

Implicatures and common knowledge

1. Background: informativeness with respect to shared assumptions

- Common ground (roughly!): set of propositions whose truth is taken for granted as part of the background of the conversation.
- Context set: set of worlds in which all the propositions in the common ground are true (represents the shared beliefs of the participants in the conversation.)
- Adding a proposition p to a common ground c amounts to kicking out of the context set the worlds where p is false.

1) $p + cg = p \cap cs$

- Informativeness:

A proposition p is more informative than a proposition q given a context set c iff
 $(p \cap c) \subset (q \cap c)$

A proposition p is as informative as a proposition q given a context set c iff
 $(p \cap c) = (q \cap c)$

Cases where p logically entails q , but p is not more informative than q given a context set c . For instance:

2) Shared assumption: When John bakes pies, he always bakes 4.

(a) Yesterday, John baked some cakes.

(b) Yesterday, John baked 4 cakes.

$[[b]] \subset [[a]]$, but it is not the case that $([[b]] \cap c) \subset ([[a]] \cap c)$

2. Gricean reasoning and informativeness

- From a Gricean perspective, we would expect the computation of quantity implicatures to be sensitive to contextual information (Heim 1991, Fox, Percus 2006)

Suppose that

1. The speaker said p.
2. There is a proposition q which (i) is a scalar alternative of p (ii) is relevant to the topic of the conversation (iii) asymmetrically entails p and (iv) is not more informative than p given the context set.

Then:

3. If the hearer reasons based on the Maxim of Quantity, she shouldn't conclude that the speaker is convinced that not q. Given the set of assumptions that hearer and speaker share uttering q wouldn't have been more informative than uttering p.
- Magri 2006: we find cases where 1 and 2 obtain, and where we nevertheless derive the implicature that q is false.

[Given that p and q are equivalent with respect to our shared assumptions, p & ~ q (plain meaning + implicature) is a contradiction with respect to our shared assumptions (i.e., the intersection of the strong meaning of the assertion with the context set is empty).

As a result, we get oddness (Magri's First Condition for Oddness: a sentence p sounds odd if its strengthened assertion is a contradiction given common knowledge).]

- These cases support the proposal that scalar implicatures are not derived via Gricean reasoning.

3. A couple of examples

Type 1: common knowledge provided by previous discourse.

- 3) John assigned the same grade to all his students... He gave the same grade to some of them. (E. Chemla, p.c. to Schlenker)

[same structure as Danny's prime numbers example]

r = John assigned the same grade to all his students.
 p = John gave the same grade to some of his students.
 q = John gave the same grade to all of his students.

- Assume that before uttering r we have no beliefs about how John's grades are distributed. Then when we update c with r, we get:

Type 1 worlds: John assigned an A to all of his students.
 Type 2 worlds: John assigned a B to all of his students.
 Type 3 worlds: John assigned a C to all of his students.
 Type 4 worlds: John assigned a D to all of his students.
 Type 5 worlds: John assigned an F to all of his students.

- Given this context set, p and q are equally informative ($p \cap c = q \cap c = \text{Type 1 worlds}$).
- Hence, no implicature is expected if implicatures are derived via Gricean reasoning.
- But, in fact, we understand the last sentence in (3) to convey that John gave the same grade to some but not all of his students ($p \& \sim q$).

[Hence, the discourse in (3) expresses a contradiction with respect to our context set.]

Type 2: “true common knowledge”*A variation on Hawkins 1991*

- 4) ? Some parents of the victim got married in the Spring of 1972.
- 5) The parents of the victim got married in the Spring of 1972.
- Intuition: (4) suggests that the victim has more than two parents. This conflicts with common knowledge.
 - Proposal: (building on Hawkins 1991): (4) implicates that (5) is false. Implicature + assertion contradict common knowledge and, as a result, (4) is odd.

(i) (5) asymmetrically entails (4).

(4) **[[Some parents of the victim got married]]** =
 $\lambda w. \exists x$ [parents-of-the-victim' (x)(w) & got married' (x)(w)]

(5) **[[The parents of the victim got married]]** =
 $\lambda w. \text{got married}'(\sigma^*x \text{ parents-of-the-victim}' (x)(w))(w)$

In all the worlds where the group of parents of the victim got married, there is an individual that satisfies the property **[[parents of the victim]]** and that got married.

In a world where the victim had three parents and two of them got married, (4) is true and (5) is false.

(ii) Given common knowledge, (4) and (5) are equally informative.

In all of the worlds of our context set, the victim has two parents. In all of those worlds, (4) is true iff (5) is true.

