

Semantics, conceptual role

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Article Summary

According to conceptual role semantics (CRS), the meaning of a representation is the role of that representation in the cognitive life of the agent, for example, in perception, thought and decision-making. It is an extension of the well-known 'use' theory of meaning, according to which the meaning of a word is its use in communication and, more generally, in social interaction. CRS supplements external use by including the role of a symbol *inside* a computer or a brain. The uses appealed to are not just actual, but also counterfactual: not only what effects a thought *does* have, but what effects it *would* have had if stimuli or other states had differed. Of course, so defined, the functional role of a thought includes all sorts of causes and effects that are non-semantic, for example, perhaps happy thoughts can bolster one's immunity, promoting good health. Conceptual roles are functional roles minus such non-semantic causes and effects.

The view has arisen separately in philosophy (where it is sometimes called 'inferential' or 'functional' role semantics) and in cognitive science (where it is sometimes called 'procedural semantics').

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1. Motivations for CRS

There are two quite different projects that go by the name 'semantics'. One, which we might call *linguistic* semantics, deals with the meanings of particular expressions in particular languages and how they fit together to make up meanings of larger expressions. The second project, *metaphysical* semantics, is one of investigating the fundamental nature of meaning, especially what it is about a person that gives their words or thoughts whatever meanings they have in the first place.

Conceptual role semantics (CRS) is in the domain of metaphysical semantics: it says that the nature of meaning is functional. It does not have anything very informative to say about linguistic issues, about particular languages or about how a language user works out the meanings of sentences on the basis of the meanings of their component words. But if correct, it can contribute to these enterprises by discouraging false and confused foundational views (see [Semantics](#)).

One major motivation for CRS is a functionalist approach to the mind generally (see [Functionalism](#)). Functionalism says that what makes a state a mental state and what gives a mental state the specific content that it has is the role it plays in interacting with other mental states in a creature's psychology.

This idea motivates a reply to theories that insist that a mind requires something more. For example, Searle ([1980](#)) has argued that computers cannot understand language in virtue of their programs or, more generally, by manipulating symbols in a certain way. He rests his case on a thought experiment, the Chinese room, in which a non-Chinese speaker manipulates Chinese symbols by following rules that do not require him to understand the meanings of the symbols he is manipulating. The rules are so devised that he produces sensible responses in Chinese to any Chinese inputs. Searle says that none the less he does not understand Chinese: he is just mindlessly manipulating symbols. CRS motivates the 'systems reply': if we can programme a computer to be intelligent, it will not be the central processing unit (CPU) all by itself that is intelligent or that understand the symbols, but rather all the complex relations between the CPU and other subsystems of the mind, for example, for perception, reasoning and decision making. So the whole system understands Chinese even if the person who is simulating the CPU does not (see [Chinese room argument](#)).

Approaching the matter from the point of view of language rather than thought, what makes CRS plausible is the fact that many terms seem definable only in conjunction with one another. For example, in learning the theoretical terms of Newtonian mechanics – ‘force’, ‘mass’, ‘kinetic energy’, ‘momentum’ and so on – we do not learn definitions outside the circle. There are no such definitions. We learn the terms by learning how to use them in our thought processes, especially in solving problems. Indeed, CRS explains the fact, noted by Thomas Kuhn ([1962](#)), that modern scientists cannot understand the phlogiston theory without learning elements of an old language that express the old concepts. The functional role of, for example, ‘principle’ as used by phlogiston theorists is very different from the functional role of any term or complex of terms of modern physics, and hence we must acquire some approximation of the eighteenth-century functional roles if we want to understand their ideas (see [Definition; Scientific method](#)).

Moreover, CRS does seem to give a plausible account of the meanings of the logical connectives. For example, we could specify the meaning of ‘and’ by noting that certain inferences – for example, the inferences from ‘ p ’ and ‘ q ’ to ‘ p and q ’, and the inference from ‘ p and q ’ to ‘ p ’ – have a special status (they are ‘primitively compelling’, in the terminology of Peacocke [1992](#)).

