Grice can do it!
(But he was wrong about cancellability)

Matthijs Westera

Institute for Logic, Language and Computation
University of Amsterdam

LEGO, October 18th 2013
Grice can do it!
(But he was wrong about “cancellability”)

Matthijs Westera

Institute for Logic, Language and Computation
University of Amsterdam

LEGO, October 18\textsuperscript{th} 2013
1.1. The epistemic step

(1) Of John, Bill and Mary, who came to the party?
   - John came. \(\leadsto\) *Mary and Bill didn’t.* (exhaustivity)
1.1. The epistemic step

(1) Of John, Bill and Mary, who came to the party?
   - John came. \(\sim\) Mary and Bill didn’t. (exhaustivity)

Conversational implicature (Grice, 1975)

An implicature, the supposition of which is necessary for maintaining the assumption that the speaker is cooperative.
1.1. The epistemic step

(1) Of John, Bill and Mary, who came to the party?
   - John came.    \( \sim \) Mary and Bill didn’t.    (exhaustivity)

Conversational implicature (Grice, 1975)

An implicature, the supposition of which is necessary for maintaining the assumption that the speaker is cooperative.

1. Had sp. believed Mary or Bill came, she should have said so.
1.1. The epistemic step

(1) Of John, Bill and Mary, who came to the party?
    - John came. \(\sim\) Mary and Bill didn’t. (exhaustivity)

Conversational implicature (Grice, 1975)

An implicature, the supposition of which is necessary for maintaining the assumption that the speaker is cooperative.

1. Had sp. believed Mary or Bill came, she should have said so.
2. She didn’t, so she lacks the belief that they came.
1.1. The epistemic step

(1) Of John, Bill and Mary, who came to the party?
   - John came. \(\sim\) Mary and Bill didn’t. (exhaustivity)

**Conversational implicature (Grice, 1975)**

An implicature, the supposition of which is necessary for maintaining the assumption that the speaker is cooperative.

1. Had sp. believed Mary or Bill came, she should have said so.
2. She didn’t, so she lacks the belief that they came.
   ...
3. She believes that they didn’t come.
1.1. The epistemic step

(1) Of John, Bill and Mary, who came to the party?
   - John came. \( \sim \) Mary and Bill didn’t. (exhaustivity)

Conversational implicature (Grice, 1975)
An implicature, the supposition of which is necessary for maintaining the assumption that the speaker is cooperative.

1. Had sp. believed Mary or Bill came, she should have said so.
2. She didn’t, so she lacks the belief that they came.
   ... (‘the epistemic step’ - Sauerland, 2004)
3. She believes that they didn’t come.
1.1. The epistemic step

(1) Of John, Bill and Mary, who came to the party?
   - John came. \( \sim \) Mary and Bill didn’t. (exhaustivity)

Conversational implicature (Grice, 1975)
An implicature, the supposition of which is necessary for maintaining the assumption that the speaker is cooperative.

1. Had sp. believed Mary or Bill came, she should have said so.
2. She didn’t, so she lacks the belief that they came.
   \[ \ldots \] (‘the epistemic step’ - Sauerland, 2004)
3. She believes that they didn’t come.

“[the epistemic] step does not follow from Gricean maxims and logic alone.” - Chierchia, et al. (2008)
1.1. The epistemic step

(1) Of John, Bill and Mary, who came to the party?
   - John came. \(\sim\) Mary and Bill didn’t. (exhaustivity)

Conversational implicature (Grice, 1975)

An implicature, the supposition of which is necessary for maintaining the assumption that the speaker is cooperative.

1. Had sp. believed Mary or Bill came, she should have said so.
2. She didn’t, so she lacks the belief that they came.
   \(\ldots\) (‘the epistemic step’ - Sauerland, 2004)
3. She believes that they didn’t come.

“[the epistemic] step does not follow from Gricean maxims and logic alone.” - Chierchia, et al. (2008)

Wrong, it does!
1.2. Existing ‘Gricean’ approaches

Most existing work (from Mill, 1867 to Geurts, 2010):
1.2. Existing ‘Gricean’ approaches

Most existing work (from Mill, 1867 to Geurts, 2010):

1. The sp. is *opinionated* about whether Mary came (Context)
1.2. Existing ‘Gricean’ approaches

Most existing work (from Mill, 1867 to Geurts, 2010):

1. The sp. is *opinionated* about whether Mary came (Context)
2. She lacks the belief that Mary came (Quantity)
1.2. Existing ‘Gricean’ approaches

Most existing work (from Mill, 1867 to Geurts, 2010):

1. The sp. is *opinionated* about whether Mary came (Context)
2. She lacks the belief that Mary came (Quantity)

3. She believes that Mary didn’t come
1.2. Existing ‘Gricean’ approaches

Most existing work (from Mill, 1867 to Geurts, 2010):

1. The sp. is *opinionated* about whether Mary came

2. She lacks the belief that Mary came

3. She believes that Mary didn’t come
1.2. Existing ‘Gricean’ approaches

Most existing work (from Mill, 1867 to Geurts, 2010):

1. The sp. is *opinionated* about whether Mary came

2. She lacks the belief that Mary came

3. She believes that Mary didn’t come

- It is empirically inadequate:

(2) I’m probably asking the wrong person, but of John, Bill and Mary, who came to the party?
- John and Bill came. ⏯ *Not Mary.*
1.2. Existing ‘Gricean’ approaches

Most existing work (from Mill, 1867 to Geurts, 2010):

1. The sp. is *opinionated* about whether Mary came

2. She lacks the belief that Mary came

3. She believes that Mary didn’t come

- It is empirically inadequate:

(2) I’m probably asking the wrong person, but of John, Bill and Mary, who came to the party?
   - John and Bill came. $\sim$ Not Mary.

- Opinionatedness must be something *conveyed by the speaker.*
Most existing work (from Mill, 1867 to Geurts, 2010):

1. The sp. is *opinionated* about whether Mary came
2. She lacks the belief that Mary came
3. She believes that Mary didn’t come

- It is empirically inadequate:

(2) I’m probably asking the wrong person, but of John, Bill and Mary, who came to the party?
- John and Bill came. \(\sim\) *Not Mary.*

- Opinionatedness must be something *conveyed by the speaker,* but how?!
1.3. The bigger picture

The standard Gricean account of exhaustivity is not *generative*:
1.3. The bigger picture

The standard Gricean account of exhaustivity is not *generative*:

- It depends on what is *relevant*;
1.3. The bigger picture

The standard Gricean account of exhaustivity is not *generative*:

- It depends on what is *relevant*;
- It requires a contextual *opinionatedness assumption*;
1.3. The bigger picture

The standard Gricean account of exhaustivity is not *generative*:

- It depends on what is *relevant*;
- It requires a contextual *opinionatedness assumption*;
- Worst of all, implicatures are *cancellable*. 
1.3. The bigger picture

The standard Gricean account of exhaustivity is not *generative*:

- It depends on what is *relevant*;
- It requires a contextual *opinionatedness assumption*;
- Worst of all, implicatures are *cancellable*.

Attempted ‘remedies’:

- Replacing ‘relevance’ by lexical scales (since Horn, 1972).
1.3. The bigger picture

The standard Gricean account of exhaustivity is not *generative*:
- It depends on what is *relevant*;
- It requires a contextual *opinionatedness assumption*;
- Worst of all, implicatures are *cancellable*.

Attempted ‘remedies’:
- Replacing ‘relevance’ by lexical scales (since Horn, 1972).
- Blindly negating these by covert operators (mainly since Chierchia, *et al.*, 2008).
1.3. The bigger picture

The standard Gricean account of exhaustivity is not generative:

- It depends on what is relevant;
- It requires a contextual opinionatedness assumption;
- Worst of all, implicatures are cancellable.

Attempted ‘remedies’:

- Replacing ‘relevance’ by lexical scales (since Horn, 1972).
- Blindly negating these by covert operators (mainly since Chierchia, et al., 2008).
- Replacing ‘cancellable’ by ‘default’ (or even ‘mandatory’).
1.3. The bigger picture

The standard Gricean account of exhaustivity is not generative:

- It depends on what is relevant;
- It requires a contextual opinionatedness assumption;
- Worst of all, implicatures are cancellable.

Attempted ‘remedies’:

- Replacing ‘relevance’ by lexical scales (since Horn, 1972).
- Blindly negating these by covert operators (mainly since Chierchia, et al., 2008).
- Replacing ‘cancellable’ by ‘default’ (or even ‘mandatory’).

I will show that none of this is necessary.
Part I: Attention!

Part II: Focus!

Part III: Listen!
Part I: Attention!
Exhaustivity without the opinionatedness assumption.

Part II: Focus!

Part III: Listen!
Part I: Attention!
Exhaustivity without the opinionatedness assumption.

Part II: Focus!
Removing the last bits of contextual uncertainty.

Part III: Listen!
Part I: Attention!
Exhaustivity without the opinionatedness assumption.

Part II: Focus!
Removing the last bits of contextual uncertainty.

Part III: Listen!
The effect of rising pitch.
Part I: Attention!

2. Diagnosis
3. Theory
4. Results
5. Reflection
2. Diagnosis

(3) a. Of John, Bill and Mary, who came to the party?
   b. John came.  \[ \sim Mary \text{ didn’t come} \]
2. Diagnosis

(3) a. Of John, Bill and Mary, who came to the party?
   b. John came.  \( \sim \) Mary didn’t come
   c. John came, or Mary and John.  \( \not\sim \) Mary didn’t come
2. Diagnosis

(3) a. Of John, Bill and Mary, who came to the party?
   b. John came. \( \sim \) Mary didn’t come
   c. John came, or Mary and John. \( \not\sim \) Mary didn’t come

Intuition

(3b) and (3c) differ in their attentive content.
2. Diagnosis

(3) a. Of John, Bill and Mary, who came to the party?
   b. John came.  \[\sim\text{Mary didn’t come}\]
   c. John came, or Mary and John.  \[\not\sim\text{Mary didn’t come}\]

Intuition
(3b) and (3c) differ in their *attentive content*.

- (3c) draws attention to the poss. that Mary came too.
2. Diagnosis

(3) a. Of John, Bill and Mary, who came to the party?
   b. John came. \( \sim \) Mary didn’t come
   c. John came, or Mary and John. \( \not\sim \) Mary didn’t come

Intuition

(3b) and (3c) differ in their *attentive content*.

- (3c) draws attention to the poss. that Mary came too.
- (And so does (3a).)
2. Diagnosis

(3) a. Of John, Bill and Mary, who came to the party?
   b. John came. \(\sim\) *Mary didn’t come*
   c. John came, or Mary and John. \(\nabla\) *Mary didn’t come*

Intuition
(3b) and (3c) differ in their *attentive content*.

- (3c) draws attention to the poss. that Mary came too.
- (And so does (3a).)
- (3b) doesn’t; it leaves the possibility *unattended*. 
2. Diagnosis

(3) a. Of John, Bill and Mary, who came to the party?
   b. John came.  \(\sim\) Mary didn’t come
   c. John came, or Mary and John.  \(\varphi\) Mary didn’t come

Intuition
(3b) and (3c) differ in their attentive content.

- (3c) draws attention to the poss. that Mary came too.
- (And so does (3a).)
- (3b) doesn’t; it leaves the possibility unattended.

Apparently, pragmatic reasoning is sensitive to this.
2. Diagnosis

(3) a. Of John, Bill and Mary, who came to the party?  
    b. John came.  \( \sim \) Mary didn’t come  
    c. John came, or Mary and John.  \( \not\sim \) Mary didn’t come  

Intuition  
(3b) and (3c) differ in their attentive content.  

- (3c) draws attention to the poss. that Mary came too.  
- (And so does (3a).)  
- (3b) doesn’t; it leaves the possibility unattended.

Apparently, pragmatic reasoning is sensitive to this.
2. Diagnosis

(3) a. Of John, Bill and Mary, who came to the party?  
   b. John came.  \( \sim \) Mary didn’t come  
   c. John came, or Mary and John.  \( \lor \) Mary didn’t come

Intuition
(3b) and (3c) differ in their **attentive content**.

- (3c) draws attention to the poss. that Mary came too.  
- (And so does (3a).)  
- (3b) doesn’t; it leaves the possibility *unattended*.

Apparently, pragmatic reasoning is sensitive to this.
2. Diagnosis

(3) a. Of John, Bill and Mary, who came to the party?
   b. John came.  ∼ Mary didn’t come
   c. John came, or Mary and John.  ∨ Mary didn’t come

Intuition
(3b) and (3c) differ in their attentive content.
   ▷ (3c) draws attention to the poss. that Mary came too.
   ▷ (And so does (3a).)
   ▷ (3b) doesn’t; it leaves the possibility unattended.

Apparently, pragmatic reasoning is sensitive to this.
2. Diagnosis

(3) a. Of John, Bill and Mary, who came to the party?
   b. John came.  \( \sim \) Mary didn’t come
   c. John came, or Mary and John.  \( \not\sim \) Mary didn’t come

Intuition

(3b) and (3c) differ in their \textit{attentive content}.

- (3c) draws attention to the poss. that Mary came too.
- (And so does (3a).)
- (3b) doesn’t; it leaves the possibility \textit{unattended}.

Apparently, pragmatic reasoning is sensitive to this.
3. Theory

3.1. Translation into logic
3.2. Semantics
3.3. Pragmatics
3.1. Translation into logic

(4) a. Of John, Bill and Mary, who came to the party?
   b. John came.                              \[ \sim \text{Mary didn't come} \]
   c. John came, or Mary and John.            \[ \not\supset \text{Mary didn’t come} \]
3.1. Translation into logic

(4) a. Of John and Mary, who came to the party?
   b. John came. 
   c. John came, or Mary and John. 

\[ \sim \text{Mary didn’t come} \]
\[ \neg \text{Mary didn’t come} \]
3.1. Translation into logic

(4) a. Of John and Mary, some came to the party.
   b. John came. \[ \sim \text{Mary didn’t come} \]
   c. John came, or Mary and John. \[ \therefore \text{Mary didn’t come} \]
3.1. Translation into logic

(4) a. John came, or Mary, or John and Mary.
   b. John came.  \[\sim \text{ Mary didn’t come}\]
   c. John came, or Mary and John.  \[\not\sim \text{ Mary didn’t come}\]
3.1. Translation into logic

(4) a. John came, or Mary, or John and Mary.
b. John came.
c. John came, or Mary and John.
3.1. Translation into logic

(4) a. John came, or Mary, or John and Mary.  \( p \lor q \lor (p \land q) \)
b. John came. \( p \)
c. John came, or Mary and John. \( p \lor (p \land q) \)
3.2. Semantics (Roelofsen, 2011)
3.2. Semantics (Roelofsen, 2011)

- **Possibility**: a set of worlds \((a, b)\)
3.2. Semantics (Roelofsen, 2011)

- **Possibility**: a set of worlds \( (a, b) \)
- **Proposition**: a set of possibilities \( (A, B, [\varphi]) \)
3.2. Semantics (Roelofsen, 2011)

- *Possibility*: a set of worlds \((a, b)\)
- *Proposition*: a set of possibilities \((A, B, [\varphi])\)
- *Informative content*: \(|\varphi| := \bigcup[\varphi]|\)

\[
(p \lor (p \land q))
\]

\[
(p \lor q \lor (p \land q))
\]

Now, (4c) \(\Rightarrow\) (4a), but (4b) \(!\Rightarrow\) (4a).
3.2. Semantics (Roelofsen, 2011)

- **Possibility**: a set of worlds \((a, b)\)
- **Proposition**: a set of possibilities \((A, B, [\varphi])\)
- **Informative content**: \(|\varphi| := \bigcup [\varphi]\)

\[
\begin{align*}
\text{(4a)} & \quad [p \lor q \lor (p \land q)] \\
\text{(4b)} & \quad [p] \\
\text{(4c)} & \quad [p \lor (p \land q)]
\end{align*}
\]
3.2. Semantics (Roelofsen, 2011)

- **Possibility**: a set of worlds \((a, b)\)
- **Proposition**: a set of possibilities \((A, B, [\varphi])\)
- **Informative content**: \(|\varphi| := \bigcup[\varphi]\)

\[
\begin{align*}
(4a) & \quad [p \lor q \lor (p \land q)] \\
(4b) & \quad [p] \\
(4c) & \quad [p \lor (p \land q)]
\end{align*}
\]
3.2. Semantics (Roelofsen, 2011)

- **Possibility**: a set of worlds \((a, b)\)
- **Proposition**: a set of possibilities \((A, B, [\varphi])\)
- **Informative content**: \(|\varphi| := \bigcup [\varphi] \)

\[
\begin{align*}
(4a) & \quad [p \lor q \lor (p \land q)] \\
(4b) & \quad [p] \\
(4c) & \quad [p \lor (p \land q)]
\end{align*}
\]

**Entailment**

\(A\) *entails* \(B\), \(A \models B\), iff

(i) \(\bigcup A \subseteq \bigcup B\); and

(ii) for all \(b \in B\), if \(b \cap \bigcup A \neq \emptyset\), \(b \cap \bigcup A \in A\)
3.2. Semantics (Roelofsen, 2011)

- **Possibility**: a set of worlds \((a, b)\)
- **Proposition**: a set of possibilities \((A, B, [\varphi])\)
- **Informative content**: \(|\varphi| := \bigcup[\varphi]\)

\[(4a) \quad [p \lor q \lor (p \land q)]\]
\[(4b) \quad [p]\]
\[(4c) \quad [p \lor (p \land q)]\]

**Entailment**

\(A\) entails \(B\), \(A \models B\), iff

(i) \(\bigcup A \subseteq \bigcup B\); and
(ii) for all \(b \in B\), if \(b \cap \bigcup A \neq \emptyset\), \(b \cap \bigcup A \in A\)

\(\rightarrow \text{at least as informative}\)
3.2. Semantics (Roelofsen, 2011)

- **Possibility**: a set of worlds \((a, b)\)
- **Proposition**: a set of possibilities \((A, B, [\varphi])\)
- **Informative content**: \(|\varphi| := \bigcup[\varphi]\\n
\[
\begin{align*}
(4a) & \quad [p \lor q \lor (p \land q)] \\
(4b) & \quad [p] \\
(4c) & \quad [p \lor (p \land q)]
\end{align*}
\]

### Entailment

A entails \(B\), \(A \models B\), iff

(i) \(\bigcup A \subseteq \bigcup B\); and

(ii) for all \(b \in B\), if \(b \cap \bigcup A \neq \emptyset\), \(b \cap \bigcup A \in A\)

→ at least as informative

→ at least as attentive
3.2. Semantics (Roelofsen, 2011)

- **Possibility**: a set of worlds \( (a, b) \)
- **Proposition**: a set of possibilities \( (A, B, [\varphi]) \)
- **Informative content**: \( |\varphi| := \bigcup [\varphi] \)

\[(4a) \ [p \lor q \lor (p \land q)] \]
\[(4b) \ [p] \]
\[(4c) \ [p \lor (p \land q)] \]

Entailment

\( A \) entails \( B \), \( A \models B \), iff

(i) \( \bigcup A \subseteq \bigcup B \); and

(ii) for all \( b \in B \), if \( b \cap \bigcup A \neq \emptyset \), \( b \cap \bigcup A \in A \)

Now, \( (4c) \models (4a) \), but \( (4b) \not\models (4a) \).
3.3. Pragmatics

The relevant maxims

1. **Quality:**
2. **Quantity:**
3. **Relation:**

(5) Did John go to the party?
It was raining.

