Tutorial “Quantification and binding" and "Intensionality”

Session 9

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Our agenda today

- **Assignment 4 Quantification**
- Assignment 4 Intensionality
- Any questions?

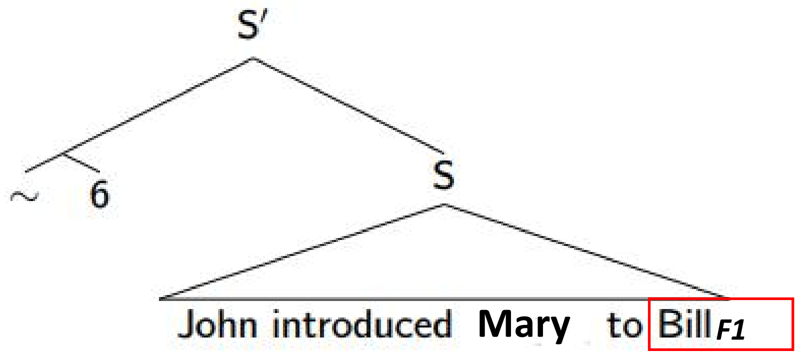
Assignment 4 Quantification
Exercise 1

Exercise 1 Give a suitable LF for (1) and compute its truth-conditions. Give a suitable set of alternatives and show the end result. You only need to compute the secondary value up to the point where it is used by the squiggle operator. From then on, focus on the primary value.

(1) **John only introduced Mary to BILL.**

The semantics of foucs alternatives

(1) John only introduced Mary to **BILL**.

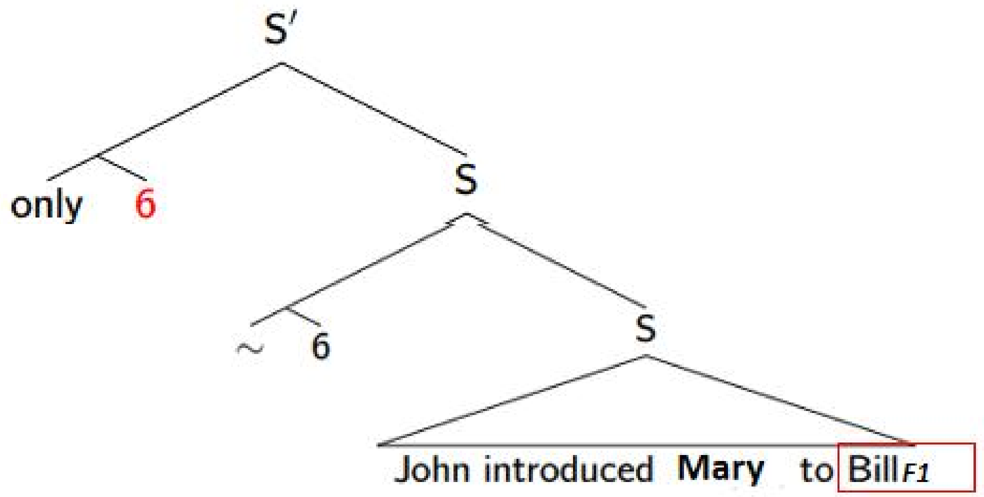


- Focused expressions bear an F-mark in the syntax, a distinguished index.
- F-mark is interpreted by a designated assignment function *h,* which is introduced by a **secondary semantic value** $[[\ ]]^{w,h,g}$
- Adjusted compositional rules for secondary values.
- The squiggle operator ~ comes with a contextual variable i (which is

anaphorically related across utterances) . ~ enforces a definedness condition on *g(i)* such that $g(i) \subseteq [\![\phi]\!]^f$ or $g(i) \in [\![\phi]\!]^f$. The focus value, $[[\ \phi]]^f$ is obtained by applying PA.

Only as a focus associating operator

(1) John **only** introduced Mary to **BILL**.



- **Only** is anaphoric on ~ .
- The presupposition of **only**
- **Only** asserts that all alternatives not entailed by p are false.

$$[\![\text{only}]\!]^{w,g} = \lambda C \in D_{\langle\langle s,t\rangle,t\rangle} \,.\, [\lambda p \in D_{\langle s,t\rangle} : p(w) = 1 \,.\, \forall q \in C[p \nRightarrow q \rightarrow q(w) = 0]]$$

Explication of the truth-conditions

Exercise 1 Give a suitable LF for (1) and compute its truth-conditions. Give a suitable set of alternatives and show the end result. You only need to compute the secondary value up to the point where it is used by the squiggle operator. From then on, focus on the primary value.

