Functional/Inferential/Conceptual Role Semantics

Philosophy: Inferential/Functional/Conceptual Role Semantics
Psychology: Procedural Semantics

- Functional role of a representation = regularities or properties of causes and effects:
  1. Production by "inputs"
  2. Interaction with other representations
  3. Contribution to production of "outputs"

Wittgenstein, Sellars

Field, Kripke, Ayer, Marcus

Johnson-Laird, Millar, Woods

Linguistic Semantics vs Metasemantics

Linguistic Semantics: Theory of truth, reference and satisfaction
Metasemantics: What meaning or content is in any language, what is it about a person in virtue of which their words or thoughts have their meanings or contents

How can we make a AI system whose words have meanings and that has genuine thoughts?

Just give its representations the right functional roles

Easy

Identity vs Supervenience vs Grounding

Meaning = functional role
Meaning supervenes on functional role
Meaning grounded in functional role

Allows different functional roles that determine the same meaning

Identity vs Supervenience vs Grounding

Meaning = functional role
Meaning supervenes on functional role
Meaning grounded in functional role

No difference in meaning without a difference in role

Meaning 1
Meaning 2
Role 1
Role 2
Ethical 1
Ethical 2
Non-ethical 1
Non-ethical 2

But what is it that meaning is if it merely supervenes on functional role?

Maybe a more abstract role?
Two Factor Theory

This is a dog
This barks
Short-arm roles

Inferential role inside head
This is an animal

Referential factor

Why does the traveler from earth who sees a twin-dog still mean by ‘dog’ what we do instead of what twin-earthers mean?

Dominant causal source, “normal” context

But is “narrow meaning” really a kind of meaning?

One Factor Theory

Role inside and outside head
This is a dog
This barks
Long-arm roles

What determines reference is not just present, but also past input-output relations.

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This barks

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Short-arm roles

Main problem

Mendelovici

“One worry with short-arm functional role theories has to do with how intentionality can arise from functional roles in the first place. Short-arm functional role theories claim that having internal states playing various internal functional roles gives rise to intentionality, presumably in that it either is, constitutes, causes, or grounds intentionality. But, we might wonder, why should playing an internal functional role give rise to intentionality at all? Once we have a state that plays some internal role, why isn’t that the end of the story? Why is there a further bit of the story to which, because of these internal roles, internal states get to have contents?”

“The Real Problem with the tracking theory and long-arm functional role theory is that tracking relations sometimes “grab” the wrong contents, but that tracking relations can’t “grab” anything at all. All they can do is track.”

Main problem

Searle’s Axiom 3: Syntax by itself is neither constitutive of nor sufficient for semantics

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Euthyphro problem

Role first
Content first
No priority

“It sounds like magic; signifying something by multiplying sound and fury. Unless you put cream in you won’t get ice cream out no matter how fast you turn the crank or how sophisticated the “processing.” The cream, in the case of a cognitive system, is the representational role of those elements over which computations are performed. And the representational role of a structure is, I submit, a matter of how the elements of the system are related, not to one another, but to the external situations they “express.”102”

Conceptual role semantics (CRS) is the view that the meanings of expressions of a language (or other symbol system) or the contents of mental states are determined or explained by the role of the expressions or mental states in thinking.

102 It might then be interpreted as a meta-semantic thesis – a thesis about what it is to mean of which an expression has the semantic role what it does (what it is of virtue of which a sentence has its content it does) or a thesis about what it takes to understand as expression (a concept), or both, IRS, or the meta-semantic interpretation, gives rise to the following two broad these.

(MNS) Meaning determination: The meanings of linguistic expressions are determined by their role in reference.

(UNDS) Understanding: To understand a linguistic expression is to know its role in inference.

Conceptual role semantics (CRS) is the view that the meanings of expressions of a language (or other symbol system) or the contents of mental states are determined or explained by the role of the expressions or mental states in thinking.

“An inferentialist of mental content holds that the content of a mental state (such as a belief or a judgment) is determined or individuated by its inferential relations to other mental states and their contents. Likewise, concepts or their contents are determined or individuated by their contributions to these inferential relations.”
Reasons for Believing Functional Role Semantics

- Learning theoretical terms
- Ideology needed to counteract Searle’s Chinese Room argument
- Fodor’s innateness argument
- Kripke’s puzzle about belief
- Essential indexical

Can’t define ‘phlogiston’ or ‘caloric’ except in terms of whole theory
Reasons for believing Functional Role Semantics:
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Fodor’s Paradox:
1. Learning the meaning of a new word = defining it in old terms
2. 2 kinds of definitions
   A. Decompositional: Chase = try to catch
   B. Single word: Chase = Verfolgen
3. Decompositional definition no good
4. Therefore all natural language word learning amounts to defining by synonyms in the innate language of thought
   Chase = CHASE
   So all concepts are innate

Impasse about whether this is an understander embedded in another understander

Must look in book 17 for instructions!

So is ‘quark’ innate? And ‘boson’?

It means what?

What does it all mean?

State Board 17
Out
In

Book 17:
• Such and such squiggles
• Input
• Such and such squiggles on scratch pad

• Change squiggles on pad thusly
• Change number board thusly
• Output such and such squiggles
Reasons for believing Functional Role Semantics

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Pierre believes that
Londres is pretty
Pierre believes that London is not pretty
‘Londres’ is the translation of ‘London’ and so the two words mean the same.
So to believe that London is pretty is to believe that Londres is pretty.
Pierre believes a contradiction, and not through confusion or failure to think through the consequences of his beliefs.

FRS solution
‘London’ and ‘Londres’ can function as two genuinely different concepts that necessarily are concepts of the same thing even if some subjects don’t know or don’t apply that necessary relation.

John Perry

The two concepts would have very different roles if Perry does not know he is Perry.

“The bearded guy in the mirror is making a mess”
“I am making a mess”

The Problem of the Essential Indecisal and Other Essays

Very different relations to action

“Now, suppose somebody said: ‘Breakthrough! The semantic interpretation of ‘Did Napoleon win at Waterloo?’ is found but whether the sentence ‘Napoleon won at Waterloo’ occurs in the volume with Dewey decimal number XXX,XXX at the 42nd Street branch of the New York City Public Library.’ So far as I can see, the analogy is exact, except that libraries use a rather more primitive storage system than computers do. ‘But’, giggled Aunt Martha, ‘if that was what ‘Did Napoleon win at Waterloo?’ meant, it wouldn’t even be a question about Napoleon.’ ‘Aye, shucks’, replied Tom Swift.”
Fodor's argument:

- The meaning of "Did Napoleon win at Waterloo?" is a set of procedures for searching the library for "Napoleon won at Waterloo".
- The sentence wouldn't be about Napoleon.
- So FRS confuses 'Napoleon' with Napoleon.

Use/mention confusion

FRS Reply:

- Two factor:
  - Referential factor handles the relation between Napoleon and Napoleon.
- One factor:
  - Roles are long-arm, so the relation between 'Napoleon' and Napoleon is accommodated.