Questions on the Recent Extensions of Our Semantic System

You must answer questions (1), (2), (3) and (6). You must answer either question (4) or question (5), but which is up to you.

(1) **Boring Comprehension Exercises on Types and Domains**

Please explain in your own words what the following are. If the thing in question is a *type*, start off you statement with "the type of function that…" If it's a *domain*, start off your statement with "the domain of functions that…"

a. $\langle\langle e , \langle e, t \rangle\rangle , \langle e, t \rangle\rangle$
b. $D_{\langle\langle e, t \rangle , \langle\langle e, t \rangle , t\rangle\rangle}$
c. $\langle e , \langle t, t \rangle\rangle$
d. $D_{\langle e, \langle t , e \rangle\rangle}$
e. $\langle\langle e, t \rangle \langle e , e \rangle\rangle$

(2) **Boring Comprehension Exercises on Lambda Notation**

a. *The following functions are defined in lambda notation. Please write them out as a set of ordered pairs.*

(i) $[\lambda x : x \in \{ 1 , 2 , 3, 4 \} . x + 23]$
(ii) $[\lambda x : x \in \{$ NY, NJ, MA $\} .$ the capital of x $]$
(iii) $[\lambda x : x \in \{$ Seth, Kyle $\} .$ **IF** x teaches LING 601 **THEN** T **ELSE** F $]$

b. *The following functions are written out as a set of ordered pairs. Please define them in lambda notation.*

(i) $\{ \langle 2, 4 \rangle, \langle 3, 9 \rangle, \langle 4, 16 \rangle, \langle 5, 25 \rangle \}$
(ii) $\{ \langle$ Seth, Cable $\rangle , \langle$Angelika, Kratzer $\rangle, \langle$Rajesh, Bhatt$\rangle \}$
(iii) $\{ \langle$ Boston, T $\rangle , \langle$ New York, T $\rangle , \langle$ Los Angeles, F $\rangle \}$

c. *Please compute the following values, using the rule of 'Lambda Conversion'.* Make sure to 'show your work' (i.e., show each step of the calculation).

(i) $[\lambda x : x \in \{ y :$ y is a number $\} . x/4]$ (44)

(ii) $[\lambda x : x \in \{ y :$ y is a US state $\} .$ the capital of x $]$ (ME)

(iii) $[\lambda x \in D_e : [\lambda y \in D_e :$ **IF** x slew y **THEN** T **ELSE** F $]]$(Cain)(Abel)

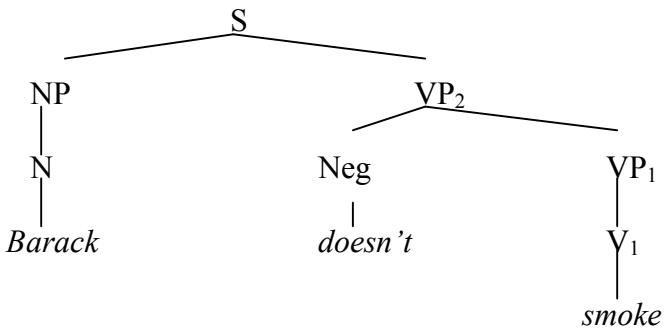
(iv) $[\lambda f \in D_{\langle e,e \rangle} : [\lambda y \in D_e : f(y)]]([\lambda y \in D_e :$ the creator of y $])$(*Harry Potter*)

(v) $[\lambda f_{\langle e,t \rangle} : [\lambda y_e :$ **IF** f(y) = T **THEN** T **ELSE** F $]]$
$([\lambda z_e :$ **IF** z is yellow **THEN** T **ELSE** F $])$(Sponge Bob)

(3) **An Exercise on Negation**

Let us suppose (wrongly) that the negation marker in English is the word *doesn't*. Thus, a sentence like "Barack doesn't smoke" would have the structure below.

a.



b. **Question 1**
If this is the correct syntax (and it's pretty close), what is the semantic type of the negation marker *doesn't*?

c. **Question 2**
Given your answer to Question 1, please devise a lexical entry for *doesn't* which allows us to derive the following (accurate) T-conditional statements.

(i) "Barack doesn't smoke" is T *iff* Barack doesn't smoke.
(ii) "Joe doesn't dance" is T *iff* Joe doesn't dance.

