Pragmatics & Game Theory
Session 4: Horn’s Rule and Levinson’s Heuristics

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WiSe 13/14
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Homeworks Question 1

What is the Q-Principle, what the R-Principle?

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

**The R principle (Speaker-based)**
Make your contribution necessary: say no more than you must (given Q)
Homeworks Question 2

In what sense are the Gricean Maxims involved in the Q- and R-Principle? Which maxims are not involved? Why?

- The Q-principle matches the first Quantity maxim: "Make your contribution as informative as is required."
- The R-principle incorporates the second Quantity maxim: "Do not make your contribution more informative than it is required." and furthermore the Maxims of Relevance and Manner.
- The Quality maxim is not particularly involved, but assumed as precondition, since conversation is assumed to be (honest) communication (the aim is information transfer of knowledge)
Homeworks Question 3

Which of these examples produce Q-based, which R-based inferences? What are the implicatures?

- If you give me the money, I will give you the car. (R-based)
  $\Rightarrow$ If you don’t give me the money, I won’t give you the car.

- Max lived in Australia three years ago. (Q-based)
  $\Rightarrow$ Max doesn’t live there anymore.

- John was assumed to become a great player. (Q-based)
  $\Rightarrow$ But he hasn’t become one.

- Steve lost a glove on his way to work. (R-based)
  $\Rightarrow$ It was his glove.
Homeworks Question 4

How can the implicatures of the examples of exercise 3 be canceled? Give one cancellation example each.

- If you give me the money, I will give you the car. If not, I need the car to find an ATM and you can have the car afterwards.
- Max lived in Australia three years ago. And after his stay in Germany he moved back to Australia one week ago.
- John was assumed to become a great player. And despite all his injuries he has finally become one.
- Steve lost a glove on his way to work. It wasn’t Steve’s. His boss left the pair at Steve’s house after a dinner party and now Steve can only give one of them back.
Homeworks Question 3 (Further suggestions)

- If you give me the money, I will give you the car.
  +> If you give me at least X$, I will give you the car.
  +> If and only if you give me the money, I will...
  +> First you have to give me the money, then I will...

- Max lived in Australia three years ago.
  +> He lived there exactly 3 years ago.
  +> He lived there at least 3 years ago.
  +> He lived there at most 3 years ago.

- John was assumed to become a great player.
  +> It is possible that he has become one, it is possible that not.

- Steve lost a glove on his way to work.
  +> He didn’t find it/get it back.
  +> He lost at most one glove.
Homeworks Question 5

What is (in general) the difference between the way Q-based and R-based implicatures get canceled?

- Since the Q-based implicature excludes a specific information $p$, it can be canceled by mentioning that $p$ is true or that it holds.
- Since the R-based implicature includes a specific information $p$, it can be canceled by mentioning that $p$ is false or doesn’t hold.
Homeworks Question 6

What is the Division of Pragmatic Labor and in what way are Q-based and R-based implicatures involved?

**Division of Pragmatic Labor**

An unmarked expression describes the prototypical case, a marked expression describes the/any non-prototypical case.

- Since for a given situation the prototypical case is more specific than any possible case, the unmarked expression describes a more informative case and therefore includes extra information (R principle).
- The marked expression can mean everything but the prototypical state, since that one is already described by the unmarked expression. Thus, the marked expression excludes by the prototypical case a specific information (Q principle).
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 of the Q-based implicatures

Example 2

(a) He ate 3 carrots. $\rightarrow$ But not more than three.
(b) You ate some of the cookies. $\rightarrow$ But not all.
(c) It’s possible she’ll win. $\rightarrow$ But not certain.
(d) Maggie is patriotic or quixotic. $\rightarrow$ But not both.
(e) I am happy. $\rightarrow$ But not ecstatic.
(f) It’s warm. $\rightarrow$ But not hot.

Note:

- Scalar implicatures are Q-based implicatures
- Q-based implicatures exclude information that is semantically/truth-conditionally/literally entailed
- by saying ’p’ Q-based implicatures license reading ’at most p’
Examples of the R-based implicatures

Example 2

(g) Can you pass me the salt, please?
   +> And please pass it now.
(h) Can you tell me the time?
   +> And if so, please tell me.

