

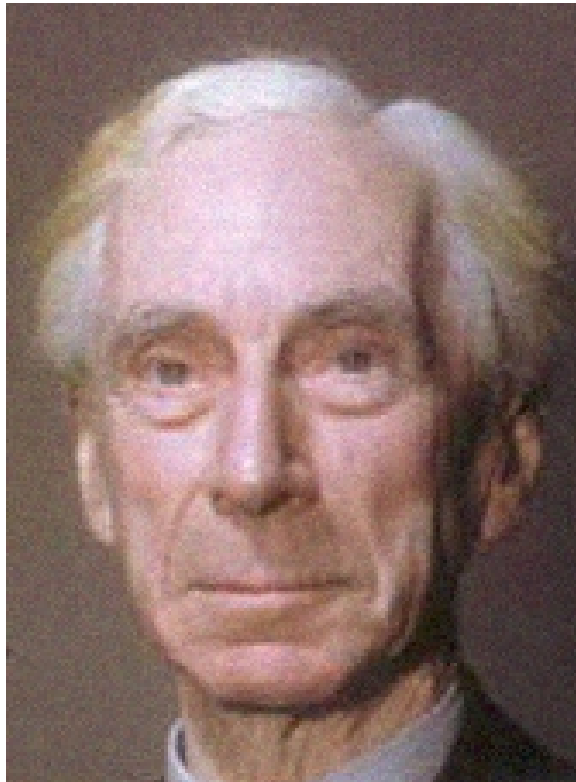
# The structure of meanings

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[www.maths.qmul.ac.uk/~wilfrid/kolkata.pdf](http://www.maths.qmul.ac.uk/~wilfrid/kolkata.pdf)



Bertrand Russell, *On Denoting* (1905):

*Everything, nothing, and something* are not assumed to have any meaning **in isolation**, but a meaning is assigned to *every* proposition in which they occur.

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Russell's essay is one of the last essays written in the framework of Aristotelian semantics.

This semantics stayed remarkably fixed and resistant to development,

at least since Porphyry (Rome, 3rd century AD).

(A case of the quite good preventing the really good.)

## The Aristotelian picture of meanings I:

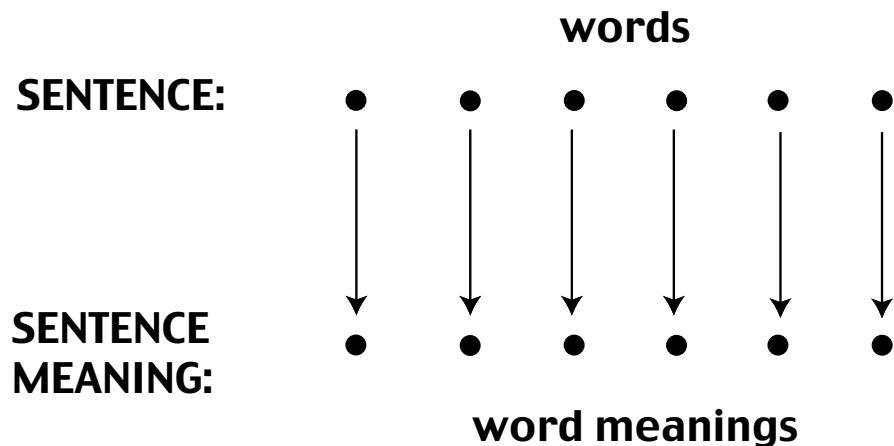
Al-Fārābī (Baghdad, 10th century):

[We] compose sentences of expressions signifying parts of the compound affair signified by the sentence.

Gottlob Frege (c. 1913):

The possibility of our understanding propositions which we have never heard before rests evidently on this, that we construct the sense of a proposition out of parts that correspond to the words.

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## The Aristotelian picture of meanings II:

Not all words in a sentence have meanings in isolation.

Ammonius (Egypt, 5th–6th centuries):

Negations, articles and conjunctions . . . are meaningless when considered on their own account (*kath' heautà theōroumena*).

Ammonius is commenting on Aristotle:

. . . some part of a sentence is meaningful in isolation (*kekhōrisménon*).

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Russell *On Denoting* also uses 'significance on its own account' as a variant of 'meaning in isolation'.