If it rained, John {went / didn't go}.
3.3. Pragmatics

The relevant maxims
For a cooperative speaker with information $s$, responding $R$ to $Q$:

1. Quality:
2. Quantity:
3. Relation:
3.3. Pragmatics

The relevant maxims
For a cooperative speaker with information $s$, responding $R$ to $Q$:
1. **Quality**: $s \subseteq \bigcup R$.
2. **Quantity**:
3. **Relation**:

(5) Did John go to the party?
It was raining.
If it rained, John {went / didn't go}. 
The relevant maxims
For a cooperative speaker with information $s$, responding $R$ to $Q$:

1. **Quality**: $s \subseteq \bigcup R$.
2. **Quantity**: For all $Q' \subseteq Q$, if $s \subseteq \bigcup Q'$ then $\bigcup R \subseteq \bigcup Q'$.
3. **Relation**:

(5) Did John go to the party?
It was raining.

If it rained, John \{went / didn't go\}. 
The relevant maxims
For a cooperative speaker with information $s$, responding $R$ to $Q$:

1. **Quality**: $s \subseteq \bigcup R$.
2. **Quantity**: For all $Q' \subseteq Q$, if $s \subseteq \bigcup Q'$ then $\bigcup R \subseteq \bigcup Q'$.
3. **Relation**: $\{ r \cap s \mid r \in R \} \vdash Q$. 

(5) Did John go to the party? It was raining.

If it rained, John \{went / didn't go\}. 
The relevant maxims
For a cooperative speaker with information \( s \), responding \( R \) to \( Q \):

1. **Quality**: \( s \subseteq \bigcup R \).
2. **Quantity**: For all \( Q' \subseteq Q \), if \( s \subseteq \bigcup Q' \) then \( \bigcup R \subseteq \bigcup Q' \).
3. **Relation**: \( \{ r \cap s \mid r \in R \} \models Q \).

(5) Did John go to the party?
   It was raining.
3.3. Pragmatics

The relevant maxims
For a cooperative speaker with information $s$, responding $R$ to $Q$:

1. **Quality**: $s \subseteq \bigcup R$.
2. **Quantity**: For all $Q' \subseteq Q$, if $s \subseteq \bigcup Q'$ then $\bigcup R \subseteq \bigcup Q'$.
3. **Relation**: $\{r \cap s \mid r \in R\} \models Q$.

(5) Did John go to the party?
It was raining.

\begin{itemize}
  \item Did John go to the party?
  \item It was raining.
\end{itemize}
3.3. Pragmatics

The relevant maxims
For a cooperative speaker with information $s$, responding $R$ to $Q$:

1. **Quality**: $s \subseteq \bigcup R$.
2. **Quantity**: For all $Q' \subseteq Q$, if $s \subseteq \bigcup Q'$ then $\bigcup R \subseteq \bigcup Q'$.
3. **Relation**: $\{ r \cap s \mid r \in R \} \models Q$.

(5) Did John go to the party?
It was raining.
3.3. Pragmatics

The relevant maxims
For a cooperative speaker with information $s$, responding $R$ to $Q$:

1. **Quality**: $s \subseteq \bigcup R$.

2. **Quantity**: For all $Q' \subseteq Q$, if $s \subseteq \bigcup Q'$ then $\bigcup R \subseteq \bigcup Q'$.

3. **Relation**: $\{ r \cap s \mid r \in R \} \models Q$.

(5) Did John go to the party?
It was raining.

\[
\begin{array}{llllll}
\bullet & \bullet & \bullet & \bullet & \bullet & \bullet \\
\bullet & \bullet & \bullet & \bullet & \bullet & \bullet
\end{array}
\quad = \quad
\begin{array}{llllll}
\bullet & \bullet & \bullet & \bullet & \bullet & \bullet \\
\bullet & \bullet & \bullet & \bullet & \bullet & \bullet
\end{array}
\quad \models \quad
\begin{array}{llllll}
\bullet & \bullet & \bullet & \bullet & \bullet & \bullet \\
\bullet & \bullet & \bullet & \bullet & \bullet & \bullet
\end{array}
\]
3.3. Pragmatics

The relevant maxims
For a cooperative speaker with information \( s \), responding \( R \) to \( Q \):

1. **Quality**: \( s \subseteq \bigcup R \).
2. **Quantity**: For all \( Q' \subseteq Q \), if \( s \subseteq \bigcup Q' \) then \( \bigcup R \subseteq \bigcup Q' \).
3. **Relation**: \( \{ r \cap s \mid r \in R \} \models Q \).

(5) Did John go to the party?
   It was raining.
3.3. Pragmatics

The relevant maxims
For a cooperative speaker with information $s$, responding $R$ to $Q$:

1. **Quality**: $s \subseteq \bigcup R$.
2. **Quantity**: For all $Q' \subseteq Q$, if $s \subseteq \bigcup Q'$ then $\bigcup R \subseteq \bigcup Q'$.
3. **Relation**: $\{ r \cap s \mid r \in R \} \models Q$.

(5) Did John go to the party?
It was raining.
The relevant maxims
For a cooperative speaker with information $s$, responding $R$ to $Q$:

1. **Quality**: $s \subseteq \bigcup R$.
2. **Quantity**: For all $Q' \subseteq Q$, if $s \subseteq \bigcup Q'$ then $\bigcup R \subseteq \bigcup Q'$.
3. **Relation**: $\{ r \cap s \mid r \in R \} = Q$.

(5) Did John go to the party?
It was raining. $\therefore$ If it rained, John \{went / didn’t go\}.
3.3. Pragmatics
(cf. Grice, 1975; Groenendijk and Stokhof, 1984; Roberts, 1996; Spector, 2007)

The relevant maxims
For a cooperative speaker with information $s$, responding $R$ to $Q$:

1. **Quality**: $s \subseteq \bigcup R$.
2. **Quantity**: For all $Q' \subseteq Q$, if $s \subseteq \bigcup Q'$ then $\bigcup R \subseteq \bigcup Q'$.
3. **Relation**: $\{ r \cap s \mid r \in R \} \models Q$. 

(5) Did John go to the party?
It was raining.
\[
\text{If it rained, John } \{ \text{went / didn't go} \}.
\]
4. Results

4.1. Examples
4.2. Formal results
4.3. And more conceptually...
4.1. Examples

a. John came, Mary came, or both came \((p \lor q \lor (p \land q))\)

b. John came. \((p)\)

c. John came, or Mary and John. \((p \lor (p \land q))\)
4.1. Examples

(4) a. John came, Mary came, or both came \((p \lor q \lor (p \land q))\)

b. John came. \((p)\)

c. John came, or Mary and John. \((p \lor (p \land q))\)

1. \(s \subseteq |p \lor (p \land q)|\) (Quality)
4.1. Examples

(4) a. John came, Mary came, or both came \((p \lor q \lor (p \land q))\)

b. John came. \((p)\)

c. John came, or Mary and John. \((p \lor (p \land q))\)
   1. \(s \subseteq |p \lor (p \land q)| = |p|\) (Quality)
4.1. Examples

(4) a. John came, Mary came, or both came \((p \lor q \lor (p \land q))\)

b. John came. \((p)\)

c. John came, or Mary and John. \((p \lor (p \land q))\)

1. \(s \subseteq |p \lor (p \land q)| = |p|\) (Quality)
2. \(s \nsubseteq |q|\) (Quantity)
4.1. Examples

(4) a. John came, Mary came, or both came \((p \lor q \lor (p \land q))\)

b. John came. \((p)\)

c. John came, or Mary and John. \((p \lor (p \land q))\)

1. \(s \subseteq |p \lor (p \land q)| = |p|\) (Quality)
2. \(s \nsubseteq |q|\) (Quantity)

\(p \lor (p \land q) \models p \lor q \lor (p \land q)\)
4.1. Examples

(4) a. John came, Mary came, or both came \((p \lor q \lor (p \land q))\)

b. John came. \((p)\)

c. John came, or Mary and John. \((p \lor (p \land q))\)

1. \(s \subseteq |p \lor (p \land q)| = |p|\) (Quality)
2. \(s \not\subseteq |q|\) (Quantity)
3. \(p \lor (p \land q) \geq p \lor q \lor (p \land q)\) (Relation)
4.1. Examples

(4) a. John came, Mary came, or both came \((p \lor q \lor (p \land q))\)

b. John came. \((p)\)
   1. \(s \subseteq |p|\)  (Quality)

 c. John came, or Mary and John. \((p \lor (p \land q))\)
   1. \(s \subseteq |p \lor (p \land q)| = |p|\)  (Quality)
   2. \(s \not\subseteq |q|\)  (Quantity)
   3. \(p \lor (p \land q) \models p \lor q \lor (p \land q)\)  (Relation)
4.1. Examples

(4) a. John came, Mary came, or both came \((p \lor q \lor (p \land q))\)

b. John came. \((p)\)
   1. \(s \subseteq |p|\)  
   2. \(s \not\subseteq |q|\)  

     (Quality)  
     (Quantity)

c. John came, or Mary and John. \((p \lor (p \land q))\)
   1. \(s \subseteq |p \lor (p \land q)| = |p|\)  
   2. \(s \not\subseteq |q|\)  
   3. \(p \lor (p \land q) \models p \lor q \lor (p \land q)\)  

     (Quality)  
     (Quantity)  
     (Relation)
4.1. Examples

(4) a. John came, Mary came, or both came \((p \lor q \lor (p \land q))\)

b. John came. \((p)\)
1. \(s \subseteq |p|\)
2. \(s \not\subseteq |q|\)

\(p \not\subseteq p \lor q \lor (p \land q)\) \hspace{1cm} \text{(Quality)}
\(p \not\subseteq p \lor q \lor (p \land q)\) \hspace{1cm} \text{(Quantity)}

c. John came, or Mary and John. \((p \lor (p \land q))\)
1. \(s \subseteq |p \lor (p \land q)| = |p|\) \hspace{1cm} \text{(Quality)}
2. \(s \not\subseteq |q|\) \hspace{1cm} \text{(Quantity)}
3. - \(p \lor (p \land q) \not\subseteq p \lor q \lor (p \land q)\) \hspace{1cm} \text{(Relation)}
4.1. Examples

(4) a. John came, Mary came, or both came \((p \lor q \lor (p \land q))\)

b. John came. \((p)\)

1. \(s \subseteq |p|\)
2. \(s \not\subseteq |q|\)

\[
p \not\subseteq p \lor q \lor (p \land q)
\]

(Quantity)

\[
p \subseteq p \lor (p \land q)
\]

(Quality)

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]

\[
\]
4.1. Examples

(4) a. John came, Mary came, or both came \((p \lor q \lor (p \land q))\)

b. John came. \((p)\)

1. \(s \subseteq |p|\)
2. \(s \not\subseteq |q|\)

\[ p \not\subseteq p \lor q \lor (p \land q) \]

\((\text{Quality})\)

\((\text{Quantity})\)

c. John came, or Mary and John. \((p \lor (p \land q))\)

1. \(s \subseteq |p \lor (p \land q)| = |p|\)
2. \(s \not\subseteq |q|\)
3. \(p \lor (p \land q) \models p \lor q \lor (p \land q)\)

\((\text{Quality})\)

\((\text{Quantity})\)

\((\text{Relation})\)
4.1. Examples

(4) a. John came, Mary came, or both came \((p \lor q \lor (p \land q))\)

b. John came. \((p)\)

1. \(s \subseteq |p|\)
2. \(s \notin |q|\)

\[p \not\subseteq p \lor q \lor (p \land q)\]

\((\text{Quality})\)

\((\text{Quantity})\)

\[\equiv\]

\c. John came, or Mary and John. \((p \lor (p \land q))\)

1. \(s \subseteq |p \lor (p \land q)| = |p|\)
2. \(s \notin |q|\)
3. \(p \lor (p \land q) \models p \lor q \lor (p \land q)\)

\((\text{Quality})\)

\((\text{Quantity})\)

\((\text{Relation})\)
4.1. Examples

(4) a. John came, Mary came, or both came \((p \lor q \lor (p \land q))\)

b. John came. \((p)\)
   1. \(s \subseteq |p|\)  
   2. \(s \not\subseteq |q|\)

\[p \not\subseteq p \lor q \lor (p \land q)\]

(c. John came, or Mary and John. \((p \lor (p \land q))\)
   1. \(s \subseteq |p \lor (p \land q)| = |p|\)  
   2. \(s \not\subseteq |q|\)
   3. - \(p \lor (p \land q) \models p \lor q \lor (p \land q)\)

(Quality)

(Quantity)

(Relation)
4.1. Examples

(4) a. John came, Mary came, or both came \((p \lor q \lor (p \land q))\)

b. John came. \((p)\)

1. \(s \subseteq |p|\)
2. \(s \nsubseteq |q|\)

\[ p \nsubseteq p \lor q \lor (p \land q) \]

(Quantity)

(Quantity)

\[ s \subseteq p \lor (p \land q) \]

(Quantity)

(Quantity)

(Relation)

c. John came, or Mary and John. \((p \lor (p \land q))\)

1. \(s \subseteq |p \lor (p \land q)| = |p|\)
2. \(s \nsubseteq |q|\)
3. \(p \lor (p \land q) \nsubseteq p \lor q \lor (p \land q)\)

(Quantity)

(Quantity)

(Relation)
4.1. Examples

(4) a. John came, Mary came, or both came \((p \lor q \lor (p \land q))\)

b. John came. \((p)\)

1. \(s \subseteq |p|\)
2. \(s \notin |q|\)
3. \(s \subseteq |p| \cup |q|\) or \(s \subseteq |p| \cup |q|\)

(Quantity)

(Relation)

(Quantity)

(Relation)

c. John came, or Mary and John. \((p \lor (p \land q))\)

1. \(s \subseteq |p \lor (p \land q)| = |p|\) \hspace{1cm} (Quality)
2. \(s \notin |q|\) \hspace{1cm} (Quantity)
3. \(p \lor (p \land q) \models p \lor q \lor (p \land q)\) \hspace{1cm} (Relation)
4.1. Examples

(4) a. John came, Mary came, or both came \((p \lor q \lor (p \land q))\)

b. John came. \((p)\)
   1. \(s \subseteq |p|\)
   2. \(s \notin |q|\)
   3. \(s \subseteq |p| \cup |q|\) or \(s \subseteq |p| \cup |q|\)

---------------------------------------------

(4) c. John came, or Mary and John. \((p \lor (p \land q))\)
   1. \(s \subseteq |p \lor (p \land q)| = |p|\) (Quality)
   2. \(s \notin |q|\) (Quantity)
   3. \(p \lor (p \land q) \models p \lor q \lor (p \land q)\) (Relation)
4.1. Examples

(4) a. John came, Mary came, or both came \((p \lor q \lor (p \land q))\)

b. John came. \((p)\)

1. \(s \subseteq |p|\)  
2. \(s \not\subseteq |q|\)  
3. \(s \subseteq |p| \cup |q|\) or \(s \subseteq |p| \cup |q|\)

\[
\begin{align*}
\text{exhaustivity!} \\
\text{exhaustivity!}
\end{align*}
\]

4. \(s \subseteq |q|\)

\[
\begin{align*}
&\text{(Quality)} \\
&\text{(Quantity)} \\
&\text{(Relation)}
\end{align*}
\]

c. John came, or Mary and John. \((p \lor (p \land q))\)

1. \(s \subseteq |p \lor (p \land q)| = |p|\)  
2. \(s \not\subseteq |q|\)  
3. \(\vdash p \lor (p \land q) \Rightarrow p \lor q \lor (p \land q)\)  

\[
\begin{align*}
&\text{(Quality)} \\
&\text{(Quantity)} \\
&\text{(Relation)}
\end{align*}
\]
4.1. Examples

(4) a. John came, Mary came, or both came \((p \lor q \lor (p \land q))\)

b. John came. \(p\)
   1. \(s \subseteq |p|\)
   2. \(s \notin |q|\)
   3. \(s \subseteq |p| \cup |q|\) or \(s \subseteq |p| \cup |q|\)
   4. \(s \subseteq |q|\) exhaustivity!

