Maxims of Language Use

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1 Recap

- last time, we investigated an algorithm that attempts to formalize Gricean reasoning
- fully pragmatic, involving reasoning about the belief states of the speaker

1. John ate some of the cookies
   Implicature: John didn’t eat all of the cookies

Reasoning Based on Basic Maxim of Quantity (B-MQ): The speaker should assert the most informative proposition that is relevant.

- but we saw that B-MQ cannot produce the required implicature
- under very minimal assumptions about relevance (closure under negation, conjunction), if all is relevant (given the assertion in (1)), so is some but not all
- the best you can do with this kind of reasoning, under the formal reasoning presented in Gamut [8], then, is ignorance inferences (that the speaker does not know whether or not John ate all of the cookies)
- this symmetry problem seems to argue fairly directly for the need for formally defined alternatives
- two approaches: Horn scales (eg. Horn [12]), and Katzir’s [14]) procedure based on syntactic complexity
• Katzir’s provides an intensional characterization of alternatives, but more importantly, we saw empirical arguments in its favour (e.g. behaviour in DE environments)

• so, we need a specification that all is an alternative for implicature, and some but not all is not

• revised maxim

**Neo-Gricean Maxim of Quantity, NG-MQ** The speaker should assert the most informative, relevant proposition from the set of formally defined alternatives.

• Fox [4]: NG-MQ is not very natural for a pragmatic maxim

• why should it be sensitive to an arbitrary formal property (the alternatives)?

• unless it can be shown that such a restriction might plausibly follow from principles of rational, cooperative information exchange, better to leave such stipulations where they belong, in the grammar, and where we already have evidence for the need for such restrictions anyway

2. Only JOHN came to the party

• what does this mean?

• assume that only the members of John’s cohort are relevant

• $F = \{x \text{ came to the party: } x \text{ an individual}\}$ (Rooth [16])

• $R = \{x \text{ came to the party: } x \text{ a member of John’s cohort}\}$

• thus, $F \cap R = R$

• what does only($\phi$) mean?

• it says that $\phi$ is true, and some set of alternatives are false

\[^1\text{Though } R \text{ could be a much bigger set, with all kinds of propositions in there.}\]
• which ones? not matter for now – the point is that the role of only is to eliminate alternatives, and it does so based on some combination of formal alternatives and contextual relevance

• Fox: well, it turns out that there is a very general way to state the implicatures of any sentence with the use of only

**Only Implicature Generalization (OIG)** One can reliably state the implicature of a sentence, \( S \), by asserting \( only(S) \), with pitch accent on the relevant scalar items

3. Only SOME of the boys came to the party

4. John only has THREE children

5. Only (John OR Mary) came to the party

• when we compute the meaning of only sentences, the only role for context is to restrict the set of alternatives that only works with

• a more accurate Logical Form for such sentences is: \( only(A)(\phi) \), where \( A \) is determined by \( F \) and \( R \)

• note, crucially, that there is no role for theory of mind type reasoning here other than in the determination of the alternatives

• thus, the grammar itself outputs that not all of the boys came to the party in (3), that John does not have four children in (4), that John and Mary didn’t both come to the party in (5)

• note that these sentences are judged false if all of the boys came to the party, if John has four children, if John and Mary both came to the party

• Fox: scalar implicatures are computed in the exact same way as the meanings of only sentences, except that they are the result of an unpronounced variant of only, exc

• thus, sentences like some of the boys came to the party are ambiguous between a parse with an exc \( (exc(A))(some of the boys came to the party)) \), and a parse without

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• So: Scalar Implicatures are computed within the grammar, and ignorance inferences are the result of pragmatic reasoning (compare with the Gricean framework within which both SIs and I-INF’s are the result of pragmatic reasoning)

Given this setup, Fox argues that we can stick to the far more natural B-MQ (state the strongest, relevant proposition), i.e. that this revised division of labour under which scalar implicatures are computed within the grammar allows for a far simpler theory of pragmatics. In any conversation, there will be some set of relevant alternatives. For example, suppose that some of the boys came to the party is asserted, and that all of them came to the party is relevant. Call this $\forall$. By the closure conditions on relevance, $\neg \forall$ will also be relevant, as will $\exists \land \neg \forall$. If the asserted sentences is parsed without an exh, the literal meaning is just whatever it is (that some, possibly all, of the boys came to the party). Now, as per B-MQ, we will compute ignorance inferences for all relevant propositions whose truth value is not determined by the sentence. In this case, we will infer that the speaker is ignorant about whether or not all of them came. Sometimes, that will be the end of the story (cf. Lauren’s point from two weeks ago). Other times, this will not be plausible, given assumptions about the speaker’s state of mind. Then, we can re-parse the sentence with an $\text{exh, exh}(A)(\text{some})$. In this case, $A = \{\text{some, all}\}$. There is no symmetry. The result, as with $\text{only}(A)(\text{some})$, is that some but not all of the boys came to the party.