(iii) Given (ii) no implicature is expected on the Gricean view.

(iv) Claim: However, (4) implicates that (5) is false.

[Assumption: **the** and **some** are scale-mates.]

Strong meaning of (4): There are some parents of the victim that got married in the Spring of 1972, and it is not true that the maximal individual that satisfies the property **[[parents of the victim]]** got married

in the Spring of 1972.

- [(iv) Hence, the strengthened meaning of (4) is a contradiction with respect to our context set. This explains why (4) sounds odd.]

Hawkins 1991 cases

- 6) ? John has interviewed a father of the victim.
- Intuition: (9) is odd because it suggests that the victim had more than one father.
 - First shot: the indefinite article triggers an antiuniqueness presupposition.
- No:
- 7) Robert caught a 20 ft. long catfish (Heim 1991)
- 8) Every candidate should send a paper of his (Sauerland 2003)
- Hawkins derives the effect as a scalar implicature: (9) implicates that (12) is false.
- 9) John has interviewed the father of the victim.
- Implementing Hawkins' proposal:
 - (i) Sentences containing presuppositional items are partial function from worlds into $\{0,1\}$ (cf. Heim and Kratzer)
- 9) **[[John has interviewed the father of the victim]]**
- $\lambda w: \exists!x$ (father-of-the-victim (x) (w). interviewed' (j)(λx (father-of-the-victim (x)(w))(w))
- 12) **[[John has interviewed a father of the victim]] =**
- $\lambda w. \exists x$ (father of the victim'(x)(w) & interviewed' (j)(x)(w))
- (ii) the presupposition of (9) asymmetrically entails the presupposition of (12).
 - (iii) the assertion of (9) asymmetrically entails the assertion of (12)
 - (iv) the assertion of (9) is as informative as the assertion of (12) given our shared assumptions (i.e., that people only have one father).

- (v) Assumption: Hawkins 1991, **a** and **the** are scale mates. [Cf. Gazdar 1977: scalar alternatives must share selectional restrictions and item-induced presuppositions.]
- (vi) From here, we can derive antiuniqueness by (a) strengthening the presupposition and (b) strengthening the assertion.

Strengthening the presupposition:

Ps(9) = {w: there is a unique father of the victim in w}
 Ps (12) = W

Strengthening ps (9) = W - {w: there is a unique father of the victim in w}

[[**John has interviewed a father of the victim**]] will be defined only in worlds where the victim doesn't have a unique father (a contradiction given common knowledge).

[Note: an additional source of oddness? In some of the worlds in the domain, the victim will have no father.]

Strengthening the assertion:

Assertion of (9) = {w: there is an x such that x is the father of the victim and John interviewed x}

Assertion of (12) = {w: the victim has a unique father y in w and John interviewed y in w}

Assertion of [[**John has interviewed a father of the victim**]] = {w: there is an x such that x is the father of the victim and John interviewed x} - {w: the victim has a unique father y in w and John interviewed y in w} =

{w: there is not a unique father of the victim in w and there is a father of the victim that John interviewed in w} [contradiction given common knowledge]

- We have already seen that the Gricean set up predicts that no implicature should be derived in cases like the above.
- What about strengthening the presupposition? Percus (2006), Sauerland (2006): strengthening the presupposition is incompatible with Gricean reasoning. But see Schlenker (2006).

4. The mystery of resistant implicatures.

- Magri's generalization: a sentence sounds odd if its strengthened meaning (plain meaning + implicature) is a contradiction given common knowledge.
- This seems right. Furthermore, we don't seem to be able to recover from this effect.
- But why should this be? In principle, we might expect the weak meaning to be accessible. Why can't we 'reanalyze' the odd examples above? [Cf. cases of implicature cancellation.]
- A related, but different puzzle: mismatching alternatives arise also when not relevant.
- Magri suggests that mismatching alternatives are not optional (see section 1.5.2. for discussion, implementation and problems).
- Consequences for theories of NP licensing:

In order to account for the distribution of NPIs, Krifka (1995) proposes that NPIs are ruled out in contexts where the implicatures they trigger contradict the assertion (see also Lahiri 1998).

10) Mary saw anything.

- (a) Implicates that Mary didn't see anything.
- (b) Asserts that Mary saw something.

Common criticism: implicatures that contradict the assertion should be cancelled. As Chierchia puts it: "implicatures that clash with the assertion do not generally yield ungrammaticality; they are simply removed (exploiting clashes of this sort is, in fact, *the* way implicatures are typically cancelled)." (Chierchia 2005: 22).

In light of the facts we have been looking at, this line of reasoning sounds much more plausible...