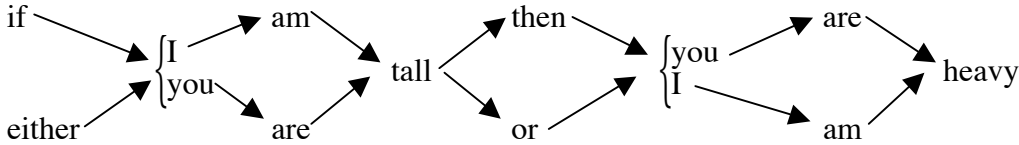


Discussion Questions on Syntax

1. Word chain devices: A model for the structure of sentences might be a device where you choose a word, which then leads to a limited set of choices for the next word and so on until you end up with a string of words that makes a sentence. Below is a word chain device that would yield a number of English sentences. The bracketed items mean that you can choose either the top one or the bottom one.



In the web version you can see little “movies” operate to build sentences with this grammar.

a. Use this word chain device to create at least one GRAMMATICAL sentence of English.

You can form a sentence by following the arrows from one word to the next. Below is one GRAMMATICAL sentence formed in this way.

either → you → are → tall → or → you → are → heavy

b. Using the words in this word chain device, make up at least one UNGRAMMATICAL sentence of English that the structure of this device would PREVENT you from creating.

The word chain device would **not** produce the sentence below. The structure of this word chain device assures that if you choose "I", the verb will be "am", but if you choose "you", the verb will be "are".

either → you → am → tall → or → you → am → heavy

c. Use this word chain device to create at least one UNGRAMMATICAL sentence of English. Explain why your sentence demonstrates the shortcoming of a word chain device as a model for sentence construction in natural human languages.

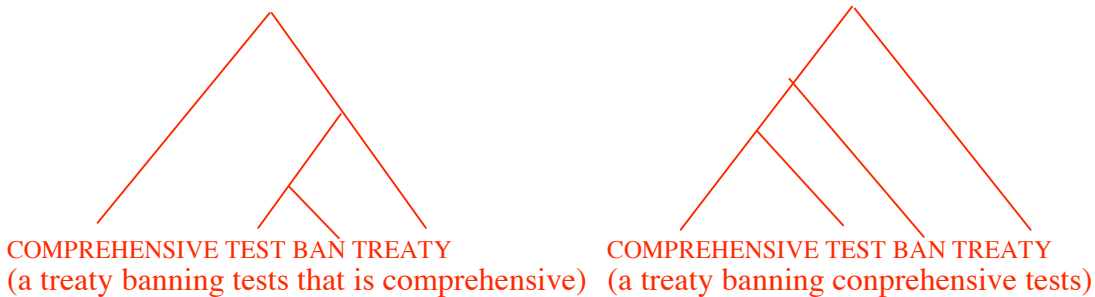
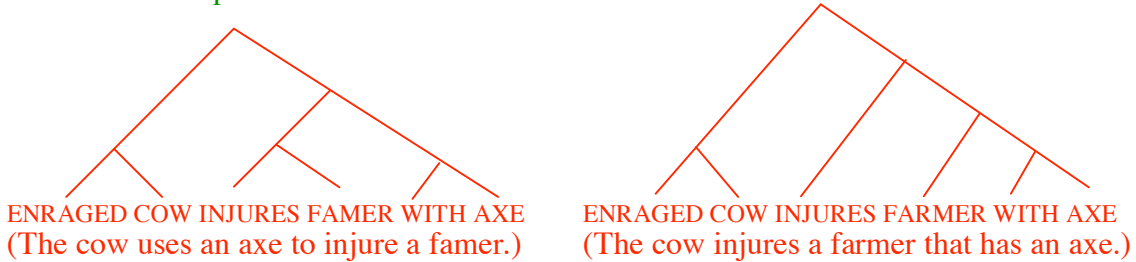
The word chain device will produce the sentence below. "**Either**" must pair with "**or**" and "**if**" must pair with "**then**", but the word chain has no way to assure this because once you reach the place where you have to choose the path to "then" or "or", there is no way to know how the sentence started. This is the problem of "**long range dependencies**" that allowed the word chain device on page 25 of the APS reader to produce a sentence like "the lizards on the rock is eating flies", where lizards would require are, but once the choice between is vs. are is reached, there is no way to know whether the sentence started with singular or plural.

either → you → are → tall → then → you → are → heavy

2. Hierarchical structure: Below are some headlines (in capitals), some phrases, and a cartoon. In each case there is an ambiguity that involves grouping the words in different ways. For each item, draw two tree structures showing the different word groupings. For this question, don't try to label the trees with NP, VP, etc.