Note:

- R-based implicatures are opposed to Q-based implicatures
- R-based implicatures include information that is not semantically/truth-conditionally entailed
- by saying ’p’ R-based implicatures license reading ’more than p’
Examples of Q-based vs. R-based implicatures

Example 3

(a) It was possible that John solved the problem.
   $\Rightarrow$ John didn’t solve the problem (For all S knows). (Q)

(b) John was able to solve the problem.
   $\Rightarrow$ John solved the problem. (R)
Examples of Q-based vs. R-based implicatures

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)
## Rules of Politeness

<table>
<thead>
<tr>
<th>Politeness rules (Lakoff 1973, Brown &amp; Levinson 1979)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rule 1 Deference: ’Don’t impose’, ’Keep aloof’ (distant)</td>
</tr>
<tr>
<td>Rule 2 Give options</td>
</tr>
<tr>
<td>Rule 3 Be friendly</td>
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</tbody>
</table>

### Note:
- Rule 1 is an R-based constraint (say no more than you must):  
  "It is a little bit cold in here." \( \Rightarrow \) Close the window.
- Rule 3 is a Q-based constraint (say as much as you can):  
  "I would be delighted if you would be so nice and would close the window, please." \( \Rightarrow \) Close the window.
Conversational breakdowns and marital breakups (Tannen, 1975)

First exchange
Wife: Bob’s having a party. You wanna go?
Husband: Okay.

Second exchange
Wife: Are you sure you want to go?
Husband: She doesn’t want to go and wants me to stay with her. (R1)
Wife: If you don’t want I would stay home, too. (R3)
Husband: Okay. Let’s not go. I’m tired anyway.

Post-mortem
Wife: We didn’t go to the party because you didn’t want to.
Husband: I wanted to. You didn’t want to.
The Principle of Informativeness

Informativeness Principle (Atlas & Levinson 1981)

Read as much into an utterance as is consistent with what you know about the world.

Note:

- The principle of informativeness is the hearer strategy of R-based inferences.
Examples of the Principle of Informativeness

Example 8

(a) if $p$ then $q$ $+$ $>$ if $\neg p$ then $\neg q$
(b) $p$ and $q$ $+$ $>$ $p$ preceded/ caused $q$
(c) $a$ and $b$ V’s $+$ $>$ $a$ and $b$ V’s together
(d) $a$ ate the cake/apples $+$ $>$ $a$ ate the whole cake/all the apples
(e) Do you know the time? $+$ $>$ If yes, tell me.
(f) I don’t think that $p$. $+$ $>$ I think that not $p$.
(g) I have a new car and the window doesn’t close. $+$ $>$ The window of my new car.
Informativeness: Inference to the best interpretation

If a predicate $Q$ is semantically nonspecific with respect to Predicates $P_1, P_2, ... P_i, P_j, ..., P_n$, and predicate $P_j$ is stereotypical for $Q$, then by saying $Q$ a speaker will convey $P_j$.

Examples:

- The secretary smiled. $\Rightarrow$ The female secretary.
- John had a drink. $\Rightarrow$ An alcoholic one.
Examples of the Principle of Informativeness VS. Quantity

Example 9

(a) I slept on a boat yesterday. $\implies$ It wasn’t my boat. (Q)
(b) I lost a book yesterday. $\implies$ It was my book. (I)
(c) I slept in a car yesterday. $\implies$ It wasn’t my car (Q)
(d) I broke a finger yesterday. $\implies$ It was my finger (I)
(e) Mort and David took a shower. $\implies$ Not together. (Q)
(f) Mort and David bought a Piano. $\implies$ Together. (I)

Note:

- if an entailment-based scale can be constructed on which the predicates can be ranked, Quantity more likely takes place
- if the application of Quantity tends to contradict our assumed ’Conventions of Noncontroversiality’, Informativ. takes place
- Horn takes Informativeness as an instance of the R principle
How Q- and R-based implicatures operate on scales