   \(p \neq p \lor q \lor (p \land q)\)
   (Quality)
   \(s \subseteq |q|\)
   (Quantity)
   \(s \subseteq |p| \cup |q|\)
   (Relation)

   \(s \subseteq |p| \cup |q|\)

   \(s \subseteq |q|\)

   \(s \subseteq |p| \cup |q|\)

   \(s \subseteq |q|\)

   \(s \subseteq |p| \cup |q|\)

   \(s \subseteq |q|\)

   \(s \subseteq |p| \cup |q|\)

   \(s \subseteq |q|\)

   \(s \subseteq |p| \cup |q|\)

   \(s \subseteq |q|\)

   \(s \subseteq |p| \cup |q|\)

   \(s \subseteq |q|\)

   \(s \subseteq |p| \cup |q|\)

   \(s \subseteq |q|\)

   \(s \subseteq |p| \cup |q|\)

   \(s \subseteq |q|\)

   \(s \subseteq |p| \cup |q|\)

   \(s \subseteq |q|\)

   \(s \subseteq |p| \cup |q|\)

   \(s \subseteq |q|\)

   \(s \subseteq |p| \cup |q|\)

   \(s \subseteq |q|\)

   \(s \subseteq |p| \cup |q|\)

   \(s \subseteq |q|\)

   \(s \subseteq |p| \cup |q|\)

   \(s \subseteq |q|\)

   \(s \subseteq |p| \cup |q|\)

   \(s \subseteq |q|\)

   \(s \subseteq |p| \cup |q|\)

   \(s \subseteq |q|\)

   \(s \subseteq |p| \cup |q|\)

   \(s \subseteq |q|\)

   \(s \subseteq |p| \cup |q|\)

   \(s \subseteq |q|\)

   \(s \subseteq |p| \cup |q|\)

   \(s \subseteq |q|\)

   \(s \subseteq |p| \cup |q|\)

   \(s \subseteq |q|\)

   \(s \subseteq |p| \cup |q|\)

   \(s \subseteq |q|\)

   \(s \subseteq |p| \cup |q|\)

   \(s \subseteq |q|\)

   \(s \subseteq |p| \cup |q|\)

   \(s \subseteq |q|\)

   \(s \subseteq |p| \cup |q|\)

   \(s \subseteq |q|\)

   \(s \subseteq |p| \cup |q|\)

   \(s \subseteq |q|\)

   \(s \subseteq |p| \cup |q|\)

   \(s \subseteq |q|\)

   \(s \subseteq |p| \cup |q|\)

   \(s \subseteq |q|\)

   \(s \subseteq |p| \cup |q|\)

   \(s \subseteq |q|\)

   \(s \subseteq |p| \cup |q|\)

   \(s \subseteq |q|\)

   \(s \subseteq |p| \cup |q|\)

   \(s \subseteq |q|\)

   \(s \subseteq |p| \cup |q|\)

   \(s \subseteq |q|\)

   \(s \subseteq |p| \cup |q|\)

   \(s \subseteq |q|\)

   \(s \subseteq |p| \cup |q|\)

   \(s \subseteq |q|\)

   \(s \subseteq |p| \cup |q|\)

   \(s \subseteq |q|\)

   \(s \subseteq |p| \cup |q|\)

   \(s \subseteq |q|\)

   \(s \subseteq |p| \cup |q|\)

   \(s \subseteq |q|\)

   \(s \subseteq |p| \cup |q|\)

   \(s \subseteq |q|\)

   \(s \subseteq |p| \cup |q|\)

   \(s \subseteq |q|\)

   \(s \subseteq |p| \cup |q|\)

   \(s \subseteq |q|\)

   \(s \subseteq |p| \cup |q|\)

   \(s \subseteq |q|\)

   \(s \subseteq |p| \cup |q|\)

   \(s \subseteq |q|\)

   \(s \subseteq |p| \cup |q|\)

   \(s \subseteq |q|\)

   \(s \subseteq |p| \cup |q|\)

   \(s \subseteq |q|\)

   \(s \subseteq |p| \cup |q|\)

   \(s \subseteq |q|\)

   \(s \subseteq |p| \cup |q|\)

   \(s \subseteq |q|\)

   \(s \subseteq |p| \cup |q|\)

   \(s \subseteq |q|\)

   \(s \subseteq |p| \cup |q|\)

   \(s \subseteq |q|\)

   \(s \subseteq |p| \cup |q|\)

   \(s \subseteq |q|\)

   \(s \subseteq |p| \cup |q|\)

   \(s \subseteq |q|\)

   \(s \subseteq |p| \cup |q|\)

   \(s \subseteq |q|\)

   \(s \subseteq |p| \cup |q|\)

   \(s \subseteq |q|\)

   \(s \subseteq |p| \cup |q|\)

   \(s \subseteq |q|\)

   \(s \subseteq |p| \cup |q|\)

   \(s \subseteq |q|\)

   \(s \subseteq |p| \cup |q|\)

   \(s \subseteq |q|\)

   \(s \subseteq |p| \cup |q|\)

   \(s \subseteq |q|\)

   \(s \subseteq |p| \cup |q|\)

   \(s \subseteq |q|\)

   \(s \subseteq |p| \cup |q|\)

   \(s \subseteq |q|\)

   \(s \subseteq |p| \cup |q|\)

   \(s \subseteq |q|\)

   \(s \subseteq |p| \cup |q|\)

   \(s \subseteq |q|\)

   \(s \subseteq |p| \cup |q|\)

   \(s \subseteq |q|\)

   \(s \subseteq |p| \cup |q|\)

   \(s \subseteq |q|\)

   \(s \subseteq |p| \cup |q|\)

   \(s \subseteq |q|\)

   \(s \subseteq |p| \cup |q|\)

   \(s \subseteq |q|\)

   \(s \subseteq |p| \cup |q|\)

   \(s \subseteq |q|\)
4.2. Formal results

Recall: $A$ entails $Q$, $A \sqsupseteq Q$, iff
(i) $\bigcup A \subseteq \bigcup Q$; and
(ii) for all $q \in Q$, $q \cap \bigcup A = \emptyset$ or $q \cap \bigcup A \in A$
4.2. Formal results

Recall: $A$ entails $Q$, $A \models Q$, iff

(i) $\cup A \subseteq \cup Q$; and

(ii) for all $q \in Q$, $q \cap \cup A = \emptyset$ or $q \cap \cup A \in A$

Relation implicature

For a cooperative speaker with info $s$, responding $A$ to $Q$: 
4.2. Formal results

Recall: \( A \) entails \( Q \), \( A \models Q \), iff
(i) \( \cup A \subseteq \cup Q \); and
(ii) for all \( q \in Q \), \( q \cap \cup A = \emptyset \) or \( q \cap \cup A \in A \)

Relation implicature
For a cooperative speaker with info \( s \), responding \( A \) to \( Q \):
(i) \( \cup A \cap s \subseteq \cup Q \)
(ii) \( \ldots \)
4.2. Formal results

Recall: $A$ entails $Q$, $A \models Q$, iff
(i) $\bigcup A \subseteq \bigcup Q$; and
(ii) for all $q \in Q$, $q \cap \bigcup A = \emptyset$ or $q \cap \bigcup A \in A$

Relation implicature

For a cooperative speaker with info $s$, responding $A$ to $Q$:
(i) $s \subseteq \overline{\bigcup A} \cup \bigcup Q$
(ii) ...
4.2. Formal results

Recall: $A$ entails $Q$, $A \models Q$, iff

(i) $\bigcup A \subseteq \bigcup Q$; and
(ii) for all $q \in Q$, $q \cap \bigcup A = \emptyset$ or $q \cap \bigcup A \in A$

Relation implicature

For a cooperative speaker with info $s$, responding $A$ to $Q$:

(i) $s \subseteq \bigcup A \cup \bigcup Q$
(ii) for all $q \in Q$, 
4.2. Formal results

Recall: *A entails Q*, \( A \models Q \), iff

(i) \( \bigcup A \subseteq \bigcup Q \); and
(ii) for all \( q \in Q \), \( q \cap \bigcup A = \emptyset \) or \( q \cap \bigcup A \in A \)

**Relation implicature**

For a cooperative speaker with info \( s \), responding \( A \) to \( Q \):

(i) \( s \subseteq \bigcup A \cup \bigcup Q \)

(ii) for all \( q \in Q \), \( q \cap \bigcup A \cap s = \emptyset \) or . . .
4.2. Formal results

Recall: $A \text{ entails } Q$, $A \models Q$, iff
(i) $\bigcup A \subseteq \bigcup Q$; and
(ii) for all $q \in Q$, $q \cap \bigcup A = \emptyset$ or $q \cap \bigcup A \in A$

Relation implicature
For a cooperative speaker with info $s$, responding $A$ to $Q$:
(i) $s \subseteq \overline{\bigcup A} \cup \bigcup Q$
(ii) for all $q \in Q$, $s \subseteq \overline{\bigcup A} \cup \overline{q}$ or ...
4.2. Formal results

Recall: \( A \) entails \( Q \), \( A \models Q \), iff
(i) \( \bigcup A \subseteq \bigcup Q \); and
(ii) for all \( q \in Q \), \( q \cap \bigcup A = \emptyset \) or \( q \cap \bigcup A \in A \)

Relation implicature

For a cooperative speaker with info \( s \), responding \( A \) to \( Q \):
(i) \( s \subseteq \overline{\bigcup A} \cup \bigcup Q \)
(ii) for all \( q \in Q \), \( s \subseteq \overline{\bigcup A} \cup \overline{q} \) or there is an \( a \in A \) s.t. given \( s \), \( q \cap \bigcup A \) and \( a \) coincide.
4.2. Formal results

Recall: A entails Q, $A \models Q$, iff
(i) $\bigcup A \subseteq \bigcup Q$; and
(ii) for all $q \in Q$, $q \cap \bigcup A = \emptyset$ or $q \cap \bigcup A \in A$

Relation implicature
For a cooperative speaker with info $s$, responding $A$ to $Q$:
(i) $s \subseteq \bigcup \overline{A} \cup \bigcup Q$
(ii) for all $q \in Q$, $s \subseteq \overline{A} \cup q$ or there is an $a \in A$ s.t. $s \subseteq (q \cap \bigcup A \cap \overline{a}) \cup (q \cap \bigcup A \cap a)$
4.2. Formal results

Recall: $A$ entails $Q$, $A \models Q$, iff
(i) $\bigcup A \subseteq \bigcup Q$; and
(ii) for all $q \in Q$, $q \cap \bigcup A = \emptyset$ or $q \cap \bigcup A \in A$

Relation implicature

For a cooperative speaker with info $s$, responding $A$ to $Q$:
(i) $s \subseteq \overline{\bigcup A} \cup \bigcup Q$
(ii) for all $q \in Q$, $s \subseteq \overline{\bigcup A} \cup \overline{q}$ or there is an $a \in A$ s.t.
$s \subseteq (q \cap \bigcup A \cap \overline{a}) \cup (q \cap \bigcup A \cap a)$
4.2. Formal results

Recall: $A$ entails $Q$, $A \models Q$, iff
(i) $\bigcup A \subseteq \bigcup Q$; and
(ii) for all $q \in Q$, $q \cap \bigcup A = \emptyset$ or $q \cap \bigcup A \in A$

Relation implicature
For a cooperative speaker with info $s$, responding $A$ to $Q$:
(i) $s \subseteq \overline{\bigcup \overline{A}} \cup \bigcup Q$
(ii) for all $q \in Q$, $s \subseteq \overline{\bigcup A} \cup \overline{q}$ or there is an $a \in A$ s.t.
$s \subseteq (q \cap \bigcup A \cap \overline{a}) \cup (q \cap \bigcup A \cap a)$

Relation implicature for singleton answer
And if responding $\{a\}$ to $Q$ for some $a \in Q$:
4.2. Formal results

Recall: A entails Q, \( A \models Q \), iff
(i) \( \cup A \subseteq \cup Q \); and
(ii) for all \( q \in Q \), \( q \cap \cup A = \emptyset \) or \( q \cap \cup A \in A \)

Relation implicature

For a cooperative speaker with info \( s \), responding \( A \) to \( Q \):
(i) \( s \subseteq \overline{\cup A} \cup \cup Q \)
(ii) for all \( q \in Q \), \( s \subseteq \overline{\cup A} \cup \overline{q} \) or there is an \( a \in A \) s.t.
\( s \subseteq (q \cap \cup A \cap \overline{a}) \cup (q \cap \cup A \cap a) \)

Relation implicature for singleton answer

And if responding \( \{a\} \) to \( Q \) for some \( a \in Q \):
4.2. Formal results

Recall: \( A \) entails \( Q \), \( A \models Q \), iff
(i) \( \cup A \subseteq \cup Q \); and
(ii) for all \( q \in Q \), \( q \cap \cup A = \emptyset \) or \( q \cap \cup A \in A \)

Relation implicature
For a cooperative speaker with info \( s \), responding \( A \) to \( Q \):
(i) \( s \subseteq \overline{\cup A} \cup \cup Q \)
(ii) for all \( q \in Q \), \( s \subseteq \overline{\cup A} \cup \overline{q} \) or there is an \( a \in A \) s.t. 
\( s \subseteq (q \cap \cup A \cap \overline{a}) \cup (q \cap \cup A \cap a) \)

Relation implicature for singleton answer
And if responding \( \{a\} \) to \( Q \) for some \( a \in Q \):
for all \( q \in Q \),
4.2. Formal results

Recall: $A$ entails $Q$, $A \models Q$, iff

(i) $\bigcup A \subseteq \bigcup Q$; and
(ii) for all $q \in Q$, $q \cap \bigcup A = \emptyset$ or $q \cap \bigcup A \in A$

Relation implicature

For a cooperative speaker with info $s$, responding $A$ to $Q$:

(i) $s \subseteq \overline{\bigcup A} \cup \bigcup Q$
(ii) for all $q \in Q$, $s \subseteq \overline{\bigcup A} \cup \overline{q}$ or there is an $a \in A$ s.t.
$s \subseteq (q \cap \bigcup A \cap \overline{a}) \cup (q \cap \bigcup A \cap a)$

Relation implicature for singleton answer

And if responding \{a\} to $Q$ for some $a \in Q$:

for all $q \in Q$, $s \subseteq \overline{a} \cup \overline{q}$ or ...
4.2. Formal results

Recall: \( A \) entails \( Q \), \( A \models Q \), iff
(i) \( \cup A \subseteq \cup Q \); and
(ii) for all \( q \in Q \), \( q \cap \cup A = \emptyset \) or \( q \cap \cup A \in A \)

Relation implicature

For a cooperative speaker with info \( s \), responding \( A \) to \( Q \):  
(i) \( s \subseteq \overline{\cup A} \cup \cup Q \)  
(ii) for all \( q \in Q \), \( s \subseteq \overline{\cup A} \cup \overline{q} \) or there is an \( a \in A \) s.t. \( s \subseteq (q \cap \cup A \cap a) \cup (q \cap \cup A \cap a) \)

Relation implicature for singleton answer

And if responding \( \{a\} \) to \( Q \) for some \( a \in Q \):  
for all \( q \in Q \), \( s \subseteq \overline{a} \cup \overline{q} \) or \( s \subseteq (q \cap a \cap \overline{a}) \cup (q \cap a \cap a) \)
4.2. Formal results

Recall: $A$ entails $Q$, $A \models Q$, iff
(i) $\cup A \subseteq \cup Q$; and
(ii) for all $q \in Q$, $q \cap \cup A = \emptyset$ or $q \cap \cup A \in A$

Relation implicature

For a cooperative speaker with info $s$, responding $A$ to $Q$:
(i) $s \subseteq \overline{\cup \bar{A} \cup \cup Q}$
(ii) for all $q \in Q$, $s \subseteq \overline{\cup A \cup q}$ or there is an $a \in A$ s.t.
$s \subseteq (q \cap \cup A \cap \bar{a}) \cup (q \cap \cup A \cap a)$

Relation implicature for singleton answer

And if responding $\{a\}$ to $Q$ for some $a \in Q$:
for all $q \in Q$, $s \subseteq \bar{a} \cup q$ or $s \subseteq \bar{a} \cup q$
4.2. Formal results

Recall: A entails $Q$, $A \models Q$, iff
(i) $\bigcup A \subseteq \bigcup Q$; and
(ii) for all $q \in Q$, $q \cap \bigcup A = \emptyset$ or $q \cap \bigcup A \in A$

Relation implicature
For a cooperative speaker with info $s$, responding $A$ to $Q$:
(i) $s \subseteq \overline{\bigcup A} \cup \bigcup Q$
(ii) for all $q \in Q$, $s \subseteq \overline{\bigcup A} \cup \overline{q}$ or there is an $a \in A$ s.t.
$s \subseteq (q \cap \bigcup A \cap a) \cup (q \cap \bigcup A \cap a)$

Relation implicature for singleton answer
And if responding $\{a\}$ to $Q$ for some $a \in Q$:
for all $q \in Q$, $s \subseteq \overline{a} \cup \overline{q}$ or $s \subseteq \overline{a} \cup q$
4.3. And more conceptually...

- The maxim of Relation requires that:
  for each possibility the speaker *leaves unattended*, the speaker
  knows how it depends on the information she provided.