ENRAGED COW INJURES FARMER WITH AX
KILLER SENTENCED TO DIE FOR 2ND TIME
the design has big squares and circles
they said she would go yesterday

Here are tree diagrams to the two meanings of the first one. On the website, you can see the trees build up



3. Grammatical categories: Below are some headlines and phrases where there is an ambiguity that involves interpreting a word as belonging to either of two grammatical categories. Identify the word and the two categories that it allows.

JUVENILE COURT TO TRY SHOOTING DEFENDANT
smoking grass can be nauseating
the horse looked very fast

Below are possible structures for the first "headline". Note that the structure of the TREES is the same. The two meanings result from the differences in the circled categories. (We

would have to modify the little phrase structure grammar on page 27 to account for the trees, e.g. we would have to add "Adjective" into the NP rule and we would need to have VP as something that can follow a V.

<pre> graph TD S --> NP1[NP] S --> VP1[VP] NP1 --- Triangle1[△] VP1 --> V1[V] VP1 --> NP2[NP] NP2 --> Adj[Adj] NP2 --> N1[N] V1 --- Triangle2[△] Adj --- Triangle3[△] N1 --- Triangle4[△] </pre>	<pre> graph TD S --> NP1[NP] S --> VP1[VP] NP1 --- Triangle1[△] VP1 --> V1[V] VP1 --> VP2[VP] VP1 --> NP2[NP] VP2 --> V2[V] VP2 --> NP3[NP] V1 --- Triangle2[△] V2 --- Triangle3[△] NP3 --- Triangle4[△] </pre>
<p>JUVENILE COURT TO TRY SHOOTING VICTIM</p> <p>Someone is a victim of a shooting (shooting is a modifier of victim), and they are going to try that person.</p>	<p>JUVENILE COURT TO TRY SHOOTING VICTIM</p> <p>The court is going to try to do some, namely to shoot someone described as a victim. The victim will be the object of the court's shooting</p>

Below are some further examples that involve a combination of grouping and grammatical category ambiguity. Analyze the ambiguities as in the above examples.

- SQUAD HELPS DOG BITE VICTIM
- TEACHER STRIKES IDLE KIDS
- SERBIAN FORCES FLYING UNAUTHORIZED FLIGHTS (from the *Bruin* about flights over Bosnia after the UN peace forces went in)
- REQUEST TO BAR STUDENT DENIED (from the *Bruin* about an attempt to keep a student out of the UC Davis medical school)
- BLOCK HEADS BACK ON CAMPAIGN TRAIL (from the *LA Times* referring to the late Sherman Block running for Sherrif again)

4. Using the little grammar on page 27, draw LABELED trees, i.e. trees including NP, VP, etc. for the following sentences:

- a. It flies erratically.
- b. He won the race through the hills easily.
- c. The runner from Kenya beat the Tanzanian by inches.
- d. Guards guard guards of guards of guards.

<pre> graph TD S --> NP[NP] S --> VP[VP] NP --- Pro[Pro] Pro --- It[It] VP --> V[V] V --- flies[flies] VP --> AdvP[AdvP] AdvP --> Adv[Adv] Adv --- erratically[erratically] </pre>	<pre> graph TD S --> NP1[NP] S --> VP[VP] NP1 --- Pro1[Pro] Pro1 --- He[He] VP --> V[V] V --- won[won] VP --> NP2[NP] NP2 --> Det[Det] Det --- the1[the] NP2 --> N[N] N --- race[race] NP2 --> PP[PP] PP --> Prep[Prep] Prep --- through[through] PP --> NP3[NP] NP3 --> Det2[Det] Det2 --- the2[the] NP3 --> N2[N] N2 --- hills[hills] VP --> AdvP[AdvP] AdvP --> Adv[Adv] Adv --- easily[easily] </pre>
	<p>Note that the PP "through the hills" is attached to the NP, i.e. "through the hills" describes the race. If "through the</p>

