On the possible pragmatic origins of inquisitiveness

Matthijs Westera
Universitat Pompeu Fabra (University of Amsterdam)
Outline

1. Background & Motivation
2. Attentional pragmatics
3. Deriving something like Alternative Semantics
Outline

1. Background & Motivation
2. Attentional pragmatics
3. Deriving something like Alternative Semantics
pQP
Inquisitive Semantics

pvq
Alternative Semantics
(= Unrestricted inquisitive semantics)

\[ \text{pvq} \]
Alternative Semantics

\[ p \vee q \neq p \vee q \vee (p \wedge q) \]
Inquisitive Semantics

$p \lor q$ \quad \equiv \quad p \lor q \land (p \land q)$
Alternative Semantics

$p \cap \CC q \neq \diamondsuit p \land q$

Groenendijk & Stokhof 1984
Roelofsen 2013
Ciardelli 2017
Inquisitive Semantics

Groenendijk & Stokhof 1984
Roelofsen 2013
Ciardelli 2017
Inquisitive Semantics

\[ \top \land \bot \models \top \]

Groenendijk & Stokhof 1984
Roelofsen 2013
Ciardelli 2017
Alternative Semantics

\( p \land q \vdash p \)

Groenendijk & Stokhof 1984
Roelofsen 2013
Ciardelli 2017
Alternative Semantics

\[ ?p \land ?q \vdash ?p \]

Diagram: Four small circles on the left are grouped to resemble a rectangle, which is equal to a larger rectangle on the right.
Alternative Semantics

\[ ?p \land ?q \models ?p \]

but \( \sqsubseteq \) is not antisymmetric
Alternative Semantics

\(?p \land ?q \models ?p\)

but \(\subseteq\) is not antisymmetric
Alternative Semantics

$p \lor q \neq p \land q \lor (p \land q)$

$p \land q \neq ?p \cap ?q$

$?p \land ?q \models ?p$

Inquisitive Semantics

$p \lor q = p \lor q \land (p \land q)$

$p \land q = ?p \cap ?q$

$?p \land ?q \models ?p$

$?p \land ?q \subseteq ?p$
Alternative Semantics

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

\[ ?p \land ?q \neq ?p \land ?q \]

\[ ?p \land ?q \models ?p \]

Inquisitive Semantics

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

\[ ?p \lor ?q \models ?p \land ?q \]

\[ ?p \land ?q \models ?p \]

\[ ?p \land ?q \models ?p \]

\[ ?p \land ?q \models ?p \]

\[ ?p \land ?q \models ?p \]

\[ ?p \land ?q \models ?p \]
Alternative Semantics

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

\[ p \land q \neq p \lor q \]

\[ p \land ?q \models ?p \]

Inquisitive Semantics

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

\[ p \land q = p \lor q \]

\[ p \land ?q \models ?p \]

\[ p \land ?q \models ?p \]

\[ p \lor ?q \models ?p \]

\[ p \land ?q \models ?p \]
Alternative Semantics

\( p \lor q \neq p \lor q \land (p \land q) \)

\( \neg p \lor q \neq \neg p \lor q \land (p \land q) \)

\( \neg p \lor q \vdash \neg p \land q \)

\( \neg p \lor q \land (p \land q) \neq \neg p \lor q \land (p \land q) \)

Inquisitive Semantics

\( p \lor q \equiv p \lor q \land (p \land q) \)

\( \neg p \lor q \equiv \neg p \lor q \land (p \land q) \)

\( \neg p \lor q \vdash \neg p \land q \)

\( \neg p \lor q \land (p \land q) \subseteq \neg p \lor q \land (p \land q) \)
Alternative Semantics

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

\[ ?p \lor ?q \neq ?p \land ?q \]

\[ ?p \land ?q \models ?p \]

\[ \not\models \]

Inquisitive Semantics

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

\[ ?p \lor ?q = ?p \land ?q \]

\[ ?p \land ?q \models ?p \]

\[ \subseteq \]
This talk

- Not sure about explanatory value of algebraic considerations...

