Tutorial ‘Introduction to Semantic Theory’ (No. 4)

Getting ready for the final exam

Zeqi Zhao

Session 10

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Our agenda today

- Assignment 10

- Something new: Exclusivity and disjunction, Symmetric alternatives, Neo-Gricean pragmatics, Scalar implicature

- A check list

- Time for questions

Assignment 10

Starting point for solving problems: Our intuitions are important.

Being silent is unnatural in a conversation. **Uttering the ignorence seems necessary.**

(3') A: Is Mary happy?
S: I have no idea.

The task here: Try to proof why S is required to utter the ignorence.

Possible reason: Uttering the ignorence is more **informative** than slience.
Maybe we need to employ **Quantity.**

Assignment 10

Recall what we derived under relevance from the previous lab class.

$\neg B_s^w p \wedge \neg B_s^w \neg p$ relevant (closure under conjunction)

U: Unopionatedness about -*p* is relevant in c.

¬U: Opionatedness about -p also relevant (closure under negation)

By Quantity, if S have relevant alternatives, S should have utter the more informative one. Both Un and ¬Un are more informative than silence (T). Not uttering U and ¬U means

$\neg B_s^w U \wedge \neg B_s^w \neg U$ (QUI)

Assignment 10

$\neg B_s^w U \wedge \neg B_s^w \neg U$ (QUI)

QUI says that S is unopionated about S's own (un)opionatedness, in other words, S doesn't know for sure about whether he/she knows whether John won.

Silence is odd because 1) it doesn't provide any information regarding neither -p nor the speaker's (un)opionatedness 2) Silence also gives rise to an odd QUI which indicates the speaker doesn't know his/her own belifes.

Consider (4):

(4) A: Did John win?

B: # I don't know if I know about this.

Inferences of disjunction

Two kinds of inferences are tied closly with disjunction: Ignorance and exclusivity. We've discussed the ignorance problem in the lab class last week.

(1) Mary hugged John or Bill.

Utterance of (1) indicates exclusivity:

Only one of them, but **not both** of John and Bill were hugged.

Inferences of disjunction

However, disjunction under negation does not give rise to exclusive inference any more.

(2) Mary didn't hug John or Bill.

Utterance of (2) indicates inclusivity:

Neither John nor Bill were hugged.

Exclusivity comes from semantics?

Why would [[or]] behave differently?

One possible explanation is that there are two different uses of [[or]]:

$$[\![\text{or}]\!] = \begin{bmatrix} 1 \rightarrow \begin{bmatrix} 1 \rightarrow 1 \\ 0 \rightarrow 1 \end{bmatrix} \\ 0 \rightarrow \begin{bmatrix} 1 \rightarrow 1 \\ 0 \rightarrow 0 \end{bmatrix} \end{bmatrix}$$

$$[\![\text{or}_{excl}]\!] = \begin{bmatrix} 1 \rightarrow \begin{bmatrix} 1 \rightarrow 0 \\ 0 \rightarrow 1 \end{bmatrix} \\ 0 \rightarrow \begin{bmatrix} 1 \rightarrow 1 \\ 0 \rightarrow 0 \end{bmatrix} \end{bmatrix}$$

or_{incl} appear under negation and or_{excl} appear without negation.

A semantic solution is inadequate

(3) Mary hug John or Bill. Tony didn't.

To get the right meaning of (3), or_{excl} must be used in the first clause.

(3a) Mary $_{VP}$[hug John or_{excl} Bill].

Since the second clause is with negation, or_{incl} should be used. However, VP-

deletion at PF requires the LF to look like (3b):

(3b) Tony didn't $_{VP}$~~[hug John or_{excl} Bill]]~~

Exclusivity as a quantity implicature

Since the semantic solution is ruled out, is it possible that Exclusivity comes from pragmatics?

(1) Mary hugged John or Bill.

Maybe the hearer of utterance (1) would draw the implicature:

B_s^w ¬ λw'. [[Mary hugged John and Bill]]$^{w'}$

or B_s^w λw'. [[Mary hugged John or Bill but not both]]

Recall the entailment between disjunction and conjunction:

The conjunction entails disjunction but not vice versa. This means, conjunction is more **informative** than disjunction.