	<p>hills" were attached to the VP, it would mean his WINNING was "through the hills". This meaning seems possible if "through the hills" were at the end ("He won the race easily through the hills."), but this meaning is difficult or impossible to get in the wording here.</p>
<p>The runner from Kenya beat the Tanzanian by inches.</p> <p>Detailed description: A syntax tree for the sentence 'The runner from Kenya beat the Tanzanian by inches.' The root node S branches into NP and VP. The NP branches into Det ('The'), N ('runner'), and PP ('from Kenya'). The PP branches into Prep ('from') and NP ('Kenya'). The VP branches into V ('beat'), NP ('the Tanzanian'), and PP ('by inches'). The NP 'the Tanzanian' branches into Det ('the') and N ('Tanzanian'). The PP 'by inches' branches into Prep ('by') and NP ('inches'). The NP 'inches' branches into N ('inches').</p>	<p>Guards guard guards of guards of guards.</p> <p>Detailed description: A syntax tree for the sentence 'Guards guard guards of guards of guards.' The root node S branches into NP and VP. The NP branches into N ('Guards'). The VP branches into V ('guard') and NP ('guards of guards of guards'). The NP 'guards of guards of guards' branches into N ('guards'), PP ('of guards of guards'), and N ('guards'). The PP 'of guards of guards' branches into Prep ('of') and NP ('guards of guards'). The NP 'guards of guards' branches into N ('guards'), PP ('of guards'), and N ('guards'). The PP 'of guards' branches into Prep ('of') and NP ('guards'). The NP 'guards' branches into N ('guards').</p>
<p>Note that the prepositional phrase "by inches" is attached to the VP, i.e. it specifies by how much he "<u>beat</u> (the Tanzanian)".</p>	

5. The following sentence is meaningful. Using the term *grammatical* to mean “conforming to the rules of a grammar”, it is also grammatical with respect to the little grammar on page 27 (the pronoun *their* counts as a Det):

Sisters are siblings of their brothers.

a. Make a change in the sentence such that it is *meaningful but ungrammatical*.

One possibility would be

Sisters siblings of their brothers they are.

This is comprehensible ("meaningful") as a sort of "Yoda English", but, among other problems with the sentence, there is no way that the grammar would allow two NP's to come next to each other, i.e. [Sisters] and [siblings of their brothers].

b. Make a change in the sentence such that it is *meaningless but grammatical*.

One possibility would be

Sisters are brothers of their siblings.

This sentence switches places of the nouns "siblings" and "brothers" from the original sentence, but otherwise it has the same structure as the original. Since the original is grammatical by our definition, this sentence must also be grammatical. However, it is nonsense ("meaningless") since "sisters" are female siblings and "brothers" are male siblings, making it impossible that "sisters" could also be "brothers".

c. Make a change in the sentence such that it is *meaningless and ungrammatical*.

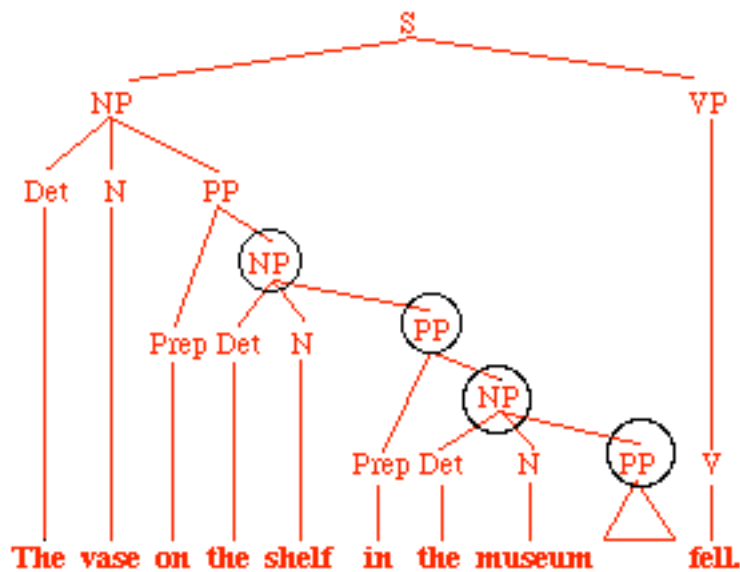
One possibility would be

Sisters brothers of their siblings they are.

This is the "Yoda English" version of the sentence in (b). As pointed about for (a), "Yoda English" is ungrammatical by the rules of the grammar that we are referring to, and as pointed out for (b), it is meaningless to say that "a sister is a brother". Hence, the sentence is both meaningless and ungrammatical.

