Basics of conversational implicatures

1. Implication relations

- Implication relations are **inferential relations** between sentences. A implies B means that A suggests/conveys B, or that B can be inferred from an utterance of A.
- Two axes of an implication relation from A to B:
  - **Licenser**. If the implication is licensed by ...
    - ... the informational or truth-conditional content of A, we say that A **entails** B.
    - ... expectations about the reasons people talk and about their typical strategies in using language, we say that A **(conversationally) implicates** B.
  - **Discourse status**
    - **Assertion**: aims to add content to the ongoing discourse, to effect some kind of change in what the conversationalists assume.
    - **Presupposition**: presents its content as already assumed or taken for granted.

2. The Gricean tradition

- Conversational implicatures are consequences of a **cooperative principle** that the discourse participants follow the **conversational maxims**.

– **The Principle of Cooperation** (Grice [1967]1989)
Make your conversational contribution such as is required, at the stage at which it occurs, by the accepted purpose or direction of the talk in which you are engaged.

– **Conversational maxims**

Maxim of Quantity
- Make your contribution as informative as it is required.
- Do not make your contribution more informative than is required.

Maxim of Quality
- Do not say what you believe to be false.
- Do not say that for which you lack adequate evidence.

Maxim of Relevance
- Be relevant.

Maxim of Manner
- Avoid obscurity of expression.
- Avoid ambiguity.
- Be brief.
- Be orderly.

Exercise: Identify the maxims violated in the following conversations.

(1) A: What should I do to get rid of this awful headache, Doctor?
B: Take some medicine.

(2) Andy received his Ph.D. in 1986, B.A. in 1980, and M.A. in 1982.

(3) [While knowing that all the students left] Some of the students left.

- R-based versus Q-based implicatures
  - **R(elevance)-based implicatures** are derived by assuming that the speaker follows the Maxim of Relevance.

    (4) A: Shall we smoke here?
    B: There is a no smoking sign.
    $\rightsquigarrow$ *We shall not smoke here.*

    (5) A: Who stole the cookies?
    B: John looks happy.
    $\rightsquigarrow$ *John stole the cookies.*

  - **Q(uantity)-based implicatures** are derived on the premiss that the speaker is trying to make his utterance sufficiently informative for the current purposes of the exchange. Example:

    (6) Mary used to swim a mile daily.
    $\rightsquigarrow$ *Mary no longer swims a mile daily.*

    The utterance (6) is compatible with both of the following scenarios:

    w_1: Mary used to swim a mile daily, and she still does.
    w_2: Mary used to swim a mile daily, but she no longer does.

    By the Maxim of Quantity, the speaker is expected to be adequately informative on the topic being discussed. In w_1, the speaker can inform the hearer with a stronger claim that Mary swims a mile daily. Uttering (6) suggests that the speaker is not in a position to make this stronger claim, and therefore is in w_2.

- Types of Q-based implicatures:
  - Scalar implicatures

    (7) a. We will invite Andy or Billy. $\rightsquigarrow$ *We won't invite both of them.*
    b. Mary read some of the articles. $\rightsquigarrow$ *Mary didn't read all of the articles.*

  - Exhaustivity effects in question-answering

    (8) A: Who did you see?
    B: Fred. $\rightsquigarrow$ *I saw only Fred.*

  - Conditional perfection

    (9) If Mary gets a grant, she will finish her thesis.
    $\rightsquigarrow$ *If Mary doesn't get a grant, she won't finish her thesis.*

  - Free choice inferences

    (10) You can have an apple or a pear.
    $\rightsquigarrow$ *You can have an apple, and you can have a pear.*

  - Ignorant implicatures

    (11) John went to Beijing or Shanghai.
    $\rightsquigarrow$ *Not that the speaker believes that John went to Beijing, and not that the speaker believes that John didn't go to Beijing.*

    (12) $\textsc{bel}(\mathsf{s}, \phi \vee \psi) \rightsquigarrow \neg\textsc{bel}(\mathsf{s}, \phi) \wedge \neg\textsc{bel}(\mathsf{s}, \neg\phi)$

