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Background: Meaning and Logic

Imperatives, Connectives and Truth

The Dilemma

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Outline

1 Background: Meaning and Logic
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3 Imperatives, Connectives and Truth
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Logic

Logical Consequence

(1) Everyone is happy
(2) So: Ernie Lepore is happy

The Questions of Logic

• Why does (2) follow from (1)?
• Why doesn’t (1) follow from (2)?
• Generally: why do some sentences follow from others?
• Why is (2) a logical consequence of (1)?

Meaning

Answering the Questions of Logic

The Semantic Answer (Frege, Tarski & others)

(Semantics: the study of meaning)

• Some sentences follow from others because of what those sentences mean

Frege (1884)
Tarski (1956)
**The Semantic Answer**

**The Truth-Conditional Theory of Meaning**

**New Questions**

- What is *meaning*?
- How can meaning make some sentences follow from other sentences?

- Frege (1884), Wittgenstein (1922), Tarski (1956) and others answered this question with the

  **Truth-Conditional Theory of Meaning**

**The Truth-Conditional Theory of Meaning**

1. Sentence meaning = truth-conditions
2. What are truth-conditions?
   - The ways the world has to be if the sentence is true

**Truth-Conditional Semantics**

**An Example**

- Meaning of “b is a cube”: $\llbracket \text{b is a cube} \rrbracket = \{w_1, w_2\}$
  - $\{w_1, w_2\}$ is a **proposition** (Stalnaker 1976)

**Truth-Conditional Semantics**

**In General**

**The Basic Theses**

1. The meaning of a *sentence* is its truth-conditions
   - The meaning of a sentence is a proposition
2. A sentence’s truth-conditions are determined by the meanings of its *words*

**The Meanings of Words**

- **Names** *(Peter, Mary)* refer to things
- **Predicates** *(blue, dance)* refer to concepts
- **Connectives** *(not, and, or)* create a proposition from one or more other propositions
Truth-Conditional Semantics

Connectives: the example of *not*

- *Not* forms opposite proposition: \([\text{not } P] = W - [P]\)
- \([b \text{ is not a cube}] = W - [b \text{ is a cube}] = \{w_3, w_4\}\)

The Meaning of Connectives

1. The meaning of a connective is a way of creating a proposition from one or more propositions.
2. Connectives: *or*, *not*, *and*, etc.

- *Not* forms the opposite proposition:
  - \([\text{not } P] = W - [P]\)
- *And* takes the shared possibilities from 2 propositions
  - \([P \text{ and } Q] = [P] \cap [Q]\)
- *Or* combines all possibilities from 2 propositions
  - \([P \text{ or } Q] = [P] \cup [Q]\)

Logical Consequence: An Example

\([b \text{ is small}] = \{w_2\}, [b \text{ is small or } b \text{ is a cube}] = \{w_1, w_2\}\)

So *P* or *Q* follows from *P*
**Logical Semantics**

1. Meaning is whatever is needed to explain logical consequence
2. Logical consequence is about truth: truth-preservation
3. So: meaning = truth-conditions
4. This theory predicts certain logical patterns:
   - For example: \( P \lor Q \) follows from \( P \)

**Imperatives**

(3) Drink a beer!

- (3) is an imperative, (4) is a modal declarative
- (4) You should/must/ought-to drink a beer
- English signals imperative mood with syntax and prosody
- Other languages have explicit morphemes for this purpose (Aikhenvald 2010)

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**Imperative Consequence**

Some Imperatives Follow from Others: *And*

*John:* Don’t smoke indoors!

*Mary:* Don’t play soccer indoors!

From John and Mary’s commands I may infer:
- Don’t smoke indoors and don’t play soccer indoors

**Imperative Inference with *And***

- So \( !P \land !Q \) follows from \( !P \) and \( !Q \)

**Imperative Consequence**

Some Imperatives Follow from Others: *if*

*John:* Say “No thank you” if Mary offers you a drink

*Mary:* Would you like a drink?

From John and Mary’s commands I may infer:
- Say “No thank you”

**Imperative Inference with *If***

- So \( !Q \) follows from \( !Q \) if \( P \) and \( P \)
**Imperative Consequence**

Some Imperatives DON’T Follow from Others

*John:* Take out the garbage!

From John’s command I may **not** infer:

- Take out the garbage or play video games

**Imperative Inference with Or** (Ross 1941)

- So \( !P \) or \( !Q \) does **not** follow from \( !P \)

**Imperative Consequence**

Some DECLARATIVES Follow from Imperatives

*John:* Dance!

