The Semantic Anatomy of Conditional Sentences

Katrin Schulz
Outline
Outline

- What does it have to do with logic?
- What makes it interesting?
- What am I working on?
Where is the logic?

- Language
  - Meaning of language
    - Semantics
  - The Mind
    - Cognition
  - The World
    - Metaphysics
Where is the logic?

The Grammar

linguistic form

The Mind

program (the software)

• model/ontology
• interpretation

meaning

data (???)

data

the hardware

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Where is the logic?

balancing form and interpretation

EXAMPLE: Simple Present in English

(1) I will have rolls for breakfast tomorrow.

(2) The sun rises at 6 a.m. tomorrow.

(3) If you invite Peter, I won’t come.

(4) *If you invite Peter, I don’t come.

(5) If the train arrives tomorrow at 9 a.m., it leaves Sidney at 3p.m. this afternoon.
WHERE IS THE LOGIC?

Balancing form and interpretation

EXAMPLE: Simple Present in English

the world parameter of a possible world is completely defined upto its temporal perspective (its “now”), the future is only defined if this follows from the present/past and non-defeasible general laws

\[ p= \langle w, t \rangle \quad \longrightarrow \quad t \quad \longrightarrow \quad w \]
What am I working on?

- Conditional sentences
  - If A, then C.
- The Mind
  - False Belief Task
- The World
  - Causality

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What am I working on?

False Belief Task

Observation
Performance with counterfactual conditionals mirrors performance with the false belief task.
What am I working on?

Causality
What am I working on?

Causality

Observation

Conditionals reason along causal dependencies.

An advertisement of an insurance company:  
“Independent research has shown that people who buy our insurance products live longer than the average American. Thus: ...

(1) If you buy our products, you will (probably) live longer.”
What am I working on?

Causality

Observation

Conditionals reason along causal dependencies.

Suppose there is a circuit such that the light is on (L) exactly when both switches are in the same position (up or not up). At the moment switch 1 is down (¬S₁), switch 2 is up (S₂) and the lamp is out (L).

(1) If switch 1 had been up, the lamp would have been on.
(2) If switch 1 had been up, switch 2 might have been down.
What am I working on?

**Causality**

- Sensibility to causal dependence is an epiphenomenon
  - Lewis

**Interpretation**

- The truth conditions of conditionals depend on causal dependencies
  - Schulz
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**SUBJECT**

- the linguistic form of real-life conditional sentences!

(1) If I had been you, I would not have done this.
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**GOAL**

- Develop a *formally precise and descriptively adequate compositional semantics* for conditionals.
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Compositional semantics for conditionals
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Compositional semantics for conditionals

EXAMPLE: Fake Tense

(1) Als ik jou *was*, zou ik dat niet doen.

(2) Als je volgende week in Parijs *was geweest*, dan *hadden* wij *kunnen afspreken*. 
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**METHODOLOGICAL GUIDELINES**

1. What you see is what you get.
   (maintain a strict form-meaning correspondence)

2. English is NOT the prototype of a language.
   (build on cross-linguistic evidence)
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**WHAT YOU SEE**

1. The construction is stable
2. The construction is extremely poor
3. The constructions is cross-linguistically linked to other constructions
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The proposal

\[ T(\text{AdvP}) = \lambda v.\lambda P.\max^u(T(\text{CP})(v)(u)); P(u)(u). \]

\[ \max^u(D) := \lambda I.\lambda J.([u];D)IJ \land \neg \exists K(([u];D)IK \land J \subset K) \]
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**Properties of the proposal**

- based on the syntax/semantics of free relatives
- modal-free
- involves plural semantics for possible worlds
- formalized in P-DPL
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**Plans for the near future**

- work out a variation of the formal framework that is based on states instead of pluralities
- develop systems for each of the languages that takes the language specific differences into account
- check the philosophical and cognitive entailments

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