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4. Outlook
Consider the sentence ”I assume that there in sunshine in Bielefeld.” What is the scalar implicature ans what is the clausal implicature of that sentence?

- the scalar implicature is: ”I don’t know for sure that there is sunshine in Bielefeld.”
- the clausal implicature is: it is possible that there is sunshine in Bielefeld and it is possible that there isn’t sunshine in Bielefeld.
Homeworks Question 2

Compare the two examples on page 138:

- (132) This soup is warm, in fact hot.
- (133) *This book is short, in fact long.

Why is only the second sentence a contradiction?

Answer: Both are contradictions on the first view. But the first one is only canceling a scalar implicature, while the second one is a real contradiction.
How does the scalar implicature resolve the problem of the ambiguous *exclusive* and *inclusive* reading of "or".

- $\text{|| } "a \text{ or } b" \text{ } ||_{in} = a \lor b = a \lor b \lor (a \land b)$
- $\text{|| } "a \text{ or } b" \text{ } ||_{ex} = a \lor b$

**Answer:** For the sentence "a or b" we got the exclusive reading $a \lor b$ by taking the inclusive reading $a \lor b$ and excluding $a \land b$ because of the scalar implicature, since $a \land b$ is a stronger item on a scale with $a \lor b$. But the implicature can be canceled, and then $a \land b$ is not excluded anymore and the inclusive reading $a \lor b$ is obtained.
What is the *projection problem* of implicatures? And what is Gazdar’s solution? Describe it.

- The projection problem says that the implicatures of complex expressions may not be simply the sum of the implicatures of all parts. Gazdar’s solution is a priority system: e.g. first add the entailment to the context, then the consistent clausal implicatures, then the consistent scalar implicatures.
Homeworks Question 5

In which two basic ways does the theory of implicature promise to simplify semantics?

- The theory helps to avoid the proliferation of hypothetical senses promoted by apparent ambiguities.
- The theory can allow the semantics to maintain relatively simple logical analyses supplemented by implicature.
Homeworks Question 6

What is the *principle of informativeness* and why is it in contrast e.g. to the scalar implicature?

- The principle of informativeness let us read more information than the utterance literally contains, so it increases the space of information. In contrast, the scalar implicature excludes a more specific case and therefore decreases the space of information.
### Quantitative Implicature

1. Make your contribution as informative as required.
2. Don’t make your contribution more informative than required.
Signification subtypes

- total signification
  - said
    - conventionally
      - generalized
    - implicated
      - conversationally
        - particularized

Abbildung: Grice’ suggestion of a partial picture of signification subtypes (Levinson 2000)
Scalar Implicature: Linguistic Scale

Linguistic Scale

Set of linguistic alternates, or contrastive expressions of the same grammatical category, which can be arranged in a linear order by degree of informativeness or semantic strength: \( \langle e_1, e_2, \ldots, e_n \rangle \)

- whereby \( e_i \) is a linguistic expression or scalar predicate
- for a sentential frame \( A \) it holds that \( A(e_i) \) entails \( A(e_j) \) if and only if \( i < j \)

Example:

- \( \langle \text{all}, \text{some} \rangle \) is a semantic scale: \( A(\text{all}) \) entails \( A(\text{some}) \)
- All boys came to the parts \( \Rightarrow \) Some boys came to the party.
Scalar Implicature: Definition

Scalar Implicature

Given any scale of the form $\langle e_1, e_2, \ldots, e_n \rangle$. If the speaker asserts $A(e_i)$ then for all $j < i$ he implicate $\neg A(e_j)$.

Scale $\langle \text{all, some} \rangle$

$A(\text{all}) \Rightarrow A(\text{some})$: 
All boys came to the party. $\Rightarrow$ Some boys came to the party.

