

Problem 1: Hypothesis testing. In English, the form of the main verb in a present tense sentence is predictable based on the other words in the sentence, as seen in the following data:

- (1) The robot comes from the future to protect John.
- (2) *The robot come from the future to protect John.
- (3) *The robots comes from the future to protect John.
- (4) The robots come from the future to protect John.

Consider the following hypothesis:

Hypothesis X: The main verb of a present tense English sentence must be in the third-person singular form (the form typically marked with *-s*, as in *protects*) if the word immediately before it is a singular noun. Otherwise, the main verb must be in the bare form (e.g., *protect*).

- a. In full prose (i.e., complete and coherent sentences), carefully explain how Hypothesis X correctly predicts the grammaticality pattern in (1)–(4).
- b. Rearrange the words in one of the sentences in (1)–(4) to construct a new sentence that disproves Hypothesis X. In full prose, carefully explain how Hypothesis X fails to predict the (un)grammaticality of your new sentence.
- c. Construct a new hypothesis, based on the phrase structure of English we have developed in class, that predicts the grammaticality pattern in (1)–(4) as well as the (un)grammaticality of your new sentence. In full prose, carefully explain how your new hypothesis correctly predicts the (un)grammaticality of your new sentence.

Problem 2: Navajo. Consider the following sentences from Navajo (an Athapaskan language of the Na-Dene family, spoken in the southwestern United States). Sentences are transcribed in a traditional system used by Americanists (linguists who study Native American languages). Pronunciation is not relevant to this problem, so you can safely ignore it, but for the curious, an IPA transcription is given to the far right.

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|-----|------------------------|------------------------------|------------------------|
| (5) | Łįį' dzaanééz yiztał. | 'The horse kicked the mule.' | [łi:ʔ dza:né:z jiztał] |
| (6) | Dzaanééz łįį' yiztał. | 'The mule kicked the horse.' | [dza:né:z łi:ʔ jiztał] |
| (7) | At'ééd ashkii yiztsqs. | 'The girl kissed the boy.' | [at'é:d afki: jiztsqs] |
| (8) | Ashkii at'ééd yiztsqs. | 'The boy kissed the girl.' | [afki: at'é:d jiztsqs] |
| (9) | Ashkii łįį' yo'į. | 'The boy saw the horse.' | [afki: łi:ʔ jo?į] |

- a. Assuming that Navajo conforms to universal phrase structure properties, what are the phrase structure rules needed to generate (5)–(9)? You need three rules: one each for S, NP, and VP.
- b. Draw a full phrase structure tree for the Navajo sentence in (5), using the rules from part (a).
- c. Translate the following sentences.

- (10) The mule saw the girl. (to Navajo)
- (11) The horse kissed the mule. (to Navajo)
- (12) At'ééd ashkii yo'į. (to English)
- (13) Dzaanééz ashkii yiztaŁ. (to English)

(continued on back)

Problem 3: Lummi. Consider the following data from Lummi (a.k.a. Straits Salish, a Central Salishan language of the Salishan family, spoken in the Pacific Northwest).

- (14) leɣnəs tsə musməs tsə swəjʔqaʔaʔ
- (15) leɣnəs tsə sʔeniʔ tsə q'əɣəʔja:ʔ
- (16) ɣʔʃits tsə swəjʔqaʔaʔ tsə sʔeniʔ
- (17) ɣʔʃits tsə sʔeniʔ tsə swəjʔqaʔaʔ

a. The translations of the Lummi sentences in (14)–(17) are given in (18)–(21), but not necessarily in the correct order! Figure out which translations correspond to which Lummi sentences.

- (18) the woman knows the boy
- (19) the boy knows the woman
- (20) the cow saw the boy
- (21) the woman saw the girl

b. Translate the following sentences.

- (22) the girl knows the cow (into Lummi)
- (23) the boy saw the cow (into Lummi)
- (24) leɣnəs tsə swəjʔqaʔaʔ tsə sʔeniʔ (into English)
- (25) ɣʔʃits tsə musməs tsə swəjʔqaʔaʔ (into English)

c. At first glance, Lummi appears to conform to universal phrase structure properties. Write the phrase structure rules that can generate (14)–(17), just considering the categories of the words and ignoring the role they play in the sentence. You will need three rules: one each for S, NP, and VP.

d. Draw a full phrase structure tree for the Lummi sentence in (14), using the rules from part (c). In full prose, explain precisely what is “wrong” with Lummi phrase structure when we take the full meaning of the sentences into account. You may find it useful to refer to the tree you just drew.