

Mental Iconicity Seminar

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W3: Language-like Thought

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Announcement: OH's, W 12-2.

“Why the hell would you want to do that?” Where are we? Where have we been?

Types and tokens.

Neural states, representations, contents, mental states.

Most of the naturalizing theories focus on simple symbolic representations.

Iconic and symbolic as strategies for encoding information.

Different kinds of informational functions give rise to different kinds of representation.

What kinds of strategies (formats) are in fact used by the mind? Why? If you were the Designer, what would you do?

Beyond the Linguistic Consensus

Today we'll look at the key motivations behind the (consensus) idea that many/all of the most central cases of cognition are language-like.

Once met with skepticism, this view is now a kind of default view.

What motivates the view?

Should we expect there will also be non-linguistic representations in the mind?

A note: teleosemantics

Language of Thought *Hypotheses*:

Intentional realism (vs behaviorism, nominalism).

There are mental states with content, and attributions of mental states helps explain behavior at the level of psychological laws.

Representationalism (vs embodied cognition, dynamic systems).

An agent has a given mental states (partly) in virtue of tokening a given type of representational vehicle. The attribution of representational vehicles helps explain behavior at the level of causal mechanism.

Structured Representations (vs “atomism”, agnosticism).

Representational vehicles are structured entities (esp. part-whole structure?). The attribution of structured representations helps explain behavior at the level of

computation.

Thought is language-like (vs. map-like, diagram-like) aka “**Mentalese**”.

Structure representations have a language-like structure. Computation takes the form of logical inference.

All forms of cognition is language-like (vs. e.g. pictorialism about perception)

Including perception, navigation, motor planning, probabilistic inference.

Hybrid and pluralist views.

Before we begin, the overwhelming fact: we talk.

Fodor’s view: what is language-like representation?

Subject-predicate structure. Atomic sentences have the form Fa , where F represents a property and a represents an object.

Hierarchy. Complex sentences have hierarchical constituency structure (and a canonical decomposition). Given “ $Fa \& Gb$ ”, “ Fa ” and “ Gb ” are constituents, but “ $a \& G$ ” is not.

Compositionality. A representational system is *compositional* iff for any given expression S , the content of the S is determined by the content of the *parts* of S and the way they are put together, e.g.:

$$[[Fa \rightarrow Gb]] = [[Fa]] + [[\rightarrow]] + [[Gb]] = [[F]] + [[a]] + [[\rightarrow]] + [[G]] + [[b]]$$

I might add...

Recursion. Linguistic syntax and semantics are recursive. This means that the same interpretive rules get applied both to complex expressions *and* to their parts.

For example:

$$[[\sim\sim P]] = \text{It's not the case that } [[\sim P]] = \text{It's not the case that it's not the case } [[P]]$$

Recursion is the heart of the *indefinite productivity* of language, since a single rule can cover indefinitely many sign types.

The Language of Thought (LOT) Hypothesis:

Background picture: thorough-going computationalism about cognition.

Thoughts (beliefs, intentions, desires) are realized in a neural-code.

The neural-code has a language-like format.

Thought processes (thinking, reasoning, planning) are computations over language-like representations in a neural code.

Fodor’s argument for LOT: productivity and systematicity

Methodology: arguing from observable cognition/behavior to underlying physical/functional organization.

Productivity. The ability of a system to produce (understand) indefinitely many novel representations.

If you can think *the duck saw the cloud* and *the cloud heard the cat*, then you can generate indefinitely new thoughts: *the duck saw the cloud which heard the cat which saw the duck*, etc.

NB: The finite storage capacity of the brain.

Systematicity. The ability of a system to recombine its parts in keeping with grammatical role.

If you can think *the cat is sleeping* and *the dog is eating*, then you can think *the cat is eating* and you can think *the dog is sleeping*.

Compositionality explains productivity and systematicity. If meaning of the whole is built up from the meaning of the parts in a rule-governed way, then (a) productivity comes from recursively combining parts into larger wholes; (b) systematicity comes from the substitution of different parts to fill the same semantic roles.

To be precise: compositionality explains systematicity; compositionality + recursion explains productivity.

Productivity and systematicity in thought. There doesn't seem to be any substantive difference between the productivity (systematicity) of language and that of thought.

Compositionality implies language-like thought. Language is compositional (by all accounts). According to Fodor, the best explanation of compositionality in thought is language-likeness.

Compositionality as physical/functional constraint. Compositionality seems to imply (i) representational parts with content; (ii) repeatable and recombining representational parts; (iii) a memory store (or semantic field) where representational parts are combined; (iv) a downstream system which is sensitive to the constituents of the memory store.

Other views: what is language-like representation?

Symbolic (arbitrary) lexicon. Must concepts be word-like for thought to be language-like?

Subject-Predicate structure. A two+ part structure with different roles: a role for subjects (denoting the bearer of the property), and a role for predicates (denoting the property attributed).

Logical operators. At least: *not*, *and*, and *or*.

Recursive structure. A kind of self-extending structure. Logical operators are (typically) recursive.

Base case: If P, Q, R are atomic formulae, then P, Q, R are sentences.

Recursive clause: For any ϕ : if ϕ is a sentence, then $\sim\phi$ is a sentence.

The argument from domain generality

An different sort of argument....

Iconic systems are domain specific.

Thought is domain general (both in subject matter and complexity).

Organizing thoughts:

There is no single universal kind of LOT-like system in the mind. We should reframe the question about the variety of symbolic systems at play.

These vary, roughly, in complexity.

Propositional and purely attributive symbolic systems. *hawk overhead, shape detectors*

Subject-predicate systems.

Language-like (discursive) systems: subject-predicate structure, recursive, quantificational, context-sensitive.

A false Fodorian dichotomy

For Fodor, representations are either complex symbols or atomic symbols.

So evidence for complexity is evidence for language.

If we reject the assumption, what do his arguments show?

Simple and complex representations

Atomic representations

Complex representations

Examples: iconic, symbolic

Orders of iconicity

First-order (atomic) iconicity

Second-order iconicity

Mixed modes of representation

Food for thought:

How would you capture compositional semantics in a teleosemantic framework?

Consider: subject-predicate structure.

Consider: recursive negation.