Conditionals, Questions and Meaning

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Conditionals
The Basics

Conditionals (Two Varieties, Bad Terminology)

(1) If Bob danced, Leland danced
   (indicative conditional)

(2) If Bob had danced, Leland would have danced
   (subjunctive conditional)

- Conditionals are a heavily worked resource in planning, communication and inquiry
- Their study has proved particularly fertile for exploring the shape of semantic theory and different views on its role in the explanation of these activities

Propositional Theories

- Conditionals express propositions, i.e. they have truth-conditions
- The meaning of a conditional is its truth-conditions
- The meaning of *if* is rendered as a two-place function, mapping two propositions to a third one

Suppositional Theories

1. The assertion of a conditional does not involve the assertion of a conditional proposition.
2. Instead, the *if*-clause marks a supposition under which the consequent alone is asserted.

von Wright (1957)  
Adams (1975)  
Edgington (1995)

The Debate

Between Propositional and Suppositional Theories

- This debate ranges over an array of phenomena.
  - It remains hotly contested (Bennett 2003; Stalnaker 2005; Lycan 2006; Edgington 2008).
  - It is a specific instance of a broader debate about the nature of meaning.

The Propositional View

A sentence’s meaning consists in the way it represents the world as being.

The Suppositional View

A sentence’s meaning consists in the role it plays in communicative and cognitive acts (assertion, acceptance, etc.).

The Plan

In Five Steps

1. Introduce a phenomenon involving *if* that frustrates both suppositional and propositional theories.
2. Provide an intuitive account of the meaning of conditionals which captures this phenomenon.
3. Describe a formal implementation of this account.
4. Explain how the underlying concept of meaning unifies the different approaches to meaning embodied by propositional and suppositional theories.
5. Describe how this implementation also combines the benefits of those two kinds of theories.

Under Interrogative Verbs (Harman 1979)

4. Mabel asked *if* John was going to the party.

But, also:

Interrogative Equatives

5. The future is coming. The question is *if* we will be ready for it.
The Interrogative Link

The Problem

Interrogative Ifs

(3) Albert wondered if Mabel loved John
(4) Mabel asked if John was going to the party
(5) The future is coming. The question is if we will be ready for it.

The Problem Posed by (3)-(5)

- No binary operation on truth-values or propositions
- No suppositional speech act

Skeptical Gambit 1

Skeptical Reply:

- Maybe the co-occurrence of if in conditionals and (3)-(5) is a linguistic accident
  - Like use of bank for two very different things

Response:

- It’s very uncommon for languages to use the same word for financial institutions and the land alongside a river
- But it’s quite common, even across unrelated languages, to use homophous words in interrogatives and conditional antecedents

Advertising Conditionals

(6) Do you need an efficient car? (Then) Honda has the vehicle for you
(7) Single? You haven’t visited Match.com
(8) Art thou bound unto a wife? Seek not to be loosed. Art thou loosed from a wife? Seek not a wife. (Corinthians 7:27, cited by Jespersen 1940: 374)

- Jespersen (1940: 374): the 2nd sentence of (8) is issued in a context where an affirmative answer (yes) to the preceding question is being supposed
The Ramsey Test (Ramsey 1931: 247)

“If two people are arguing ‘If p, will q?’ and are both in doubt as to p, they are adding p hypothetically to their stock of knowledge, and arguing on that basis about q…”

This test may be enriched to reflect the interrogative contribution of if p

The Enriched Ramsey Test

If two people are arguing ‘If p, will q?’, they are adding p hypothetically to the stock issues guiding their inquiry, and arguing on the basis of a hypothetical affirmative resolution of that issue about q

(9) If Bob danced, Leland danced

(9’) a. Suppose we are wondering if Bob danced…
b. …and it turns out that he did.
c. Then it will follow that Leland danced.