Main conclusion:

If pragmatic reasoning is sensitive to *attentive content* (which it must be, to distinguish between (3b) and (3c));
then *exhaustivity is a conversational implicature*. 
4.3. And more conceptually...

- The maxim of Relation requires that:
  for each possibility the speaker *leaves unattended*, the speaker
  knows how it depends on the information she provided.
- Together with Quality, this implies *opinionatedness*.
4.3. And more conceptually...

- The maxim of Relation requires that:
  for each possibility the speaker *leaves unattended*, the speaker knows how it depends on the information she provided.
- Together with Quality, this implies *opinionatedness*.
- Together with Quantity, this in turn yields exhaustivity.
4.3. And more conceptually...

- The maxim of Relation requires that:
  for each possibility the speaker *leaves unattended*, the speaker knows how it depends on the information she provided.
- Together with Quality, this implies *opinionatedness*.
- Together with Quantity, this in turn yields exhaustivity.

Main conclusion:
4.3. And more conceptually...

- The maxim of Relation requires that:
  for each possibility the speaker *leaves unattended*, the speaker
  knows how it depends on the information she provided.
- Together with Quality, this implies *opinionatedness*.
- Together with Quantity, this in turn yields exhaustivity.

Main conclusion:

- If pragmatic reasoning is sensitive to *attentive content*
4.3. And more conceptually...

- The maxim of Relation requires that:
  for each possibility the speaker *leaves unattended*, the speaker
  knows how it depends on the information she provided.
- Together with Quality, this implies *opinionatedness*.
- Together with Quantity, this in turn yields exhaustivity.

Main conclusion:

- If pragmatic reasoning is sensitive to *attentive content*
  (which it must be, to distinguish between (3b) and (3c)).
4.3. And more conceptually...

- The maxim of Relation requires that: for each possibility the speaker *leaves unattended*, the speaker knows how it depends on the information she provided.
- Together with Quality, this implies *opinionatedness*.
- Together with Quantity, this in turn yields exhaustivity.

Main conclusion:

- If pragmatic reasoning is sensitive to *attentive content* (which it must be, to distinguish between (3b) and (3c));
- then *exhaustivity is a conversational implicature*. 
5. Reflection

5.1. ‘Alternatives’
5.2. Semantics
5.3. Semantic desiderata
5.4. ‘Embedded’ implicatures
5.5. ‘Gricean’?
5.1. ‘Alternatives’

Existing approaches (since forever):
- ‘Why did the speaker not say “p \land q”?’
5.1. ‘Alternatives’

Existing approaches (since forever):
  ▶ ‘Why did the speaker not say “p \land q”?’
  ▶ Mere ignorance is sufficient reason.
5.1. ‘Alternatives’

Existing approaches (since forever):

- ‘Why did the speaker not say “p ∧ q”?’
- Mere ignorance is sufficient reason.

My approach:

- ‘Why did the speaker not say “p ∨ (p ∧ q)”?’

Beware:

- These ‘alternatives’ are fully determined by the maxims.
- Speakers need not reason in terms of alternatives.
5.1. ‘Alternatives’

Existing approaches (since forever):
- ‘Why did the speaker not say \( p \land q \)?’
- Mere ignorance is sufficient reason.

My approach:
- ‘Why did the speaker not say \( p \lor (p \land q) \)?’
- *Ignorance is no excuse.*
5.1. ‘Alternatives’

Existing approaches (since forever):
  ▸ ‘Why did the speaker not say “$p \land q$”?’
  ▸ Mere ignorance is sufficient reason.

My approach:
  ▸ ‘Why did the speaker not say “$p \lor (p \land q)$”?’
  ▸ *Ignorance is no excuse.*
  ▸ Hence something stronger is implied: exhaustivity.
5.1. ‘Alternatives’

Existing approaches (since forever):

- ‘Why did the speaker not say “p \land q”?’
- Mere ignorance is sufficient reason.

My approach:

- ‘Why did the speaker not say “p \lor (p \land q)”?’
- *Ignorance is no excuse.*
- Hence something stronger is implied: exhaustivity.

Beware:

- These ‘alternatives’ are fully determined by the maxims.
- Speakers need not reason in terms of alternatives.
5.2. Semantics

Restriction

A restricted to b, \( A_b := \{ a \cap b \mid a \in A, a \cap b \neq \emptyset \} \)

Semantics (Roelofsen, 2011)

1. \([p] = \{ \{ w \in \text{Worlds} \mid w(p) = \text{true} \} \} \)
2. \([\neg \varphi] = \{ U[\varphi] \} \) if \( U[\varphi] \) is nonempty; \( \emptyset \) otherwise.
3. \([\varphi \lor \psi] = ([\varphi] \cup [\psi])|_{\varphi \cup \psi} = [\varphi] \cup [\psi] \)
4. \([\varphi \land \psi] = ([\varphi] \cup [\psi])|_{\varphi \cap \psi} \)

Attentive semantics is not the only suitable semantics:

Unrestricted Inquisitive Sem. (Ciardelli, 2009; Westera, 2012)

Minimally, the semantics must lack the absorption laws:

Absorption:

\( p \lor (p \land q) \equiv p \equiv p \land (p \lor q) \)
5.2. Semantics

Restriction

A restricted to b, \( A_b := \{ a \cap b \mid a \in A, a \cap b \neq \emptyset \} \)

Semantics (Roelofsen, 2011)

1. \([p] = \{ \{ w \in \textbf{Worlds} \mid w(p) = \text{true} \} \}\)
2. \([-\varphi] = \{ \bigcup[\varphi] \} \) if \( \bigcup[\varphi] \) is nonempty; \( \emptyset \) otherwise.
3. \([\varphi \lor \psi] = ([\varphi] \cup [\psi])|_{\varphi \lor \psi} = [\varphi] \cup [\psi] \)
4. \([\varphi \land \psi] = ([\varphi] \cup [\psi])|_{\varphi \land \psi} \)

Attentive semantics is not the only suitable semantics:

- *Unrestricted Inquisitive Sem.* (Ciardelli, 2009; Westera, 2012)
5.2. Semantics

Restriction

A restricted to \( b \), \( A_b := \{ a \cap b \mid a \in A, a \cap b \neq \emptyset \} \)

Semantics (Roelofsen, 2011)

1. \([p] = \{ \{ w \in \textbf{Worlds} \mid w(p) = \text{true} \} \}\)
2. \([-\varphi] = \{ \bigcup[\varphi] \} \) if \( \bigcup[\varphi] \) is nonempty; \( \emptyset \) otherwise.
3. \([\varphi \lor \psi] = ( [\varphi] \cup [\psi] )_{|\varphi| \lor |\psi|} = [\varphi] \cup [\psi] \)
4. \([\varphi \land \psi] = ( [\varphi] \cup [\psi] )_{|\varphi| \land |\psi|} \)

Attentive semantics is not the only suitable semantics:

- Unrestricted Inquisitive Sem. (Ciardelli, 2009; Westera, 2012)

Minimally, the semantics must lack the absorption laws:

- Absorption: \( p \lor (p \land q) \equiv p \equiv p \land (p \lor q) \)
5.3. Semantic desiderata

- No absorption laws.
5.3. Semantic desiderata

- No absorption laws.
- Questions, the responses to which may be exhaustified, are *not* partitions.

(cf. Groenendijk and Stokhof, 1984)
5.3. Semantic desiderata

- No absorption laws.
- Questions, the responses to which may be exhaustified, are *not* partitions.
  
  (cf. Groenendijk and Stokhof, 1984)

- Wh-words are existential quantifiers over sets.
5.4. ‘Embedded’ exhaustivity

E.g., Chierchia, *et al.*, (2008++):
5.4. ‘Embedded’ exhaustivity

E.g., Chierchia, et al., (2008++):

(6) John, Mary or Bob came.

\[ \sim \text{Only one of them came.} \]
5.4. ‘Embedded’ exhaustivity

E.g., Chierchia, *et al.*, (2008++): 

(6) John, Mary or Bob came.  
    \[ \sim \text{Only one of them came.} \]

(7) Each of the students read Othello or King Lear.  
    \[ \sim \text{Each of the students didn’t read both.} \]
5.4. ‘Embedded’ exhaustivity

E.g., Chierchia, et al., (2008++):

(6) John, Mary or Bob came.
    \( \sim \) Only one of them came.

(7) Each of the students read Othello or King Lear.
    \( \sim \) Each of the students didn’t read both.

The problem

The problem has never been the Gricean approach as such, but rather how to find the right ‘alternatives’.
5.4. ‘Embedded’ exhaustivity

E.g., Chierchia, et al., (2008+)

(6) John, Mary or Bob came.
   \sim Only one of them came.

(7) Each of the students read Othello or King Lear.
   \sim Each of the students didn’t read both.

The problem

The problem has never been the Gricean approach as such, but rather how to find the right ‘alternatives’.

In my account:

- Attentively, conjunction and disjunction denote union.
5.4. ‘Embedded’ exhaustivity

E.g., Chierchia, *et al.*, (2008++):

(6) John, Mary or Bob came.
    \[ \sim \text{Only one of them came.} \]

(7) Each of the students read Othello or King Lear.
    \[ \sim \text{Each of the students didn’t read both.} \]

The problem

The problem has never been the Gricean approach as such, but rather how to find the right ‘alternatives’.

In my account:

- *Attentively*, conjunction and disjunction denote *union*.
- Hence, embedding simply *accumulates* attentive content.
5.4. ‘Embedded’ exhaustivity

E.g., Chierchia, *et al.*, (2008++):

(6) John, Mary or Bob came.
    \(\sim\) Only one of them came.

(7) Each of the students read Othello or King Lear.
    \(\sim\) Each of the students didn’t read both.

The problem

The problem has never been the Gricean approach as such, but rather *how to find the right ‘alternatives’*.

In my account:

- *Attentively*, conjunction and disjunction denote *union*.
- Hence, embedding simply *accumulates* attentive content.
- E.g., for each of the students, there is attentive content...
5.4. ‘Embedded’ exhaustivity

E.g., Chierchia, et al., (2008++):

(6) John, Mary or Bob came.
    \sim Only one of them came.

(7) Each of the students read Othello or King Lear.
    \sim Each of the students didn’t read both.

The problem

The problem has never been the Gricean approach as such, but rather how to find the right ‘alternatives’.

In my account:

› Attentively, conjunction and disjunction denote union.
› Hence, embedding simply accumulates attentive content.
› E.g., for each of the students, there is attentive content...

Many ‘embedded’ implicatures are in fact predicted.
5.5. ‘Gricean’?

“that there [appear to be] divergences in meaning between [...] the formal devices [and] their analogs or counterparts in natural language” (Grice, 1975)
5.5. ‘Gricean’?

“that there [appear to be] divergences in meaning between [...] the formal devices [and] their analogs or counterparts in natural language” (Grice, 1975)

- The semantics treats informative content classically.
5.5. ‘Gricean’?

“that there [appear to be] divergences in meaning between [...] the formal devices [and] their analogs or counterparts in natural language” (Grice, 1975)

- The semantics treats informative content classically.
- Grice wouldn’t be against other dimensions of meaning.
“that there [appear to be] divergences in meaning between [...] the formal devices [and] their analogs or counterparts in natural language” (Grice, 1975)

- The semantics treats informative content classically.
- Grice wouldn’t be against other dimensions of meaning.
- The connectives are still algebraically ‘basic’.
5.5. ‘Gricean’?

“that there [appear to be] divergences in meaning between [...] the formal devices [and] their analogs or counterparts in natural language” (Grice, 1975)

- The semantics treats informative content classically.
- Grice wouldn’t be against other dimensions of meaning.
- The connectives are still algebraically ‘basic’.

Besides: this is the only way.
End of Part I
Part II: Focus!

6. Cancellability
7. Exhaustivity and Focus
8. Anticipated ‘but’s
6. Cancellability

6.1. Grice on cancellability
6.2. Textbook examples
6.3. Non-cancellable by definition
6.4. Exhaustivity
6.1. Grice on cancellability

A putative conversational implicature that \( p \) is explicitly cancellable if [...] it is admissible to add “but not \( p \)”, or “I do not mean to imply that \( p \)” [...].

(Grice, 1975, p. 44.)
6.1. Grice on cancellability

A putative conversational implicature that \( p \) is explicitly cancellable if \([\ldots]\) it is admissible to add “but not \( p \)”, or “I do not mean to imply that \( p \)” \([\ldots]\).

(Grice, 1975, p. 44.)

\([\ldots]\) since it is possible to opt out of the observation of [the Cooperative Principle], it follows that a conversational implicature can be cancelled in a particular case. (p.57)
6.2. Textbook examples

Some typical examples of cancellation:

(8) On an unrelated note, it was raining.

(9) John, or Mary, or both.

(10) Will one of your parents be home?

(11) How many people will be home?

(12) John or Mary. Oh, but I did not mean to imply not both.

(13) It is raining. Oh, but it has stopped!

The speaker is changing her mind...
6.2. Textbook examples

Some typical examples of cancellation:

(8) On an unrelated note, it was raining.
6.2. Textbook examples

Some typical examples of cancellation:

(8) On an unrelated note, it was raining.

(9) John, or Mary, or both. $\not\exists$ not both
6.2. Textbook examples

Some typical examples of cancellation:

(8) On an unrelated note, it was raining.

(9) John, or Mary, or both. \(\not\) not both

(10) Will one of your parents be home?
    Sure, one of them will be home. Indeed, both will be home.
6.2. Textbook examples

Some typical examples of cancellation:

(8) On an unrelated note, it was raining.

(9) John, or Mary, or both.  \( \not \) not both

(10) Will one of your parents be home?
    Sure, one of them will be home. Indeed, both will be home.

(12) John or Mary. Oh, but I did not mean to imply not both.
6.2. Textbook examples

Some typical examples of cancellation:

(8) On an unrelated note, it was raining.

(9) John, or Mary, or both. \( \not \) not both

CI are computed \textit{globally}...

(10) Will one of your parents be home?
    Sure, one of them will be home. Indeed, both will be home.

(12) John or Mary. Oh, but I did not mean to imply not both.
6.2. Textbook examples

Some typical examples of cancellation:

(8) On an unrelated note, it was raining.
(9) John, or Mary, or both. \( \nabla \text{not both} \)
CI are computed \textit{globally}...

(10) Will one of your parents be home?
Sure, one of them will be home. Indeed, both will be home.

(12) John or Mary. Oh, but I did not mean to imply not both.
6.2. Textbook examples

Some typical examples of cancellation:

(8) On an unrelated note, it was raining.

(9) John, or Mary, or both. \( \not \) not both

CI are computed *globally*...

(cf. Geurts, 2010)

(10) Will one of your parents be home?
    Sure, one of them will be home. Indeed, both will be home.

(12) John or Mary. Oh, but I did not mean to imply not both.
6.2. Textbook examples

Some typical examples of cancellation:

(8) On an unrelated note, it was raining.
(9) John, or Mary, or both. \( \not\) not both

CI are computed \textit{globally}...

(cf. Geurts, 2010)

(10) Will one of your parents be home?
Sure, one of them will be home. Indeed, both will be home.

(11) How many people will be home?
One of my parents will be home. \# Indeed, both will be home.

(12) John or Mary. Oh, but I did not mean to imply not both.
6.2. Textbook examples

Some typical examples of cancellation:

(8) On an unrelated note, it was raining.

(9) John, or Mary, or both. \( \not \) not both

CI are computed globally...

(10) Will one of your parents be home?
    Sure, one of them will be home. Indeed, both will be home.

(11) How many people will be home?
    One of my parents will be home. \# Indeed, both will be home.

In (10), the CI wasn’t there to begin with... (cf. Geurts, 2010)

(12) John or Mary. Oh, but I did not mean to imply not both.
6.2. Textbook examples

Some typical examples of cancellation:

(8) On an unrelated note, it was raining.

(9) John, or Mary, or both.  \( \not\) not both

CI are computed \textit{globally}...

(cf. Geurts, 2010)

(10) Will one of your parents be home?
    Sure, one of them will be home. Indeed, both will be home.

(11) How many people will be home?
    One of my parents will be home. \# Indeed, both will be home.

In (10), the CI wasn’t there to begin with... (cf. Geurts, 2010)

(12) John or Mary. Oh, but I did not mean to imply not both.
6.2. Textbook examples

Some typical examples of cancellation:

(8) On an unrelated note, it was raining.

(9) John, or Mary, or both. \( \not \) not both

CI are computed \textit{globally}...

(cf. Geurts, 2010)

(10) Will one of your parents be home?
Sure, one of them will be home. Indeed, both will be home.

(11) How many people will be home?
One of my parents will be home. \( \neq \) Indeed, both will be home.

In (10), the CI wasn’t there to begin with...

(cf. Geurts, 2010)

(12) John or Mary. Oh, but I did not mean to imply not both.

(13) It is raining. Oh, but it has stopped!
6.2. Textbook examples

Some typical examples of cancellation:

(8) On an unrelated note, it was raining.

(9) John, or Mary, or both. \( \not\) not both

CI are computed *globally*...

(cf. Geurts, 2010)

(10) Will one of your parents be home?
Sure, one of them will be home. Indeed, both will be home.

(11) How many people will be home?
One of my parents will be home. \( \neq \) Indeed, both will be home.

In (10), the CI wasn’t there to begin with... (cf. Geurts, 2010)

(12) John or Mary. Oh, but I did not mean to imply not both.

(13) It is raining. Oh, but it has stopped!

The speaker is changing her mind...
6.2. Textbook examples

Some typical examples of cancellation:

(8) On an unrelated note, it was raining.

