More on implicatures

0.   Agenda

*   Finish presentation of Sauerland's proposal.

*   Problem: embedded implicatures.

*   A way to go: silent exhaustivity operators. Fox's proposal.

1.   Sauerland 2004a

The plot

*   The neo-Gricean account of scalar implicatures:

1)   If a speaker utters a statement S that contains a scalar item, then, for all S' that (i) <u>belong to the set of scalar alternatives of S</u> and (ii) are relevant to the topic of conversation and (iii) are more informative than S, the hearer can conclude that the speaker does not have evidence that S' is true.

2)   Given the assumption that the speaker is opinionated with respect to the truth value of the scalar alternatives of S, the hearer can conclude further that the speaker believes that all the scalar alternatives S' that are both relevant to the topic of conversation and more informative than S are false.

*   Sauerland (2004) makes explicit a procedure for deriving scalar implicatures for sentences   that   contain   more   than   one   scalar   item.

*   <u>Disjunction</u> presents problems for this account. Sauerland aims to overcome these problems by

   (i)   enriching the set of alternatives for disjunction.

   (ii)   proposing that the hearer assumes that the speaker is opinionated only in cases where that assumption does not lead to the conclusion that the speaker has contradictory beliefs.

Computing scalar implicatures: first shot

- <u>Getting scalar alternatives.</u>

3) A sentence ψ is a one-step scalar alternative of φ if the following two conditions hold:

   a. φ is not equal to ψ
   b. there are scalar expressions α and α' which both occur on the same scale C such that ψ is the result of replacing one occurrence of α in φ with α'.

4) A sentence ψ is a scalar alternative of φ if there is a sequence $(\varphi_0, \ldots, \varphi_n)$ with n ≥ 0 and $\varphi_0 = \varphi$ and $\varphi_n = \psi$ such that, for all i with $1 \leq i \leq n$, φ i is a one-step scalar alternative of $\varphi i - 1$.

5) Prediction: Crossing scales.

   Let X be an element of quantitative scale Q_X and Y an element of the quantitative scale Q_Y. Let ψ (X, Y) be a sentence that contains both X and Y. The set of scalar alternatives of ψ (X, Y) will be

6) $\{ \varphi (X', Y') = X'$ is an element of Q_X and Y' is an element of $Q_Y\}$

- <u>Computing scalar implicatures</u>

7) $\neg\psi'$ is an scalar implicature of ψ if the following three hold:

   a. ψ' is a scalar alternative of ψ
   b. ψ' entails ψ
   c. ψ' does not entail ψ

 [Note: (i) no reference to relevance; (ii) no reference to epistemic state of speaker]

- <u>Examples</u>

8) It is not the case that Paul ate all of the eggs.

scalar item

   Scale = {some, all}
   Scalar alternatives = {It is not the case that Paul ate some of the eggs}
   Implicature = Paul ate some of the eggs.

9)   It is not the case that every child knows every adult.

                        scalar item   scalar item
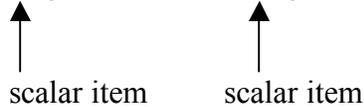
Scale =   {some, all}

Scalar alternatives = {It is not the case that some child knows some adult, it is not the case that some child knows every adult, It is not the case that every child knows some adult}

Scalar implicatures:

(i)   Every child knows some adult
(ii)   Some child knows every adult
(iii)   Some child knows some adult   (follows from (i))

The challenge of disjunction

•   <u>Problem 1:</u> we can't derive the <u>ignorance inferences</u> in 11).

10)   Mary went to UMass or to UConn.

11)   (a)   The speaker doesn't know whether Mary went to UMass.

       (b)   The speaker doesn't know whether Mary went to UConn.

•   <u>Problem 2</u>: scalar items in the scope of disjunction[1].

12)   Mary read *War and Peace*, or *Love in the Times of Cholera*, or *Hopscotch*.

