LSA.311: Lecture 8

Kai von Fintel

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The Plan for Today

- Quick primer to intensional semantics (toy alert!)
- Introducing indexicals: *I, here, now, actually*
- The need for double-indexing
- The absence of certain operators

Extensions and Intensions

- A sentence ϕ has as its *extension* at a world a truth-value:
  - $[\![\phi]\!]^w = 1$ or 0
- A sentence has as its *intension* a function from worlds to truth-values:
  - $\lambda w.[\![\phi]\!]^w$ (Notation: $[\![\phi]\!]_{\mathcal{C}}$)

Truth of an utterance

- An utterance of a sentence ϕ in world w is true if $[\![\phi]\!]_{\mathcal{C}}(w) = 1$ and false if $[\![\phi]\!]_{\mathcal{C}}(w) = 0$.

Extensional Composition

- Most functions expressed by natural language expressions are *extensional*
- They just need to apply to the extension of their arguments
- $[\![\alpha\beta]\!]_{\mathcal{C}} = \lambda w.([\![\alpha]\!]^w([\![\beta]\!]^w))$

Intensional Composition

- Some functions are *intensional*
- They need to apply to the intension of their arguments
- $[\![\alpha\beta]\!]_{\mathcal{C}} = \lambda w.([\![\alpha]\!]^w([\![\beta]\!]_{\mathcal{C}}))$

Might

- Joe might be in Cambridge
- might (Joe in Cambridge)
- $[\![\text{Joe in Cambridge}]\!]^w = 1$ iff Joe is in Cambridge in w
- $[\![\text{Joe in Cambridge}]\!]_{\mathcal{G}} = \lambda w$. Joe is in Cambridge in w
- $[\![\text{might}]\!]^w = \lambda\phi.\exists w'$ accessible from $w : \phi(w') = 1$
- $[\![\text{might (Joe in Cambridge)}]\!]^w = 1$ iff $\exists w'$ accessible from w : Joe is in Cambridge in w'.

Adding time and tense

- Joe was in Cambridge
- PAST (Joe in Cambridge)
- $[\![\text{Joe in Cambridge}]\!]^{w,t} = 1$ iff Joe is in Cambridge in w at t.
- $[\![\text{Joe in Cambridge}]\!]_{\mathcal{G}} = \lambda w, t$. Joe is in Cambridge in w at t.
- $[\![\text{PAST}]\!]^{w,t} = \lambda\phi.\exists t'$ prior to $t : \phi(w, t') = 1$
- $[\![\text{PAST (Joe in Cambridge)}]\!]^{w,t} = 1$ iff $\exists t'$ prior to t : Joe is in Cambridge in w at t'.

Truth of an utterance

- An utterance of a sentence ϕ in world w at t is true if $[\![\phi]\!]_{\mathcal{G}}(w, t) = 1$ and false if $[\![\phi]\!]_{\mathcal{G}}(w, t) = 0$.

Adding *I*

- I am in Cambridge.
- What is $[\![\text{I}]\!]^{w,t}$?
- the individual who is speaking in w at t?
- But there are other people speaking at the same time as me ...

Adding a speaker parameter

- $[\![\phi]\!]^{w,t,s}$
- $[\![\text{I}]\!]^{w,t,s} = s$
- $[\![\text{I in Cambridge}]\!]_{\mathcal{G}} = \lambda w, t, s.\ s$ is in Cambridge in w at t.

Truth of an utterance

- An utterance of a sentence ϕ by s in world w at t is true if $[\![\phi]\!]_{\mathcal{C}}(w,t,s) = 1$ and false if $[\![\phi]\!]_{\mathcal{C}}(w,t,s) = 0$.

Adding *here*

- Joe is here.
- No need to posit a place parameter
- $[\![\text{here}]\!]^{w,t,s} =$ the place where s is in w at t

I am here

- $[\![\text{I in here}]\!]_{\mathcal{C}} = \lambda w, t, s.$ s is, in w at t, in the place where s is in w at t.
- Tautological

I am not here

- $[\![\text{not (I in here)}]\!]_{\mathcal{C}} = \lambda w, t, s.$ s is, in w at t, *not* in the place where s is in w at t.
- Contradiction
- Answering Machine:
  - I am not here right now

I didn't have to be here

- Or: I might not have been here.
- There is an accessible world w' where s is, at t, *not* in the place where s is in w' at t.
- Just as contradictory as *I am not here*