Exclusivity as a quantity implicature

The question to be decided is who Mary hugged.

s uttered Mary killed John or Bill.

s is cooperative obeying quality (and relevance):

B_s^w *dis*: λw'. [[Mary hugged John and Bill]]^w

con: λw'. [[Mary hugged John and Bill]]$^{w'}$ is relevant in c (relevance)

and *con* is more informative in c than *dis* (entailment)

If B_s^w *con*, *s* should have utter *Mary killed John and Bill*. (quantity)

Since *s* did not utter so, ¬ B_s^w [[Mary hugged John and Bill]]$^{w'}$ (QUI1)

Exclusivity as a quantity implicature

The same can be done for the other alternative λw'. [[Mary hugged John or Bill but not both]].

¬ B_s^w λw'. [[Mary hugged John or Bill but not both]] (QUI2)

Since both disjuncts entails the disjunction:

¬ B_s^w [[Mary hugged John]] (QUI3)

¬ B_s^w [[Mary hugged John]] (QUI4)

No strengthening possible

What we have now:

$\neg B_s^w$ [[Mary hugged John and Bill]]$^{w'}$ (QUI1)

$\neg B_s^w \lambda w'$. [[Mary hugged John or Bill but not both]] (QUI2)

$\neg B_s^w$ [[Mary hugged John]] (QUI3)

$\neg B_s^w$ [[Mary hugged John]] (QUI4)

What we want: $B_s^w \neg$ [[Mary hugged John and Bill]]$^{w'}$

It seems strengthening with opinionatedness could help us get what we want. However, as we've seen in the lecture, strengthening would give rise to contradiction with the basic QUIs.

Neo-Gricean maxim of quantity

Our old maxim of quantity is too general when defining alternatives of a certain utterance:

> For any context c, world w and declarative sentences ϕ and ψ, if $[\lambda w' . [\![\phi]\!]^{w',g}]$ is more informative in c than $[\lambda w' . [\![\psi]\!]^{w',g}]$, $[\lambda w' . [\![\phi]\!]^{w',g}]$ and $[\lambda w' . [\![\psi]\!]^{w',g}]$ are both relevant in c, and $B_s^w(\lambda w' . [\![\phi]\!]^{w',g})$ and $B_s^w(\lambda w' . [\![\psi]\!]^{w',g})$, s should utter ϕ.

With the **Neo-Gricean maxim of quantity,** a set of **formal alternatives** to an utterance is explicitly defined.

> For any context c, world w and declarative sentences ϕ and ψ, if $[\lambda w' . [\![\phi]\!]^{w',g}]$ is more informative in c than $[\lambda w' . [\![\psi]\!]^{w',g}]$, $[\lambda w' . [\![\phi]\!]^{w',g}]$ and $[\lambda w' . [\![\psi]\!]^{w',g}]$ are both relevant in c, ϕ is among the formal (i.e., structural) alternatives to ψ, and $B_s^w(\lambda w' . [\![\phi]\!]^{w',g})$ and $B_s^w(\lambda w' . [\![\psi]\!]^{w',g})$, s should utter ϕ.

Horn scales

Horn scales, defined first in Horn (1972), are more or less conventionalized scales of lexical items organized by **informativity in some sense.**

Here are some standard sets:
{all, most, many, some}
{and, or}
{n, . . . , 5, 4, 3, 2, 1}
{always, often, sometimes}

Structural alternatives

a. **Scalar alternatives** of an utterance are alternatives with its scalar item replaced with one of the members from its Horn's set:
e.g. {or, and}

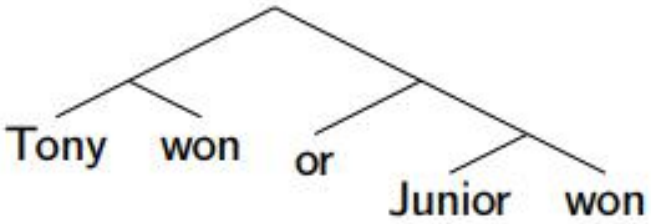
$$Alt(\text{Tony killed Sal or Paulie}) = \left\{ \begin{array}{c} \text{Tony killed Sal or Paulie} \\ \text{Tony killed Sal and Paulie} \end{array} \right\}$$

{some,all}

Alt (some people came) = {some people came,
all people came}

Structural alternatives

b. Structural alternatives of an utterance U come from the lexicon, subconstituents of U. They can't be more complicated than U itself.