This states the function of a conditional in terms of its contribution to the evolving body of information and issues that characterizes a conversation or inquiry

If this statement can serve as a semantics, it holds promise for capturing the conditional-interrogative link

A Plan

For the Immediate Future

1. Adopt a convenient model of information
2. Describe an approach to semantics that deals in ‘transitions between bodies of information’
3. Scale up this model to capture:
   - Not only information but issues (i.e. questions)
   - Hypothetical changes to this body of info & issues
4. Use a semantics of this variety to give an analysis of conditionals
   - It will parallel the paraphrase of (9) given in (9’)

The Possible Worlds Model of Information

- Think of a set of possible worlds as distinguishing ways the world might be (possibilities in the set) from ways it isn’t (possibilities excluded from the set)
- This is what information (or a ‘proposition’) does

This view on the nature of content is not required, but is convenient to operate with

Truth Conditional Semantics: pair each sentence $\phi$ with a proposition $[\phi]$
Information
A Convenient Model

Start with a space of possibilities $W = \{w_1, w_2, w_3, w_4\}$

- $w_1$
- $w_2$
- $w_3$
- $w_4$

Information
The Convenient Model Meets Truth-Conditional Semantics

- $[\text{Cube}] = \{w_1, w_2\}$
  - (‘Cube’: $a$ is a cube)

- $[\neg \text{Cube}] = W - [\text{Cube}] = \{w_3, w_4\}$

- Everybody agrees that conversation takes place against an ever-changing background of information
  - Call it $c$ for the contextual possibilities/info
  - Classic models: Stalnaker (1978), Lewis (1979)

Classical Picture: Semantics delivers propositions and pragmatics provides rules for changing background information

Dynamic Picture: Semantics operates directly on background information

In Short: meaning is information vs. meaning is information change potential
Information

The Convenient Model Meets a Different Kind of Semantics

Informational Dynamic Semantics

- Assign each $\phi$ a function $[\phi]$ characterizing how it changes the information embodied by $c$: $c[\phi] = c'$
- Think of this information as a way of tracking the agent’s current state of mind
- $[\phi]$ is the characteristic role that $\phi$ plays in changing an agent’s mental states

Formal Inspirations: Pratt (1976); Heim (1982); Veltman (1996)

The Question

Do some sentences effect $c$ in ways that can’t be modeled as simply adding a proposition to it (i.e. $c \cap [\phi]$)?

Informational Dynamic Semantics

For Epistemic Might (Veltman 1996)

- $c[\text{Might}(\text{Cube})] = \{w \in c \mid c[\text{Cube}] \neq \emptyset\}$ ‘Test’
  - $c = c$ or $\emptyset$
- $c = \{w_1, w_4\}[\text{Might}(\text{Cube})] = ?$
- $\{w_1, w_4\}[\text{Cube}] =$

$c$

$w_1$

$w_4$

$w_1$

$c'$

$c = \emptyset$

$w_4$
Support
\[ c \models \phi \iff c[\phi] = c \]

Entailment
\[ \phi_1, \ldots, \phi_n \models \psi \iff c[\phi_1] \cdots [\phi_n] \models \psi \]

Truth in \( w \) (Starr 2010: Ch.1)
\[ w \models \phi \iff \{w\}[\phi] = \{w\} \]

Propositions
\[ [\phi] = \{w \mid w \models \phi\} \]

Regardless of how we answer ‘The Question’, there is one way in which the dynamic view is clearly more general.

I think of a dynamic meaning as the characteristic role a sentence plays in changing mental states.

There may be more to that role than its informational effects, since there is more to mental states than their informational content.

It precisely this property that my semantics requires.

**One Answer:** Yes, namely Might\((p)\). (Veltman 1996: §2)

**Another Answer:** When the propositions may be context-dependent, e.g. \([\text{Might}(p)]_c\), the situation is complicated. (Starr 2010: Ch.1) There are, however, reasons to prefer the dynamic account over a contextualist one. (Yalcin 2008: §2.6)

**Hamblin’s (1958) Picture (Also Higginbotham 1996)**

- Knowing the meaning of an interrogative is knowing what would count as an answer to it
  
  \[(10)\]
  
  a. Did Bob dance?
  b. Yes, Bob danced (affirmative answer)
  c. No, Bob didn’t dance (negative answer)

- To ask or wonder is to bear a certain relation to a set of these alternative propositions

**On Answerhood Conditions (Hamblin 1973)**

- Yes/no interrogatives: \([?p] = \{[p], [\neg p]\}\)
- if \( p \) is a yes/no interrogative, so: \([\text{if } p] = \{[p], [\neg p]\}\)
Thought and talk happen against a background of information and issues (Roberts 2004; Schaffer 2005; Groenendijk 2006; Yalcin 2008).