Gottlob Frege (1884):

Look for the meanings of the words in a sentence, not in the words in isolation (*Vereinzelung*), but in the interconnections of the sentence (*dem Satzzusammenhange*).

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What does ‘meaningless in isolation’ mean? It does *not* mean: meaningless when occurring on its own.

Aristotle (Greece, 4th century BC);

In such cases the part is meaningless in isolation, as in ‘pirate-yacht’ the ‘yacht’ means nothing on its own account.

Boethius (Rome, 6th century AD);

When I say ‘suburban’, the ‘urban’ seems to mean something, but when isolated (*separatum*) from the whole word and considered on its own account (*ad ipsum refertur*), it means nothing.

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It *does* mean at least this: An expression  $e$  that is ‘meaningless in isolation’ should be considered as combining with other expressions so as to form meaningful complex expressions.

Normally these other expressions are considered as having meanings ‘in isolation’.

In today’s language,

there is a function  $F_e$  such that if  $e$  is combined with an expression  $g$  whose meaning is  $\mu(g)$ , then the resulting compound expression  $e(g)$  has meaning  $F_e(\mu(g))$ .

The compound expression could also be  $e(g_1, g_2)$  etc.

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Ammonius:

Determiners . . . combine with the subject terms and indicate how the predicate relates to the number of individuals under the subject; . . . ‘Every man is an animal’ signifies that ‘animal’ holds of all individuals falling under ‘man’.

Compare Russell *On Denoting*:

*everything* [is] to be interpreted as follows:

$C(\text{everything})$  means ‘ $C(x)$  is always true’.

The notion of ‘function’ is 18th century.

Frege (*Begriffsschrift 1879*) was the first to express the Aristotelian notion in terms of functions and arguments.

The Aristotelians usually expressed the idea by metaphors, for example that the expression ‘does a job’ (*exercet officium*).

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William of Ockham (14th century):

The syncategoreme strictly speaking has no meaning, but rather when attached to another expression causes that other expression to have a certain meaning, or . . . or does some other job (*aliud officium exercet*) on the [meaningful expression].

Ockham would apparently say that the square root function  $\sqrt{\phantom{x}}$  causes ‘4’ to stand for 2. This seems to be his peculiarity.

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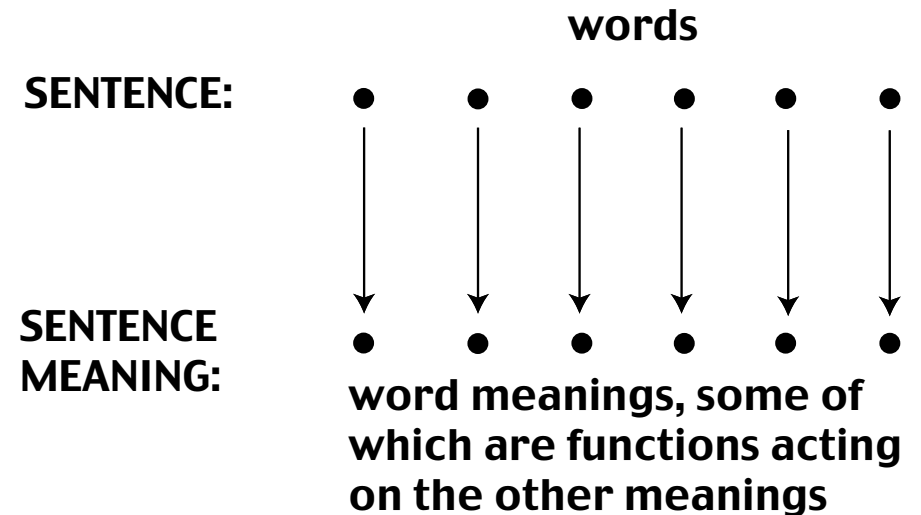
## Comment

Unless we want to hold to some narrow notion of ‘meaning’ (e.g. that meanings are mental pictures), it’s better to state the Aristotelian position not as ‘some expressions have no meaning in isolation’, but as

The meanings of some expressions are functions taking meanings to meanings.

Frege was the first to come clean on this.

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## Unresolved question

What decides which words have meanings that are functions?

For example Russell wrote

$C(\text{everything})$ .

Why not

$\text{everything}(C)$ ?

