24.903
Language & Structure III: Semantics and Pragmatics
Spring 2003, 2-151, MW 1-2.30
April 23, 2003
Assignment 9, due in class on April 30

1. Consider the following pairs of sentences:

(1) a. i. Two students got As.
ii. No more than two students got As.
b. i. Not many students got As.
ii. At least one student got an A.
c. i. Few students got As.
ii. At least one student got an A.
d. i. Many students got As.
ii. Not all students got As.
e. i. Every man in this room is asleep.
ii. There is at least one man in this room.

For each pair, discuss whether the first sentence **entails** the second sentence, or **implicates** the (b) sentences, or maybe neither of the above. Give reasons for your decision, bearing in mind that implicatures have to be cancellable and calculable.

2. Determine whether the following quantifiers are conservative. If they are conservative, prove that they are conservative (i.e. show that $Q(A)(B) \iff Q(A)(A \cap B)$), and if they are not conservative, provide a counterexample.

(2) a. *most*
b. *only*
c. *few*
d. Q_1, where $Q_1(A)(B)$ =1 iff $|B - A| > |A - B|$.
e. Q_2, where $Q_2(A)(B)$ =1 iff $(B - A) \cup (A - B) = \phi$.

3. When one utters *Rick is a philosopher or he is a poet or he is a musician*, it is normally understood that Rick has exactly one of these occupations, although we also know that someone might be at the same time a philosopher, a poet and a musician. We explore how this observation could be derived.

(a) Option 1: Postulation of an exclusive *or*:
Show that assuming that there is an exclusive *or* (with the semantics of $\otimes$) makes the wrong predictions.

(b) Option 2: Inclusive *or* with global computation of implicatures:
Suppose now that *or* is unambiguous, and always has the meaning of inclusive disjunction ($\vee$).

Let us use the following abbreviations:
A = *Rick is a philosopher*
B = *he is a poet*
C = *he is a musician*

Discuss the predictions of a theory based on scalar implicatures for the following sub-hypotheses:

(i) The scalar alternative of $A \vee B \vee C$ is $A \wedge B \wedge C$.
(ii) The scalar alternative of $A \vee B \vee C$ is $(A \vee B) \wedge C$.
(iii) The scalar alternative of $A \vee B \vee C$ is $(A \wedge B) \vee C$.

(c) Option 3: Inclusive *or* with local computation of implicatures:

Let us now depart from the standard assumption that implicatures are computed by comparing entire sentences to other sentences that could have been uttered instead. Rather, we will assume that implicatures are computed locally in each subtree, in the following way:

(i) Atomic formulas don't have implicatures.

(ii) For any formulas p and q (whether atomic or not),
- the implicature of $p \wedge q$ is the conjunction of the implicatures of p and the implicatures of q.
- the implicature of $p \vee q$ is the conjunction of $\neg(p \wedge q)$, the implicatures of p and the implicatures of q.

Example: the implicature of $((A \vee B) \wedge C)$ is the conjunction of the implicature of $(A \vee B)$ and of the implicature of C [by (ii)].
C has no implicature [by (i)].
The implicature of $(A \vee B)$ is $\neg(A \wedge B)$ [by (ii) and (i)].
In sum, the implicature of $((A \vee B) \wedge C)$ is: $\neg(A \wedge B)$.
This appears to be correct. If I say *(Rick is a philosopher or he is a poet) and he is a musician*, it will typically be understood that Rick isn't both a philosopher and a poet.

Show that this procedure also derives the correct result for $((A \vee B) \vee C)$.

(d) **Optional**: Prove that the result can be generalized i.e. show that for any natural number $n \geq 2$, this procedure predicts that $A_1 \vee A_2 \vee \ldots \vee A_n$ implicates that at most one of $A_1, \ldots, A_n$ is true. Since $A_1 \vee A_2 \vee \ldots \vee A_n$ also asserts that at least one of $A_1, \ldots, A_n$ is true, the assertion together with the implicature will yield the result that exactly one of $A_1, \ldots, A_n$ is true.