(9) John, or Mary, or both. \( \not \) not both

CI are computed \textit{globally}...

(10) Will one of your parents be home?
Sure, one of them will be home. Indeed, both will be home.

(11) How many people will be home?
One of my parents will be home. \# Indeed, both will be home.

In (10), the CI wasn’t there to begin with...

(cf. Geurts, 2010)

(12) John or Mary. Oh, but I did not mean to imply not both.

(13) It is raining. Oh, but it has stopped!

The speaker is changing her mind...
6.3. Non-cancellable by definition

- Surely CI are cancellable in a way that is *not* prevention, disambiguation or correction?
6.3. Non-cancellable by definition

- Surely CI are cancellable in a way that is *not* prevention, disambiguation or correction?
- CIs are considered ‘defeasible’, ‘less robust’, ‘voluntary’.
6.3. Non-cancellable by definition

- Surely CI are cancellable in a way that is *not* prevention, disambiguation or correction?
- CIs are considered ‘defeasible’, ‘less robust’, ‘voluntary’.

**Implicature cancellation (*strict version*)**

For a consistent speaker to make a conversational implicature and subsequently cancel it.
6.3. Non-cancellable by definition

- Surely CIs are cancellable in a way that is *not* prevention, disambiguation or correction?
- CIs are considered ‘defeasible’, ‘less robust’, ‘voluntary’.

**Implicature cancellation (**strict** version)**

For a *consistent* speaker to make a conversational implicature and subsequently cancel it.
6.3. Non-cancellable by definition

- Surely CI are cancellable in a way that is not prevention, disambiguation or correction?
- CIs are considered ‘defeasible’, ‘less robust’, ‘voluntary’.

**Implicature cancellation (strict version)**

For a consistent speaker to make a conversational implicature and subsequently cancel it.
6.3. Non-cancellable by definition

- Surely CI are cancellable in a way that is *not* prevention, disambiguation or correction?
- CIs are considered ‘defeasible’, ‘less robust’, ‘voluntary’.

**Implicature cancellation (strict version)**

For a consistent speaker to make a conversational implicature and subsequently cancel it.

**However...**

CIs in the sense of Grice (1975) cannot be cancelled in this sense:
6.3. Non-cancellable by definition

- Surely CI are cancellable in a way that is *not* prevention, disambiguation or correction?
- CIs are considered ‘defeasible’, ‘less robust’, ‘voluntary’.

Implicature cancellation (*strict version*)

For a consistent speaker to make a conversational implicature and subsequently cancel it.

However...

CIs in the sense of Grice (1975) cannot be cancelled in this sense:

1. CI is necessary for maintaining the cooperativity assumption.
6.3. Non-cancellable by definition

- Surely CI are cancellable in a way that is *not* prevention, disambiguation or correction?
- CIs are considered ‘defeasible’, ‘less robust’, ‘voluntary’.

Implicature cancellation (*strict version*)

For a consistent speaker to make a conversational implicature and subsequently cancel it.

However...

CIs in the sense of Grice (1975) cannot be cancelled in this sense:

1. CI is necessary for maintaining the cooperativity assumption.
2. The mutual assumption of cooperativity is necessary for CI.
6.3. Non-cancellable by definition

- Surely CI are cancellable in a way that is *not* prevention, disambiguation or correction?
- CIs are considered ‘defeasible’, ‘less robust’, ‘voluntary’.

Implicature cancellation (*strict version*)

For a consistent speaker to make a conversational implicature and subsequently cancel it.

However...

CIs in the sense of Grice (1975) cannot be cancelled in this sense:

1. CI is necessary for maintaining the cooperativity assumption.
2. The mutual assumption of cooperativity is necessary for CI.
3. Hence, cancelling CI requires the sp. to retroactively:
   (i) revoke the cooperativity assumption; or
   (ii) revise what counted as cooperative.
6.3. Non-cancellable by definition

- Surely CI are cancellable in a way that is not prevention, disambiguation or correction?
- CIs are considered ‘defeasible’, ‘less robust’, ‘voluntary’.

Implicature cancellation (strict version)

For a consistent speaker to make a conversational implicature and subsequently cancel it.

However...

CIs in the sense of Grice (1975) cannot be cancelled in this sense:

1. CI is necessary for maintaining the cooperativity assumption.
2. The mutual assumption of cooperativity is necessary for CI.
3. Hence, cancelling CI requires the sp. to retroactively:
   (i) revoke the cooperativity assumption; or
   (ii) revise what counted as cooperative.
4. The speaker would be either uncooperative, or inconsistent.
6.4. Exhaustivity

In sum:

- Grice’s choice of the word “cancel” is unfortunate.
6.4. Exhaustivity

In sum:

- Grice’s choice of the word “cancel” is unfortunate.
- CI is defeasible only insofar as the mutual assumption of cooperativity is.
6.4. Exhaustivity

In sum:

- Grice’s choice of the word “cancel” is unfortunate.
- CI is defeasible only insofar as the mutual assumption of cooperativity is. (That is, not really.)
6.4. Exhaustivity

In sum:

- Grice’s choice of the word “cancel” is unfortunate.
- CI is defeasible only insofar as the mutual assumption of cooperativity is. (That is, not really.)
- A really defeasible ‘CI’ is not a CI; it’s an inference.
6.4. Exhaustivity

In sum:

- Grice’s choice of the word “cancel” is unfortunate.
- CI is defeasible only insofar as the mutual assumption of cooperativity is. (That is, not really.)
- A really defeasible ‘CI’ is not a CI; it’s an inference.

Now, if I’m correct:

- Exhaustivity is a conversational implicature.
6.4. Exhaustivity

In sum:

- Grice’s choice of the word “cancel” is unfortunate.
- CI is defeasible only insofar as the mutual assumption of cooperativity is. (That is, not really.)
- A really defeasible ‘CI’ is not a CI; it’s an inference.

Now, if I’m correct:

- Exhaustivity is a conversational implicature.
- Hence, exhaustivity is not really defeasible.
6.4. Exhaustivity

In sum:

- Grice’s choice of the word “cancel” is unfortunate.
- CI is defeasible only insofar as the mutual assumption of cooperativity is. (That is, not really.)
- A really defeasible ‘CI’ is not a CI; it’s an inference.

Now, if I’m correct:

- Exhaustivity is a conversational implicature.
- Hence, exhaustivity is not really defeasible.
- (Previously, the competence assumption made it defeasible).
6.4. Exhaustivity

In sum:

- Grice’s choice of the word “cancel” is unfortunate.
- CI is defeasible only insofar as the mutual assumption of cooperativity is. (That is, not really.)
- A really defeasible ‘CI’ is not a CI; it’s an inference.

Now, if I’m correct:

- Exhaustivity is a conversational implicature.
- Hence, exhaustivity is not really defeasible.
- (Previously, the competence assumption made it defeasible).

This makes the Gricean story much more generative...
7. Exhaustivity and focus

7.1. The focus principle
7.2. Focus vs. ‘only’
7.3. Enforcing exhaustivity
7.1. The focus principle

- The maxims of Quantity/Relation refer to a QUD.
7.1. The focus principle

- The maxims of Quantity/Relation refer to a QUD.
- For implicatures, this QUD must be mutual knowledge.
7.1. The focus principle

- The maxims of Quantity/Relation refer to a QUD.
- For implicatures, this QUD must be mutual knowledge.

Focus principle (Beaver and Clark, 2008)
Some part of a declarative utterance must evoke all of the possibilities of the QUD.
7.1. The focus principle

- The maxims of Quantity/Relation refer to a QUD.
- For implicatures, this QUD must be mutual knowledge.

Focus principle (Beaver and Clark, 2008)

Some part of a declarative utterance must evoke all of the possibilities of the QUD.
7.1. The focus principle

- The maxims of Quantity/Relation refer to a QUD.
- For implicatures, this QUD must be mutual knowledge.

Focus principle (Beaver and Clark, 2008)
Some part of a declarative utterance must evoke all of the possibilities of the QUD.

Hence:
- Focus is necessary for Quan/Rel implicatures.
7.1. The focus principle

- The maxims of Quantity/Relation refer to a QUD.
- For implicatures, this QUD must be mutual knowledge.

Focus principle (Beaver and Clark, 2008)
Some part of a declarative utterance must evoke all of the possibilities of the QUD.

Hence:
- Focus is necessary for Quan/Rel implicatures.
- Focus is (almost) sufficient for Quan/Rel implicatures.
7.1. The focus principle

- The maxims of Quantity/Relation refer to a QUD.
- For implicatures, this QUD must be mutual knowledge.

Focus principle (Beaver and Clark, 2008)
Some part of a declarative utterance must evoke all of the possibilities of the QUD.

Hence:
- Focus is necessary for Quan/Rel implicatures.
- Focus is (almost) sufficient for Quan/Rel implicatures.

This makes the Gricean story even more generative.
7.2. Focus vs. ‘only’

The foregoing is not to say that focus ‘means’ ‘only’:

(14) If John was there, Mary was there. (c.f., Horn, 1972) \equiv If only John was there, Mary was there.

(15) John was there, and Mary too. \equiv Only John was there, and only Mary.

But at least for ‘simple’ sentences: “[subject] F predicate ‘only [subject] F predicate’.”
7.2. Focus vs. ‘only’

The foregoing is not to say that focus ‘means’ ‘only’:

(14) If \([\text{John}]_F\) was there, Mary was there. \quad (\text{c.f., Horn, 1972})
\[ \neq \] If only John was there, Mary was there.
7.2. Focus vs. ‘only’

The foregoing is not to say that focus ‘means’ ‘only’:

(14) If $[\text{John}]_F$ was there, Mary was there. (c.f., Horn, 1972)
    $\not\equiv$ If only John was there, Mary was there.

(15) $[\text{John}]_F$ was there, and $[\text{Mary}]_F$ too.
    $\not\equiv$ Only John was there, and only Mary.
7.2. Focus vs. ‘only’

The foregoing is not to say that focus ‘means’ ‘only’:

(14) If [John]_F was there, Mary was there. (c.f., Horn, 1972)
     \[\not\equiv\] If only John was there, Mary was there.

(15) [John]_F was there, and [Mary]_F too.
     \[\not\equiv\] Only John was there, and only Mary.

But at least for ‘simple’ sentences:

- ‘[Subject]_F predicate’ \(\sim\) ‘only [Subject]_F predicate’.
7.3. Enforcing exhaustivity

We have eliminated the need for:

- an opinionatedness assumption.
- an explicit QUD.

The only remaining contextual indeterminacy:

- the domain restriction on focus alternatives.

But this too can be fixed:


This is the way to enforce exhaustivity.
7.3. Enforcing exhaustivity

We have eliminated the need for:

- an opinionatedness assumption.
7.3. Enforcing exhaustivity

We have eliminated the need for:

- an opinionatedness assumption.
- an explicit QUD.
7.3. Enforcing exhaustivity

We have eliminated the need for:

- an opinionatedness assumption.
- an explicit QUD.

The only remaining contextual indeterminacy:


This is the way to enforce exhaustivity.
7.3. Enforcing exhaustivity

We have eliminated the need for:

- an opinionatedness assumption.
- an explicit QUD.

The only remaining contextual indeterminacy:

- The \textit{domain restriction} on focus alternatives.
We have eliminated the need for:

- an opinionatedness assumption.
- an explicit QUD.

The only remaining contextual indeterminacy:

- The domain restriction on focus alternatives.

But this too can be fixed:

\[(16)\) Of John, Bill and Mary, \([\text{John}]_F\) came.
7.3. Enforcing exhaustivity

We have eliminated the need for:
  - an opinionatedness assumption.
  - an explicit QUD.

The only remaining contextual indeterminacy:
  - The *domain restriction* on focus alternatives.

But this too can be fixed:

(16) Of John, Bill and Mary, [John]_F came.

This is the way to enforce exhaustivity.
8. Anticipated ‘but’s

8.1. But... experiments!
8.2. But... mention some!
8.3. But... Hungarian!
8.1. But... experiments!

Why do experiments show such mixed results?
8.1. But... experiments!

Why do experiments show such mixed results?

- QUD and focus are left implicit;
8.1. But... experiments!

Why do experiments show such mixed results?

- QUD and focus are left implicit;
  (or the wrong foci are compared (Zondervan, 2010))
8.1. But... experiments!

Why do experiments show such mixed results?

- QUD and focus are left implicit;
  (or the wrong foci are compared (Zondervan, 2010))
- Domain restriction is left implicit;
8.1. But... experiments!

Why do experiments show such mixed results?

- QUD and focus are left implicit; (or the wrong foci are compared (Zondervan, 2010))
- Domain restriction is left implicit;
- Level of granularity is left implicit;
8.1. But... experiments!

Why do experiments show such mixed results?

- QUD and focus are left implicit; (or the wrong foci are compared (Zondervan, 2010))
- Domain restriction is left implicit;
- Level of granularity is left implicit;
- The experimental task may disable maxims;
8.1. But... experiments!

Why do experiments show such mixed results?

- QUD and focus are left implicit; (or the wrong foci are compared (Zondervan, 2010))
- Domain restriction is left implicit;
- Level of granularity is left implicit;
- The experimental task may disable maxims;
- Intonation is not controlled for (e.g., final rise).
8.2. But... mention-some!

Contexts where, supposedly, exhaustivity is absent:

(16) Where can I buy an Italian newspaper?
    In the kiosk around the corner. Nowhere else.
8.2. But... mention-some!

Contexts where, supposedly, exhaustivity is absent:

(16) Where can I buy an Italian newspaper?
    In the kiosk around the corner. ➔ Nowhere else.

But is it really absent?
8.2. But... mention-some!

Contexts where, supposedly, exhaustivity is absent:

(16) Where can I buy an Italian newspaper?
    In the kiosk around the corner. \(\n\) Nowhere else.
    \(\sim\) Nowhere else that is nearby, easy to explain, . . .

But is it really absent?
8.2. But... mention-some!

Contexts where, supposedly, exhaustivity is absent:

(16) Where can I buy an Italian newspaper?
  In the kiosk around the corner. \(\nearrow\) Nowhere else.
  \(\sim\) Nowhere else that is nearby, easy to explain, ... 

But is it really absent?

- We get exhaustivity as usual, but on a restricted domain.
8.2. But... mention-some!

Contexts where, supposedly, exhaustivity is absent:

(16) Where can I buy an Italian newspaper?
    In the kiosk around the corner. ✈️ Nowhere else.
    ~ Nowhere else that is nearby, easy to explain, ...

But is it really absent?

- We get exhaustivity as usual, but on a restricted domain.
- No ‘mention-some’ when the domain is explicit:
8.2. But... mention-some!

Contexts where, supposedly, exhaustivity is absent:

(16) Where can I buy an Italian newspaper?
    In the kiosk around the corner. ✏ Nowhere else.
    ~ Nowhere else that is nearby, easy to explain, ... 

But is it really absent?

▷ We get exhaustivity as usual, but on a restricted domain.
▷ No ‘mention-some’ when the domain is explicit:

(17) Of the three nearby kiosks, where can I buy an IN?
    In the kiosk around the corner. ~ Not in the other kiosks.
8.2. But... mention-some!

Contexts where, supposedly, exhaustivity is absent:

(16) Where can I buy an Italian newspaper?
   In the kiosk around the corner. ↗️ Nowhere else.
   ↗ Nowhere else that is nearby, easy to explain, . . .

But is it really absent?

- We get exhaustivity as usual, but on a restricted domain.
- No ‘mention-some’ when the domain is explicit:

(17) Of the three nearby kiosks, where can I buy an IN?
   In the kiosk around the corner. ↗ Not in the other kiosks.

(Alternatively, use a final rise...)
8.3. But... Hungarian!

Semantics of Hungarian focus (since Szabolcsi, 1981):

(18) \([\text{Amy and Ben}]_F \text{ saw Cleo.} \equiv [\text{Amy}]_F \text{ saw Cleo.}\)
8.3. But... Hungarian!

Semantics of Hungarian focus (since Szabolcsi, 1981):

(18) \[\text{Amy and Ben}]_F \text{ saw Cleo.} \equiv \[\text{Amy}]_F \text{ saw Cleo.}

(19) \[\text{Amy és Ben}]_F \text{ láttta Cleot.} \not\equiv \[\text{Amy}]_F \text{ láttta Cleot.}
8.3. But... Hungarian!

Semantics of Hungarian focus (since Szabolcsi, 1981):

(18) \([\text{Amy and Ben}]_F \text{ saw Cleo.} \equiv [\text{Amy}]_F \text{ saw Cleo.}\)
(19) \([\text{Amy és Ben}]_F \text{ láttá Cleot.} \not\equiv [\text{Amy}]_F \text{ láttá Cleot.}\)
(20) It is Amy and Ben who saw Cleo.’ \not\equiv ‘It is Amy who saw Cleo.’
8.3. But... Hungarian!

Semantics of Hungarian focus (since Szabolcsi, 1981):

(18) \([\text{Amy and Ben}]_F \text{ saw Cleo.} \equiv [\text{Amy}]_F \text{ saw Cleo.}\)
(19) \([\text{Amy és Ben}]_F \text{ látta Cleot.} \not\equiv [\text{Amy}]_F \text{ látta Cleot.}\)
(20) It is Amy and Ben who saw Cleo.' \not\equiv \text{‘It is Amy who saw Cleo.’}

8.3. But... Hungarian!

Semantics of Hungarian focus (since Szabolcsi, 1981):

(18) \([\text{Amy and Ben}]_F \text{ saw Cleo. } \equiv [\text{Amy}]_F \text{ saw Cleo.}\]

(19) \([\text{Amy és Ben}]_F \text{ látta Cleot. } \not\equiv [\text{Amy}]_F \text{ látta Cleot.}\]

(20) It is Amy and Ben who saw Cleo.’ \not\equiv ‘It is Amy who saw Cleo.’