Issues are clusters of alternative propositions
- Open alternatives that the agents are concerned with deciding between
- Formally: a division of \( c \) into disjoint subsets

Interrogative operators — e.g. (\( ? \cdot \)), (if \( \cdot \)) — don’t change background information, but rather, issues
- I.e. \( ?p \) partitions \( c \) into the \( p \)-worlds and the \( \neg p \)-worlds

Jay wonders if \( a \) is a cube: Wonder(Jay, (if Cube))
- Eliminates each world \( w \) where the issues and information representing Jay’s doxastic state \( C^w_J \) doesn’t already contain the issue that would be raised by (if Cube)

\[
\{c_0, \ldots, c_n\}[\text{Wonders}(Jay, (if Cube))] = \\
\{ \{w \in c_0 \mid C^w_J[(if Cube)] = C^w_J\}, \ldots, \\
\{w \in c_n \mid C^w_J[(if Cube)] = C^w_J\}\}
\]

The Upshot: if has an interrogative semantics, just like ?
Information and issues are not only taken for granted in conversation and inquiry.

Agents routinely entertain certain enrichments of the information and issues they are taking for granted.

Acts like supposition introduce these enrichments; the speech acts which follow may exploit what’s entertained in addition to what’s taken for granted.

The real virtuosity comes in the ways that what’s entertained can be related to what’s accepted.

Relevant moves that exploit what’s entertained:

**Elaboration:** \( s \downarrow q \)

Continues enriching the supposition itself, e.g. \( \langle c, \langle c[p] \rangle \rangle \downarrow q = \langle c, \langle c[p][q] \rangle \rangle \).

**Conclusion:** \( s \uparrow q \)

Relates what’s entertained to what’s accepted via an entailment test. Let \( s = \langle c, \langle c[p] \rangle \rangle \):

- If \( c[p] \) (what’s entertained) entails \( q \), \( c \) remains as is.
- Otherwise, something actually contradictory has been proposed, i.e. we are brought to: \( \langle \emptyset, \langle c \rangle \rangle \).

\[ s \uparrow q = \langle \{ w \in c \mid c[p] \models q \} \rangle, \langle c[p][q] \rangle \]
The Interrogative Link

The Theory

(11) # Bob never danced. If Bob danced, Leland danced.

- Indicative conditionals presuppose the possibility of their antecedent (Stalnaker 1975: §3; Bennett 2003: §23)
- This is not mysterious on an interrogative analysis of if

Modeling presupposition failure as undefinedness:

\[
s[(\text{if } \phi) \psi] = \begin{cases} 
  ((s \downarrow (\text{if } \phi)) \downarrow \phi) \uparrow \psi & \text{if } s[\phi] \neq \langle \emptyset, \ldots \rangle \\
  \text{Undefined} & \text{otherwise}
\end{cases}
\]

Additional Benefits

- A highly successful logic of indicative conditionals
  - Key components: dynamic entailment, presupposition (Starr 2009: §3.1)
- An attractive account of indicative conditionals’ truth-conditions
  - Key components: presupposition, dynamic reconstruction of classical truth-conditions (Starr 2009: §3.2)
- An analysis that mixes the best of propositional and suppositional theories

Propositional Theory’s ‘Exclusive’ Benefits

- Unified account of indicatives and subjunctives (Stalnaker 1975)
- Account of truth-value judgements
- Fully compositional
- Unifies with truth-conditional frameworks used for other constructions

Suppositional Theory’s ‘Exclusive’ Benefits

- Sensitivity to private information (Gibbard 1981)
- Indicative conditionals’ probabilities (Edgington 2008)
Indicatives semantics offered here can be unified with a semantics for subjunctives (Starr 2010: Ch.3)
- Truth-value judgements ✓
- Fully compositional ✓
- Unifies with truth-conditional frameworks ✓ (E.g. Muskens 1996)
- Account of sensitivity to private information ✓
  - In parallel with earlier remarks about Might
- Conditionals’ probabilities: open issue

Propositional theories hold that meaning resides in truth-conditions
- Suppositional theories hold that meaning resides the cognitive and communicative acts in which language features
- Here I’ve provided a formal and conceptual sketch of a semantics that unifies these two perspectives
- Meaning determines truth-conditions
- But it is a more general property of sentences which resides in the characteristic role they play in changing the mental states of language users

References

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## References

**References II**


## References III


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