A further motivation for CRS is that it explains a reasonable version of a principle

of charity according to which we cannot rationally attribute irrationality to a person without limit (see [Charity, principle of §4](#)). Attributing unexplainable irrationality leads to a poor match of roles. If the best translation yields poor enough matches, then the alien conceptual system is not intelligible in ours.

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2. Two-factor CRS

Putnam (1975) raised what might seem to be a powerful objection to any CRS. He pointed out that many natural kind concepts, such as 'water' and 'gold', depend in part for their meaning upon something other than the role of a representation in a person's head, namely upon what happens to be in their external environment (see [Content: wide and narrow; Methodological individualism](#)).

Some proponents of CRS have responded by favouring a 'two-factor' version of CRS. On this view, meaning consists of an internal, 'narrow' aspect of meaning – which might be handled by functional roles that are within the body – and an external referential/truth-theoretic aspect of meaning, which might be handled by some other metaphysical theories of meaning (for example, a causal one). According to the external factor, 'Superman flies' and 'Clark Kent flies' are semantically the same since Superman = Clark Kent; it is the internal factor that distinguishes them. But the internal factor

counts 'Water is more greenish than bluish' as semantically the same in my mouth as in the mouth of my twin on twin earth (see [Content: wide and narrow §2](#)); in this case, it is the external factor that distinguishes them.

Two-factor theories gain some independent plausibility from the need for them to account for *indexical* thought and assertions, assertions whose truth depends upon facts about when and where they were made and by whom (see [Content, indexical](#)). For example, suppose that you and I say 'I am ill'. One aspect of the meaning of 'I' is common to us, another aspect is different. What is the same is that our terms are both used according to the rule that they refer to the speaker; what is different is that the speakers are different. White ([1982](#)) generalized this distinction to apply to the internal and external factors for all referring expressions, not just indexicals.

In a two-factor account, the conceptual roles stop at the skin in sense and effector organs; they are 'short-arm' roles. But CRS can also be held in a one-factor version in which the conceptual roles reach out into the world – these roles are 'long-arm'. Harman ([1987](#)) has advocated a one-factor account which includes in the long-arm roles much of the machinery that a two-factor theorist includes in the referential factor, but without any commitment to a separable narrow aspect of meaning.

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3. Criticisms of CRS

Error. Actual conceptual roles involve errors, even dispositions to err. For instance, in applying the word 'dog' to candidate dogs, one will make errors, for example, in mistaking coyotes for dogs (see [Fodor 1987](#)). This problem arises in one form or another for all naturalistic theories of truth and reference, but in the case of CRS it applies to erroneous inferences as well as to erroneous applications of words to things. Among all the conceptual connections of a symbol with other symbols, or (in the case of long-arm roles) with the world, which ones are correct and which ones are errors? Saul Kripke ([1982](#)), for example, wonders what distinguishes someone who mistakenly says '57 + 65 = 5' from someone who says it correctly, meaning by '+' a function that agrees with addition except in yielding a value of 5 with 57 and 65 as arguments. The answer a person gives in the two cases could be the same, correct in one and erroneous in the other.

Some think we can solve the problem by appealing to dispositions to 'correct' previous answers, or to 'correct' those corrections. But others wonder why all these dispositions could not be the same for two persons who use '+' to designate different functions. (The problem of error is sometimes said to be the problem of specifying semantic 'norms', although norms in this sense should not be confused with norms in the sense of how one ought to apply a word; see [Horwich 1994](#).) Another line of reply is to attempt to specify some sort of naturalistic idealization which specifies roles that abstract away from error, in the way that laws of free fall abstract away from friction.