- But if English focus already conveys mandatory exhaustivity...
8.3. But… Hungarian!

Semantics of Hungarian focus (since Szabolcsi, 1981):

(18) [Amy and Ben]$_F$ saw Cleo. $\equiv$ [Amy]$_F$ saw Cleo.

(19) [Amy és Ben]$_F$ láttá Cleot. $\not\equiv$ [Amy]$_F$ láttá Cleot.

(20) It is Amy and Ben who saw Cleo.’ $\not\equiv$ ‘It is Amy who saw Cleo.’


- But if English focus already conveys mandatory exhaustivity...
- then in what sense can Hungarian focus be stronger?
8.3. But... Hungarian!

Semantics of Hungarian focus (since Szabolcsi, 1981):

(20) It is Amy and Ben who saw Cleo.’ ⊤ ‘It is Amy who saw Cleo.’


▶ But if English focus already conveys mandatory exhaustivity...
▶ then in what sense can Hungarian focus be stronger?

Proposal:

▶ Hungarian focus conveys that the domain is ‘wide’.
Semantics of Hungarian focus (since Szabolcsi, 1981):

(18) \([\text{Amy and Ben}]_F \text{ saw Cleo.} \equiv [\text{Amy}]_F \text{ saw Cleo.}\)

(19) \([\text{Amy és Ben}]_F \text{ látta Cleot.} \not\equiv [\text{Amy}]_F \text{ látta Cleot.}\)

(20) It is Amy and Ben who saw Cleo.’ \not\equiv ‘It is Amy who saw Cleo.’


- But if English focus already conveys mandatory exhaustivity...
- then *in what sense* can Hungarian focus be *stronger*?

Proposal:

- Hungarian focus conveys that *the domain is ‘wide’.*

(21) Of Amy, Ben, and John, \([\text{Amy and Ben}]_F \text{ saw Cleo.} \not\equiv \text{ Of Amy, Ben, and John, [Amy]}_F \text{ saw Cleo.}\)
End of Part II
Part III: Listen!

9. Preventing exhaustivity: the rising pitch
9. Preventing exhaustivity: the rising pitch

9.1. The sentence-final rise
9.2. Deriving the readings
9.3. General results
9.4. Interrogatives
9.5. Multiple foci
9.1. The sentence-final rise

(22) Of John, Bill and Mary, who came to the party?
  John came↘.
  ~ Mary and Bill didn’t.
9.1. The sentence-final rise

(22) Of John, Bill and Mary, who came to the party?

John came↑.

Mary and Bill didn’t.
9.1. The sentence-final rise

(22) Of John, Bill and Mary, who came to the party?
    John came↗.
    ∼ ...wait, there’s more.
    ↗ Mary and Bill didn’t.
9.1. The sentence-final rise

(22) Of John, Bill and Mary, who came to the party?
    John came↑. ≈ Mary and Bill didn’t.
    ↗ ...wait, there’s more.
    ↗ ...perhaps that implies sth. about M&B?
9.1. The sentence-final rise

(22) Of John, Bill and Mary, who came to the party?
    John came↗.
    ↘ Mary and Bill didn’t.
    ↘ ...wait, there’s more.
    ↘ ...perhaps that implies sth. about M&B?
    ↘ ...but I’m not sure.
9.1. The sentence-final rise

(22) Of John, Bill and Mary, who came to the party?
John came ↗.
Mary and Bill didn’t.

〜 ...wait, there’s more.
〜 ...perhaps that implies sth. about M&B?
〜 ...but I’m not sure.
〜 ...did I make myself clear?
9.1. The sentence-final rise

(22) Of John, Bill and Mary, who came to the party?
John came $\rightarrow^L$. $\nearrow$ Mary and Bill didn’t.
$\leadsto$ ...wait, there’s more.
$\leadsto$ ...perhaps that implies sth. about M&B?
c. John came $\rightarrow^H$.
$\leadsto$ ...but I’m not sure.
$\leadsto$ ...did I make myself clear?
9.1. The sentence-final rise

(22) Of John, Bill and Mary, who came to the party?
   John came \(\uparrow^L\). \(\nRightarrow\) Mary and Bill didn’t.
   \(\Rightarrow\) ...wait, there’s more.
   \(\Rightarrow\) ...perhaps that implies sth. about M&B?
   c. John came \(\uparrow^H\).
   \(\Rightarrow\) ...but I’m not sure.
   \(\Rightarrow\) ...did I make myself clear?
9.1. The sentence-final rise

(22) Of John, Bill and Mary, who came to the party?
    John came $\nearrow^L$. $\nearrow$ Mary and Bill didn’t.
    $\nearrow$ ...wait, there’s more. (Quantity)
    $\nearrow$ ...perhaps that implies sth. about M&B? (Relation)
    c. John came $\nearrow^H$.
    $\nearrow$ ...but I’m not sure.
    $\nearrow$ ...did I make myself clear?
9.1. The sentence-final rise

(22) Of John, Bill and Mary, who came to the party?
    John came \( \uparrow \mathrm{L} \).         \( \not\uparrow \) Mary and Bill didn’t.  
        \( \leadsto \) ...wait, there’s more.     (Quantity)  
        \( \leadsto \) ...perhaps that implies sth. about M&B?   (Relation) 
    c. John came \( \uparrow \mathrm{H} \).  
        \( \leadsto \) ...but I’m not sure.  
        \( \leadsto \) ...did I make myself clear?

Proposal

1. The final rise marks the violation of a maxim.
9.1. The sentence-final rise

(22) Of John, Bill and Mary, who came to the party?

John came \( \nearrow^L \), \( \nRightarrow \) Mary and Bill didn’t.

\( \leadsto \) ...wait, there’s more. \hspace{1cm} (Quantity)

\( \leadsto \) ...perhaps that implies sth. about M&B? \hspace{1cm} (Relation)

\( \leadsto \) c. John came \( \nearrow^H \).

\( \leadsto \) ...but I’m not sure. \hspace{1cm} (Quality)

\( \leadsto \) ...did I make myself clear?

Proposal

1. The final rise marks the violation of a maxim.
9.1. The sentence-final rise

(22) Of John, Bill and Mary, who came to the party?
John came $\nearrow^L$. $\not\nearrow$ Mary and Bill didn’t.
\[\rightarrow \ \text{...wait, there’s more.} \quad \text{(Quantity)}\]
\[\rightarrow \ \text{...perhaps that implies sth. about M&B?} \quad \text{(Relation)}\]
c. John came $\nearrow^H$.
\[\rightarrow \ \text{...but I’m not sure.} \quad \text{(Quality)}\]
\[\rightarrow \ \text{...did I make myself clear?} \quad \text{(Manner)}\]

Proposal

1. The final rise marks the violation of a maxim.
9.1. The sentence-final rise

(22) Of John, Bill and Mary, who came to the party?
   John came $\uparrow^L$. $\uparrow$ Mary and Bill didn’t.
   $\sim$ ...wait, there’s more. (Quantity)
   $\sim$ ...perhaps that implies sth. about M&B? (Relation)
   c. John came $\uparrow^H$.
   $\sim$ ...but I’m not sure. (Quality)
   $\sim$ ...did I make myself clear? (Manner)

Proposal

1. The final rise marks the violation of a maxim.
2. Its pitch conveys *emotivity*. (Banziger & Scherer, 2005)
9.1. The sentence-final rise

(22) Of John, Bill and Mary, who came to the party?
    John came $\nearrow^L$. $\not\searrow$ Mary and Bill didn’t.
    $\not\searrow$ ...wait, there’s more. \hspace{1cm} (Quantity)
    $\not\searrow$ ...perhaps that implies sth. about M&B? \hspace{1cm} (Relation)
    c. John came $\nearrow^H$.
    $\not\searrow$ ...but I’m not sure. \hspace{1cm} (Quality)
    $\not\searrow$ ...did I make myself clear? \hspace{1cm} (Manner)

Proposal

1. The final rise marks the violation of a maxim.
2. Its pitch conveys emotivity. \hspace{1cm} (Banziger & Scherer, 2005)
3. This reflects the severity of the violation:
   $\nearrow^H$: Quality/Manner; \hspace{1cm} (cf. Ward & Hirschberg, 1992)
   $\nearrow^L$: Quantity/Relation.
9.1. The sentence-final rise

(22) Of John, Bill and Mary, who came to the party?
John came $\uparrow^L$. $\searrow$ Mary and Bill didn’t.
$\searrow$ ...wait, there’s more. (Quantity)
$\searrow$ ...perhaps that implies sth. about M&B? (Relation)
c. John came $\uparrow^H$.
$\searrow$ ...but I’m not sure. (Quality)
$\searrow$ ...did I make myself clear? (Manner)

Proposal

1. The final rise marks the violation of a maxim.
2. Its pitch conveys emotivity. (Banziger & Scherer, 2005)
3. This reflects the severity of the violation:
   $\uparrow^H$: Quality/Manner; (cf. Ward & Hirschberg, 1992)
   $\uparrow^L$: Quantity/Relation.

This proposal is new in its generality, not in spirit.
9.2. Deriving the readings

(23) Of J and M, who came to the party? \[ (p \lor q \lor (p \land q)) \]

John came. \[ (p) \]
9.2. Deriving the readings

(23) Of J and M, who came to the party? \((p \lor q \lor (p \land q))\)

John came \(\uparrow\).

Readings

...wait, there’s more. (Quantity)
...perhaps that implies sth. about Mary? (Relation)
...but I’m not sure. (Quality)
...did I make myself clear? (Manner)
9.2. Deriving the readings

(23) Of J and M, who came to the party? (\( p \lor q \lor (p \land q) \))
John came \( \uparrow \).

1. \( s \subseteq |p| \) (Quality)
2. \( s \notin |q| \) (Quantity)
3. \( s \subseteq \overline{|p|} \cup |q| \) or \( s \subseteq |p| \cup \overline{|q|} \) (Relation)

Readings

...wait, there’s more. (Quantity)
...perhaps that implies sth. about Mary? (Relation)
...but I’m not sure. (Quality)
...did I make myself clear? (Manner)
9.2. Deriving the readings

(23) Of J and M, who came to the party? \((p \lor q \lor (p \land q))\)

John came \(\uparrow\).

1. \(s \subseteq \lvert p \rvert\) (Quality)
2. \(s \not\subseteq \lvert q \rvert\) (Quantity)
3. \(s \subseteq \overline{\lvert p \rvert \lor \lvert q \rvert}\) or \(s \subseteq \overline{\lvert p \rvert \lor \lvert q \rvert}\) (Relation)
4. The speaker thinks she is clear, concise, etc. (Manner)

Readings

...wait, there’s more. (Quantity)
...perhaps that implies sth. about Mary? (Relation)
...but I’m not sure. (Quality)
...did I make myself clear? (Manner)
9.2. Deriving the readings

(23) Of J and M, who came to the party? \((p \lor q \lor (p \land q))\)
    John came ↑.

1. \(s \notin \lvert p \rvert\)
2. \(s \notin \lvert q \rvert\)
3. \(s \subseteq \lvert p \rvert \cup \lvert q \rvert\) or \(s \subseteq \lvert p \rvert \cup \lvert q \rvert\)
4. The speaker thinks she is clear, concise, etc.

Readings

...wait, there’s more. (Quantity)
...perhaps that implies sth. about Mary? (Relation)
...but I’m not sure. (Quality)
...did I make myself clear? (Manner)
9.2. Deriving the readings

(23) Of J and M, who came to the party? 

\[ (p \lor q \lor (p \land q)) \]

\( (p) \)

\( (\uparrow) \)

1. \( s \notin |p| \)
2. \( s \notin |q| \)
3. \( s \subseteq |p| \cup |q| \) or \( s \subseteq |p| \cup |q| \)
4. The speaker thinks she is clear, concise, etc.

Readings

...wait, there's more. (Quantity)

...perhaps that implies sth. about Mary? (Relation)

✓ ...but I'm not sure. (Quality)

✓ ...did I make myself clear? (Manner)
9.2. Deriving the readings

(23) Of J and M, who came to the party? \((p \lor q \lor (p \land q))\)

John came \(\uparrow\).

1. \(s \subseteq |p|\)  
2. \(s \notin |q|\)  
3. \(s \subseteq |p| \cup |q|\) or \(s \subseteq |p| \cup |q|\)  
4. The speaker thinks she is clear, concise, etc.

Readings

...wait, there’s more.  
...perhaps that implies sth. about Mary?  
\(\checkmark\) ...but I’m not sure.  
...did I make myself clear?
9.2. Deriving the readings

(23) Of J and M, who came to the party? \((p \lor q \lor (p \land q))\)

John came ↑.

1. \(s \subseteq |p|\)
2. \(s \subseteq |q|\)
3. \(s \subseteq |p| \cup |q|\) or \(s \subseteq |p| \cup |q|\)
4. The speaker thinks she is clear, concise, etc.

Readings

...wait, there’s more. (Quantity)

...perhaps that implies sth. about Mary? (Relation)

✓ ...but I’m not sure. (Quality)

✓ ...did I make myself clear? (Manner)
9.2. Deriving the readings

(23) Of J and M, who came to the party? \((p ∨ q ∨ (p ∧ q))\)
John came ↗.

1. \(s \subseteq |p|\)  
2. \(s \subseteq |q|\)
3. \(s \subseteq |p| ∪ |q|\) or \(s \subseteq |p| ∪ |q|\)
4. The speaker thinks she is clear, concise, etc.

Readings

✓ ...wait, there’s more.  
   ...perhaps that implies sth. about Mary?  
✓ ...but I’m not sure.  
   ...did I make myself clear?

(Quality)  
(Relation)  
(Manner)
9.2. Deriving the readings

(23) Of J and M, who came to the party? \((p \lor q \lor (p \land q))\)

John came \(\uparrow\).

1. \(s \subseteq |p|\)  
   
   (Quality)

2. \(s \not\subseteq |q|\)  
   
   (Quantity)

3. \(s \subseteq \overline{|p| \cup |q|}\) or \(s \subseteq \overline{|p| \cup |q|}\)  
   
   (Relation)

4. The speaker thinks she is clear, concise, etc.  
   
   (Manner)

Readings

✓ ...wait, there’s more.  
   
   (Quantity)

   ...perhaps that implies sth. about Mary?  
   
   (Relation)

✓ ...but I’m not sure.  
   
   (Quality)

   ...did I make myself clear?  
   
   (Manner)
9.2. Deriving the readings

(23) Of J and M, who came to the party? \((p \lor q \lor (p \land q))\)

John came ↑.

1. \(s \subseteq |p|\)  
2. \(s \nsubseteq |q|\)  
3. \(s \nsubseteq |p| \cup |q|\) and \(s \nsubseteq \overline{|p| \cup |q|}\)  
4. The speaker thinks she is clear, concise, etc.

Readings

✓ ...wait, there’s more.  
   ...perhaps that implies sth. about Mary?  
✓ ...but I’m not sure.  
   ...did I make myself clear?
9.2. Deriving the readings

(23) Of J and M, who came to the party? \( (p \lor q \lor (p \land q)) \)
John came \(\uparrow\).

\[
\begin{align*}
1. & \quad s \subseteq |p| \\
2. & \quad s \not\subseteq |q| \\
3. & \quad s \not\subseteq |p| \cup |q| \text{ and } s \not\subseteq \overline{|p| \cup |q|} \\
4. & \quad \text{The speaker thinks she is clear, concise, etc.} \\
\end{align*}
\]

Readings

✓ ...wait, there’s more. \( (\text{Quantity}) \)
✓ ...perhaps that implies sth. about Mary? \( (\text{Relation}) \)
✓ ...but I’m not sure. \( (\text{Quality}) \)
✓ ...did I make myself clear? \( (\text{Manner}) \)
9.2. Deriving the readings

(23) Of J and M, who came to the party? \((p \lor q \lor (p \land q))\)
    John came \(\uparrow\).

1. \(s \subseteq |p|\)  
   (Quality)

2. \(s \not\subseteq |q|\)  
   (Quantity)

3. \(s \subseteq \overline{|p|} \cup |q|\) or \(s \subseteq |p| \cup \overline{|q|}\)  
   (Relation)

4. The speaker thinks she is clear, concise, etc.  
   (Manner)

Readings

✓ ...wait, there’s more.  
   (Quantity)

✓ ...perhaps that implies sth. about Mary?  
   (Relation)

✓ ...but I’m not sure.  
   (Quality)
   ...did I make myself clear?  
   (Manner)
9.2. Deriving the readings

(23) Of J and M, who came to the party? \((p \lor q \lor (p \land q))\)  
John came ↑.

1. \(s \subseteq |p|\)  \((\text{Quality})\)
2. \(s \not\subseteq |q|\)  \((\text{Quantity})\)
3. \(s \subseteq \overline{|p|} \cup |q|\) or \(s \subseteq \overline{|p|} \cup \overline{|q|}\)  \((\text{Relation})\)
4. The speaker doesn’t think she’s clear, concise, etc.  \((\uparrow)\)

Readings

✓ ...wait, there’s more.  \((\text{Quantity})\)
✓ ...perhaps that implies sth. about Mary?  \((\text{Relation})\)
✓ ...but I’m not sure.  \((\text{Quality})\)
   ...did I make myself clear?  \((\text{Manner})\)
9.2. Deriving the readings

(23) Of J and M, who came to the party? \((p \lor q \lor (p \land q))\)

John came \(\rightarrow\).

