

Is Semantics Scientific?

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WE ARE GROOT:)**



Can Semantics Be Regarded As A Science?

Fallacy: Science progresses by a process of discovery.

In the present century, scientific developments and philosophy of science have presented a very different picture of scientific method.

There is no expectation to arrive at 'the truth'. But, this method ensures better and better approximations to the truth by falsifying hypotheses.

Even the most well-founded theories are tentative or provisional and are termed as 'bold conjectures'.

Formula By Karl Popper:

$$P_1 \gg TT \gg EE \gg P_2$$

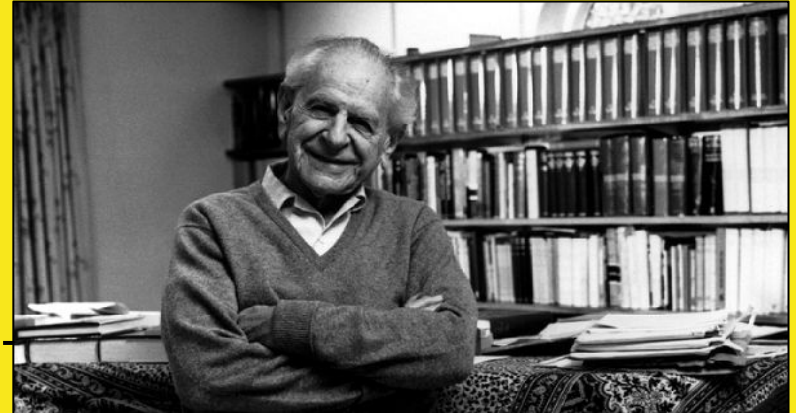
Where,

P_1 = Problem

TT = Tentative Theory

EE = Error Elimination

P_2 = New Problems



Semantics Is A 'Would-Be' Science

Further desiderata for a scientific theory-

It should be complete in the sense of accounting for all the data at one's disposal.

It should be testable by OBJECTIVE means.

What is an objective test??

An objective test is a test that has right or wrong answers and so can be marked objectively. It can be compared with a subjective test, which is evaluated by giving an opinion, usually based on agreed criteria

In the case of semantics, it is often unclear what is the domain of the theory, and hence what set of observations it should try to account for.

Semantics adopts the general method of inquiry common to natural sciences and to other types of empirical investigations.

This is known as the 'HYPO-DEDUCTIVE METHOD'.

Contextual View Of Meaning

If we regard language as 'expressive' or 'communicative' we imply that it is an instrument of inner mental states. And as we know so little of inner mental states, even by the most careful introspection, the language problem becomes more mysterious the more we try to explain it by referring it to inner mental happenings which are not observable. By regarding words as acts, events, habits, we limit our inquiry to what is objective in the group life of our fellows.

During the 1920s and 1930s linguists began to give serious consideration to its scientific credentials. This meant giving serious consideration to the OBSERVATIONAL aspect of scientific investigation.

CONTEXTUALISM has superficial attractiveness for anyone who aspires to the ideal of scientific objectivity.

If meaning is discussed in terms of ideas, concepts, or internal, mental, states, it remains beyond the scope of scientific observation.

Hence we should discuss it in terms of situation, use, context- outwards and observable correlates of language behavior.