Words/world. Fodor criticizes a computer-oriented form of CRS for confusing what words denote with the words themselves. The functional roles in the target version of CRS stress searching data banks and manipulating representations, and this Fodor says is like claiming that the meaning of 'Napoleon won at Waterloo' is a set of instructions for finding that sentence in a book in the New York Public Library. All such a search yields is more words: we never get the semantic values of those words, namely Napoleon or Waterloo. But, the CRS theorist says in response, long-arm roles include causal chains outside the machine. And the two-factor version of CRS relies on a second factor, the referential factor, to explain the relation between the word 'Napoleon' and Napoleon.

CRS is often criticized from the point of view

of truth-conditional theories of meaning (see [Meaning and truth](#)). If the meaning of a sentence is its truth-conditions, then the meaning cannot be its conceptual role. But with the two-factor theory, proponents of CRS have the option of counting meanings as the same or different in accordance with whether the external factor specifies truth-conditions that are the same or different. Further, there is reason to suppose that meaning is more fine-grained than truth-conditions. For example, the truth-conditions of 'I am happy' and 'Ned is happy' are the same (since I am Ned), but the meanings of those sentences differ. The further machinery involved in the internal factor can capture the differences among sentences with the same truth-conditions.

Sensory properties. Fodor also criticizes CRS for giving the wrong account of how I and Helen Keller (who was blind and deaf from an early age) can mean the same thing by, for example, 'Water tastes great'. After all, none of her thoughts bears the same relation to the evidence of sight and sound that mine do. But here Fodor assumes that CRS only has the resource of appealing to similarity in *inferential* role, which is entirely internal. He disparages such an account in favour of a referential view: we mean the same because our concepts of water are concepts of the same *thing*. But a two-factor CRS, relying in part on a referential component, has the option of giving exactly the same account as can a long-arm one-factor account.

What glues the two factors together. Fodor and Lepore (1992) object to the two-factor account, wondering what glues the two factors together. Why can there not be a sentence that has the inferential role of 'Water is greenish' but is true if and only if 3 is a prime number? But there is nothing in the CRS approach that dictates that there is any restriction at all on what roles can go with what truth-conditions. This is an independent question that both proponents and opponents of CRS can ask. Everyone who accepts the existence of inferential roles and truth-conditions should find the question meaningful, whether or not they think these are two factors of meaning.

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4. Criticisms of CRS (cont.)

Holism. CRS is often viewed as essentially holistic, but the CRS theorist does have the option of regarding some proper subset of the functional roles in which an expression participates as the ones that constitute its meaning. Thus the subset could be taken to be those that are analytic (or 'true by virtue of meaning'); or as the primitively compelling inferences ([Peacocke 1992](#)) plus those generated by them; or the explanatorily basic regularities ([Horwich 1994](#)).

One natural and common view of what distinguishes the meaning-constitutive roles is that they are analytic, or played by an expression by virtue of its meaning, as in the case of an inference from 'bachelor' to 'male'. Proponents of CRS are thus viewed as having to choose between accepting holism and accepting that the distinction between the analytic and synthetic is scientifically respectable, a claim that has been seriously

challenged by Quine (1954) (see [Analyticity](#)). Indeed, Fodor and Lepore (1992) argue that, lacking an analytic/synthetic distinction, CRS is committed to semantic holism, regarding the meaning of any expression as depending on its inferential relations to *every* other expression in the language (see [Holism: mental and semantic](#)). This, they argue, amounts to the denial of a psychologically viable account of meaning.

Proponents of CRS can counter as follows. First, there is a question of whether a meaning-constitutive inference is thereby analytic. *If* what is meaning-constitutive is analytic, then holistic versions of CRS need analyticity too, since they regard all inferences as meaning-constitutive. But if what is meaning-constitutive is *not* thereby analytic, then neither holistic nor non-holistic versions of CRS need analyticity. So analyticity is not the issue between holistic and non-holistic versions of CRS.

