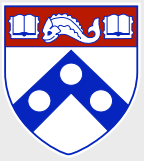
Contexts, Boxes, and Names – Oh My!



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Indexicals and Belief Reports

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Natural Language Semantics

Goal: describe meaning of sentences containing names and attitude verbs like 'believe that', 'know that', 'assert that'...

Strategy: develop a theory of names and attitude verbs that assigns propositions to sentences.

Proposition: a thing that determines a truth value with respect to a world.

 $\longrightarrow \{T, F\}$

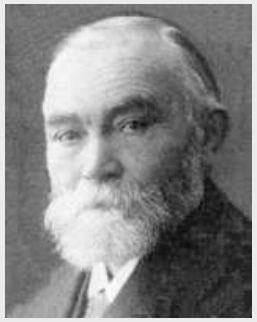
⟨ Williams College, located-at, Williamstown ⟩.

Terminology

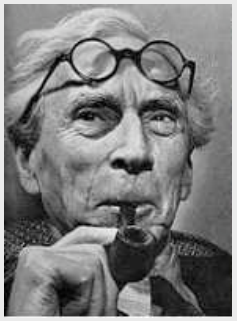
- Semantics vs. pragmatics: narrow literal meaning vs. broader information conveyed.
- Indexical: linguistic term whose meaning depends on context (*e.g.*,'I', 'here', 'now').
- Modal logics: characterize necessity, possibility.
  - Can think of in terms of *possible worlds*.
- Temporal logics: characterize relations between objects involving time.

Connections to Computer Science

- Kripke's work on temporal/modal logics: modelling, specification, verification, programming languages.
  - Logic of Indexicals (Kaplan).
- Direct applications of results about names/attitude verbs.
  - Specification of NLP applications.
  - Better understanding of objects of belief.



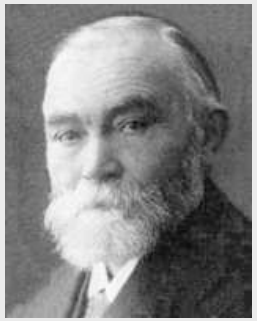
Frege's Puzzle



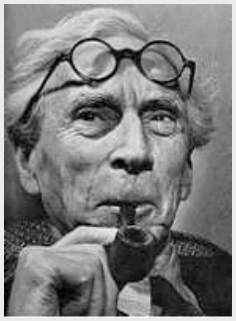
With respect to  DC Comics,

(1) Lois believes that Clark Kent is Clark Kent. $\Longrightarrow$ T

(2) Lois believes that Clark Kent is Superman. $\Longrightarrow$ F



Frege's Puzzle



If the meaning of a name (what it contributes to propositions) is just the object that it denotes,

(1) and (2) both semantically express:

⟨ Lois Lane, belief, ⟨ CK/SM, identity ⟩⟩

(1) + (2) + Lois is rational ⇒ contradiction!

Frege's Solution

Sense vs. Reference

Idea: names contribute more than their referents to propositions.

Think of sense as an algorithm for determining a referent.

Frege's Solution

$\phi \stackrel{\text{def}}{=}$ 'the glasses-wearing reporter at *The Daily Planet* ...'

$\theta \stackrel{\text{def}}{=}$ 'the crime-stopping superhero of Gotham ...'

Extensions (objects) vs. Intensions (propositions).

(1) $\equiv$ (1d) $\ulcorner$Lois believes that ϕ is ϕ.$\urcorner \Longrightarrow \mathsf{T}$

(2) $\equiv$ (2d) $\ulcorner$Lois believes that θ is θ.$\urcorner \Longrightarrow \mathsf{F}$

New Theory of Reference




(AKA Direct Reference, Causal Theory, 'Fido'-Fido Theory)

- Mill (1843) - 'denotation not connotation'.
- Barcan Marcus (1960s) - 'just a tag'.
- Kripke (1970s) - 'rigid designator'.
- Kaplan (1970s) - 'device of direct reference'.

Kripke's Modal Argument

- Names-as-descriptions gives silly results when combined with modal operators.
- 'Necessarily, Clark Kent is a reporter' ≡ Necessarily, 'the glasses-wearing reporter at *The Daily Planet*... is a reporter'.
- But there are many possible worlds where Clark Kent has a different occupation.
- Names refer along a chain of transmission going back to a dubbing.
- Names only contribute their referents to propositions.
- But how to explain Frege's Puzzle?...

Attempts at a Solution

Problem for Direct Reference is that it says (1) and (2) have same semantic content:

$$\langle \text{Lois, belief, } \langle \text{Clark Kent/Superman, } = \rangle \rangle$$

but is true and false at the same world.

Perhaps belief is not an unmediated relation between agents and propositions.

Belief mediated by a *way* of grasping proposition (alternative: we believe something other than propositions).

$$\mathsf{BEL}(x, p, w) \iff x \text{ believes } p \text{ in way } w$$

What can play the role of w?

- Richards 1990s - Embed linguistic information in propositions.
- Salmon/Soames 1990s - Explain Frege's Puzzle at pragmatic level.
- Braun 1990s - Rational agent can hold ϕ and $\neg\phi$.

Indexicals

Indexical: a term whose referent varies with context ('I', 'here', 'now', 'this', 'that', ...).

Content:

Character:

$[\![\cdot]\!] \longrightarrow (\quad \longrightarrow \{T, F\})$

Indexicality and Abiguity

Note that some terms are ambiguous, but do not have interesting character functions:

'bank' – a monetary institution. 'bank' – the edge of a body of water.

The word 'bank' means something different in different contexts but meaning does not depend on context.

Could view them as distinct terms: 'bank_1' and 'bank_2'.

Kaplan models character as a function – loses distinction between ambiguity and indexicality.

Belief Under a Character

Character can explain some confusing sentences:

(3) I am here now.

(4) Nate Foster is in TCL 206 at 3:10PM on November 7th, 2003.

(3b) I believe that I am here now.

(4b) I believe that Nate Foster is in TCL 206 at 3:10PM on November 7th, 2003.

(3b) is always true. (4b) is not.

Reason that (3b) can't be false is that for all contexts, it yields a true proposition whereas (4b) is often false.

Suggests that *character* can fill the way slot of belief relation.

Names as Indexicals

Problem: for proper names, Kaplan claims that character and content just collapse onto the object. So we can't use character to explain Frege's Puzzle.

Idea: Treat names as indexical (they are ambiguous anyways). Then character will be non-trivial [Pelczar 1998].

Complication: What is the character of an indexical name? Namely, what features of a context determine referent of an indexical name?

Recall Kripke's story about proper names: names refer along a causal chain going back to a dubbing.

Speaker's intentions in a context determine causal chain, dubbing ceremony, and hence object denoted.

Intentions are constituents of contexts (metaphysically worrying?).

Analogous to demonstratives (*e.g.*, what is demonstrated by 'that'?).