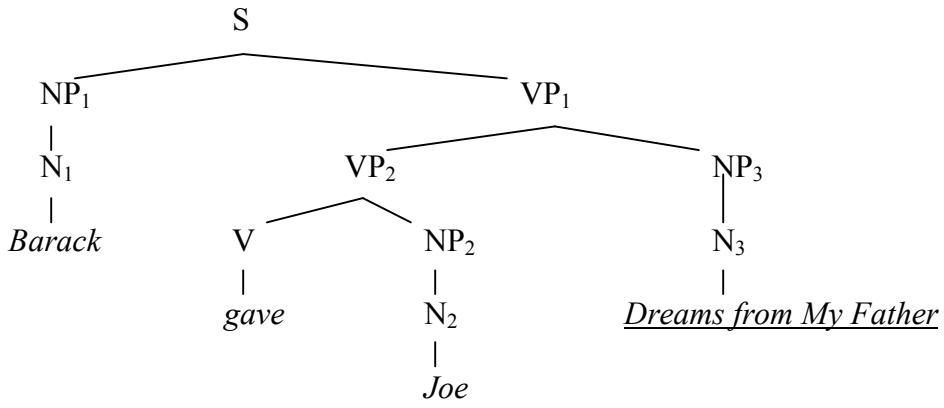
In answering this question, please be sure to do both of the following:
- Provide the lexical entry for *doesn't*
- Provide a proof showing that it derives one of the two T-conditional statements above.

Hint! Consider our treatment of *and* when it conjoins together VPs.
Hint! Consider our treatment of *it is not the case that*.

(4) **An Exercise on Ditransitives**

The semantic system we've developed thus far in class can interpret sentences containing transitive verbs. In this exercise, you'll briefly consider *ditransitive* verbs like *give*, which select for two internal arguments. To begin, let's assume that the sentence "Barack gave Joe *Dreams from My Father*" has the structure below.

a.



b. **Question 1**
If this is the correct syntax, what is the semantic type of *gave*?

c. **Question 2**
Given your answer to Question 1, please devise a lexical entry for *gave* which allows us to derive the following (accurate) T-conditional statements.

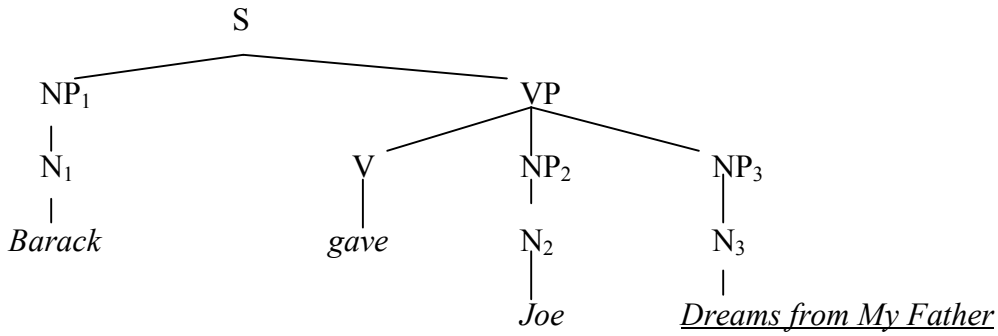
(i) "Barack gave Joe *Dreams from My Father*" is T *iff* Barack gave Joe *Dreams from My Father.*

(ii) "Joe gave Barack *Twilight*" is T *iff* Joe gave Barack *Twilight*.

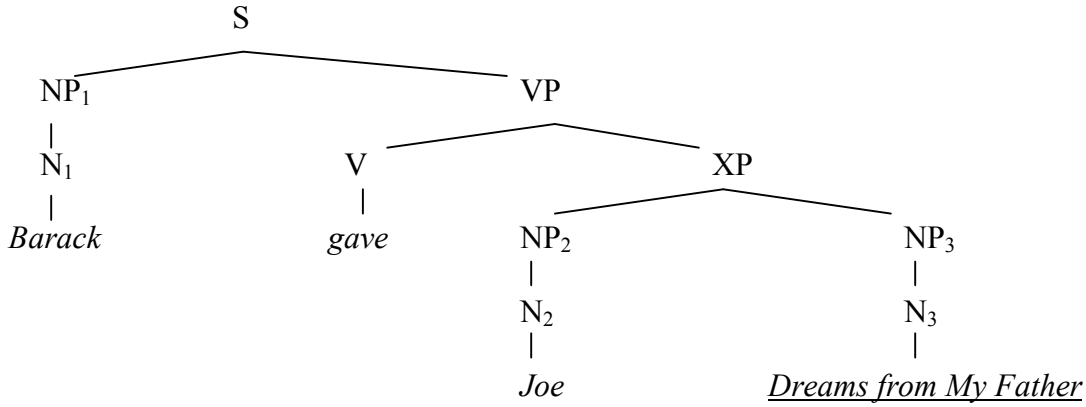
In answering this question, you do **not** have to include proofs of the T-conditional statements above. Simply providing the lexical item for *gave* will be sufficient.