Second, proponents of CRS can reply that the view is not committed to regarding what is meaning-constitutive as analytic. In terms of our earlier two-factor account, they can, for example, regard the meaning-constitutive roles as those that are explanatorily basic in a *narrow* psychology: they are the rules that explain other rules of use and determine *narrow* content ([Horwich 1994](#)). Narrow content does not involve *truth*-values; these arise only with regard to *wide* content, and so *a fortiori* it does not involve any commitment to *truth by virtue of meaning alone*.

A third approach to accommodating holism with a psychologically viable account of meaning is to substitute close enough similarity of meaning for strict identity of meaning. That may be all we need for making sense of psychological generalizations, interpersonal comparisons and the processes of reasoning and changing one's mind.

Compositionality. Fodor and Lepore ([1992](#)) raise a further worry that links the metaphysical semantic issue with a linguistic one: a CRS would seem to risk violating 'compositionality', that is, the requirement that the meaning of a complex expression be a function (in the mathematical sense) of the meanings of its parts (see [Compositionality](#)). It is widely thought that such a property of both language and thought is required to explain how human beings seem to be able to grasp indefinitely many ever more complicated thoughts, and how they can learn to understand complex sentences on the basis of simple ones. CRS threatens this principle, since, Fodor and Lepore say, the conceptual role of a complex non-idiomatic representation is not always a function of the conceptual roles of its parts. Someone who thinks that rattling snakes, especially, are dangerous is disposed to infer 'This is dangerous' from 'This is a rattling snake' for reasons that may not depend at all on any inferences they are disposed to make from 'This is rattling' or 'This is a snake' separately.

Advocates of non-holistic versions of CRS should regard the argument's assumption

that all inferences are to be included in inferential roles as question-begging. Non-holistic versions of CRS can deal with compositionality by counting only a subset of inferences as meaning-constitutive. As mentioned above, these inferences could be identified as the analytic ones, the explanatorily basic ones, or as those that are primitively compelling or generated by them. The threat to compositionality can be avoided by not counting the inference from 'This is a rattling snake' to 'This is dangerous' as part of the meaning-constitutive roles of either sentence.

Advocates of holistic versions of CRS may wish to go along with Fodor and Lepore in assuming that all inferences are part of inferential roles. They should point out that the inferential role of 'rattling' and 'snake' is a matter not just of their roles in *isolation* from one another, but also their roles in contexts involving 'rattling' and 'snake' *together*. The 'rules of use' of these terms are context-sensitive, not context-free.

Once we allow context-sensitive rules of use, compositionality can be trivially satisfied. For example, we can characterize the meaning of a word as an ordered pair, $\langle X, Y \rangle$, where X is the set of inferences *to* sentences containing the word and Y is the set of inferences *from* sentences containing the word. This is a holistic version of the view, for it includes the inference from 'rattling snake' to 'dangerous' in the meaning of 'rattling' and 'snake', and this example stands proxy for the inclusion of *every* inference in the

meaning of every word involved in those inferences. Now the roles just mentioned satisfy the requirements of compositionality from a metaphysical point of view without being a psycholinguistic or a linguistic theory of the representations on the basis of which language is learned or sentences are understood.

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5. Framework, not theory

CRS is more of a framework for a theory than an actual theory. There is no agreement among proponents of this framework about how the roles are constituted. By actual causal interactions among thoughts? All? Some? If some, which ones? And what about systematically mistaken inferences (for example, the 'gambler's fallacy')? Do widespread cognitive illusions contribute to the determination of meaning? Or are the roles normative? If the roles are idealized to avoid mistakes, how is the idealization supposed to be understood? Inference can be understood in intentional terms or in purely causal terms, and the latter would be preferable from the point of view of avoiding circularity in specifying roles. And is there any way to distinguish correcting an old practice from changing to a new one ([Kripke 1982](#))? Many successful philosophical theories are quite sketchy. Some say that CRS is no worse than many of them, but others say that the problems in filling in these details involve difficulties that are fatal

to the whole project.

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