In class exercises: more context-free grammar development

9.19(0) Fall 2023, Instructor: Roger Levy

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1 Possessive phrases

Here are a few examples of English **possessive phrases**:

> my friend   the dog's tail   a healthy child's vital signs   women's day

Think carefully about the range of possible possessive phrases in English, and then write an English grammar fragment (building on what we achieved in the last class) for possessive phrases. Your fragment should account for ambiguities like *Mary and Sally's teacher* and *A relative of Kim's friend.*

Observe also that the following are infelicitous: **dog's tail, *a spaghetti's plate*; your grammar fragment doesn't need to rule these out, but in the context of your grammatical analysis you should be able to assimilate the badness of these examples to observations we've made in previous classes. (If this comment is cryptic to you, don't worry; we'll discuss it after everyone has a chance to work on this exercise in class.)

2 Coordination and unbounded *wh*-dependencies

First, let's spend some time reviewing how unbounded *wh*-dependencies like relative clauses (e.g., *the rock that I know that the squirrel likes*) can be handled by context-free grammars using derived categories of the form X/Y. Specifically, how does the analysis of unbounded dependencies account for the acceptability status of the following sentence pair, in both of which cases a *wh-* word linearly precedes a gap?

> The fact that the witness knew who the defendant deceived surprised the lawyer.
> *The fact that the witness knew who the defendant deceived the lawyer surprised.

Next, think and discuss with your in-class partner how *wh*-dependencies interact with the syntax of coordination, which we summarized as a meta-rule of the form X → X Conj X. Come up with examples (both acceptable and unacceptable examples) that involve *wh*-dependencies and coordination, and think about how to model them using a context-free grammar fragment. Do we need to add anything new to our grammar get *wh*-dependencies and coordination to work together to properly predict the acceptability of your examples?

3   Auxiliary inversion

English polar (i.e., yes/no) questions are unlike most other kinds of English sentences in the following respect: the finite verb comes at the beginning of the sentence:

> **Is** the dog sleeping?
> **Will** some of your friends be coming to the party?

Intuitively, there is a one-to-one relationship between a polar question and a declarative counterpart:

> **Is** the dog sleeping? ↔ The dog **is** sleeping.
> **Will** some of your friends be coming to the party? ↔ Some of your friends **will** be coming to the party.

Task: state in words the generalization between the structure of a polar question and the structure of its declarative counterpart that correctly accounts for the word orders seen in both.

Optional bonus: here are some more facts about English syntax and the auxiliary system:

1. Unless the verb in the declarative version of the sentence is an auxiliary (*be*, *have*) or a modal verb (*can*, *could*, *may*, *might*, *must*, *shall*, *should*, *will*, *would*), to form a polar question something different than what is described above happens to form a polar question. What happens? What commonalities does it share with the version of polar question formation we looked at at the outset of this section?

2. The same thing happens most of the time with *wh*-question formation:

   > What do you plan to eat for dinner?
   > Who have you danced with tonight?
   > Where did Dani say that they would meet Jamie? (note that this is ambiguous—how, and why?)

   However, the pattern is different when the *wh*-phrase does not serve as the subject of the sentence; **show this with examples**.

Try incorporating some of these observations into an English grammar fragment. You may need or want to state meta-rules about the grammar, or about the lexicon. This is an open-ended problem: the English auxiliary system is remarkably rich and subtle, and numerous research papers have been written on it. (As a historical note, many prominent linguists who started their careers in the 1960s and 1970s say they got into linguistics because the analysis of the English auxiliary system in Chomsky's 1957 *Syntactic Structures* was "just so cool"—that is a direct quote from one of my dissertation advisors!)