W ∨ (L ∨ H)

We want: Mary read exactly one of the three books. That is,

∼ (W & L) & ∼ (W & H) & ∼ (L & H)

---

[1] The puzzle posed by a disjunction in the scope of disjunction was hinted at by McCawley (1993) in an exercise (p. 324) and later discussed by Lee (1995, 1996) and Simons (1998). The problem in its full generality was discussed by Schwarz (2000) and Chierchia (2002).

Let's see what we predict:

Scalar alternatives: {W ∨ (L & H), W & (L ∨ H), W & (L & H)}

Implicatures:

13)   (a)   ~ (W & (L & H))

      (b)   ~ (W & (L ∨ H))

      (c)   ~ (W ∨ (L & H))

(15a): it is not true that Mary read the three books.

(15b): it is not true that Mary read W & H and it is not true that Mary read W & L. ☺

      1.   ~ (W & (L ∨ H))
      2.   Show: ~ (W & H)
      3.   Assume: W & H
      4.   Show: contradiction
      5.   ~ W ∨ ~ (L ∨ H)   from 1
      6.   W   from 3
      7.   ~ (L ∨ H)   from 5
      8.   ~ H   from 7
      9.   H   from 3
      10. H & ~ H   from 8, 9

      (same for ~ (W & L))

(15c):   It is not true that Mary read L & H   ☺
            It is not true that Mary read W   `   ☹

We need to keep the implicature that Mary didn't read L & H, and get rid of the implicature that Mary didn't read W.

14)   Kai had the broccoli or some of the peas last night.

15)   Alternatives = {Kai had the broccoli or all of the peas, Kai had the broccoli   and some of the peas, Kai had the broccoli and all the peas }

16)   Implicatures

    (a)   It is not true that Kai had the broccoli or all of the peas
    (b)   It is not true that Kai had the broccoli and some of the peas.   ☺
    (c)   It is not true that Kai had the broccoli and all of the peas.

From (18a)

    (a)   It is not true that Kai had all of the peas   ☺
    (b)   It is not true that Kai had the broccoli   ☹

Proposal

Part 1: The scale of disjunction

17)   A & B
        A   B

        A ∨ B

18)   Kai had the broccoli or some of the peas last night.

19)   Alternatives = {Kai had the broccoli or all of the peas, Kai had the broccoli, Kai had some of the peas, Kai had all of the peas Kai had the broccoli and some of the peas, Kai had the broccoli and all the peas}

20)   It is not true that Kai had all of the peas.   ☺

•   Problem 1: we predict that any sentence A will trigger the implicature ~ B for any B such that A doesn't entail B.

Solution: The L and R operators.

•   Problem 2:

21)   (a)   Kai didn't have the broccoli   ☹
    (b)   Kai didn't have some of the peas   ☹

Part 2: **The epistemic status of implicatures**

- The implicatures generated by Gricean reasoning are of the form "the speaker is not convinced that p".

- In order to get implicatures of the form "the speaker is convinced that not p" we need to assume that the speaker is opinionated with respect to the truth-value of the alternatives.

- But sometimes that assumption would lead to the conclusion that the speaker had contradictory beliefs.

22)   A or B

       The speaker doesn't believe that A
       The speaker doesn't believe that B.

       →   The speaker doesn't believe that A or B.

- Proposal: Hearer assumes that the speaker is opinionated only in cases where this assumption doesn't lead to the conclusion that the speaker has contradictory beliefs.

- Implicatures are generated in two steps:

First step: Primary (Gricean) implicatures ("the speaker is not convinced that")

Second step: Secondary implicatures ("the speaker is convinced that not"). This step is only licensed if it doesn't give rise to a contradiction:

23)   If $\sim K \psi$ is a primary implicature of ϕ and $K \sim \psi$ is consistent with the conjunction of ϕ and all primary implicatures of ϕ, then $K\sim\psi$ is a secondary implicature of ϕ.

24) A or B

Primary implicatures:

The speaker is not convinced that A
The speaker is not convinced that B
The speaker is not convinced that A and B.

Secondary implicatures:

The speaker is convinced that A & B.