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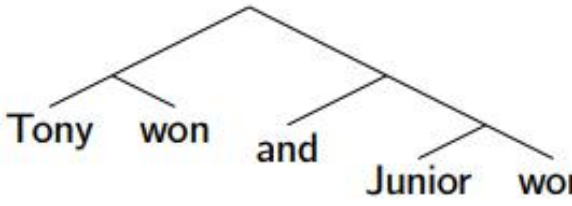

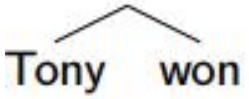

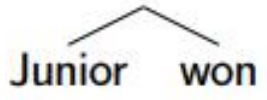

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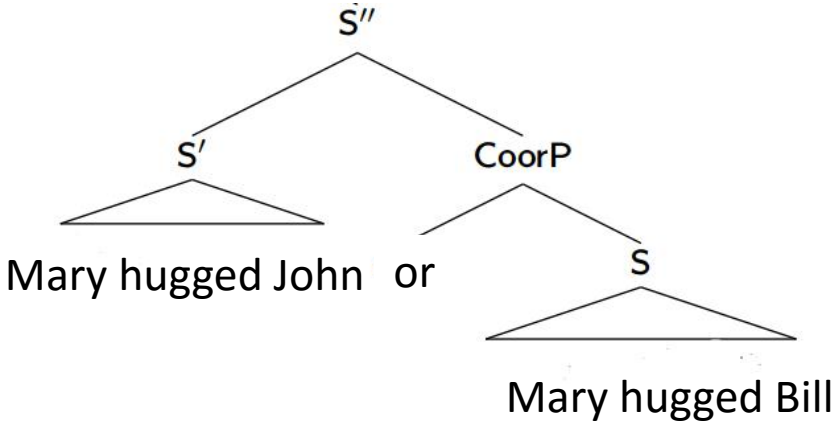
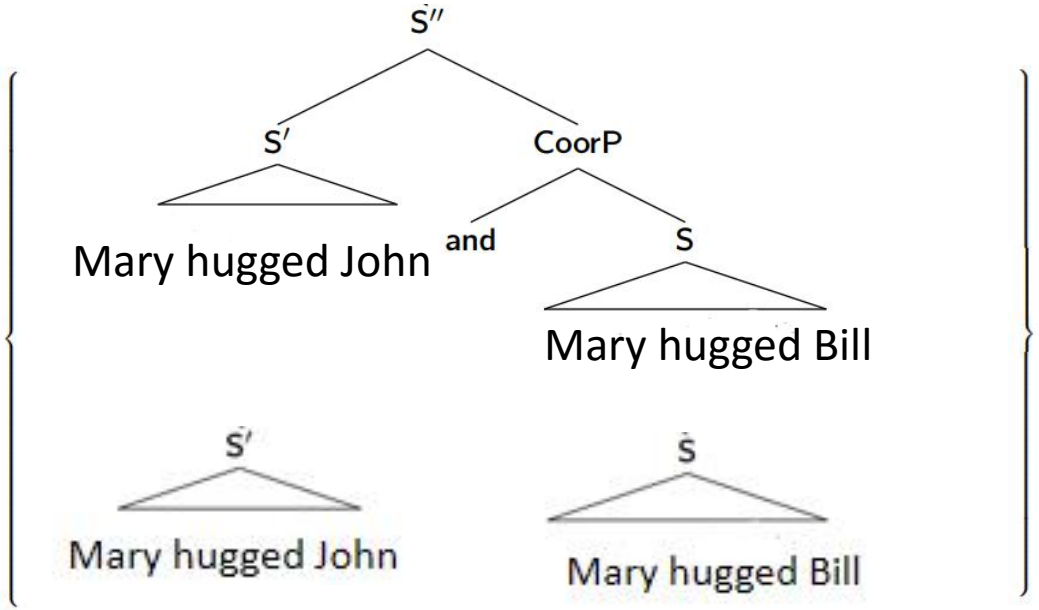
Structural alternatives

With this modified maxim of quantity, we can now define the set of formal alternatives and the set of structural alternatives of (1):

Alt: (Mary hugged John or Bill)= { Mary hugged John and Bill, Mary hugged John or Bill}





The contradiction does not arise

The utterance *Mary hugged John or Bill but not both* is in neither these two sets. Therefore, it is not in the scope of maxim of quantity and QUI2 should be ruled out.