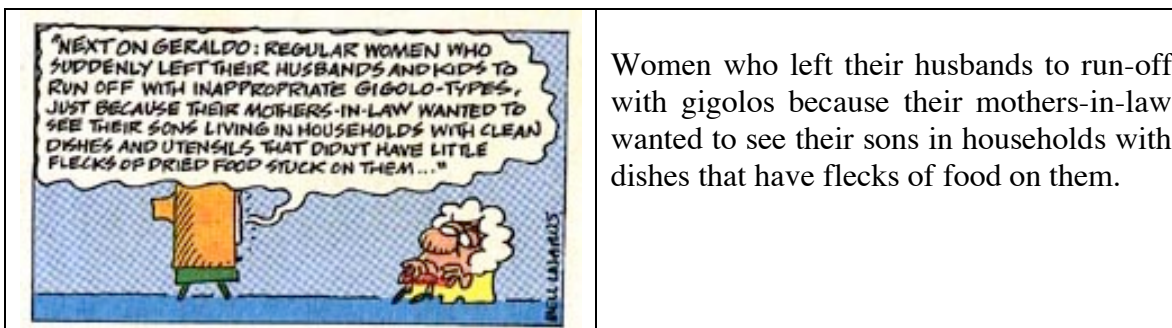
6. Using the little grammar on page 27, create a sentence with a tree structure that involves at least two cases of recursion.

Here is a possibility:



Each time a circled node occurs, one must cycle back to a rule which has previously applied, resulting in recursion.

7. Here is a panel from a “Momma” cartoon and a simplified version of the sentence in the cartoon.



Women who left their husbands to run-off with gigolos because their mothers-in-law wanted to see their sons in households with dishes that have flecks of food on them.

Make the following three modifications to the grammar on page 27, then figure out how the recursive properties of the grammar can account for the right-hand sentence, which could potentially go on infinitely. (Treat the hyphenated items as single words.)

- Add “S” to the NP rule, as in the grammar under the “Doonesbury” cartoon on p. 29.
- Add “(to VP)” to the end of the VP rule.
- Add “(because S)” to the end of the AdvP rule.

See how well you can do on your own. A tree of the sentence would be HUGE!

8. Here are sentences from two languages from the Middle East:

Turkish: kertenkele bir sinek yakala-di ‘the lizard caught a fly’
lizard a fly catch-past

Hebrew: ha-letaa taps-a zvuv ‘the lizard caught the fly’
the-lizard caught-it(fem.) fly

- Using our typological categorizations of SOV, VSO, etc., what *types* do these languages fall into?

Turkish is SOV (the verb is at the end of the sentence)

Hebrew is SVO (the verb comes between the subject and the object)

- Here are the phrases meaning ‘on (the) rock’ in the two languages. Which phrase goes with which language? How do you know?

al ha-sela
on the-rock

kaya-da
rock-on

The first (*al ha-sela*) goes with **Hebrew**. The Hebrew sentence in (a) suggests that Hebrew is *head-initial* because in the VP, the *verb* (the “head”) comes before the object). In the PP here, the **PRE**position **al** (the “head” of the PP) also comes first in its phrase.

The second (*kaya-da*) goes with **Turkish**. The Turkish sentence in (a) suggests that Turkish is *head-final* because in the VP, the *verb* (the “head”) comes after

the object. In the PP here, the **POST**position **-da** (the “head” of the PP) also comes last in its phrase.

- c. Here are some further phrases in the two languages. State whether these are the orders you expect for the phrase types and why you have those expectations.

Turkish	Hebrew	
<u>kertenkele-nin</u> <u>kuyruk-u</u> lizard-'s tail-its	<u>zanav</u> <u>shel</u> <u>letaa</u> tail of lizard	‘the lizard’s tail’
<u>büyük</u> <u>kertenkele</u> big lizard	<u>letaa</u> <u>gdol-a</u> lizard big-fem.	‘big lizard’
<u>iki</u> <u>kertenkele</u> two lizard	<u>štey</u> <u>leta-ot</u> two lizard-plural (fem.)	‘two lizards’

Turkish: The orders are all as expected for a *head-final* language

- Possessed follows Possessor (the possessed is the “head” since the possessor is a sort of modifier of it—the phrase is about a type of tail, not a type of lizard)
- Noun follows Adjective (this is a normal NP, where the head, N, comes at the end of its phrase)
- Noun follows Number (same comment as Noun following Adjective)

Hebrew: The first two are as predicted in a *head-initial* language, but the last is not

- Possessed precedes Possessor
- Noun precedes Adjective
- Noun follows Number (this is an NP, so the Noun is the head, but it comes after the Number)

9. In a language you know other than English, think about the order of words of phrases like those in 8a-c. What is the order for each type of phrase? Is the language CONSISTENT in the way it orders HEADS and MODIFIERS in the various phrase types?

The answer will depend on the language you choose!