1. \(s \subseteq |p|\) \(\quad\) (Quality)
2. \(s \notin |q|\) \(\quad\) (Quantity)
3. \(s \subseteq |p| \cup |q|\) or \(s \subseteq |p| \cup \overline{|q|}\) \(\quad\) (Relation)
4. The speaker doesn’t think she’s clear, concise, etc. \(\rightarrow\)

Readings

✓ ...wait, there’s more. \(\quad\) (Quantity)
✓ ...perhaps that implies sth. about Mary? \(\quad\) (Relation)
✓ ...but I’m not sure. \(\quad\) (Quality)
✓ ...did I make myself clear? \(\quad\) (Manner)
9.3. General results

My approach unifies existing approaches:

- Quality: 'lack of belief in proposition expressed' (Truckenbrodt, 2006)
- Relation: 'uncertain relevance'/'scalar uncertainty' (Ward & Hirschberg, 1985)
- Relation: 'rise-fall-rise quantifies over focus alternatives' (Constant, 2012)
- Quantity: 'unfinishedness' (Bartels, 1999)
- Manner reading: Usually treated as a side-effect.

Noteworthy:
- Attentive content is crucial for the Relation readings.
- Conjunctive lists: Quantity (I will say more!);
- Disjunctive lists: Relation (I will attend more!)
9.3. General results

My approach unifies existing approaches:

- Quality: ‘lack of belief in proposition expressed’
  
  (Truckenbrodt, 2006)
9.3. General results

My approach unifies existing approaches:

- Quality: ‘lack of belief in proposition expressed’
  
  (Truckenbrodt, 2006)

- Relation: ‘uncertain relevance’/‘scalar uncertainty’
  
  (Ward & Hirschberg, 1985)

- Quantity: ‘unfinishedness’ (Bartels, 1999)

- Manner reading: Usually treated as a side-effect.

Noteworthy:

- Attentive content is crucial for the Relation readings.

Conjunctive lists: Quantity (I will say more!); Disjunctive lists: Relation (I will attend more!)
9.3. General results

My approach unifies existing approaches:

- **Quality**: ‘lack of belief in proposition expressed’
  
  (Truckenbrodt, 2006)

- **Relation**: ‘uncertain relevance’/‘scalar uncertainty’
  
  (Ward & Hirschberg, 1985)

- **Relation**: ‘rise-fall-rise quantifies over focus alternatives’
  
  (Constant, 2012)

Noteworthy:

- Attentive content is crucial for the Relation readings.

Conjunctive lists: Quantity (I will say more!); Disjunctive lists: Relation (I will attend more!)
9.3. General results

My approach unifies existing approaches:

- Quality: ‘lack of belief in proposition expressed’
  (Truckenbrodt, 2006)
- Relation: ‘uncertain relevance’/‘scalar uncertainty’
  (Ward & Hirschberg, 1985)
- Relation: ‘rise-fall-rise quantifies over focus alternatives’
  (Constant, 2012)
- Quantity: ‘unfinishedness’
  (Bartels, 1999)
9.3. General results

My approach unifies existing approaches:

- **Quality**: ‘lack of belief in proposition expressed’
  (Truckenbrodt, 2006)

- **Relation**: ‘uncertain relevance’/‘scalar uncertainty’
  (Ward & Hirschberg, 1985)

- **Relation**: ‘rise-fall-rise quantifies over focus alternatives’
  (Constant, 2012)

- **Quantity**: ‘unfinishedness’
  (Bartels, 1999)

- **Manner reading**: Usually treated as a side-effect.
9.3. General results

My approach unifies existing approaches:

- Quality: ‘lack of belief in proposition expressed’ (Truckenbrodt, 2006)
- Relation: ‘uncertain relevance’/‘scalar uncertainty’ (Ward & Hirschberg, 1985)
- Relation: ‘rise-fall-rise quantifies over focus alternatives’ (Constant, 2012)
- Quantity: ‘unfinishedness’ (Bartels, 1999)
- Manner reading: Usually treated as a side-effect.

Noteworthy:

- Attentive content is crucial for the Relation readings.
9.3. General results

My approach unifies existing approaches:

- Quality: ‘lack of belief in proposition expressed’
  (Truckenbrodt, 2006)
- Relation: ‘uncertain relevance’/‘scalar uncertainty’
  (Ward & Hirschberg, 1985)
- Relation: ‘rise-fall-rise quantifies over focus alternatives’
  (Constant, 2012)
- Quantity: ‘unfinishedness’
  (Bartels, 1999)
- Manner reading: Usually treated as a side-effect.

Noteworthy:

- Attentive content is crucial for the Relation readings.
- Conjunctive lists: Quantity (I will say more!);
  Disjunctive lists: Relation (I will attend more!)
9.4. Interrogatives

Work in progress

Upon seeing John’s shoes in the hallway:

(24) Oh, is John home

(25) Oh, is John home
9.4. Interrogatives

Work in progress

Upon seeing John’s shoes in the hallway:

(24) ?? Oh, is John home

(25) Oh, is John home
Upn seeing John’s shoes in the hallway:

(24) ?? Oh, is John home ↗

(25) Oh, is John home ↘

Proposal:
The rise in polar questions: ‘there are more possibilities’ (Relation).
Upon seeing John’s shoes in the hallway:

(24) ?? Oh, is John home↗

(25) Oh, is John home↘

Proposal:

The rise in polar questions: ‘there are more possibilities’ (Relation).

- In contrast, (25) says ‘this is the only possibility’.
Upon seeing John’s shoes in the hallway:

(24) ?? Oh, is John home↗
(25) Oh, is John home↘

**Proposal:**
The rise in polar questions: ‘there are more possibilities’ (Relation).

- In contrast, (25) says ‘this is the only possibility’.
- (24) patterns with disjunctive lists:

(26) ?? Oh, is John home↗, or not↘
9.5. Multiple foci

Work in progress

(27) Who had what for lunch?
   a. \([\text{John}_F\] had the \([\text{beans}_F]\).
9.5. Multiple foci
Work in progress

(27) Who had what for lunch?
   a. [John]$_F$ \$ had the [beans]$_F$ \$.
9.5. Multiple foci

Work in progress

(27) Who had what for lunch?

a. \([\text{John}]_{\downarrow} \text{ had the } [\text{beans}]_{\downarrow}.\) \(\sim\) John had only beans; \(\sim\) only John had something.
9.5. Multiple foci

Work in progress

(27) Who had what for lunch?

a. $[\text{John}]_F \downarrow \text{had the } [\text{beans}]_F \downarrow$. $\sim \text{ John had only beans; }$
$\sim \text{ only John had something.}$

b. $[\text{John}]_F \uparrow \text{ had the } [\text{beans}]_F \downarrow$. $\sim \text{ John had only beans; }$
$\not\sim \text{ only John had something.}$
9.5. Multiple foci

Work in progress

(27) Who had what for lunch?
   a. \([\text{John}]_{F} \downarrow \text{had the } [\text{beans}]_{F} \downarrow\). \sim \text{John had only beans;}
      \sim \text{only John had something.}
   b. \([\text{John}]_{F} \uparrow \text{had the } [\text{beans}]_{F} \downarrow\). \sim \text{John had only beans;}
      \not\sim \text{only John had something.}
   c. \([\text{John}]_{F} \downarrow \text{had the } [\text{beans}]_{F} \uparrow\). \not\sim \text{John had only beans;}
      \sim \text{only John had the beans.}

\[\ldots\] \sim \text{is known as contrastive topic (\textit{B¨uring}, 2003).}

\[\ldots\] \not\sim \text{B¨uring: it conveys 'I'm only answering a subquestion'.}

\[\ldots\] \sim \text{My account might enable a compositional analysis.}
9.5. Multiple foci

Work in progress

(27) Who had what for lunch?
   a. [John]$_F$ ↘ had the [beans]$_F$ ↘.   $\sim$ John had only beans; $\sim$ only John had something.
   b. [John]$_F$ ↗ had the [beans]$_F$ ↘.   $\sim$ John had only beans; $\sim$ only John had something.
   c. [John]$_F$ ↘ had the [beans]$_F$ ↗.   $\not\sim$ John had only beans; $\sim$ only John had the beans.
9.5. Multiple foci
Work in progress

(27) Who had what for lunch?
   a. $[\text{John}]_F \downarrow$ had the $[\text{beans}]_F \downarrow$. $\sim$ John had only beans;
      $\sim$ only John had something.
   b. $[\text{John}]_F \uparrow$ had the $[\text{beans}]_F \downarrow$. $\sim$ John had only beans;
      $\not\sim$ only John had something.
   c. $[\text{John}]_F \downarrow$ had the $[\text{beans}]_F \uparrow$. $\not\sim$ John had only beans;
      $\sim$ only John had the beans.
   d. $[\text{John}]_F \uparrow$ had the $[\text{beans}]_F \uparrow$. $\not\sim$ John had only beans;
      $\not\sim$ only John had something.
9.5. Multiple foci

Work in progress

(27) Who had what for lunch?

a. \([\text{John}]_F \downarrow \text{had the } [\text{beans}]_F \downarrow\).

\(\sim\) John had only beans;

\(\sim\) only John had something.

b. \([\text{John}]_F \uparrow \text{had the } [\text{beans}]_F \downarrow\).

\(\sim\) John had only beans;

\(\rightharpoonup\) only John had something.

c. \([\text{John}]_F \downarrow \text{had the } [\text{beans}]_F \uparrow\).

\(\rightharpoonup\) John had only beans;

\(\sim\) only John had the beans.

d. \([\text{John}]_F \uparrow \text{had the } [\text{beans}]_F \uparrow\).

\(\rightharpoonup\) John had only beans;

\(\rightharpoonup\) only John had something.

\(\cdots\)\(\uparrow\) is known as *contrastive topic* (Büring, 2003).
9.5. Multiple foci
Work in progress

(27) Who had what for lunch?
   a. [John]$_F$ ↘ had the [beans]$_F$ ↘.
      $\sim$ John had only beans;
      $\sim$ only John had something.
   b. [John]$_F$ ↗ had the [beans]$_F$ ↘.
      $\sim$ John had only beans;
      $\nearrow$ only John had something.
   c. [John]$_F$ ↘ had the [beans]$_F$ ↗.
      $\nearrow$ John had only beans;
      $\sim$ only John had the beans.
   d. [John]$_F$ ↗ had the [beans]$_F$ ↗.
      $\nearrow$ John had only beans;
      $\nearrow$ only John had something.

$\nearrow$ [...]$_F$ ↗ is known as contrastive topic (Büring, 2003).
$\nearrow$ Büring: it conveys ‘I’m only answering a subquestion’.
9.5. Multiple foci

Work in progress

(27) Who had what for lunch?
   a. \([\text{John}]_F \downarrow \text{had the } [\text{beans}]_F \downarrow\). \sim \text{John had only beans;}
      \sim \text{only John had something.}
   b. \([\text{John}]_F \uparrow \text{had the } [\text{beans}]_F \downarrow\). \sim \text{John had only beans;}
      \not\sim \text{only John had something.}
   c. \([\text{John}]_F \downarrow \text{had the } [\text{beans}]_F \uparrow\). \not\sim \text{John had only beans;}
      \sim \text{only John had the beans.}
   d. \([\text{John}]_F \uparrow \text{had the } [\text{beans}]_F \uparrow\). \not\sim \text{John had only beans;}
      \not\sim \text{only John had something.}

» \([\ldots]_F \uparrow\) is known as \textit{contrastive topic} (Büring, 2003).

» Büring: it conveys ‘I’m only answering a subquestion’.

» My account might enable a compositional analysis.
End of Part III
10. Main conclusions

Part I: Attention!
If pragmatic reasoning is sensitive to attentive content then exhaustivity is a conversational implicature.

Part II: Focus!
Conversational implicatures are not really cancellable. Focus makes the Gricean story even more generative. Beware of implicit domain restrictions.

Part III: Listen!
The final rise conveys a maxim violation. 'Relation' reading requires attentive content. Polar questions? Contrastive topic?
10. Main conclusions

Part I: Attention!

- If pragmatic reasoning is sensitive to *attentive content*
10. Main conclusions

Part I: Attention!

- If pragmatic reasoning is sensitive to *attentive content*
- then *exhaustivity is a conversational implicature.*
10. Main conclusions

Part I: Attention!
- If pragmatic reasoning is sensitive to *attentive content*
- then *exhaustivity is a conversational implicature*.

Part II: Focus!
- Conversational implicatures are not really cancellable.
10. Main conclusions

Part I: Attention!

- If pragmatic reasoning is sensitive to *attentive content*
- then *exhaustivity is a conversational implicature*.

Part II: Focus!

- Conversational implicatures are not really cancellable.
- Focus makes the Gricean story even more generative.
10. Main conclusions

Part I: Attention!

- If pragmatic reasoning is sensitive to *attentive content*
- then *exhaustivity is a conversational implicature*.

Part II: Focus!

- Conversational implicatures are not really cancellable.
- Focus makes the Gricean story even more generative.
- Beware of implicit domain restrictions.
10. Main conclusions

Part I: Attention!

- If pragmatic reasoning is sensitive to *attentive content*
- then *exhaustivity is a conversational implicature.*

Part II: Focus!

- Conversational implicatures are not really cancellable.
- Focus makes the Gricean story even more generative.
- Beware of implicit domain restrictions.

Part III: Listen!

- The final rise conveys a maxim violation.
10. Main conclusions

Part I: Attention!

- If pragmatic reasoning is sensitive to *attentive content*
- then *exhaustivity is a conversational implicature*.

Part II: Focus!

- Conversational implicatures are not really cancellable.
- Focus makes the Gricean story even more generative.
- Beware of implicit domain restrictions.

Part III: Listen!

- The final rise conveys a maxim violation.
- ‘Relation’ reading requires attentive content.
10. Main conclusions

Part I: Attention!

- If pragmatic reasoning is sensitive to *attentive content*
- then *exhaustivity is a conversational implicature*.

Part II: Focus!

- Conversational implicatures are not really cancellable.
- Focus makes the Gricean story even more generative.
- Beware of implicit domain restrictions.

Part III: Listen!

- The final rise conveys a maxim violation.
- ‘Relation’ reading requires attentive content.
- Polar questions? Contrastive topic?
Articles

- *Exhaustivity through the maxim of Relation*  
  (*LENLS* proceedings, see staff.science.uva.nl/~westera/)
- ‘Attention, I’m violating a maxim!’  
  (submitted, available through me)

Thanks to the *Netherlands Organisation for Scientific Research* (NWO) for financial support; to F. Roelofsen, J. Groenendijk, C. Cummins, K. Von Fintel, A. Ettinger, J. Tyler, M. Križ, the audiences of *SemDial, S-Circle* (UCSC), *SPE6, ICL, CISI, ESSLLI StuS, LIRA, Göttingen, INSEMP*, and many anonymous reviewers for valuable comments.
Appendix A. Other maxims of Relation

i. $R_s \models Q$ (mine)

ii. $R_{CG} \models Q$ (Roberts's (1996) contextual entailment)

iii. $R_h \models Q$ (≈ GS's (1984) pragmatic answer)

ii. and iii. are too strong:

The participants need not already know how $R$ is relevant.
They need only be able to figure it out. (left implicit here)

(5) Did John go to the party?
It was raining.
If it rained, John {went / didn't go}.
Appendix A. Other maxims of Relation

i. \( R_s \models Q \) \hspace{2cm} \text{(mine)}

ii. \( R_{CG} \models Q \) \hspace{2cm} \text{(Roberts's (1996) contextual entailment)}

\( \text{ii. and iii. are too strong:} \)

\( \Rightarrow \) The participants need not already know how \( R \) is relevant.

\( \Rightarrow \) They need only be able to figure it out.

(5) Did John go to the party?

It was raining.

If it rained, John \{ went / didn't go \}.
Appendix A. Other maxims of Relation

i. $R_s \models Q$  
   (mine)

ii. $R_{CG} \models Q$  
   (Roberts’s (1996) contextual entailment)

iii. $R_h \models Q$  
    (≈ GS’s (1984) pragmatic answer)

ii. and iii. are too strong: 

The participants need not already know how $R$ is relevant. 
They need only be able to figure it out. 

(5) Did John go to the party? 
It was raining. 

If it rained, John \{went / didn’t go\}. 

Appendix A. Other maxims of Relation

i. $R_s \vdash Q$  
   (mine)

ii. $R_{CG} \vdash Q$  
    (Roberts’s (1996) *contextual entailment*)

iii. $R_h \vdash Q$  
     ($\approx$ GS’s (1984) *pragmatic answer*)

ii. and iii. are too strong:
Appendix A. Other maxims of Relation

i. $R_s \models Q$  
ii. $R_{CG} \models Q$  
iii. $R_h \models Q$

\( R_{CG} \models Q \) (Roberts’s (1996) contextual entailment)  
\( R_h \models Q \) (≈ GS’s (1984) pragmatic answer)

ii. and iii. are too strong:  
- The participants need not already know how $R$ is relevant.
Appendix A. Other maxims of Relation

i.  $R_s \models Q$  
    (mine)

ii. $R_{CG} \models Q$  
    (Roberts’s (1996) contextual entailment)

iii. $R_h \models Q$  
    ($\approx$ GS’s (1984) pragmatic answer)

ii. and iii. are too strong:
  
  ▶ The participants need not already know how $R$ is relevant.
  