$A(\text{some}) \Rightarrow \neg A(\text{all})$: 
"Some boys came to the party” $\Rightarrow$ Not all boys came to the party.
Scalar Implicature: Examples

- \( \langle \text{all, many, some} \rangle \): some \( + \rightarrow \) not many/all; many \( + \rightarrow \) not all
- \( \langle \text{and, or} \rangle \): or \( + \rightarrow \) not and (both)
- \( \langle n, \ldots 3, 2, 1 \rangle \): 2 \( + \rightarrow \) not 3, not 5 \( \ldots \) not \( n \)
- \( \langle \text{excellent, good} \rangle \): good \( + \rightarrow \) not excellent
- \( \langle \text{always, often, sometimes} \rangle \)
- \( \langle \text{succeed \ V\ing, try to \ V, want to \ V} \rangle \)
- \( \langle \text{certain that } p, \text{ probable that } p, \text{ possible that } p \rangle \)
- \( \langle \text{must, should, may} \rangle \)
- \( \langle \text{love, like} \rangle \)
- \( \langle \text{none, not all} \rangle \)
Scalar Implicature: Derivation

How a Scalar Implicature derives

Given a scale $\langle e_1, e_2, ... e_n \rangle$. The speaker $S$ has said $A(e_i)$. If $S$ was in a position to state that a stronger item on the scale holds - i.e. to assert $A(e_j)$ with $j < i$ - then he would violate the first maxim of Quantity if he asserted $A(e_i)$. Since assuming $S$ as cooperating and not violating a maxim, I assume $S$ of not being in the position to state that the stronger item $e_j$ on the scale holds.

Note:

- We defined: $j < i \Rightarrow A(e_i) \rightarrow \neg A(e_j)$
- But more concretely: $j < i \Rightarrow A(e_i) \rightarrow K \neg A(e_j)$ or $\neg KA(e_j)$
- Strong inference: $j < i \Rightarrow A(e_i) \rightarrow K \neg A(e_j)$
- Weak inference: $j < i \Rightarrow A(e_i) \rightarrow \neg KA(e_j)$
Clausal Implicature: Definition

**Clausal Implicature**

If $S$ asserts a complex expression $B(p)$ that contains an embedded sequence $p$, but $B(p)$ neither entails nor presuppose $p$ and there an alternative expression $C(p)$ that contains $p$ such that it entails or presuppose $p$, then by asserting $B(p)$ rather than $C(p)$, $S$ implicates that he doesn’t know whether $p$ is true, he implicates $Pp \land P\neg p$. 
## Clausal Implicature: Examples

**Examples:**

<table>
<thead>
<tr>
<th>Stronger Form C</th>
<th>Weaker form B</th>
<th>Implicature of B</th>
</tr>
</thead>
<tbody>
<tr>
<td>$C(p)$: 'A knows $p$'</td>
<td>$B(p)$: 'A believes $p$'</td>
<td>$Pp, P\neg p$</td>
</tr>
<tr>
<td>$C(p)$: 'A realizes $p$'</td>
<td>$B(p)$: 'A thought $p$'</td>
<td>$Pp, P\neg p$</td>
</tr>
<tr>
<td>$C(p)$: 'A revealed $p$'</td>
<td>$B(p)$: 'A said that $p$'</td>
<td>$Pp, P\neg p$</td>
</tr>
<tr>
<td>$C(p)$: 'necessarily $p$'</td>
<td>$B(p)$: 'possibly $p$'</td>
<td>$Pp, P\neg p$</td>
</tr>
<tr>
<td>$C(p, q)$: '$p$ and $q$'</td>
<td>$B(p, q)$: '$p$ or $q$'</td>
<td>$Pp, Pq, P\neg p, P\neg q$</td>
</tr>
<tr>
<td>$C(p, q)$: 'since $p$, $q$'</td>
<td>$B(p, q)$: 'if $p$, $q$'</td>
<td>$Pp, Pq, P\neg p, P\neg q$</td>
</tr>
</tbody>
</table>
**Example**

**Example 1**

A: The food is good, in fact it is excellent.

**Example 2**

A: *This guy if tall, in fact sho rt.

What is the difference between these examples? What makes the difference? 
'good' $\rightarrow$ 'not excellent', but it can be canceled 
'tall' $\rightarrow$ 'not short', and cannot be canceled
Readings of Disjunctions

Disjunction "or" can be ambiguous between an exclusive and inclusive reading.