Main question:
How (else) might we motivate something like Alternative Semantics?
This talk

- Not sure about explanatory value of algebraic considerations...

**Main question:**
How (else) might we motivate something like Alternative Semantics?

- E.g. why would ‘or’ but not ‘and’ introduce alternatives?
On the possible pragmatic origins of inquisitiveness

Matthijs Westera
Universitat Pompeu Fabra
(University of Amsterdam)
Outline

1. Background & Motivation
2. **Attentional pragmatics**
3. Deriving something like alternative Semantics
Attention

(1) John was at the party or Mary was.
Attention

(1) John was at the party
or Mary was.

Attentional content:
Uttering a sentence draws attention
to the (classical) denotations of
all its parts.
Attentional intent:

Set of things (propositions) to which the speaker intended to draw attention.
Attentional intent:

Set of things (propositions) to which the speaker intended to draw attention.

Listeners & linguists:

- Which subset of the attentional content is the attentional intent?

(Westera 2017)
Attentional Pragmatics

I-maxims: For an informational intent \( p \) and a \( QUD \ Q \):

\[
\begin{align*}
I-\text{Quality}(p) &= \square^\uparrow p \\
I-\text{Relation}(Q, p) &= Q(p) \\
I-\text{Quantity}(Q, p) &= \forall q \left( \left( I-\text{Quality}(q) \land I-\text{Relation}(Q, q) \right) \rightarrow (p \subseteq q) \right)
\end{align*}
\]
Attentional Pragmatics

**I-maxims:** For an informational intent $p$ and a QUDE $Q$:

- $I$-Quality($p$) = $\Box^\vee p$
- $I$-Relation($Q, p$) = $Q(p)$
- $I$-Quantity($Q, p$) = $\forall q \left( \left( I$-Quality($q$) $\land I$-Relation($Q, q$) $\right) \rightarrow (p \subseteq q) \right)$

**A-maxims:** For an attentional intent $A$ and a QUDE $Q$:

- $A$-Quality($A$) = $\forall a \left( A(a) \rightarrow \Diamond^\vee a \right)$  
  \hspace{10cm} (first attempt)
- $A$-Relation($Q, A$) = $\forall a (A(a) \rightarrow Q(a))$
- $A$-Quantity($Q, A$) = $\forall a \left( \left( A$-Quality($\{a\}$) $\land A$-Relation($Q, \{a\}$) $\right) \rightarrow A(a) \right)$

(Westera 2017)
Attentional Pragmatics

**I-maxims:** For an informational intent $p$ and a $\text{QUDE} \ Q$:

$I$-Quality($p$) = $\Box^\land p$

$I$-Relation($Q, p$) = $Q(p)$

$I$-Quantity($Q, p$) = $\forall q \left( \left( \begin{array}{c} I$-Quality($q$) \\
$I$-Relation($Q, q$) \end{array} \right) \rightarrow (p \subseteq q) \right)$

**A-maxims:** For an attentional intent $A$ and a $\text{QUDE} \ Q$:

$A$-Quality($A$) = $\forall a \left( A(a) \rightarrow \diamond (\lor a \land \forall b ((Q(b) \land b \subseteq a) \rightarrow \neg \lor b)) \right)$

$A$-Relation($Q, A$) = $\forall a (A(a) \rightarrow Q(a))$

$A$-Quantity($Q, A$) = $\forall a \left( \left( \begin{array}{c} A$-Quality($\{a\}$) \\
A$-Relation($Q, \{a\}$) \end{array} \right) \rightarrow A(a) \right)$

(Westera 2017)
Illustration: Exhaustivity (1/2)
Illustration: Exhaustivity (1/2)

QUD

pvq

A-Quantity
Illustration: Exhaustivity (1/2)
Illustration: Exhaustivity (1/2)

QUD  \( p \lor q \)  A-Quantity  intersection

\( p \lor q \land (p \land q) \)
Illustration: Exhaustivity (1/2)
Illustration: Exhaustivity (1/2)
Illustration: Exhaustivity (2/2)
Outline

1. Background & Motivation
2. Attentional pragmatics
3. Deriving something like Alternative Semantics
Example (1/6)

(3) John was at the party and Mary was there too.