3. Basic properties of conversational implicatures

- In contrast to entailments, conversational implicatures are *defeasible* (also called *cancellable*), *suspendable*, and *reinforceable*. Compare:
  - Defeasible ("A, and/but not B")
    (13) a. Mary used to swim a mile daily, and she still does.
    b. Lee smokes and drinks, # but/and she doesn't smoke.
  - Suspendible ("A, and I wonder B")
    (14) a. Mary used to swim a mile daily. I wonder if she still does.
    b. Lee smokes and drinks. # I wonder if Andy came.
  - Reinforceable ("A and/but B")
    (15) a. Mary used to swim a mile daily, but she no longer does.
    b. Lee smokes and drinks, # but/and she smokes.

  Exercise: Show that the implication from (a) to (b) is defeasible, suspendible, and reinforceable.

(16) a. Joan likes some of her presents.
b. Joan doesn't like all of her presents.

(17) a. Mary doesn't believe that John will come.
b. Mary believes that John won't come.

4. Scalar implicatures

4.1. Scales, scalar items, and scalar implicatures

- Scales and scalar items:

(18) a. ⟨ or, and ⟩ *Coordinations*
b. ⟨ some, all/every ⟩ *Quantifiers*
c. ⟨ one, two, three, . . . ⟩ *Numerals*
d. ⟨ allowed to, required to ⟩ *Modals*
e. ⟨ good, amazing ⟩ *Gradable adjectives*
f. ⟨ sometimes, often, always ⟩ *Frequency adverbs*

– **Direct scalar implicatures** ($\phi_{weak} \rightsquigarrow \neg\phi_{strong}$)

(19) a. We will invite Andy or Billy. ⇝ but not both.
b. Mary read some of the articles. ⇝ but not all.
c. John read two books. ⇝ and not more.
d. You are allowed to leave. ⇝ but not required to.
e. This novel is good. ⇝ but not amazing.
f. John sometimes arrives at 6am. ⇝ but not always.

– **Indirect scalar implicatures** ($\neg\phi_{strong} \rightsquigarrow \phi_{weak}$)

(20) a. Not all of the students came. ⇝ Some of the students came.
b. You are not required to leave. ⇝ You are allowed to leave.
c. The soup is not hot. ⇝ The soup is warm.

4.2. Ways to derive scalar implicatures

- **The lexical approach**

  The disjunctive *or* is lexically ambiguous between an inclusive reading and an exclusive reading.

p	q	$p \vee_{incl} q$	$p \vee_{excl} q$
1	1	1	0
1	0	1	1
0	1	1	1
0	0	0	0

- **The pragmatic/Gricean approach**

  The disjunctive *or* is unambiguously inclusive. Scalar implicatures are conversational implicatures, derived as follows based on Grice's conversational maxims:

  (21) John invited Andy or Billy.
  (Let ϕ_{or} = "John invited Andy or$_{incl}$ Billy."; ϕ_{and} = "John invited Andy and Billy.")
  a. S(peaker) said: "ϕ_{or}."
  b. Due to the Principle of Cooperation, S must have stated the **strongest** statement that S believes to be **true** and **relevant**.
  c. ϕ_{and} is relevant and is stronger than ϕ_{or}, but S didn't say it.
  d. Hence, it is not the case that [S believes that ϕ_{and} is true]
  [$\neg$BEL(s, ϕ): Weak/Primary implicature]
  e. If S is well-informed, then: S believes that ϕ_{and} is false
  [BEL(s, $\neg\phi$): Strong/Secondary implicature]

- **The grammatical approach** (Fox 2007, Fox & Spector 2009, Chierchia et al. 2012, a.o.)