From John’s command I can infer:

- I may dance

**Imperative Inference with Or**

- So **May** \( P \) follows from \( !P \)

**Imperatives Aren’t True or False**

*Mary:* Drink a beer!

*Me:* That’s false. ?!?!?!

**Imperatives Aren’t True or False**

1. Imperatives cannot be seriously evaluated for truth or falsity
2. So imperatives do not have truth-conditions

**Mixing Imperatives**

(5) Go home and I’ll go to the grocery store

- The first part is an imperative
- The second part is a declarative

**And Mixes Moods**

- **And** can connect imperative and declarative sentences

- Examples involving **Or** and **If** can also be found. (See paper)
Imperatives Aren’t True or False

Mary: Drink a beer!
Me: That’s false. ?!?!?!?

Imperatives Aren’t True or False

1. Imperatives cannot be seriously evaluated for truth or falsity
2. So imperatives do not have truth-conditions

Imperatives and Logic

Logical Semantics

1. Meaning is whatever is needed to explain logical consequence
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3. So: meaning = truth-conditions
4. This theory predicts certain logical patterns:
   - For example: $P \lor Q$ follows from $P$

Facts about Imperatives

1. Some imperatives follow from others; others do not
   - $!P, !Q \models !P$ and $!Q, !P \not\models !P$ or $!Q$
2. Imperatives do not have truth-conditions
3. Connectives can mix imperatives and declaratives

One Dead-End

- Many researchers’ response: imperatives have a different kind of content (Hofstadter & McKinsey 1939; McGinn 1977; Portner 2004)
- These theories must offer different analyses of logical consequence for imperatives and declaratives
- They must also have connectives combine imperatives and declaratives differently
  - Imperative and declarative content are different
  - Recall $Or$
- Thus, all connectives have two different meanings

Objections

1. $And$, $Or$ and $If$ can connect imperatives to declaratives
2. Declaratives can be logical consequences of imperatives

Imperatives and Logic

Pessimism and Quietism

- Austin (1962) and Wittgenstein (1953): give up on mathematical approaches to meaning altogether
- They criticized logical semantics for focusing solely on truth and representation
- This leaves out the expressive dimension of language
- Language doesn’t just represent the world, it also expresses a particular attitude about what it represents

My Project

- I agree with Austin and Wittgenstein that representation is just one facet of language
- But I disagree with them that this forces us to give up on a mathematical theory of meaning
Contextual Information

- As communication and inquiry unfold, a body of information accumulates.
- Think of this information as what the agents are mutually taking for granted in some way.
- It provides a shared resource that the participants can rely on when communicating.

(Stalnaker 1978; Lewis 1979)

Preferences

- Agents not only gather information and identify competing alternatives, they form **preferences** regarding those alternatives.
- Central to **decision theoretic** approaches to rational choice, as applied in philosophy, AI, and economics (e.g. Ramsey 1931; Hansson & Grüne-Yanoff 2009).
- Identifying an issue introduces a goal of finding *any* of the alternatives.
- Forming a preference introduces a hunch about or desire for finding a particular alternative.
- Of particular interest: the preferences being mutually taken for granted for the purposes of an interaction.

Preferences can be represented as a binary preference relation on the alternatives. I.e., a set of pairs of propositions constructed from c. For example:

- **Preference State (R)**
  - **R**: binary relation on a set of alternatives (propositions)
  - **R(a, a')**: a is preferred to a'
  - Each pair in **R** is called a **preference**
 Preference and Meaning

An Advertisement

The Semantics

1. The meaning of a sentence is the characteristic role it plays in changing states of minds
2. Declaratives create more informed states of mind
3. Imperatives create directed states of mind (preferences)
4. Logical consequence is not defined in terms of truth
5. Logical consequence: after accepting some sentences, other sentences will fail to change anything
   - Declaratives: fail to provide more information
   - Imperatives: fail to provide additional directions
6. This semantics captures all of the facts mentioned earlier about imperatives

Conclusions

Meaning and Logic

1. Meaning is whatever is needed to explain logical consequence
2. Meaning is not truth-conditions
3. Meaning is about changing mental states
4. Since some mental states have truth conditions, some sentences do too
5. But there are more to mental states, and more to sentences too
6. All sentences have an expressive dimension over and above their representational dimension
   - How they change mental states

Thank you!

Slides will be posted at http://williamstarr.net/research.html
References I


References II


References III
