a more convenient notation than trees (I will go over this notation in class on Monday). You can check which tree is described by a labeled bracketing like \([S \ [NP \ [N \ John]\] \ [VP \ [V \ likes] \ [NP \ [N \ Bill]\]]]\) by going to phpsyntaxtree: http://ironcreek.net/phpsyntaxtree

1. The following phrase structure rules and lexicon are for an imaginary language ("Inglish") which differs from English in some respects.

   **Phrase structure rules**
   
   \[S \rightarrow NP \ VP\]
   \[NP \rightarrow (Det) \ N \ (Det) \ (PP)\]
   \[PP \rightarrow P \ NP\]
   \[VP \rightarrow (NP) \ (PP) \ V\]

   **Lexicon**
   
   \[N \rightarrow John\]
   \[V \rightarrow likes\]
   \[Det \rightarrow his\]
   \[N \rightarrow boy\]
   \[V \rightarrow eats\]
   \[Det \rightarrow her\]
   \[N \rightarrow girl\]
   \[P \rightarrow with\]
   \[N \rightarrow friend\]
   \[Det \rightarrow the\]
   \[N \rightarrow cake\]
   \[Det \rightarrow a\]

   a. Draw trees for three Inglish sentences.

   b. Give a brief description of how Inglish sentences differ from simple English sentences.

   \((10 \text{ points})\)

2. Given the phrase structure rules and lexicon in (1), which of the following strings is a grammatical (i.e. syntactically correct) sentence of Inglish?

   a. John ate the cake.
   b. The small boy the cake ate.
   c. A boy the cake ate.
   d. The cake small the boy ate.
   e. A boy the cake big ate.
   f. The boy the cake with his friend ate.
   g. The cake the cake with his cake ate.
   h. John John likes.

   \((8 \text{ points})\)
3. As we have seen, English has recursion. (Sentences can be embedded inside other sentences, NPs can be embedded inside other NPs, etc. etc.) Recursion is a universal property of human languages, and as expected, Inglish allows for recursive sentences. Here are two examples of recursive sentences in English:

John thinks Bill cake eats that

(= English “John thinks that Bill eats cake.”)

John expects Bill the cake big eats

(= English “John expects Bill to eat the big cake.”)

a. Extend the phrase structure rules in (1) to allow for these new sentences. (You should end up with a set of rules that look similar to those we have been using for English, but with different word order in some cases.)

**Hint:** you will need to modify the VP rule and add one additional PS rule.

b. Using your modified rules, draw the tree for an Inglish sentence with two levels of recursion (the example Inglish sentences for this question have one level of recursion).

(12 points)

Total: 30 points

**Extra credit question (DIFFICULT) (7 points)**

As mentioned briefly in class, Spanish allows for subject NPs to come either at the beginning or the end of the S constituent:

Juan ha comido

*(Juan has eaten)*

Ha comido Juan

*(Has eaten Juan)*
When the sentence has an object however, the subject must come first:

[GOOD] Juan ha comido un burrito \textit{(Juan has eaten a burrito)}

[BAD] Ha comdio un burrito Juan \textit{(Has eaten a burrito Juan)}

The main PS rule for a Spanish sentence is as follows:

\[ S \to \text{NP Aux VP} \]

You can assume that the other phrase structure rules (like the ones for NP and VP) are the same as those for English. (Of course this isn’t quite true, but the various other differences between English and Spanish don’t matter for this question.)

The rule above will make it possible to generate “Juan ha comido” and “Juan ha comido un burrito” but not “ha comido Juan.”

• Give a transformational rule which makes it possible to generate sentences like “Ha comido Juan.” Make sure that this rule \emph{doesn’t} make it possible to generate bad sentences like “Ha comido un burrito Juan.” (Hint: make use of the subcategorization features of the verb when stating your transformation.) For full points, you must state the transformation using the proper notation, but you can get partial credit for a precise description of the rule using English.

• Does the transformation apply optionally or obligatorily?

• Bill suggests that instead of using a transformation, we could just use the following two phrase structure rules for S:

\[ S \to \text{NP Aux VP} \]
\[ S \to \text{Aux VP NP} \]

What is the problem with Bill’s suggestion? (Hint: the rules he’s proposing will overgenerate).

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1 Sentences such as ”Ha comido un burrito Juan” are “only found in very flowery literary styles” \textit{(A New Reference Grammar of Modern Spanish, J. Butt & C. Benjamin (eds.), McGraw Hill 2000, p. 524)}. There are many further complications that we will ignore here. For example, when the object is a pronoun, the subject can still appear on the right (“Lo sabe Juan” = “Juan knows it” is OK; \textit{op. cit.} p. 513).