Ling115: Semantics I

Conversational implicatures in children

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1. Analysis of Conversational Implicatures


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1. Analysis of Conversational Implicatures
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### Conversational Implicatures 1/3

<table>
<thead>
<tr>
<th></th>
<th>Literal meaning alone</th>
<th>Extra reasoning</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>New info</strong></td>
<td>ENTAILMENT</td>
<td>CONVERSATIONAL IMPLICATURE</td>
</tr>
<tr>
<td><strong>Info already assumed</strong></td>
<td>PRESUPPOSITION</td>
<td>PRESUPPOSITION</td>
</tr>
</tbody>
</table>
Conversational Implicatures 2/3

• A conversationally implicates $B =_{\text{def}} A$ does not entail $B$, but $B$ is part of what the utterer of $A$ meant.

**Literal meaning and entailments** + **Inferences about utterer’s intentions**

**Utterance meaning**

SEMANTICS

**PRAGMATICS**
Conversational Implicatures 3/3

QUESTION:
(1) Nirit has ___ portable chairs.  ?⇒
    ?⇒
    Nirit has exactly four portable chairs.

That is: Does four mean “at least four” or “exactly four”?

CONCLUSION:

four

- literal, logical meaning: “at least four”, “four or possibly more”
- pragmatic meaning: “exactly four”
(2) Some students passed the exam.

QUESTION:
Does some mean “some and possibly all” or “some but not all”?

ANSWER:

- literal, logical meaning: “some and possibly all”
- pragmatic meaning: “some but not all”, “some did and some didn’t”
More cases 2/3

(3) John visited Sue or Pat on Sunday.

QUESTION:
Does natural language or mean “at least one of the two and possibly both” (inclusive disjunction) or “one or the other but not both” (exclusive disjunction)?

ANSWER:

  literal, logical meaning: “at least one of the two and possibly both”

or

  pragmatic meaning: “one or the other but not both”
(2) There might be a parrot in the box.

QUESTION:
Is **might**’s meaning compatible with **must** (“might and perhaps must”) or incompatible with **must** (meaning “might but not must”)?

ANSWER:

**might**
- literal, logical meaning: “might and perhaps must”
- pragmatic meaning: “might but not must”
Grice’s Maxims and scales 1/2

• Paul Grice (1989) proposes that both the speaker and the hearer adhere to the following conversation maxims:

(1) **GRICEAN MAXIMS**:

  » **Relation**: Be relevant.
  
  » **Quantity**: Be as informative as required (be neither over-informative nor under-informative). ☐ Notion of **scale**.
  
  » **Quality**: Say only what you believe to be true and adequately supported.
  
  » **Manner**: Be perspicuous: be brief and orderly and avoid obscurity and ambiguity.

• Taking the literal/logical meaning of a sentence and adding these maxims, further inferences can be made that lead to a stronger, pragmatic meaning.
Grice’s Maxims and scales 2/2

• Some semantically related lexical items can be ordered in a SCALE OF STRENGTH:

(2) **Weakest**  **Strongest**

<some, several, many, most, every>
<…, three, four, five, six, seven, eight…>
<or, and>
<might/possibly, probably, must/necessarily>
Sample Pragmatic Inferences 1/2

(1) A: How did the students do on the exam?
    B: Some students passed.

(1B) conversationally implicates “Not all the students passed”

Deriving this conversational implication:

It is assumed that B follows Grice’s principles and hence that he is being relevant, maximally informative and true to his beliefs. The following two utterances would have been relevant:

    All the students passed.
    Some students passed.

Of these two, All the students passed expresses a stronger proposition and thus is more informative than Some students passed. Given that the speaker did not utter All the students passed even though it would have been relevant and more informative, it must be that the speaker thinks that All the students passed is not true. Hence, uttering the weaker sentence yields as an implicature the negation of the stronger sentence: “It is not the case that all students passed”.

Sample Pragmatic Inferences 2/2

(2) A: What did John do on Sunday?
   B: He visited Sue or Pat.

(2B) conversationally implicates “It is not the case that he visited (both) Sue and Pat.”

Deriving this conversational implication:

The speaker is assumed to be relevant, maximally informative and true. The two following propositions are relevant, the first one of which would have been stronger and more informative:

- **He visited Sue and he visited Pat.**
- **He visited Sue or he visited Pat.**

Since the speaker chose to utter the weaker one and not the stronger one, it must be because he doesn’t think the stronger one is true. Hence, we take the negation of the stronger one to be true: “It is not the case that he visited Sue and Pat”.