  Scalar implicatures are derived as logical consequences of applying a covert exhaustification *O*-operator ($\approx$ *only*) to a scalar statement:

  – A scalar item α is associated with a set of scalar alternatives σ-ALT(α). This set grows pointwise. (Sauerland 2004)
  – $[\![O_C(\mathrm{S})]\!]$ is defined only if $C \subseteq$ ALT(S), where C is a contextually determined domain variable and ALT(S) is the set of alternatives of S. (Cf. *Focus Condition* by of Rooth 1992, 1996)[1]
  – The O_C-operator affirms the propositional prejacent and negates the propositions in the domain C that are not entailed by the prejacent. Formally:

  (22) $O_C = \lambda p \lambda w[p(w) = 1 \wedge \forall q \in C[p \not\subseteq q \rightarrow q(w) = 0]]$

  Example:

  (23) John invited Andy or Billy.
  a. LF: O_C [$_S$ John invited Andy or Billy]
  b. $C = \sigma$-ALT(S) = $\{\phi_{or}, \phi_{and}\}$
  c. $O_C(\phi_{or}) = \phi_{or} \wedge \neg\phi_{and}$

[1] In addition to scalar alternatives, there can also be focus (F-)alternatives and domain (D-)alternatives.

4.3. Scalar implicatures in downward-entailing contexts

- Compare the directions of entailments in the following pairs of sentences. *Possibly* preserves the direction of entailments of its complements, while *n't* reverses the direction.

  (24) a. Mary is a semanticist. $\Rightarrow$ Mary is a linguist.
  b. Possibly, Mary is a semanticist. $\Rightarrow$ Possibly, Mary is a linguist.
  c. Mary isn't a semanticist. $\Leftarrow$ Mary isn't a linguist.

- **Monotonicity of propositional operators**

  (25) For a one-place propositional operator π, its monotonicity is defined as follows:
  a. π **upward-entailing** (UE) iff for any two sentences p and q s.t. $p \Rightarrow q$: $\pi(p) \Rightarrow \pi(q)$;
  b. π **downward-entailing** (DE) iff for any two sentences p and q s.t. $p \Rightarrow q$: $\pi(p) \Leftarrow \pi(q)$;
  c. π is **non-monotonic** (NM) iff π is neither UE nor DE.

- Monotonicity of conditionals

  (26) Consequent (UE)
  a. We will hire Andy and Billy. $\Rightarrow$ We will hire Andy.
  b. We will hire Andy and Billy if we are funded. $\Rightarrow$ We will hire Andy if we are funded.

  (27) Antecedent (DE)
  a. Mary is a semanticist. $\Rightarrow$ Mary is a linguist.
  b. We will hire Mary if she is a semanticist. $\Leftarrow$ We will hire Mary if she is a linguist.

  (28) Bi-conditionals (NM)
  a. We will hire Mary iff she is a semanticist. $\not\Rightarrow$ We will hire Mary iff she is a linguist.
  b. We will hire Mary iff she is a semanticist. $\not\Leftarrow$ We will hire Mary iff she is a linguist.

- Scalar implicatures are not evoked in downward-entailing contexts.
  - *Under the semantic scope of negation*. Compare:

    (29) John didn't invite Andy or Billy.
    a. $\times$ Not that [John invited Andy or Billy **but not both**].
    b. $\surd$ Not that [John invited Andy or Billy or both].

    (30) Andy or Billy wasn't invited by John.
  - *In the antecedent of a conditional*. Compare:

    (31) If John read some of the books, he will get full credits.
    a. $\times$ If John read some **but not all** of the books, he will ...
    b. $\surd$ If John read at least some of the books, he will ...

    (32) If John hands in the homework by tomorrow, he will get some of the credits.

- The **scale of strength** is reversed in downward-entailing context. For instance, the exclusive reading of *or* is stronger in positive statements, while the inclusive reading is stronger in negative statements.

  (33) a. $p \vee_{excl} q \Rightarrow p \vee_{incl} q$.
  b. $\neg[p \vee_{incl} q] \Rightarrow \neg[p \vee_{excl} q]$.

- **Maximize Strength Hypothesis**: In a sentence that contains a scalar clause, the strengthening of the scalar clause is licensed only if this strengthening operation does not weaken the meaning of the entire sentence.