25) Kai had the broccoli or some of the peas

26) Alternatives = {Kai had the broccoli or all of the peas, Kai had the broccoli   and some of the peas, Kai had the broccoli and all the peas, Kai had the broccoli, Kai had some of the peas, Kai had all of the peas}

27) Primary (Ignorance) implicatures

Speaker is not convinced that

Kai had the broccoli
Kai had some of the peas
Kai had all of the peas
Kai had the broccoli and some of the peas
Kai had the broccoli and all of the peas
Kai had the broccoli or all of the peas.

28) Secondary implicatures.

Speaker is convinced that it is not true that

Kai had the broccoli	blocked	☺
Kai had some of the peas	blocked	☺
Kai had all of the peas	yes	☺
Kai had the broccoli and some of the peas	yes	
Kai had the broccoli and all of the peas	yes, follows from above.	
Kai had the broccoli or all of the peas.	tes, follows from above.	

So we get:

29) Speaker is not convinced that Kai had the broccoli ☺
   Speaker is not convinced that Kai had some of the peas ☺

30) Speaker is convinced that Kai didn't have all of the peas ☺
   Speaker is convinced that Kai didn't have both the broccoli and ☺
   some of the peas.

2. But… embedded implicatures

- Evidence for locally computed implicatures (examples galore in last class's handout).

31) If John owns three cars, the fourth outside the house must belong to someone else.

32) You should buy the car with four doors rather than the one with two; it's more useful and the price is good.

33) A teacher who is sometimes late is preferable to one who is always late.

(Levinson 2000)

- "There are a number of constructions, dubbed intrusive constructions, where the truth-conditions of the whole expression depend on the implicatures of some of its constituent parts" (Levinson 2000: 214)

- Sauerland's neogricean approach can give us implicatures embedded under disjunction, but it is unclear how it would deal with examples like the above.

**3.	The exhaustivity operator approach** (Fox)

• Fox 2004, 2006: the source of scalar implicatures is a silent operator akin to **only**, (**exh**) which is syntactically projected (see also Chierchia, Groenendijk and Stokhof 1984, Krifka 1995, Landman 1998, van Rooy 2002).

• <u>Very</u> roughly:

34)	John did [some]$_F$ of the homework.

Exh [John did [some]$_F$ of the homework.

John only did [some]$_F$ of the homework.

• Allowing this operator to project at embedded sites will give us embedded implicatures.

• <u>Background: a Rooth-style semantics for overt *only*.</u>

35)	Mary only introduced [Bill]$_F$ to Sue.			(Rooth 1985)

Intuitively:	(i) Mary introduced Bill to Sue
		(ii) Mary didn't introduce anybody else to Sue.

• First shot:

36)	[[**only**]] =	$\lambda C_{<st,t>} \lambda p \lambda w\ (p(w)\ \&\ \forall q\ ((C(q)\ \&\ q(w)) \rightarrow p = q))$

> [i.e, **only** is a function that takes a proposition p (in our example, the proposition that Mary introduced Bill to Sue), and a set of propositional alternatives C (here, the set of propositions of the form 'that Mary introduced x to Sue'), and yields the proposition that is true in a world w iff p is true in w[2] and no other proposition in C is true in w.]

• How do we get the relevant alternatives? (Rooth 1985, 1992)

Let us assume that the structure of 35) is 37) below, where C is an implicit argument of type $<<s,t>,t>$ (see von Fintel 1997).

---

[2] The question of whether p is part of the truth-conditions, or merely presupposed (or implicated) is the subject of much debate. See, e.g., Horn (1992, 1996), and Atlas (1993).

37)

```
          ╱‾‾‾‾╲
   only_C      Mary only introduced [Bill]_F to Sue
```

Following Rooth (1992), we can take C to be a contextually relevant subset of the focus value of the sister of **only** containing at least the denotation of the sister of **only** and one other element.

Informally, we get the focus value of a sentence by making substitutions in the position corresponding to the focused phrase. For instance, in the example above, the focus value of **Mary introduced [Bill_F] to Sue** is the set of propositions of the form 'Mary introduced x to Sue'.

- A concern: [3]

38)   Mary only introduced [Bill and John]_F to Sue.

According to 36), 38) will be true in a world w iff

(i) Mary introduced Bill and John to Sue in w and
(ii) all the relevant alternatives are false in w.