Semantics And Psychology

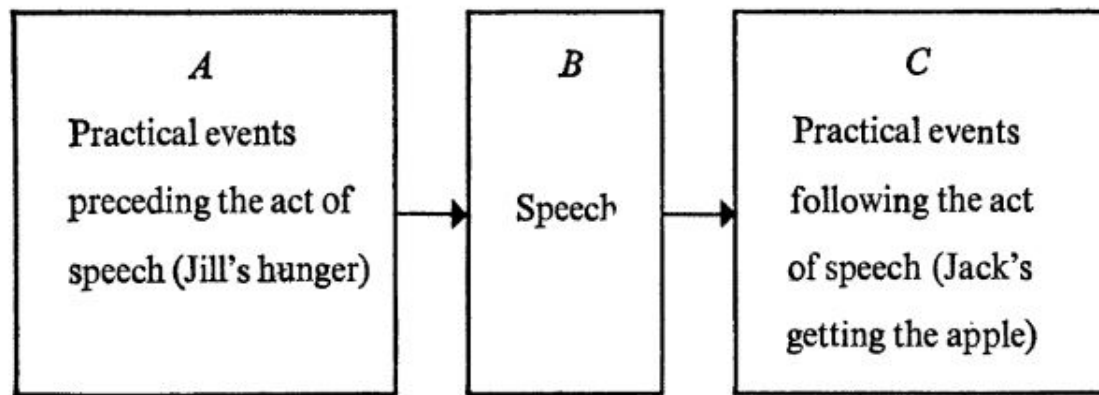
It appeared to support the contextualist view-point.

Bloomfield defined linguistic form as ‘the situation in which the speaker utters it, and the response calls forth the hearer’.

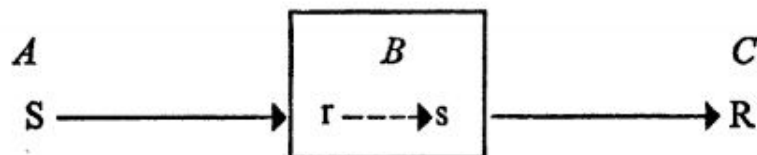
Seeing the example below, it will be fair to say that language is regarded as a remote control system i.e. stimulus to one organism can result in response in another organism.

Let us take a simple situation in which a couple named, Jack and Jill, are walking down the hill:

‘Jill is hungry. She sees an apple on a tree. She makes a noise with her larynx, tongue and lips. Jack vaults the fence, climbs the tree, takes the apple, brings it to Jill, and places it in her hand. Jill eats the apple.’



These he interpreted in stimulus-and-response terms as follows:



Components In Any Communicative Situation

Another behaviourist approach to meaning was that of Charles Morris. He recognized 5 basic components in any communicative situation:

1. A sign: A is a preparatory-stimulus that, in the absence of stimulus-objects initiating response- sequences of a certain behavior-family, causes in some organisms a disposition to respond by response-sequences of this behavior-family, then A is a sign.
2. An interpreter: An organism for which something is a sign
3. An interpretant: The interpreters reaction to the sign
4. A Denotatum: The something else to which the interpretant is a partial response
5. A significatum: In other words, the meaning.

A Simple *Sign* Situation:

A simple sign situation to understand this is:

A dog is kept in a pen. When food is placed for him in a certain place in the pen at A, the buzzer sounds (called S₁) with the food so that he hears it, and responds to it as if he smelt it or saw the food.

We can say that:

S₁- Is a sign

Dog- Interpreter

Movement to A- Interpretant

Food placed at A- Denotatum

The buzzer can be analogous to a simple linguistic message, such as- 'Grub up' or 'Dinner time'

Meaning = Observable Context

The situations to which the linguists naturally turn to are primitive in one sense or the other.

Contextualism in its crudest form is incapable of dealing with any but the simplest and most unsophisticated cases of language use.

In most circumstances, in which linguistic communication occurs (say, telling a story, attending and speaking a lecture, me presenting) observing the situation in which speaker and listener find themselves will tell us little, if anything, about the meaning of the message.

We can analyse and claim that-

Bloomfield espoused a weaker form of contextualism, in which relation between context and meaning is indirect.

MEANING IS ULTIMATELY REDUCIBLE TO OBSERVABLE CONTEXT.

Weaker form of contextualism has the advantage of approximating 'context' more nearly to what we usually understand by 'meaning'; it has the corresponding disadvantage of rendering 'context' a much more abstract notion, so that it gets more and more difficult to relate it to observation.

How Do We Deal With Context?

