Problem Set 8

Due October 30 before class. Submit PDF on Luminus > Files > Student Submission > PS8.

Some extra background, touched on only briefly in class:

Scalar implicatures refer to conversational implicatures which naturally arise when we use expressions that can be thought of as naturally being on a scale. An example is illustrated in (1).

(1) I have two kids.
scalar implicature: the speaker does not have three or more kids

We have the intuition that the scalar implicature in (1) came about because the sentence uses the word *two* and that *two* is a member on a natural scale: the scale of numbers (2). Substituting out *two* in (1) for other members on the scale in (2), we yield a natural set of alternative sentences as in (3). Notice that the alternatives in (3) are ordered by entailment: (a) $\Leftarrow$ (b) $\Leftarrow$ (c) $\Leftarrow$ ... (Recall that numerals have "at least *n*" interpretation, not "exactly *n*" interpretation.)

(2) $\{$ one, two, three, ... $\}$

(3) a. I have one kid
b. I have two kids
c. I have three kids
d. ...

The Gricean approach make very clear predictions about how to reason over these alternative sentences. The speaker could have just as easily said one of the other sentences in (3); why didn't they? If the speaker has three kids, they should have said (3c) instead of (3b): they would both be true, but (c) is more informative, so saying (b) and having three kids would violate Quantity. Therefore, we reason that the speaker doesn't have three or more children.

More generally, for alternative sentences derived from a scale, if (b) asymmetrically entails (a), saying "(a)" introduces a scalar implicature that (b) is false. Horn (1972) introduced the idea that certain scales naturally trigger this logic, and we now call these scales "Horn scales." The scale of numbers in (2) is an example of a Horn scale.

Another example of a Horn scale is {or, and}. For example, *Wanyan was drinking coffee or tea* raises a scalar implicature that Wanyan wasn't drinking coffee *and* tea. We can calculate this implicature in the same way: replacing *or* with *and* since they're on a scale together, ordering by entailment, and calculating the implicature that more informative alternatives are false. There are other Horn scales as well, which is part of what this problem set is about.

1. **Calculating scalar implicatures:**

   The following examples raise scalar implicatures. For each example, identify the relevant Horn scale, give the relevant alternative sentences, and calculate the scalar implicature.

   (4) Nick is often on time.

   (5) Evan should drive.

   (6) Everyone read two books.

2. **The meanings of vague quantifiers:**

   We're having a party, so Alex baked a huge cake.

   (a) After the party, Alex says the following:

   (7) The guests ate {none, some, very little, much, most, all} of the cake.

   For each variation of this sentences, give a range for the amount of cake (as a percentage) that you think the guests ate. (Use your own intuition here, or ask your friends! The answers for some of these quantifiers will inherently be a bit fuzzy.)

   (b) Now suppose that, before the party, Alex said the following:

   (8) If the guests eat {none, some, very little, much, most, all} of the cakes, I will be happy.

   For each variant, give a range for the amount of cake that, if eaten, Alex will be happy.

   (c) We can think of differences in the interpretation of quantifiers between (7) and (8) as due to the fact that scalar implicatures are calculated for the quantifier in (7), but not in the downward-entailing environment in (8).

   Give the relevant Horn scale that includes *some* to explain the differences in interpretations between (7) and (8).

References

Horn, Laurence Robert. 1972. On the semantic properies of logical operators in English. Doctoral Dissertation, University of California at Los Angeles.