• Attentional content:
  - {..., Pj, Pm, Pj∧Pm}
Example (1/6)

(3) John was at the party and Mary was there too.

• Attentional content:
  - {..., Pj, Pm, Pj∧Pm}

• Attentional intent:
  - {Pj, Pm}?
  - {Pj∧Pm}?
Example (1/6)

(3) John was at the party and Mary was there too.

- **Attentional content:**
  - {..., Pj, Pm, Pj∧Pm}

- **Attentional intent:**
  - {Pj, Pm}?
  - {Pj∧Pm}?
  - {Pj∧Pm}?
(3) John was at the party and Mary was there too.

- Attentional content: 
  - $\{\ldots, P_j, P_m, P_j \land P_m\}$
- Attentional intent: 
  - $\{P_j, P_m\}$?
  - $\{P_j \land P_m\}$?
  - $\{P_j, P_m, P_j \land P_m\}$?
Example (1/6)

(3) John was at the party and Mary was there too.

• Attentional content:
  - {..., Pj, Pm, Pj∧Pm}

• Attentional intent:
  - {Pj, Pm}?
  - {Pj∧Pm}
  - {Pj, Pm, Pj∧Pm}?
Example (2/6)

(4) John was at the party.

• Attentional content:
  - {..., Pj}
Example (2/6)

(4) John was at the party.

• Attentional content:
  - {..., Pj}

• Attentional intent:
  - {Pj}
Example (2/6)

(4) John was at the party.

• Attentional content:
  - {..., Pj}

• Attentional intent:
  - {Pj}
  - No other possibilities
Example (3/6)

(5) John wasn’t at the party.

• Attentional content:
  - {..., ¬Pj, Pj}
Example (3/6)

(5) John wasn’t at the party.

• Attentional content:
  - \{..., \neg P_j, P_j\}

• Attentional intent:
  - \{\neg P_j\}

cf. Krifka 2013
Example (3/6)

(5) John wasn’t at the party.

• Attentional content:
  - {..., \neg Pj, Pj}

• Attentional intent:
  - {\neg Pj}
  - {Pj}?
Example (3/6)

(5) John wasn’t at the party.

- **Attentional content:**
  - \{..., \neg P_j, P_j\}

- **Attentional intent:**
  - \{\neg P_j\}
  - \{P_j\}?
Example (4/6)

(6) John was at the party or Mary was there.

- Attentional content:
  - \{..., P_j, P_m, P_j \lor P_m\}
Example (4/6)

(6) John was at the party or Mary was there.

• Attentional content:
  - \{..., \text{P}_j, \text{P}_m, \text{P}_j \lor \text{P}_m\}

• Attentional intent:
  - \{\text{P}_j, \text{P}_m\}?
  - \{\text{P}_j \lor \text{P}_m\}?
  - \{\text{P}_j, \text{P}_m, \text{P}_j \lor \text{P}_m\}?
Example (4/6)

(6) John was at the party or Mary was there.

• Attentional content:
  - {..., $P_j$, $P_m$, $P_j \lor P_m$}

• Attentional intent:
  - {$P_j$, $P_m$}?
  - {$P_j \lor P_m$}?
  - {$P_j$, $P_m$, $P_j \lor P_m$}?
Example (4/6)

(6) John was at the party or Mary was there.

- Attentional content:
  - {..., Pj, Pm, Pj ∨ Pm}

- Attentional intent:
  - {Pj, Pm}?
  - {Pj ∨ Pm}?
  - {Pj, Pm, Pj ∨ Pm}?