Given the following scales $\langle p_1, p_2 \rangle$ ($p_1$ entails $p_2$: $w(p_1) \subseteq w(p_2)$)

- $\langle \text{my, a} \rangle$ (context-dependent)
- $\langle \text{all, some} \rangle$ (Q)
- $\langle \text{A and B, A or B} \rangle$ (Q)
- $\langle \text{A and B do sth. together, A and B do sth} \rangle$ (context-dep.)
- $\langle \text{A succeed doing sth., A tried to do sth.} \rangle$ (Q)
- $\langle \text{A did sth., A was able to do sth.} \rangle$ (R)
- $\langle \text{if } P_1 \text{ then } P_2, \text{ if } P_1 \text{ then } P_2 \text{ and if } \neg P_1 \text{ then } \neg P_2 \rangle$ (R)

Q-based implicature: by saying $p_2$ the speaker excludes $p_1$
R-based implicature: by saying $p_2$ the speaker means $p_1$

Question: What scales accuse Q-based, what scales R-based implicatures?
**Division of Pragmatic Labor**

Given a scale, e.g. \( \langle \text{shot, killed} \rangle \)

Given a situation for which by saying "killed" the more specific "shot" is meant by R-based implicature

<table>
<thead>
<tr>
<th>Example 28</th>
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</thead>
</table>
| (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 shot him with his gun. (Q) |

By using a more complex expression (b) something else must be meant, otherwise the speaker could have used the simple expression (a) \(\rightarrow\) Q-based implicature
Division of Pragmatic Labor

An unmarked expression describes the prototypical case, a marked expression describes a non-prototypical case.
Examples of the Division of Pragmatic Labor

Example 28

(a) Black Bart killed the sheriff.
   \[\rightarrow\] In a prototypical way (with his gun).
   Black Bart caused the sheriff to die.

(b) \[\rightarrow\] In any non-prototypical way (knife, snake, poison).
Examples of the Division of Pragmatic Labor

Example 29

(a) Lee stopped the car.
   \[+\rightarrow\text{In a prototypical way (brake pedal).}\]
   Lee got the car to stop.
(b) \[+\rightarrow\text{In any non-prototypical way (emergency brake, wall).}\]
Examples of the Division of Pragmatic Labor

Example 30
A: Open the door.

\[ + \rightarrow \text{Open the door in a normal way.} \]

Example 31
A: Walk up to the door, turn the door handle clockwise as far as it will go, and then pull gently towards you.

\[ + \rightarrow \text{Open the door in a non-normal way (e.g. more careful, silent).} \]
Examples of the Division of Pragmatic Labor

Example 32
A: Miss Singer produced a series of sounds corresponding closely to the score of an aria from Rigoletto.

$\rightarrow$ She sang in a non-normal way (horrible).

Example 33
A: Miss singer sang an aria from Rigoletto.

$\rightarrow$ She sang in a normal way.
Levinson’s three heuristics

There is a difference between the Q-based Implicature accused by giving as much information as possible (some, all) and the one accused by using a marked expression (kill, cause to die).

Levinson (2001) 3 types of implicatures:

- Q-heuristic: ’exclude the more specific case’-Implicature (Horn’s scalar Q-based implicature)
- I-heuristic: ’get the more specific/prototypical interpretation’-Implicature (Horn’s R-based implicature and first DOPL-force)
- M-heuristic: ’get a non-prototypical reading by a marked expression’-Implicature (Horn’s second DOPL-force)
Levinson’s three heuristics

**Q heuristic**
What isn’t said, isn’t.

**I heuristic**
What is simply described is stereotypically exemplified.

**M heuristic**
What’s said in an abnormal way, isn’t normal.

Note: Q and M look similar because they both exclude something: Q excludes a more specific case, M excludes the prototypical case. But i) they exclude fundamentally different things and ii) they are triggered differently: Q by being over-informative, but not (necessarily) by marking the expression, and M by providing the same information, but by marking the expression.
Comparing the three Heuristics