  ▶ They need only be able to figure it out.
Appendix A. Other maxims of Relation

i. $R_s \models Q$  
   (mine)

ii. $R_{CG} \models Q$  
   (Roberts’s (1996) contextual entailment)

iii. $R_h \models Q$  
   ($\approx$ GS’s (1984) pragmatic answer)

ii. and iii. are too strong:
   - The participants need not *already know* how $R$ is relevant.
   - They need only be able to *figure it out*.
     (left implicit here)
Appendix A. Other maxims of Relation

i. \( R_s \models Q \)  
   (mine)

ii. \( R_{CG} \models Q \)  
    (Roberts’s (1996) \textit{contextual entailment})

iii. \( R_h \models Q \)  
    (\( \approx \) GS’s (1984) \textit{pragmatic answer})

ii. and iii. are too strong:
   
   ▶ The participants need not \textit{already know} how \( R \) is relevant.
   
   ▶ They need only be able to \textit{figure it out}.
   (left implicit here)

\textbf{(5)} Did John go to the party?

It was raining. \( \neg \) If it rained, John \{went / didn’t go\}. 
Appendix B. Relatedness and knowledge

$R_s \models Q$  ‘the speaker knows how $R$ is related to $Q$’
Appendix B. Relatedness and knowledge

\( R_s \models Q \)  \( \text{‘the speaker knows how } R \text{ is related to } Q \)’

**Relatedness**

\( A \) is *related* to \( Q \) in world \( w \) iff for some fact \( f \), \( w \in f \), \( A_f \models Q \).

\[ \text{(e.g., let } f = \{ w \} \text{)} \]

Within a world, everything is related.
Appendix B. Relatedness and knowledge

\[ R_s \models Q \quad \text{‘the speaker knows how } R \text{ is related to } Q \text{’} \]

**Relatedness**

\( A \) is *related* to \( Q \) in world \( w \) iff for some fact \( f \), \( w \in f \), \( A_f \models Q \).

- The speaker *knows that* \( A \) is related to \( Q \) iff in all \( w \in s \), \( A \) is rel. to \( Q \).
Appendix B. Relatedness and knowledge

\[ R_s \models Q \quad \text{‘the speaker knows how R is related to Q’} \]

**Relatedness**

A is *related* to Q in world w iff for some fact \( f \), \( w \in f \), \( A_f \models Q \).

- The speaker *knows that* A is related to Q iff in all \( w \in s \), A is rel. to Q.
- The speaker *knows how* A is related to Q iff in all \( w \in s \), A is related to Q by *the same f*.
Appendix B. Relatedness and knowledge

\[ R_s \models Q \quad \text{‘the speaker knows how } R \text{ is related to } Q \text{’} \]

Relatedness

A is \textit{related} to \( Q \) in world \( w \) iff for some fact \( f, w \in f, A_f \models Q \).

\begin{itemize}
  \item The speaker \textit{knows that} \( A \) is related to \( Q \) iff in all \( w \in s \), \( A \) is rel. to \( Q \).
  \item The speaker \textit{knows how} \( A \) is related to \( Q \) iff in all \( w \in s \), \( A \) is related to \( Q \) by \textit{the same} \( f \).
\end{itemize}

Now:

\begin{itemize}
  \item For all \( A, Q \) true in \( w \):
    \( \text{there is a fact } f, w \in f, \text{s.t. } A_f \models Q \).
\end{itemize}
Appendix B. Relatedness and knowledge

\[ R_s \models Q \]  ‘the speaker knows how \( R \) is related to \( Q \)’

**Relatedness**

\( A \) is *related* to \( Q \) in world \( w \) iff for some fact \( f \), \( w \in f \), \( A_f \models Q \).

- The speaker *knows that* \( A \) is related to \( Q \) iff in all \( w \in s \), \( A \) is rel. to \( Q \).
- The speaker *knows how* \( A \) is related to \( Q \) iff in all \( w \in s \), \( A \) is related to \( Q \) by the same \( f \).

Now:

- For all \( A, Q \) true in \( w \):
  - there is a fact \( f \), \( w \in f \), s.t. \( A_f \models Q \).
  (e.g., let \( f \) be \( \{w\} \))
Appendix B. Relatedness and knowledge

\[ R_s \models Q \quad \text{‘the speaker knows how } R \text{ is related to } Q \’ \]

**Relatedness**

\( A \) is *related* to \( Q \) in world \( w \) iff for some fact \( f \), \( w \in f \), \( A_f \models Q \).

- The speaker *knows that* \( A \) is related to \( Q \) iff in all \( w \in s \), \( A \) is rel. to \( Q \).
- The speaker *knows how* \( A \) is related to \( Q \) iff in all \( w \in s \), \( A \) is related to \( Q \) by the same \( f \).

Now:

- For all \( A, Q \) true in \( w \):
  
  there is a fact \( f \), \( w \in f \), s.t. \( A_f \models Q \).

  (e.g., let \( f \) be \( \{ w \} \))

  *Within a world, everything is related.*
Appendix C. Logical relatedness

Just as [logical consequence] rules the validity of argumentation, [logical relatedness] rules the coherence of information exchange.

(Groenendijk and Roelofsen, 2009)
Appendix C. Logical relatedness

Just as [logical consequence] rules the validity of argumentation, [logical relatedness] rules the coherence of information exchange.

(Groenendijk and Roelofsen, 2009)

(22) Dogs and cats are mammals. (Logical cons.)
Dogs are mammals.

(23) Dogs are mammals.
Appendix C. Logical relatedness

Just as [logical consequence] rules the validity of argumentation, [logical relatedness] rules the coherence of information exchange.

(Groenendijk and Roelofsen, 2009)

(22) Dogs and cats are mammals.  
Dogs are mammals.  
(Logical cons.)

(23) Dogs are mammals.  
Dogs are animals.  
(Non-logical cons.)
Appendix C. Logical relatedness

Just as [logical consequence] rules the validity of argumentation, [logical relatedness] rules the coherence of information exchange.

(Groenendijk and Roelofsen, 2009)

(22) Dogs and cats are mammals.  
Dogs are mammals.  

(23) Dogs are mammals. + world knowledge  
Dogs are animals.  

(Logical cons.)  
(Non-logical cons.)
Appendix C. Logical relatedness

Just as [logical consequence] rules the validity of argumentation, [logical relatedness] rules the coherence of information exchange.

(Groenendijk and Roelofsen, 2009)

(22) Dogs and cats are mammals. $+$ logic
Dogs are mammals.

(23) Dogs are mammals. $+$ world knowledge
Dogs are animals.
Appendix C. Logical relatedness

Just as [logical consequence] rules the validity of argumentation, [logical relatedness] rules the coherence of information exchange.

(Groenendijk and Roelofsen, 2009)

(22) Dogs and cats are mammals. + logic  (Logical cons.)
Dogs are mammals.

(23) Dogs are mammals. + world knowledge  (Non-logical cons.)
Dogs are animals.

Relatedness
A is related to Q in world w iff for some fact f, w ∈ f, A_f ⊨ Q.
Appendix C. Logical relatedness

Just as [logical consequence] rules the validity of argumentation, [logical relatedness] rules the coherence of information exchange.

(Groenendijk and Roelofsen, 2009)

(22) Dogs and cats are mammals. + logic

Dogs are mammals.

(23) Dogs are mammals. + world knowledge

Dogs are animals.

Relatedness

A is related to Q in world w iff for some fact f, w ∈ f, A_f |= Q.

- Logical iff f captures all and only the laws of logic.
Appendix C. Logical relatedness

Just as [logical consequence] rules the validity of argumentation, [logical relatedness] rules the coherence of information exchange.

(Groenendijk and Roelofsen, 2009)

(22) Dogs and cats are mammals. + logic
Dogs are mammals.

(23) Dogs are mammals. + world knowledge
Dogs are animals.

Relatedness

A is related to Q in world w iff for some fact f, w ∈ f, A_f ⊨ Q.

› Logical iff f captures all and only the laws of logic.
› Non-logical iff f is a contingency.
Appendix C. Logical relatedness

Just as [logical consequence] rules the validity of argumentation, [logical relatedness] rules the coherence of information exchange.

(Groenendijk and Roelofsen, 2009)

(22) Dogs and cats are mammals. + logic (Logical cons.)
Dogs are mammals.

(23) Dogs are mammals. + world knowledge (Non-logical cons.)
Dogs are animals.

Relatedness

A is related to Q in world w iff for some fact f, w ∈ f, A_f ⊨ Q.

- Logical iff f captures all and only the laws of logic.
- Non-logical iff f is a contingency.

Logical consequence is logical relatedness.
Appendix D. Evoked questions

- Conveying uncertainty regarding $\phi$ typically evokes the question of whether $\phi$. 

Connecting this to the literature is a work in progress.
Appendix D. Evoked questions

- Conveying uncertainty regarding $\phi$ typically evokes the question of whether $\phi$.
- Hence, the Quality, Relation and Manner readings evoke questions!
Appendix D. Evoked questions

- Conveying uncertainty regarding $\phi$ typically *evokes the question* of whether $\phi$.
- Hence, the Quality, Relation and Manner readings evoke questions!

(24) Did John go to the party?
   It was raining ↘. $\sim$ He {likes / dislikes} rainy parties
Appendix D. Evoked questions

- Conveying uncertainty regarding $\phi$ typically evokes the question of whether $\phi$.
- Hence, the Quality, Relation and Manner readings evoke questions!

(24) Did John go to the party?
It was raining $\searrow$. $\leadsto$ He \{likes / dislikes\} rainy parties
It was raining $\nearrow^L$. $\leadsto$ Does he like rainy parties?
Appendix D. Evoked questions

- Conveying uncertainty regarding $\phi$ typically evokes the question of whether $\phi$.
- Hence, the Quality, Relation and Manner readings evoke questions!

(24) Did John go to the party?
- It was raining $↘$.
- $\rightsquigarrow$ He $\{\text{likes} / \text{dislikes}\}$ rainy parties
- It was raining $↗$.
- $\rightsquigarrow$ Does he like rainy parties?
- He only likes rainy parties $↗$?
- $\rightsquigarrow$ Was it raining?
Appendix D. Evoked questions

- Conveying uncertainty regarding $\phi$ typically evokes the question of whether $\phi$.
- Hence, the Quality, Relation and Manner readings evoke questions!

(24) Did John go to the party?
   It was raining $\downarrow$. $\leadsto$ He \{likes / dislikes\} rainy parties
   It was raining $\uparrow^L$. $\leadsto$ Does he like rainy parties?
   He only likes rainy parties $\uparrow^L$? $\leadsto$ Was it raining?

Connecting this to the literature is a work in progress.
Appendix E. Objective/subjective cooperativity

The maxims can be (and have been) defined in two ways:

- **Objective**: Say only what is true, relevant, etc.
- **Subjective**: Say only what you think is true, relevant, etc.

My account of the final rise relies on subjective maxims:

- Violating 'say only what you think is true' = uncertainty
- Violating 'say only what is true' = lying

But an account based on objective maxims would also work:

- Final rise: 'For some maxim, I'm not sure whether or how I comply with it'.
Appendix E. Objective/subjective cooperativity

The maxims can be (and have been) defined in two ways:

- **Objective**: Say only what is true, relevant, etc.
- **Subjective**: Say only what you think is true, relevant, etc.

My account of the final rise relies on subjective maxims:

- Violating 'say only what you think is true' = uncertainty
- Violating 'say only what is true' = lying

But an account based on objective maxims would also work:

- Final rise: 'For some maxim, I'm not sure whether or how I comply with it'.
The maxims can be (and have been) defined in two ways:

- **Objective**: Say only what is true, relevant, etc.
- **Subjective**: Say only what you think is true, relevant, etc.

My account of the final rise relies on subjective maxims:

- Violating 'say only what you think is true' = uncertainty
- Violating 'say only what is true' = lying

But an account based on objective maxims would also work:

- Final rise: 'For some maxim, I'm not sure whether or how I comply with it'.
The maxims can be (and have been) defined in two ways:

- **Objective**: Say only what *is* true, relevant, etc.
- **Subjective**: Say only what *you think* is true, relevant, etc.

My account of the final rise relies on *subjective* maxims:
Appendix E. Objective/subjective cooperativity

The maxims can be (and have been) defined in two ways:

- **Objective**: Say only what *is* true, relevant, etc.
- **Subjective**: Say only what *you think* is true, relevant, etc.

My account of the final rise relies on *subjective* maxims:

- Violating ‘say only what you think is true’ = uncertainty
Appendix E. Objective/subjective cooperativity

The maxims can be (and have been) defined in two ways:

- **Objective**: Say only what *is* true, relevant, etc.
- **Subjective**: Say only what you *think* is true, relevant, etc.

My account of the final rise relies on *subjective* maxims:

- Violating ‘say only what you think is true’ = uncertainty
- Violating ‘say only what is true’ = lying
Appendix E. Objective/subjective cooperativity

The maxims can be (and have been) defined in two ways:
- **Objective**: Say only what *is* true, relevant, etc.
- **Subjective**: Say only what *you think* is true, relevant, etc.

My account of the final rise relies on *subjective* maxims:
- Violating ‘say only what you think is true’ = uncertainty
- Violating ‘say only what is true’ = lying

But an account based on *objective* maxims would also work:
Appendix E. Objective/subjective cooperativity

The maxims can be (and have been) defined in two ways:

- **Objective**: Say only what *is* true, relevant, etc.
- **Subjective**: Say only what *you think* is true, relevant, etc.

My account of the final rise relies on *subjective* maxims:

- Violating ‘say only what you think is true’ = uncertainty
- Violating ‘say only what is true’ = lying

But an account based on *objective* maxims would also work:

- Final rise: ‘For some maxim, I’m not sure whether or how I comply with it’.
Appendix F. Exhaustivity without Quantity

Example given by Fox (forthcoming):

(25) There’s money in box A or in box B! $(p \lor q)$

$\sim$ Not in both.
Appendix F. Exhaustivity without Quantity

Example given by Fox (forthcoming):

(25) There’s money in box A or in box B! \((p \lor q)\)

\(~\) Not in both.

But a quizmaster is not expected to comply with Quantity!
Appendix F. Exhaustivity without Quantity

Example given by Fox (forthcoming):

(25) There’s money in box A or in box B! \((p \lor q)\) \(\sim\) Not in both.

But a quizmaster is not expected to comply with Quantity!

However, she \textit{does} comply with Relation, Quality, Manner:
Appendix F. Exhaustivity without Quantity

Example given by Fox (forthcoming):

(25) There’s money in box A or in box B! \((p \lor q)\)

\(\sim\) Not in both.

But a quizmaster is not expected to comply with Quantity!

However, she does comply with Relation, Quality, Manner:

1. \(s \subseteq |p| \cup |q|\) (Quality)
2. - (Quantity disabled)
3. \(s \subseteq |p| \cup |q| \cup (|p| \cap |q|)\) or \(s \subseteq |p| \cup |q| \cup |p| \cap |q|\) (Relation)
4. Comply with the maxims transparently. (Manner)
Appendix F. Exhaustivity without Quantity

Example given by Fox (forthcoming):

(25) There’s money in box A or in box B! \((p \lor q)\)

\(\sim\) Not in both.

But a quizmaster is not expected to comply with Quantity!

However, she does comply with Relation, Quality, Manner:

1. \(s \subseteq |p| \cup |q|\) (Quality)
2. - (Quantity disabled)
3. \(s \subseteq |p| \cup |q| \cup (|p| \cap |q|) \) or \(s \subseteq |p| \cup |q| \cup |p| \cap |q|\) (Relation)
4. Comply with the maxims transparently. (Manner)

5. \(s \subseteq (|p| \cap |q|) \) or \(s \subseteq |p| \cap |q|\) (from 1 and 2)
Appendix F. Exhaustivity without Quantity

Example given by Fox (forthcoming):

(25) There’s money in box A or in box B! \((p \vee q)\)
\[\sim \text{Not in both.}\]

But a quizmaster is not expected to comply with Quantity!

However, she does comply with Relation, Quality, Manner:

1. \(s \subseteq |p| \cup |q|\) (Quality)
2. - (Quantity disabled)
3. \(s \subseteq |p| \cup |q| \cup (|p| \cap |q|)\) or \(s \subseteq |p| \cup |q| \cup |p| \cap |q|\) (Relation)
4. Comply with the maxims transparently. (Manner)

\[\text{--------------------------}\]
5. \(s \subseteq (|p| \cap |q|)\) or \(s \subseteq |p| \cap |q|\) (from 1 and 2)
6. The quizmaster does not want to give it away.

\[\text{--------------------------}\]
Appendix F. Exhaustivity without Quantity

Example given by Fox (forthcoming):

(25) There’s money in box A or in box B! \( p \lor q \) 
\[ \sim \text{Not in both.} \]

But a quizmaster is not expected to comply with Quantity!

However, she *does* comply with Relation, Quality, Manner:

1. \( s \subseteq |p| \cup |q| \)  
   \( \text{(Quality)} \)
2. -  
   \( \text{(Quantity disabled)} \)
3. \( s \subseteq |p| \cup |q| \cup (|p| \cap |q|) \) or \( s \subseteq |p| \cup |q| \cup |p| \cap |q| \)  
   \( \text{(Relation)} \)
4. Comply with the maxims transparently.  
   \( \text{(Manner)} \)
5. \( s \subseteq (|p| \cap |q|) \) or \( s \subseteq |p| \cap |q| \)  
   \( \text{(from 1 and 2)} \)
6. The quizmaster does not want to give it away.  
   \( \text{\ } \)
7. \( s \subseteq |p| \cap |q| \)  
   \( \text{(from 5 and 6)} \)
References (i)

- Geurts (2010). Quantity implicatures.
References (ii)