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Summary

<table>
<thead>
<tr>
<th>Word</th>
<th>Literal/logical meaning in mental lexicon</th>
<th>Derived pragmatic meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>four</td>
<td>“at least four”</td>
<td>“exactly four”</td>
</tr>
<tr>
<td>some</td>
<td>“some and possibly all”</td>
<td>“some but not all”</td>
</tr>
<tr>
<td>or</td>
<td>“one or both”</td>
<td>“one but not both”</td>
</tr>
<tr>
<td>Might</td>
<td>“might and possibly must”</td>
<td>“might but not must”</td>
</tr>
</tbody>
</table>

Inference process using scales and Grice’s Maxims
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1. Analysis of Conversational Implicatures.

   2.1. Aim.
   2.2. Experiment 1.
   2.3. Experiment 2.
   2.4. Experiment 3.
   2.5 Noveck’s conclusion.


Aim

• In experimental research, implicatures are usually left aside.

• Noveck (2001) tries to fill this gap. He investigates how the meaning of certain weak scalar items (might, or, some) develops from children to adults. Can children access both meanings? If one is highly preferred, which one and why? What about adults?

Noveck’s conclusion: children behave more logically than adults in this respect.
Experiment 1: might 1/2

- Participants: 32 five-yr-olds, 20 seven-yr-olds, 16 nine-yr-olds, 20 adults
- Materials: one open box with parrot and bear, one open box with parrot, one closed box. Participants are told that the closed box has the same content as either the first box or the second.
- Procedure: the puppet presents each of eight modals statements (e.g. There might be a parrot in the closed box), and the participant’s task is to say whether the puppet’s claim is right or not.
### Experiment 1: *might* 2/2

**Results:**

<table>
<thead>
<tr>
<th>Presented statements</th>
<th>Is the puppet right?</th>
<th>Age (years) (n)</th>
<th>Necessary conclusion (parrot)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>5 (32)</td>
<td>7 (20)</td>
</tr>
<tr>
<td>Has to be a parrot</td>
<td>Yes</td>
<td>75*</td>
<td>90**</td>
</tr>
<tr>
<td>Does not have to be a parrot</td>
<td>No</td>
<td>72*</td>
<td>75*</td>
</tr>
<tr>
<td>Might be a parrot</td>
<td>Yes</td>
<td>72*</td>
<td>80**</td>
</tr>
<tr>
<td>Cannot be a parrot</td>
<td>No</td>
<td>66</td>
<td>80**</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>73**</td>
<td>81**</td>
</tr>
</tbody>
</table>
Experiment 2: might after logical training 1/2

• The aim was to verify the findings of experiment 1, but this time after intensive training trying to encourage logical interpretations.

• Participants: 19 five-yr-olds, 16 seven-yr-olds, 26 adults

• Training: one open box with horse and fish, one open box with horse, one closed box. Participants are told that the closed box has the same content as either the first box or the second. Then they are asked questions like the following and corrected when they don’t give the logical response:

  (1) If we open the box, could there be a horse inside? (yes)

• Materials and procedure: similar as before.
Experiment 2: might after logical training

• Results:

<table>
<thead>
<tr>
<th>Presented statements</th>
<th>Is the puppet right?</th>
<th>Age (years) (n)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>5 (16)</td>
</tr>
<tr>
<td>------------------------------</td>
<td>----------------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>Evaluations of necessary conclusion</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Must be a parrot</td>
<td>Yes</td>
<td>81*</td>
</tr>
<tr>
<td>Might not be a parrot</td>
<td>No</td>
<td>75*</td>
</tr>
<tr>
<td>Might be a parrot</td>
<td>Yes</td>
<td>81*</td>
</tr>
<tr>
<td>Must not be a parrot</td>
<td>No</td>
<td>69</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>77</td>
</tr>
<tr>
<td>Has to be a parrot</td>
<td>Yes</td>
<td>94**</td>
</tr>
<tr>
<td>Does not have to be a parrot</td>
<td>No</td>
<td>63</td>
</tr>
<tr>
<td>Could be a parrot</td>
<td>Yes</td>
<td>88*</td>
</tr>
<tr>
<td>Could not be a parrot</td>
<td>No</td>
<td>75*</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>80</td>
</tr>
</tbody>
</table>
Experiment 3: French *certains* “some” 1/2