- I-inferences based on stereotypical presumptions, Q- and M-inferences based primarily on linguistic alternates
- But Q- and M-inference differ in the kind of *metalinguistic contrast* \(^1\) that they rely on:
  - Q-inferences rely on sets of alternates with essentially similar form, but contrastive semantic content
  - M-inferences rely on a set of alternates that contrast in form but not in inherent semantic content

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\(^1\) They are metalinguistic in the sense that they can only be recovered by reference to what else might have been said but was not.
## Comparing the three Heuristics

<table>
<thead>
<tr>
<th></th>
<th>Q-Heuristic</th>
<th>M-Heuristic</th>
<th>l-Heuristic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gricean Maxim</td>
<td>Q1</td>
<td>M1 &amp; M4</td>
<td>Q2</td>
</tr>
<tr>
<td>Horn’s terms</td>
<td>Q</td>
<td>Q</td>
<td>R</td>
</tr>
<tr>
<td>Negative Inference</td>
<td>yes</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>Contrast between</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- semantically strong/weak</td>
<td>yes</td>
<td>no</td>
<td>-</td>
</tr>
<tr>
<td>- synonymous surface forms</td>
<td>no</td>
<td>yes</td>
<td>-</td>
</tr>
<tr>
<td>Within the scope of</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metalinguistic negation</td>
<td>yes</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>Inference to stereotype</td>
<td>no</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>Overriding GCIs</td>
<td>none</td>
<td>Q</td>
<td>Q,M</td>
</tr>
</tbody>
</table>
Comparing the three Heuristics

The projection problem is handled by priority: $Q > M > I$

Example 1: scalar implicature cancels $I$ ($Q > I$)

Example 1

(a) Bill entered the room and Harry left.
   $=>$ First Bill entered, and then Harry left. ($I$)

(b) Bill entered the room or Harry left.
   $=>$ Not both happened. ($Q$)
   $=>$ *First Bill entered, or then Harry left. ($I?$)
Comparing the three Heuristics

The projection problem is handled by priority: \( Q > M > I \)

Example 2: clausal implicature cancels \( I \) (\( Q > I \))

Example 2

(a) If they try again, they will beat the landspeed record or they have beaten it already and won’t try again.

\[ +> \text{*If they won’t try again, they won’t have beaten the landspeed record. (I)} \]

\[ +> \text{Possibly the’ve beaten the landspeed record and won’t try again. (Q)} \]
Comparing the three Heuristics

The projection problem is handled by priority: \( Q > M > I \)

Example 3: DOPL says that \( M \) cancels \( I \) (\( M > I \))

Example 3

(a) Cortes killed Montezuma.
   \( +\) Cortes directly caused the death of Montezuma, e.g. strangled him with his hands. (I)

(b) Cortes caused the death of Montezuma.
   \( +\) Cortes indirectly caused the death of Montezuma, e.g. ordered him to be put to death. (M)
Comparing the three Heuristics

The projection problem is handled by priority: $Q > M > I$

Example 4: clausal implicature cancels $M$ ($Q > M$)

Example 3

(a) Cortes caused the death of Montezuma or indeed he killed him outright with his own hands.

$+$ $>$ *Cortes didn’t cause the death of Montezuma in a direct way, e.g. he didn’t kill him with his own hands.

$+$ $>$ It is possible that Cortes killed Montezuma with his own hands.
Resume

- Horn describes implicatures based on two principles: Q- and R-principle
- Levinson distinguish the same set of implicatures by three heuristics: Q, M and I-heuristic
  - the Q-heuristic induces implicatures of semantic scales
  - the I-heuristic realizes the informativeness principle (inference to the prototypical case)
  - the M-heuristic causes implicatures that are the counterpart of I-inferences in respect to Horn’s division of pragmatic labor

Homework

- Read about Levinson’s 3 heuristics in *Presumptive Meanings* (Levinson, 2001) Chapter 1.3 and 1.4 (pages 27-42)
- Answer 6 questions that guide you through the chapter