Recent work in semantics has returned to the ‘mentalism’ against which Firth, Bloomfield and others reacted.

Recognition of common-sense reality: ‘meaning’ is actually a mental phenomenon.

Bewilderment which results from lack of contextual information.

In each case, the originator of the message has assumed an unusual amount about what background knowledge is in the mind of the reader.

Familiar examples where contextual predictability of meaning enables us to understand such skeleton messages as:

1. Its high! And it’s out of the grounds.
 2. Beauty! Straight down the middle.
 3. Splash! Upside Down.
 4. Students! Donkeys!
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Specification of context (linguistic or non-linguistic) has the effect of narrowing down the communicative possibilities of the message as it exists in abstraction from context.

The particularization of meaning:

- A. Context eliminates certain ambiguities or multiple meanings in the message.
- B. Context indicates the referents of certain types of words we call DEICTIC (this, that, here, there, now, then, etc.) and of other expressions of definite meanings such as I, he, you, it, the man etc.
- C. Context supplies information which the speaker/writer has omitted through ellipsis.

DISAMBIGUATING ROLE OF CONTEXT

“Shall I put this on?”

1. Radio
2. Sweater
3. Lump of Wood

» Switch X on

» don X ,i.e put X on oneself

» place X on top of something

“Shall I put the radio on?”

“Shall I put the sweater on?”

“Shall I put the lump of wood on?”

DISAMBIGUATING PROBABILISTIC ROLE OF CONTEXT

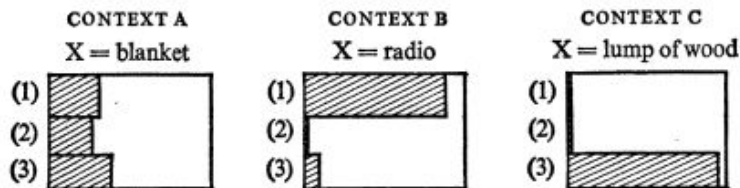
- Disambiguation is a misleading term
- Effect of context to add a probability
- They are far more ambiguous than we first realise
- Total meaning is not an aggregate, dependant on already established potential meanings

An ‘electric sweater’ analogous to an electric blanket.

“Putting the radio on the table”

“Putting the sweater on the table”

put X on	{	= (1)	'switch X on'
		= (2)	'put X on oneself'
		= (3)	'put X on (something else)'



Shaded parts represent a rough estimate of the probabilities

PERFORMANCE AND COMPETENCE, PoV:CONTEXT

COMPETENCE

- What we know about meaning, “knowing” language
- To interpret ‘put...on’ in various senses
 - Encyclopedic knowledge of the universe is a part of ‘communicative competence’
 - Cannot be practically include in semantic study
 - So far, ‘real world’ knowledge mingles in level of performance
- ‘semantic competence’ and ‘contextual performance’
- Situations can cause meaning to diverge and converge
- Semantics: study of meaning
- Pragmatics: study of how meanings are interpreted

PERFORMANCE

- Practical use of that knowledge, “doing” something with the knowledge
- Inferring which meaning is most likely

If we assume such a distinction, we can accept that semantics can disregard factors of contextual variability

What is the
alternative to
contextualism?

MENTALISM AND 'INTUITION'

Linguists returned to the idea of 'mentalism'
The notion that the primary function of language is the communication of ideas.
We can resort to intuition for data on language.

- Examples by Chomsky in 'Current Issues In Linguistics'
- "data of this sort[intuitive] are simply what constitute the subject matter for linguistic theory."

"John is easy to please."

"John is eager to please."

"To please John is easy(*eager) "

"John's eagerness(*easiness) to please.... "

" insight from the current data >>> making data more firm "
-Chomsky

MENTALISM AND 'INTUITION'

Can intuition be a source of meaning?