¬ B_s^w [[Mary hugged John and Bill]]$^{w'}$ (QUI1)

¬ B_s^w λw'. [[Mary hugged John or Bill but not both]] (QUI2)

¬ B_s^w [[Mary hugged John]] (QUI3)

¬ B_s^w [[Mary hugged John]] (QUI4)

The contradiction does not arise

$\neg B_s^w$ [[Mary hugged John and Bill]]$^{w'}$ (QUI1)

$\neg B_s^w$ [[Mary hugged John]] (QUI3)

$\neg B_s^w$ [[Mary hugged John]] (QUI4)

QUI1 can now be strengthened with giving rise to a contradiction.

$B_s^w \neg$ [[Mary hugged John and Bill]]$^{w'}$ (QUI1 + opinionatedness)

More Scalar implicature (Lab class 11)

By doing so, we can also get scalar implicatures from other utterances with scalar elements.

(4) Some students failed the exam.

(4) has an inference that not all students failed the exam.

(5) Not all students failed the exam.

(5) has an inference that some students didn't fail the exam.

Try to proof that these inferencec are in fact quantity implicatures and derive the implicatures.

A check list: Semantics

- Know why we need the rules and how to apply them.

FA, IFA, PM, TN1, TN2, NN, DEA, AID....

- Know how to derive the truth-conditions of a sentence given its LF.

Different LFs may lead to different truth-conditions.

- Characteristic functions and Schönfinkelisation (Tutorial 3)

- Semantic relationships: Entailment and presupposition (Tutorial 4)

Entailment between disjunction and conjunction may be useful also for pragmatics.

A check list: Semantics

- Intensionality (Tutorial 7)

Intension and extension, propostion

Lexical entry for propositional attitude predicates (**Type <<*s,t*>,<*e,t*>>**)

Possible worlds and accessibility relations (factive, reflexive, veridical)

A check list: Pragmatics

- The Gricean Co-operative Principle (PoC)

The maxim of quality (truthfulness)

The maxim of quantity (informativeness)

The maxim of relevance (“relevance”)

The maxims of manner (perspicuity)

A check list: Pragmatics

- **(Un-)opinionatedness** $\neg B_x^w(p) \wedge \neg B_x^w(\neg p)$

(Un-)opinionatedness and relevance

- How to proof relevance

relevance with (contextual) entailment, closure under negation, closure under conjunction, closure under believe

A check list: Pragmatics

- Conversational Implicatures (QI), (RI)

Flouting of the maxims (QUI)

- Weak/strong pragmatic meaning

Strengthening by the opinionatedness

$\neg B_s^w p \Rightarrow B_s^w \neg$ p

When is strengthening impossible?

- Ignorance and silence (assignment 10)

A check list: Pragmatics

- Scalar implicatures (tutorial 10)

What are formal (i.e., structural) alternatives of an LF.

Neo-Gricean maxim of quantity

Horn's sets

➢Disjunction and conjunction: {or, and}

or_{incl} / or_{excl}

Exclusivity (tutorial 10) and Ignorance (lab class 10)

➢ {Some, all} (lab class 11)

A check list: Pragmatics

- Make sure you know the logic symbols.

¬ “negation”, ∧ “conjunction”, v “disjunction”, ∃ “some”, ∀ “all”,

⊤ “tautology”, ⊥ “contradiction”,

- Duals in modal logic

If it is not the case that p is necessary, then it is possible that not-p.

$$\neg\Box(p) \equiv \Diamond\neg(p)$$

If it is not the case that p is possible, then it is necessary that not-p.

$$\neg\Diamond(p) \equiv \Box\neg(p)$$

- De Morgan's law

$$\neg(p \vee q) \equiv (\neg p \wedge \neg q)$$
$$\neg(p \wedge q) \equiv (\neg p \vee \neg q)$$

Time for questions

and good luck with the exam!