(1) **John only introduced Mary to BILL.**

Note: You need to make the truth-conditions explict by assuming, first of all, a suitable maximal plurality, and then the corresponding set of alternatives.

See slide p.17.

Assignment 4 Quantification
Exercise 2

Exercise 2 (2) is a so-called alternative-question (with stress on the two predicates, which can be ignored for this task). I.e., it asks the addressee to specify which of two alternatives is the case. Given Karttunen's view of interrogative denotations as (characteristic functions) of sets of propositions, what would a natural denotation for (2) look like? Can you think of an LF with appropriate lexical entries that would achieve this result? There is more than one solution to this. Don't kill yourself over this.

(2) **Is John HAPPY or (is he) SAD?**

Alternative Questions

In English, a non-*wh*-question like (2) has two possible readings:

(2) Is John **HAPPY** or (is he) **SAD**?

a. Polar/Yes-no question reading:
"Is it the case that John is experencing any of these two feelings, happy or sad?"

b. <u>Alternative question reading:</u>
"Which of these two feelings is John experencing: Happy or sad?"

Karttunen's *true answer* approach

Questions denote (characteristic functions) of sets of propositions of type <<s,t>,t>.

<u>Alternative question reading:</u>

“Which of these two feelings is John experencing: Happy or sad?”

[[Is John **HAPPY** or (is he) **SAD**?]]^{w,g}=

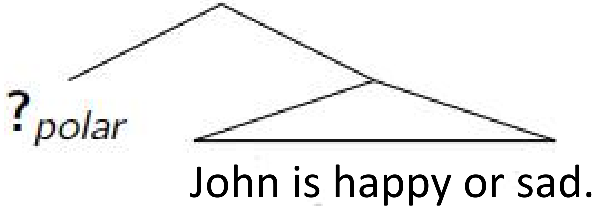
$$\{ \quad \lambda w.\text{ John is happy in } w, \quad \lambda w.\text{ John is sad in } w \quad \}$$

Ingnore the exhaustivity for the moment.

Question operators

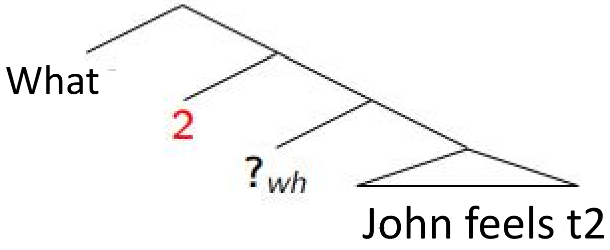
Polar interrogative operator: $?_{polar}$

$$[\![?_{polar}]\!]^w = \lambda p \in D_{\langle s,t \rangle} . [\lambda q \in D_{\langle s,t \rangle} . q = p \vee q = [\lambda w'.p(w') = 0]]]$$



Wh-interrogatives operator: $?_{wh}$

$$[\![\text{what}]\!]^w = \lambda f \in D_{\langle e, \langle \langle s,t \rangle ,t \rangle \rangle} . [\lambda p \in D_{\langle s,t \rangle} . \exists x [x \text{ is a feeling in } w \wedge f(x)(p) = 1]]$$



$$[\![?_{wh}]\!]^w = \lambda p \in D_{\langle s,t \rangle} . [\lambda q \in D_{\langle s,t \rangle} . q = p]$$

One possible way to think about alternative questions

(2) Is John **HAPPY** or (is he) **SAD**?

There are two alternatives of unbiased choice offered by the disjunction. Neither the above two question operators can capture the nature of alternative questions.

A possible solution: Hamblin (1973)

Lexical expressions are set-denoting. An expression of type τ is enriched to <τ, t>.

$[[John]]^{w,g}=\{John\}$

$[[happy]]= \{\lambda x.\ x \text{ is happy in } w\}$

$[[sad]]= \{\lambda x.\ x \text{ is sad in } w\}$

$[[or]] = \lambda\alpha_{<\tau,t>}\ \lambda\beta_{<\tau,t>}.\ \alpha \cup \beta$

$[[happy\ or\ sad]]= \{\lambda x.\ x \text{ is happy in } w\} \cup \{\lambda x.\ x \text{ is sad in } w\}$

Point-wise functional application (PFA)

[[John is happy or sad]]=[[happy or sad]] ([[John]])

={λx. x is happy in w} ∪{λx. x is sad in w} ([[John]])   ???