- Prediction: Focus disambiguates...
Example (5/6)

(7) John was at the party, or both John and Mary

• Attentional content:
  - \{..., Pj, Pm, Pj \land Pm\}
Example (5/6)

(7) John was at the party, or both John and Mary

• Attentional content:
  - \{..., P_j, P_m, P_j\land P_m\}

• Attentional intent:
  - \{P_j, P_j\land P_m\}
  - \{P_j\}
  - \{P_j\land P_m\}?
  - \{P_j, P_m, P_j\land P_m\}?
Example (5/6)

(7) John was at the party, or both John and Mary

• Attentional content:
  - \{..., P_j, P_m, P_j \land P_m\}

• Attentional intent:
  - \{P_j, P_j \land P_m\}
  - \{P_j\}
  - \{P_j \land P_m\}?
  - \{P_j, P_m, P_j \land P_m\}?
Example (5/6)

(7) John was at the party, or both John and Mary

• Attentional content:
  - {..., Pj, Pm, Pj∧Pm}

• Attentional intent:
  - {Pj, Pj∧Pm}
  - {Pj}
  - {Pj∧Pm}?
  - {Pj, Pm, Pj∧Pm}?
General result (1/2)

- For any utterance that complies with the maxims wrt a QUD closed under intersection:

\[
\text{informational intent} = \bigcup (\text{attentional intent})
\]
Example (6/6)

(8) It is not the case that John was there and Mary was there.

• Attentional content:
  - \{..., P_j, P_m, P_j \land P_m, \neg P_j \land P_m\}
Example (6/6)

(8) It is not the case that John was there and Mary was there.

- Attentional content:
  - {..., Pj, Pm, Pj ∧ Pm, ¬Pj ∧ Pm}

- Attentional intent:
  - {¬(Pj ∧ Pm)}
  - {¬Pj, ¬Pm}?
Example (6/6)

(8) It is not the case that John was there and Mary was there.

• Attentional content:
  - \{\ldots, P_J, P_m, P_J \land P_m, \neg P_J \land P_m\}

• Attentional intent:
  - \{\neg (P_J \land P_m)\}
  - \{\neg P_J, \neg P_m\}?
General result (2/2)

- For an utterance in disjunctive normal form, wrt a QUD containing its literals, closed under intersection and union:
General result (2/2)

- For an utterance in disjunctive normal form, wrt a QUD containing its literals, closed under intersection and union:

  \[
  \text{attentional intent} = \text{the set of all disjuncts}
  \]
Outline

1. Background & Motivation
2. Attentional pragmatics
3. Deriving something like alternative Semantics
Discussion (1/2)

- Something like Alternative Semantics can be derived from a pragmatics of attention plus a classical semantics.
Discussion (1/2)

- Something like Alternative Semantics can be derived from a pragmatics of attention *plus a classical semantics*.
- Sensitivity to prosodic focus.
Discussion (1/2)

- Something like Alternative Semantics can be derived from a pragmatics of attention plus a classical semantics.
- Sensitivity to prosodic focus.
- Some more difficult cases have been left out (but see Westera 2017):
  - Cases that violate a maxim;
  - Conjunctions of disjunctions;
  - Quantifiers;
  - Interrogatives.
Discussion (2/2)

- By drawing attention to possible answers to a QUD (without asserting them), an ‘issue’ is raised.
Discussion (2/2)

- By drawing attention to possible answers to a QUD (without asserting them), an ‘issue’ is raised.
  - To find its minimal resolving answers, downward-close it.
Discussion (2/2)

• By drawing attention to possible answers to a QUD (without asserting them), an ‘issue’ is raised.
  - To find its minimal resolving answers, downward-close it.
  - (To find its exhaustive answers, turn it into a partition.)
• By drawing attention to possible answers to a QUD (without asserting them), an ‘issue’ is raised.
  - To find its minimal resolving answers, downward-close it.
  - (To find its exhaustive answers, turn it into a partition.)

• Natural language constructions may be sensitive to any of these aspects.
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And in an earlier stage from the NWO project ‘the Inquisitive Turn’.
A more difficult case

(9) John or Mary was there, and Bill or Sue.

- Attentional intent:
  - Option A: \( \{P_j \land P_b, P_j \land P_s, P_m \land P_b, P_m \land P_s\} \)?
  - Option B: \( \{P_j, P_m\} \land \{P_b, P_s\} \)