- Participants: 31 eight-yr-olds, 30 ten-yr-olds, 25 adults
- Materials: statements with the quantifiers all and some (in French). Some statements are true (e.g. *All elephants have trunks*), some are false (e.g. *All dogs have spots*) and some are logically true but pragmatically infelicitous (e.g. *Some giraffes have long necks*).
- Procedure: participants had to say whether they agreed with each statement or not.
Experiment 3: French *certains* “some” 2/2

- Results:

<table>
<thead>
<tr>
<th>Sentence type</th>
<th>Correct response</th>
<th>Age (years) (n)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>7–8 (31)</td>
</tr>
<tr>
<td>Utterances expressed with <em>Some</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Absurd (false)</td>
<td>No</td>
<td>95</td>
</tr>
<tr>
<td>(e.g. Some stores are made of bubbles)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Appropriate (true)</td>
<td>Yes</td>
<td>84</td>
</tr>
<tr>
<td>(e.g. Some birds live in cages)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inappropriate (true though pragmatically infelicitous)</td>
<td>Yes</td>
<td>89</td>
</tr>
<tr>
<td>(e.g. Some giraffes have long necks)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Noveck’s Conclusion

• P. 184: “… the competent use of a weak scalable term is linked initially to an explicit [MR: logical] interpretation and [that] this is followed by a pragmatic one.”
  – First: logical meaning is acquired, put in lexicon
  – Later: ability to run pragmatic inference appears

• This developmental path is consistent with Grice’s theory of implicatures (or similar theories) assumed by linguists.

• Still, the question is left open, what exactly in the pragmatic inferencing process is problematic for children.
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   3.1. Potential sources of difficulty.
   3.2. Experiment A: or
   3.3. Experiment B: or and overt alternatives
Potential sources of difficulty

• Gricean Maxims:
  (1) **Relation**: Be relevant.
    **Quantity**: Be as informative as required.
    **Quality**: Say only what you believe to be true and adequately supported.
    **Manner**: Be perspicuous.

• Hypothesis 1: Children lack full understanding of these maxim and thus cannot master the pragmatic inferencing process.
Potential sources of difficulty 2/2

• Scales

(2) <some, several, many, most, every>
    <..., three, four, five, six, seven, eight...>
    <or, and>
    <might/possibly, probably, must/necessarily>

• Hypothesis 2: According to Reinhart (1999), “computations that require comparison of pairs of derivations are beyond the processing capacity of [young] children [...]. The claim is that children “know” the sem/pragm principles but cannot implement this knowledge when it requires ‘reference-set’ computations” p. 166
Experiment A: or 1/2

• Participants: 15 children (mean age 5;2) and 8 adults.
• Story where, after considering several toys, each of four boys takes both a stake-board and a bike.
• Puppet utters Every boy chose a skate-board or a bike and the participant has to accept it or reject it.
Experiment A: or 2/2

• Results:

<table>
<thead>
<tr>
<th>Pragmatic responses</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Adults</td>
<td>100%</td>
</tr>
<tr>
<td>1 child</td>
<td>at chance</td>
</tr>
<tr>
<td>7 children</td>
<td>92,8%</td>
</tr>
<tr>
<td>7 children</td>
<td>7,2%</td>
</tr>
</tbody>
</table>
Experiment B: 
**or** and overt alternatives 1/2

- Participants: 15 children (mean age 4;8).
- Story where, after looking at all the animals, each farmer decides to clean a horse and a rabbit.
- Two puppets provide alternative descriptions of the story:

  Every farmer cleaned a horse **or** a rabbit.

  Every farmer cleaned a horse **and** a rabbit.

The participants are asked to reward with a coin the puppet who “said it better”.

Experiment B: or and overt alternatives 2/2

• Results:

  Pragmatic responses

  Children 93.3%

That is, when the alternatives/scales are explicitly given, children choose the pragmatic response as adults do.
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1. Analysis of Conversational Implicatures


Conclusions

• Linguists assume that, for e.g. four, the logical interpretation “at least four” is listed in the mental lexicon, whereas the interpretation “exactly four” is derived from Gricean Maxims and scales.

• Developmental evidence (Noveck 2001) shows that there is a stage where children access the logical meaning without accessing the implicated meaning, thus supporting the linguists’ view.

• Further experiments (Chierchia et al. 2001) suggest that the source of difficulty deriving the implicated meaning resides not in the Maxims but in the alternatives / scales.