More generally, suppose the speaker asserts $\phi$, and $R$ is a set of relevant propositions.

• there will be (in general) $n$ different readings of $\phi$, $S_1(\phi), \ldots, S_n(\phi)$
• any $S_i(\phi)$ will leave a subset $R'$ of propositions in $R$ undecided (in truth-value)
• by B-MQ, we will get ignorance inferences for all the members of $R'$ (these are pragmatic)
• we select whichever reading by some mechanism of disambiguation
2 Empirical Arguments in Favour of the Grammatical Theory

2.1 Free Choice

6. You’re allowed to eat the cake or the ice cream
   Inference: You’re allowed to eat the cake and you’re allowed to eat the ice cream

• has been argued that the above inference is the result of scalar implicature

• however, standard Gricean reasoning (eg. Sauerland [18]) actually contradicts the attested inference

• $\text{ALT}(A \lor B) = \{A \lor B, A, B, A \land B\}$

• $\text{ALT}(\lozenge(A \lor B)) = \{\lozenge(A \lor B), \lozenge A, \lozenge B, \lozenge(A \land B)\}$

• Fox [4]: if implicatures are computed within the grammar by $exh$, we have a parse $exh(\lozenge(A \lor B))$

• since $exh$ is a syntactic device that applies to any sentence, nothing would prevent it from applying recursively, so apply $exh$ again: $exh(exh(\lozenge(A \lor B)))$

• this parse derives free choice

• But wait: doesn’t this mess things up with basic disjunction? i.e. what if we add a second level of exhaustification to $exh(C)(A \lor B)$?

• Fox shows that a second level of exhaustification will not make any difference, i.e. $exh(C')(exh(C)(A \lor B)) = exh(C)(A \lor B)$, so there is

\footnote{Primary Implicatures: The speaker does not believe A, the speaker does not believe B, the speaker does not believe A and B. Secondary Implicatures: The speaker believes that not both A and B.}

\footnote{Primary Implicatures: The speaker does not believe $\lozenge A$, the speaker does not believe $\lozenge B$, the speaker does not believe $\lozenge A \land B$. Here, at the first step of pragmatic reasoning, you’ve already contradicted free choice.}

\footnote{The alternatives for the second level of exhaustification are: $\{exh(C)(\lozenge(A \lor B)), exh(C)(\lozenge A), exh(C)(\lozenge B), exh(C)(\lozenge(A \land B))\}$.}
no way, in basic disjunctions, to avoid the ignorance inference that the speaker doesn’t know which of the disjuncts is true.

2.2 Embedded Implicatures and Hurford’s Constraint

- Chierchia [1] provided compelling evidence that implicatures need to be computed within the grammar by providing examples of implicature computation that apply in arbitrarily embedded positions, below the level of speech act.

7. John ate the apples or some of the bananas

8. John believes that some of his workers hate him

- have been various (neo-)Gricean responses to such facts (eg. Sauerland [18], van Rooij and Schulz [19], Russell [17], Geurts [9]), which makes the task of theory comparison feasible.

- however, perspicuously absent from such responses is any attempt to deal with the following complex of facts involving Hurford’s Constraint [13] and its occasional obviation by scalar implicature.

9. (a) #John was born in Paris or in France
(b) # John was born in France or in Paris

10. (a) Either (John or Mary) or (Both John and Mary) will come to the party
# (b) Either (Both John and Mary) or (John or Mary) will come to the party

- see Fox [3, 5], Singh [22, 21], Chierchia, Fox, and Spector [2], Fox and Spector [7] for arguments that these data crucially involve $exh$, and various constraints on $exh$.

2.3 Modularity

- accumulating evidence that the computation of scalar implicatures is sometimes ‘blind’ to common knowledge.

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5More generally, recursive exhaustification will always lead to a fixed point.
under the assumption that sentences will be odd if they give rise to implicatures that contradict common knowledge (Hawkins [10], Heim [11]), the oddness of a large class of sentences can be accounted for if it is assumed that implicatures are computed within the grammar.

11. # John has an even number of children. In fact, he has three. (Fox and Hackl [6], Cheirchia, Fox, and Spector [2])

12. # John is tall after dinner (Magri [15])

13. # A weight of the tent is 4 pounds (Singh [20])

References