Interestingly, the structure in (4a) has never been seriously proposed by syntacticians as the syntax of ditransitive sentences. Instead, for many decades the structure in (4d) below was the prevailing theory, while more recently (4e) has been found to be more accurate.

d. *Classic, Ternary-Branching Structure for Ditransitives* (ca. 1970s)



e. *More Realistic, Binary-Branching (Shell) Structure for Ditransitives* (ca. 1990s)



f. **Question 3**
Is there any lexical entry which could be assigned to *gave* which would allow our system to interpret the structures in (4d) or (4e)? Why or why not?

g. **Question 4**
In light of your answer to Question 3, please evaluate the following claim. Is it correct? Why or why not?

> *Semantic theory and syntactic theory can be done independent of one another. Semantic assumptions don't greatly impact syntactic ones, and vice versa. Thus, a semantic theorist needn't worry too much about what syntacticians think, and vice versa.*

h. **Question 5**
If you answer to Question 3 was 'no', please provide a *new* rule, one that would – in combination with the lexical entry you provided for Question 2 – allow one of the structures in (4d) or (4e) to be interpreted. (*Note: simply stating the rule is sufficient for this problem.*)

(5) **An Exercise on VSO Languages**

The system we've developed in class works very well for languages where the basic word-order in transitive sentences is either S(ubject)-V(erb)-O(bject) or S-O-V. However, in some languages, transitive sentences exhibit a different basic word-order. In the language Gitksan (Tsimshianic; British Columbia), the required word-order in a transitive sentence is V-S-O.

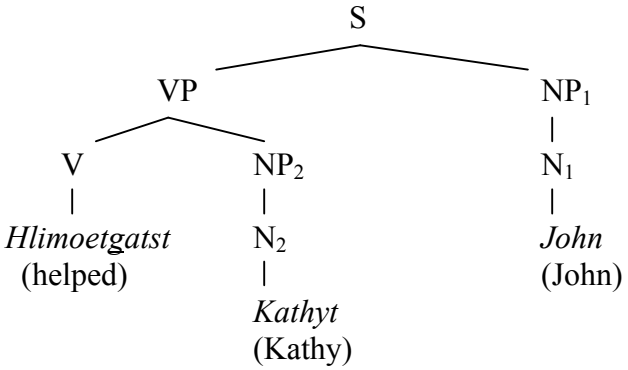
a. Word Order in Gitksan Transitive Sentence

hlimoetgatst	Kathyt	John
helped	Kathy	John

Kathy helped John.

To begin, let us assume that the syntactic structure of (5a) is as in (5b) below.

b.



c. **Question 1**
Assuming that this is the correct syntax, please devise a lexical entry for *hlimoetgatst* 'helped' which allows us to derive the following (accurate) T-conditional statement.

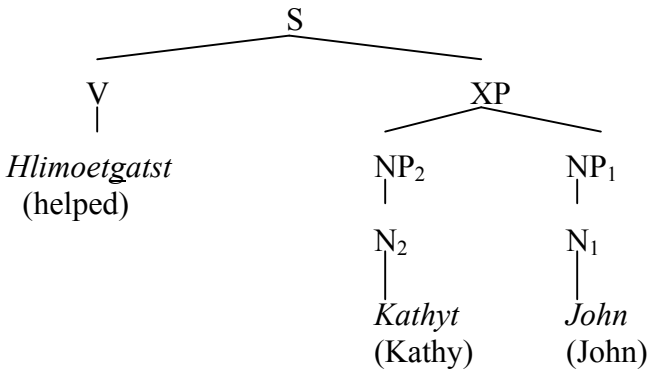
(i) "Hlimoetgatst Kathyt John" is T *iff* Kathy helped John

In answering this question, you do **not** have to include a proof of the T-conditional statement above. Simply providing the lexical item for *hlimoetgatst* will be sufficient.

d. **Question 2**
In what way, if any, does your lexical entry for *hlimoetgatst* differ from the entry one would write for the English verb *help*? How would these differences impact the claim that English *help* is a 'translation' of the Gitksan verb *hlimoetgatst*?