But if it is true that Mary introduced Bill and John to Sue some of the alternatives must be true as well, namely the ones that are logically entailed by the proposition that Mary introduced Bill and John to Sue (i.e., that Mary introduced Bill to Sue, that Mary introduced John to Sue.)

- Second shot (see von Fintel 1997 for discussion):

39) $[[\textbf{only}]] = \lambda C_{<st,t>} \lambda p \lambda w \ (p(w) \ \& \ \forall q \ (C(q) \ \& \ q(w)) \rightarrow (p \Rightarrow q))$
          $p \Rightarrow q =_{def} \forall w \ (p(w) \rightarrow q(w))$

[i.e., **only** is a function that takes a set of propositions C and a proposition p and yields the proposition that is true in a world w iff p is true in w and no proposition in C is true in w <u>unless it is logically entailed by p</u>[4].]

- This is the denotation that Fox adopts for his silent **only**, **exh**

40) $[[\textbf{exh}]] = \lambda C_{<st,t>} \lambda p \lambda w \ (p(w) \ \& \ \forall q \ (C(q) \ \& \ q(w)) \rightarrow (p \Rightarrow q))$
          $p \Rightarrow q =_{def} \forall w \ (p(w) \rightarrow q(w))$

---

[3] See Rooth 1992, footnote 2.
[4] An alternative would be to assume that the propositions entailed by p do not constitute legitimate alternatives to p (see von Fintel 1997).

- The proposal

41) (a) John did [some]$_F$ of the homework.

    (b) Exh (John did [some]$_F$ of the homework)

    (d) John did some of the homework and John didn't do all of the homework.

- Note parallel with questions/answer pairs (G & S 1984)

42) A: Who came to the party?
    B: James and Pete

    Exhaustivity inference: "and nobody else came"

    "A weakly exhaustive answer provides a complete list, a strongly exhaustive answer contains in addition the closure condition stating 'and that's all, folks.' (G & S 1997: 1110)

- Several alternatives (from Fox 2004, see more discussion on Fox 2006)

(i) New ambiguity hypothesis

    All sentences are systematically ambiguous:

    (a) Exh (John did some of the homework)
    (b) John did some of the homework

    When a sentence is ambiguous, the default interpretation is the strongest alternative ("Chierchia's pragmatic principle")

(ii) Assertions are always understood as answers to questions, and they always come with an exhaustive operator. Implicature cancellation is the result of addressing a different question (Irene, p.c. to Danny)

43) A: How many chairs do you have?

    A': I need four chairs

    B: I have four chairs.

(iii) **Exh** is completely optional. But if absent, we will get conclude that the speaker is ignorant about the stronger alternatives (by regular Gricean reasoning). In many cases this will be implausible, hence, **exh** is preferred (see Fox 2006).

- Fox presents a battery of arguments for his proposal that we will not go into today. But note that we can already see a clear advantage over the neo-Gricean system: it allows us to compute implicatures in <u>embedded positions</u>.

44) If [**Exh** (John owns three cars)], the fourth outside the house must belong to someone else.

- <u>Do we still need the Gricean system?</u>

    Yes. The exhaustivity operator does not deliver ignorance inferences. (In fact, what it gives us is stronger than Sauerland's secondary implicatures.)

- Sauerland, "On embedded implicatures": Differences between embedded and global (only primary?) implicatures.

    Claim: embedded implicatures are optional; primary implicatures cannot be cancelled.

45) Anyone who saw Elvis or Bobby Fisher must be blind. But those who saw both of them must have good eyes.

46) # John saw Fisher or Elvis. He definitely saw Fisher

    (cf. with # The cat is on the mat, but I don't believe it)

47) # They played many of Beethoven's symphonies, and definitely all.

48) They played many of Beeethoven's symphonies and possibly all.

    What about..?

49) John saw Fisher or Elvis. In fact, he saw Fisher.

    In fact seems to be used to express corrections:

50) A: John didn't talk to Mary.

    B: You are wrong. In fact, he did talk to her.

[see paper for other differences]