Three points on this:

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1. Russell's  $C()$  may be a syntactic function.

In natural languages there's no guarantee that the semantic functions follow the syntactic ones.

2. To state the meaning of  $C(\text{everything})$ ,

Russell uses the assumption that  $C()$  itself signifies a function.

(So 'everything' signifies a function of functions.)

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3. We can always write  $f(a)$  as  $E_a(f)$  where  $E_a$  is the evaluation function

$$f \mapsto f(a).$$

So the choice of which expressions stand for functions is in general intratheoretic, with no real-world content.

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I recently saw a criticism of Heim and Kratzer, *Semantics in Generative Grammar*, claiming that their evaluation functions 'lack empirical content'.

This is back to front.

In general the function  $E_a$  has just the same empirical content as  $a$ . What *does* lack empirical content is the choice between the two.

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### **Another unresolved question**

What decides which arguments go to which functions?

Clearly the first answer has to be 'syntax'.

But how does it work?

The Aristotelians were in general hopeless on this.

An attempt at a systematic answer by the Modists (late 13th century) collapsed under ontological irrelevances.

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Walter Burley (early 14th century):

Every man except Socrates is running;  
therefore Plato except Socrates is running.

Burley is apparently reading

everybody(except-Socrates(is-running)).

Common sense suggests

(except-Socrates(everybody))(is-running).

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It seems at present that any answer must describe how the order of application of the functions can be read off from the sentence syntax and the context of utterance.

Since the 1920s, formal languages of logic are constructed so as to make this trivial.

For natural languages it is still highly contentious.

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### **The Aristotelian picture of meanings III:**

When an utterance allows more than one meaning, the mental state of the utterer determines the required meaning.

Diodorus Cronus (4th century BC, not an Aristotelian but his view fed into the tradition):

No utterance should be understood except in the sense that the speaker feels he is giving to it.

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David Hilbert (1899):

[In geometry] the primitives can be thought (*gedacht*) in any way one likes. If I think (*denke*) of my 'points' as any system of things, for example love, law, chimney-sweeps . . .

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Again Frege led the attack on this aspect of Aristotelian semantics.

But within formal languages the solution came from Alfred Tarski (1936):

[The] semantical concepts are defined in terms of the usual concepts of the metalanguage and are thus reduced to purely logical concepts . . .

For Tarski an 'interpretation' is a set-theoretic object, not a state of mind.

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### Back to Russell's *On Denoting*

Russell proposes that the meaning of a definite description 'the  $X$ ' should be given by giving a meaning to each sentence containing it.

' $C(\text{the } X)$ ' means:

There is some value for ' $x$ ' such that:

- ' $x$  is an  $X$ ' is true;
- 'if  $y$  is an  $X$  then  $y$  equals  $x$ ' is always true;
- ' $C(x)$ ' is true.

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In more complex cases there are problems of scope (i.e. order of application of the functions).

Russell makes a start on these problems in Chapter III of the introduction to *Principia Mathematica* (1913).

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He claims more:

... [we shouldn't] regard denoting phrases as standing for genuine constituents of the propositions in whose verbal expressions they occur.

In the absence of any explanation of 'genuine constituents', this claim is meaningless.

He could just be saying that functions are not 'first class objects' (in the computer scientists' jargon). This is not interesting.

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Also Russell's account has more layers than the simple Aristotelian theory:

- Layer One: words, sentences.
- Layer Two: denoting complexes, propositions.
- Layer Three: meanings.

There are signs of severe muddle here; I don't know if anyone has managed to sort it out consistently.

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On Russell's account, 'The clock is slow' entails that there is exactly one clock.

This is clearly wrong, and we know it's not straightforward to repair. E.g. 'there is exactly one salient clock'; but what clocks are salient?

We know any answer must say something about how utterances relate to their context.

Since the Aristotelian tradition was blind to such questions, Russell's oversight shouldn't be surprising.

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In sum, analysis of the Aristotelian tradition in which Russell wrote reveals the following problems for semantics:

- What if anything is the empirical content of claims that the meanings of certain expressions are functions?
- What in the syntax of a sentence determines the structure of arguments and function applications in the meaning of the sentence?
- Describe how the meaning of a sentence is affected by the context of utterance.

All of these problems impinge on Russell's theory of descriptions.

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