**Disjunction Readings**

<table>
<thead>
<tr>
<th>Inclusive ((\lor))</th>
<th>&quot;p or q&quot;: (p \lor q \lor (p \land q))</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exclusive ((\lor))</td>
<td>&quot;p or q&quot;: (p \lor q \land \neg(p \land q))</td>
</tr>
</tbody>
</table>

Examples: (Note: the addition "or both" disambiguates)

- My father is a scientist or a researcher.
- The flag is black or white.
- The flag is blueish or greenish.
- Take an apple or a pie!
- She is in the kitchen or in the bathroom.
- He will come or he won’t come.
Readings of Disjunctions

Disjunction "or" can be ambiguous between an exclusive and inclusive reading.

### Disjunction Readings

| Inclusive (\(\lor\)) | "p or q": \(p \lor q \lor (p \land q)\) |
| Exclusive (\(\lor\)) | "p or q": \(p \lor q \land \neg(p \land q)\) |

### Explanation by Implicature

By saying "p or q" we exclude "p and q" by scalar implicature and therefore get the exclusive reading \(p \lor q\). But this implicature can be canceled by the addition "or both" and then we get the inclusive reading \(p \lor q\).
Modal logic operators

The Problem with the modal operators $\Box$ (necessarily) and $\Diamond$ (possibly):

- **Axiom 1:** If $p$ is necessary, then $p$ is possible:
  $$\Box p \rightarrow \Diamond p$$

- **Axiom 2:** If $p$ is possible, then it is possible that not $p$:
  $$\Diamond p \rightarrow \Diamond \neg p$$

- **Axiom 3:** If it is possible that not $p$, then it is not necessarily $p$:
  $$\Diamond \neg p \rightarrow \neg \Box p$$

- All three axioms lead to: $\Box p \rightarrow \neg \Box p$

Why do we come to such an absurd conclusion? Which Axiom is wrong or is not a logical implication?

**Answer:** Axiom 2 is not an implication, but an implicature:

Given the scale $\langle \Box, \Diamond \rangle$, then $\Diamond p \rightarrow \neg \Box p \iff \Diamond \neg p$
The projection problem of implicatures

The implicatures of complex expressions may not be equivalent to the simple sum of the implicatures of all the parts.
The projection Problem and Gazdar’s Solution

Gazdar’s projection mechanism

Given context $C$: set of beliefs the speaker is committed to before she said utterance $U$

1. If the entailment (semantic content) of $U$ is consistent with $C$
   - then: add the entailment of $U$ to $C$
   - else: make the entailment of $U$ consistent by Quality implicature and add it to $C$

2. add all those clausal implicatures of $U$ to $C$, that are consistent with (new) $C$ and cancel all the others

3. add all those scalar implicatures of $U$ to $C$ that are consistent with (new) $C$ and cancel all the others
Example of Gazdar’s projection mechanism

Given a situation where a speaker $S$ knows that many of the students are lazy. $S$ says: ”Most of these students are real working horses and the rest is probably not better.”

Interpretation:

- Since the literal meaning *most students aren’t lazy* is not consistent with the context: we get the irony by quality implicature and the meaning that *most of the students are lazy* by step 1.
- We get the meanings *it is probable that all students are lazy* and *it is probably that not all students are lazy* by clausal implicature, according to step 2.
- The scalar implicature *most but not all students are lazy* is not consistent with the new context enriched by the clausal implicature’s *it is probable that all students are lazy*. Thus this scalar implicature is canceled according to step 3.
There are other kinds of Quantity implicatures (or other pragmatic inferences) that are in conflict with scalar/clausal implicatures:

- Note that scalar/clausal implicatures decrease the information space by the rational deliberation *otherwise the speaker would have said it*

- As an example think of the scale \( \langle \text{my } x, \text{a } x \rangle \)
  - "Yesterday I slept in a car." *It was not my car* by scalar implicature
  - "Yesterday I broke a finger." *It was my finger* by ???

