

Lgcs 106, Semantics. Lecture Notes. 26 Jan 2010.

1. Recap. Our goal in this class is a theory of **semantic competence**, that is, a theory that explains and predicts native speakers' **intuitions** about meaning.

Last class, we started to look at native speakers' intuitions about meaning by observing, among other things, two types of inferences: *entailment* and *implicature*.

1.1 Entailment

"A entails B" means roughly:

- in a situation in which A is true, B is also true;
- the information that B conveys is contained in the information A conveys.

Examples:

- (1) a. Missy is a little dog. b. Missy is a dog.
- (2) a. Every student in this class passed the exam.
b. Most students in this class passed the exam.
c. Some students in this class passed the exam.
- (3) a. You answered four questions correctly.
b. You answered three questions correctly.
c. You answered two questions correctly.

Entailments are **not defeasible** (or **cancellable**). Thus, overtly denying an entailment produces a contradictory statement:

- (4) Missy is a little dog, but Missy is not a dog.
- (5) Every student passed the exam, but it's not the case that most students passed the exam.

'Positive' sentences are **upward entailing**: we get inferences from sets to supersets, from specific to general.

'Negative' sentences are **downward entailing**: we get inferences from sets to subsets, from general to specific. We observed four downward entailing environments: negated sentences, *if*-clauses, *every*-relatives, and *any*-relatives. These environments are just those that permit Negative Polarity Items such as *ever*.

1.2 Implicature (Grice 1975)

Not all inferences are instances of entailment:

- (6) a. Most students passed the exam.
b. Not every student passed the exam.
- (7) a. There were some casualties.
b. There were not many casualties.
- (8) a. You answered four questions correctly.
b. You answered no more than four questions correctly.

"Implicatures are inferences based on both the content of what has been said and some specific assumptions about the co-operative nature of ordinary verbal interaction." Levinson (1983).

The main idea: Interlocutors (participants in a conversation) expect each other to converse **co-operatively**. Being **co-operative** involves, among other things, making the most informative statement you can. In effect, if a speaker does not make the most informative statement s/he can from a scale of informativeness, s/he implicates that any more informative statement on the scale does not hold. (Thus these implicatures are called **scalar** implicatures.)

In (7), the implicature arises because *every* is more informative than *most*. Thus, when a speaker uses *most*, s/he implicates 'not every'.

Unlike entailments, implicatures are *defeasible*:

- (9) Most students passed the exam, in fact every student did.

Also unlike entailments, they are also *reinforceable* without sounding redundant:

- (10) Most students passed the exam, but not every student did.

Cf: Missy is a little dog, and/but Missy is a dog.

Note that these scalar implicatures disappear in downward entailing environments:

- (11) If you answered four questions correctly, you passed the exam.
- (12) Anyone who answered four questions correctly passed the exam.

2. Logic vs. Natural Language.

What is the meaning of natural language *and*? Consider:

(13) Katie drinks and she smokes.

(14) *and*

A	B	A and B
T	T	
T	F	
F	T	
F	F	

What is the meaning of natural language *or*? Consider:

(15) Kate drinks or she smokes.

Two possible interpretations for *or*:

(16) Inclusive *or* (textbook interpretation)

A	B	A or B
T	T	
T	F	
F	T	
F	F	

(17) Exclusive *or*

A	B	A or B
T	T	F
T	F	T
F	T	T
F	F	F

The textbook interpretation of *or* might be right for the purposes of logic and mathematics, but does it capture the meaning of *or* in natural languages?

Don't we get an exclusive interpretation for (15)?

One way of accounting for the exclusive interpretation of *or* would be to say that in natural language, *or* is exclusive.

There is an alternative explanation, however, which appeals to the theory of implicature. The explanation runs as follows.

Natural language *or* is really interpreted inclusively. Let's represent inclusive *or* as *or_{incl}*. Which is more informative, *and* or *or*? Think about the situations in which *A and B* is true, vs. those in which *A or_{incl} B* is true.

In positive (i.e. 'upward entailing') contexts, *and* and *or_{incl}* form a strength scale: $\langle \textit{and}, \textit{or}_{\textit{incl}} \rangle$. Assuming that I am being co-operative, by the maxim of quantity, if I use *or_{incl}*, I implicate 'not and', since *and* is stronger than *or_{incl}*. Thus, the exclusive interpretation or *or_{incl}* is derived as an implicature:

- (18) a. Katie drinks or smokes.
- b. $\sim \rightarrow$ Katie doesn't drink and smoke.

Two components come together:

- (a) Semantic meaning: Katie drinks or she smokes (possibly both)
- (b) Implicature: Katie doesn't drink and smoke

If (b) is truly an implicature, we expect it to be both defeasible and reinforceable. The following examples show that the implicature is indeed defeasible and reinforceable, respectively:

- (19) a. Katie drinks or smokes, possibly both.
- b. Katie drinks or smokes, but not both.

There is supporting evidence for this implicature analysis of *or*: In certain linguistic environments ('downward entailing environments' such as negation and *if*-clauses), you only get the inclusive reading of *or*.

To see this, it is useful to first work out the truth tables for *and* and *or* under negation. The following truth tables show that under negation, inclusive *or* is stronger than *and*; you can see this from the truth table, which shows that whenever *not(A or_{incl} B)* is true, *not(A and B)* will also be true.

(20) *and*

A	B	A and B	not (A and B)
T	T	T	F
T	F	F	T
F	T	F	T
F	F	F	T

(21) Inclusive *or*

A	B	A or B	not (A and B)
T	T	T	F
T	F	T	F
F	T	T	F
F	F	F	T

(22) Exclusive *or*

A	B	A or B	not (A or B)
T	T	F	T
T	F	T	F
F	T	T	F
F	F	F	T

Predictions:

In downward entailing contexts such as negation, or_{incl} should be stronger than *and*. As a result, the implicature of an exclusive reading should disappear, and or_{incl} should be interpreted inclusively.

In contrast, or_{excl} should be interpreted exclusively in every environment, including downward entailing environments.

What are our intuitions for the natural language examples?

Consider, for example:

(23) Katie doesn't drink or smoke.

The question is whether this sentence is judged **true** in a situation in which Katie both drinks and smokes.

If *or* is interpreted inclusively, we expect it to be false in such a scenario.

If *or* is interpreted exclusively, we expect it to be true in such a scenario.

The standard line is that (23) is in fact judged false given such a scenario; thus, we have support for adopting the inclusive analysis of *or*.

Same goes for other contexts which reverse strength scales:

(24) If Katie drinks or smokes, she will be disqualified.

(25) Anyone who drinks or smokes will be disqualified.

(26) Everyone who drinks or smokes will be disqualified.

If *or* is interpreted inclusively here, then Katie should be disqualified in three cases: if she smokes, if she drinks, or if she does both. And this does seem to square with our intuitions about this example.