What we want is for each member of the set of type <<s,t>,t> to combine with [[John]], returning a set of <s,t>. The usual FA doesn't work anymore. We need a set-tolerant FA rule.

Pointwise Functional Application Rule (PFA)

If α is a branching node and $\{\beta, \gamma\}$ is the set of its daughters, then:

a. $[\![\alpha]\!]_{¢} = \lambda w.\ [\![\beta]\!]_{¢}(w)([\![\gamma]\!]_{¢}(w))$

b. or $\{\lambda w.\ [\![\beta]\!]_{¢}(w)(x(w)) : x \in [\![\gamma]\!]_{¢}\}$

c. or $\{\lambda w.\ f(w)([\![\gamma]\!]_{¢}(w)) : f \in [\![\beta]\!]_{¢}\}$

d. or $\{\lambda w.\ f(w)(x(w)) : f \in [\![\beta]\!]_{¢}\ \&\ x \in [\![\gamma]\!]_{¢}\}$

whichever is defined.

Point-wise functional application (PFA)

[[John is happy or sad]]=[[happy or sad]] ([[John]])

={λx. x is happy in w} ∪ {λx. x is sad in w} ([[John]])   (PFA)

={ λw. John is happy in w, λw. John is sad in w }

[[Is John **HAPPY** or (is he) **SAD**?]]^{w,g}=

{   λw. John is happy in w, λw. John is sad in w   }

Even though we already have the set of direct anwers we want. But don't forget: The derivation is not over yet. A question operator is still needed.

Other possible solutions

- **Karttunen (1997): *Alternative question rule*.**

Basic assumptions: Excatly those that we adopted for this course.

The root denotation of a question: The set of true answers.

The *proto-question rule:* It shifts the meaning of declarative sentence from a proposition to a protoquestion, namely, the a set of true propositions that are identical to this proposition.

Our agenda today

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- **Assignment 4 Intensionality**
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Assignment 4 Intensionality
Exercise 1

Give a trivalent lexical entry for **start** that captures its presupposition in (1a). (1b) is somewhat odd. Does the Strong Kleene semantics for the conditional predict this? If so, why? If not, describe what would be necessary to account for the oddness of (1b).

(1) a. **Moe started going to class.**
b. ?**If Moe started going to class, he used to go to class.**

Trivalent lexical entry for *start*

(1) Moe started going to class.

(1) entails: Moe has been going to class since some time $t' < t_i$.

Moe had not been going to class until t'.

$[[start]]^i = \lambda P \in \langle e,t \rangle, \lambda x \in D_e,$

1 if x did not do P at $t' < t_i \wedge$ x is doing P at t_i

0 if x did not do P at $t' < t_i \wedge$ x is not doing P at t_i

if x did P at $t' < t_i$

PAST operator

With the PAST, the evaluation time is shifted back to the past:

$[[\text{start-ed}]]^{i} = \lambda P \in \langle e,t \rangle, \lambda x \in De,$

1 if x did not use to do P at $t'' < t' < t_i \wedge$ x was doing P at $t' < t_i$

0 if x did not use to do P at $t'' < t' < t_i \wedge$ x was not doing P at $t' < t_i$

if x did use to do P at $t'' < t' < t_i$

The Strong Kleene semantics for conditionals

A conditional **if ϕ then ψ** receives # only if $[\![\phi]\!]^{i,g} \neq 0$ and $[\![\psi]\!]^{i,g} \neq 1$.

$\rightarrow$	1	0	#
1	1	0	#
0	1	1	1
#	1	#	#

$$((p_r \rightarrow q) \neq \#) \leftrightarrow (p_r = \# \rightarrow q = 1) \quad \text{truth-table}$$
$$\leftrightarrow (r = 0 \rightarrow q = 1) \quad \text{presupposition}$$
$$\leftrightarrow (\neg r \rightarrow q)$$
$$\leftrightarrow (\neg q \rightarrow r) \quad \text{contraposition}$$

The asymmetric filtering of conditionls

(1b) If Moe started going to class, he used to go to class.

The presupposition for (13) should be *If Moe did not use to go to class, Moe did not use to go to class.*

What is the problem with this presupposition? Should it be filtered?
If so, can the asymmetric (left to right) filtering of conditionls filter it?

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Thanks and see you next week!