- There seems to be a pragmatic inference that works in the opposite direction and let us read more into an utterance: *principle of informativeness*
In order to understand how and why a language changes, the linguist must keep in mind two ever-present and antinomic factors: first, the requirements of communication, the need for the speaker to convey his message, and second, the principle of least effort, which makes him restrict his output of energy, both mental and physical, to the minimum compatible with archiving his ends. (Martinet, 1962)

(Speaker and Hearer economy)
The Gricean Maxims

- **Quality**
  1. Do not say what you believe to be false.
  2. Do not say for which you lack evidence.

- **Quantity**
  1. Make your contribution as informative as is required (for the current purpose of exchange)
  2. Do not make your contribution more informative than it is required.

- **Relation**
  1. Be relevant.

- **Manner**
  1. Avoid obscurity of expression.
  2. Avoid ambiguity.
  3. Be brief.
  4. Be orderly.
The Gricean Maxims & Speaker/Hearer Economy

**Prerequisites**
1. Do not say what you believe to be false.
2. Do not say for which you lack evidence.

**Hearer Economy: Q-Principle**
1. Make your contribution as informative as is required (for the current purpose of exchange)

**Speaker Economy: R-Principle**
1. Do not make your contribution more informative than it is required.
2. Be relevant.
3. Avoid obscurity of expression.
4. Avoid ambiguity.
5. Be brief.
6. Be orderly.
The Q Principle & The R Principle

The Q Principle (Hearer-based)
Make your contribution sufficient (Q1): say as much as you can (given R)

The R principle (Speaker-based)
Make your contribution necessary (Q2, Relation, Manner): say no more than you must (given Q)
Examples

Example 3

(a) It was possible that John solved the problem.
   \[\Rightarrow\] John didn’t solve the problem. (Q)
(b) John was able to solve the problem.
   \[\Rightarrow\] John solved the problem. (R)
Example 4

(a) Max is meeting a woman this evening.
   $\Rightarrow$ The woman in question is not Max’s wife, sister... (Q)

(b) Max broke a finger yesterday.
   $\Rightarrow$ It was Max’s finger. (R)
Convers. breakdowns and marital breakups (Tannen, 1975)

<table>
<thead>
<tr>
<th>First exchange</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Wife:</strong> Bob’s having a party. You wanna go?</td>
</tr>
<tr>
<td><strong>Husband:</strong> Okay.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Second exchange</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Wife:</strong> Are you sure you want to go?</td>
</tr>
<tr>
<td><strong>Husband:</strong> + &gt; Because if you don’t want I would stay home too.</td>
</tr>
<tr>
<td><strong>Husband:</strong> + &gt; She doesn’t want to go and want’s me to stay with her. (R)</td>
</tr>
<tr>
<td><strong>Husband:</strong> Okay. Let’s not go. I’m tired anyway.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Post-mortem</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Wife:</strong> We didn’t go to the party because you didn’t want to.</td>
</tr>
<tr>
<td><strong>Husband:</strong> I wanted to. You didn’t want to.</td>
</tr>
</tbody>
</table>
Examples

Example 28

(a) Black Bart killed the sheriff.
   $\Rightarrow$ He shot him with his gun \((R)\)

(b) Black Bart caused the sheriff to die.
   $\Rightarrow$ He didn’t kill him with his gun. \((Q)\)
Division of Pragmatic Labor

An unmarked expression describes the prototypical case (by R principle), a marked expression doesn’t describe the prototypical case (by Q principle) and therefore a specific one.
Resume and Outlook

Resume

- Horn describes linguistic phenomena like cases of Implicatures by the same functional dynamics: Q- and R-principle
- Both principles go back to the forces of speaker and hearer economy.
- Both principles cause a linguistic phenomenon "The division of Pragmatic Labor" (Horn’s rule)

Outlook

- Read about the Q- and R-principle and the Division of pragmatic labor (Horn 1984, pages 11-23)
- Homework: Answer 6 questions that guide you through the chapter