Solution: add place parameter

- $[\![\phi]\!]^{w,t,s,p}$
- An utterance of a sentence ϕ by s in world w at t in place p is true if $[\![\phi]\!]_{\mathcal{C}}(w,t,s,p) = 1$ and false if $[\![\phi]\!]_{\mathcal{C}}(w,t,s,p) = 0$.
- $[\![\text{here}]\!]^{w,t,s,p} = p$

The *here* sentences again

- $[\![\text{I in here}]\!]_{\not c} = \lambda w, t, s, p.\ s$ is, in w at t, in place p.
  - Not tautological but nobody can utter it without speaking the truth.
- $[\![\text{not (I in here)}]\!]_{\not c} = \lambda w, t, s, p.\ s$ is, in w at t, *not* in place p.
  - Not a contradiction but nobody can utter it without speaking falsely.
- $[\![\text{might (not (I in here))}]\!]_{\not c} = \lambda w, t, s, p. \exists w'$ accessible from $w : s$ is, in w' at t, *not* in place p.
  - Contingent truth, the way it should be (it depends on what are accessible possibilities)

What was the trick?

- Our initial meaning for *here* was:
  - $[\![\text{here}]\!]^{w,t,s} =$ the place where s is in w at t
- A modal operator like *might* shifts the world parameter, so *here* refers to where the speaker is at the time of speaking in the "new world".
- But *here* should always refer to where the speaker *actually* is.
- So, we introduced a new parameter p, which "remembers" where the utterance takes place and is not affected by modal operators.

Class Exercise

- Construct an example with a temporal operator that shows an analogous problem to the modal case, which was:
- I might not have been here.

Wide scope instead?

- We could get the right result in another way:
  - Give *here* wide scope in *I might not have been here*
  - Then, the reference of *here* will not be affected by the modal operator
- Problem:
  - Mary always sends me many things that I never mention to anyone who works *here*.
  - I am usually neither *here* nor where they need me.

Where We Are

- 4 parameters of evaluation
  - world
  - time
  - speaker
  - place of utterance
- The world and time parameter are shifted by intensional operators
- Speaker and place of utterance are "stored" and remain unaffected by intensional operators

Get rid of the speaker?

- $[\![\text{I}]\!]^{w,t,p} =$ the individual located in place p in world w at time t.
- What would *I might not have been here* mean?

Now

- $[\![\text{now}]\!]^{w,t,s,p} = t$

Kamp

- Once everyone now alive hadn't been born yet.
- There is at least one time t' in the past of the speech time such that:
  - everyone x s.t. x now alive is s.t. x not born at t'
- What does *now* refer to?
- The time parameter was shifted to the past t', so that's what *now* would refer to
- But that's wrong
- No scope solution
- Kamp: need to remember speech time

Double-indexing

- two time parameters:
  - the time of the utterance
    - to be remembered even in the scope of temporal operators
  - the "evaluation time"
    - will be shifted by temporal operators
- $[\![\text{PAST}]\!]^{w,t,t_u,s,p} = \lambda\phi.\exists t'$ prior to $t : \phi(w, t', t_u, s, p) = 1$

Actually

- It very well might have been that everyone who is *actually* here was somewhere else instead.
- add world of utterance parameter for *actually* to pick up, no matter how deeply embedded

Simplify

- now that we have world of utterance, time of utterance, and speaker, we can get rid of p
- *here* refers to where the speaker is in the world of utterance at the time of utterance

Where We Are

- 5 parameters
  - utterance parameters
    - world of utterance
    - time of utterance
    - speaker
  - shiftable parameters
    - world of evaluation
    - time of evaluation
- $[\![\phi]\!]^{w,t,w_u,t_u,s}$

Truth of an utterance

- An utterance of a sentence ϕ by s in world w at t is true if $[\![\phi]\!]_{\mathcal{C}}(w,t,w,t,s) = 1$ and false if $[\![\phi]\!]_{\mathcal{C}}(w,t,w,t,s) = 0$.
- Note:
  - initially both world parameters and both time parameters are set to the utterance values
  - it is only when modal/temporal operators appear that the first two parameters get shifted away

Conspicuous Absence

- Could there be operators that shift the "utterance parameters"?
- Technically: yes
  - Nothing prevents us from shifting the s parameter, for example
  - It's all a matter of constructing an operator that does it.
  - $[\![\text{REVERSE}]\!]^{w,t,w_u,t_u,s} = \lambda\phi.\phi(w,t,w_u,t_u,a) = 1$, where a is the person that s is addressing in w_u at t_u.
  - REVERSE I am an idiot
  - = You are an idiot
- Monstrosity!

Next Week

- The Kaplanian Two-Step
- Why?
- Advice: go to Stalnaker's class tomorrow (2:55–4:35)!