Interestingly, the structure in (5b) is not generally thought to be the correct syntax for the VSO sentences of Gitksan (or any VSO language, really). Instead, the available evidence suggests that the structure in (5e) below is more accurate.

e.



f. **Question 3**
Is there any lexical entry which could be assigned to *hlimoetgatst* which would allow our system to interpret the structure in (5e)? Why or why not?

g. **Question 4**
In light of your answer to Question 3, please evaluate the following claim. Is it correct? Why or why not?

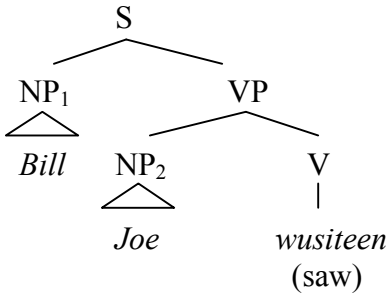
> *Semantic theory and syntactic theory can be done independent of one another. Semantic assumptions don't greatly impact syntactic ones, and vice versa. Thus, a semantic theorist needn't worry too much about what syntacticians think, and vice versa.*

h. **Question 5**
If you answer to Question 3 was 'no', please provide a *new* rule, one that would – in combination with the lexical entry you provided for Question 1 – allow the structure in (5e) to be interpreted. (*Note: simply stating the rule is sufficient for this problem.*)

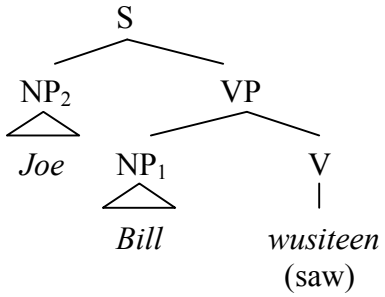
(6) **An Exercise on Free Word Order Languages**

Tlingit (Na-Dene; Alaska) is a free word-order language. That is, any permutation of Subject, Object and Verb in a transitive sentence is well-formed in the language. Consequently, all the structures below can be understood to be true *iff* Bill saw Joe.

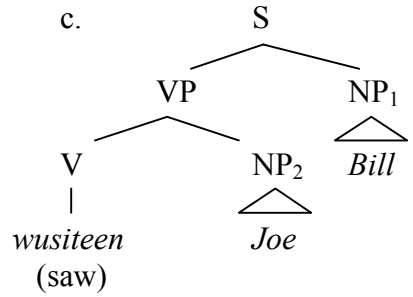
a.



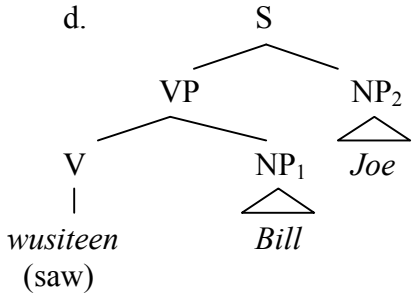
b.



c.



d.



e. **Question 1**
Is it possible to give a single lexical entry for the verb *wusiteen* 'saw' so that our semantic system can derive that each of the structures above is T *iff* Bill saw Joe? Why or why not?

Some folks have hypothesized that each of the structures above is derived from a single, underlying SOV word order. That is, the formation of a transitive sentence in Tlingit always begins with the sentence having the structure in (6a) above.

f. **Question 2**
Now assume that the structures in (6b-d) are derived from the structure in (6a). Does this affect your answer to Question 1? That is, does it now become possible (or impossible) to give a single lexical entry for *wusiteen* that will allow us to correctly predict the T-conditions of (6a-d)?

g. **Question 3**
In light of your answers to Questions 1 and 2, please evaluate the following claim.

> *For truly free word-order languages, the simplest theory would be one where all the word-orders are basic, where* ***no*** *word-order is derived from any other. The only reason why linguists postulate an underlying word-order for languages like Tlingit is that their syntactic theory requires them to. Aside from one's syntactic biases, there's no motivation for assuming that only one word-order in the language is basic.*