- Seems to be unreliable-Subjective to introspection
-Veracity of observations
- Intersubjectivity
- Agreement on ambiguity , synonymity etc
- Linguistic Knowledge
- Introspection are private, data is public

The disadvantages of intuitions are:

- Reporting intuitive observations
difficult
- Observations could differ
 - Dialects
 - Misrepresenting facts.
- Eliciting judgements and verbalizing in
other languages.

ALTERNATIVES TO INTUITION

Intuition is fallible or unclear. But are there any viable alternatives?

Behavioral Evidence

- Corpora
 - Phraseology
 - Phenomena in a language outside one's imagination
 - Cannot rely only on corpora
- Tests to elicit judgements
 - Not direct enquiry on meaning.
 - Indirect clues on truth conditions.

Physiological Evidence

- Studies of aphasia are a source of cerebral organization
- Support to semantics is uncertain and fragmentary.

Ultimately, intuition is our first and last resort for evidence to back theories.

CONTROLLED USE OF INTUITION

- Need to figure out more controlled use of intuitive data.
- Conceptual or logical meaning
- Semantic categories
- Incorporate all sentences into set of basic sentences
- Theory can be falsified by showing basic sentence to be untrue.
- Limit intuition to the judgement of basic sentences

TYPES OF BASIC SENTENCES

- SYNONYMOUS
- ENTAILMENT
- INCONSISTENT
- TAUTOLOGY
- CONTRADICTION
- PRESUPPOSITION
- SEMANTICALLY ANOMALOUS

His pants were too small. His pants were not big enough

She is a widow. She has no husband.

The car is red. The car has no colour

The bachelor is unmarried

John killed the bear and it is still alive.

The present king of France is bald. There is a present king of France

The orphan's mother lives in New York

BASIC SENTENCES

- Partial definitions
- Statements hold truth and falsehood by virtue of conceptual meaning alone
- Limiting to declarative sentences
- Yes/No sentences
 - Q-synonymy
 - Q-entailment
 - Q-contradiction
- ‘Satisfaction condition’ for commands

“She lives in Paris, She lives in the Capital of France”

“It has been raining hard, The ground is wet”

“John has just eaten a 7-course meal, John is hungry”

“Mr Smith bit his own ear off.”

“Is your father a man?”

“Is your father a woman?”

“Did you buy any apples?Did you buy any fruit?”

“Do your homework” has satisfaction of “You will do your homework”

TRUTH BASED SEMANTICS

- The number of semantic categories can be reduced(infact to 1)
- Limiting to entailment
 - Synonymy is bidirectional entailment
 - Inconsistency: one sentence entails the negation of other and viceversa
 - Tautology: a proposition entailed by all other propositions
 - Contradiction: negation is a tautology
- Inferential Theory

TRUTH BASED SEMANTICS,Contd...

- Truth conditional approach: knowing conditions under which sentence is true.
 - S is true iff p
 - Developed by logician Tarski for truths in mathematical language.
 - “Sun is yellow” is true iff the sun is yellow
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- “Sooraj peela hai”(Hindi) or “suryan mannayann”(Malayalam) is true iff the sun is yellow

AMBIGUITY

- **Should 'X is ambiguous' be classified as a basic statement?**
- self-evident to native speakers
- However, must be provided with context clues or paraphrases

Hugo is drawing
a cart

- Linguists often rely on the recognition of ambiguities during analysis
- Ambiguity is the property of a sentence
- An ambiguous (declarative) sentence can be defined as a (declarative) sentence that expresses more than one proposition.
- sentences are syntactic units whereas propositions are semantic units.
- Ambiguity is a one-many relation between syntax and sense
- Synonymy is somewhat the opposite phenomenon, Two sentences are synonymous if they express the same proposition
- However, we cannot define synonymy as sense-equivalence between the sentences.

TRANSLATION EQUIVALENCE

- **X is a translation of Y**
- Finding a synonymy in a different language
- Rely on the intuition of a bilingual person or consult documentary evidence such as translations, grammars, and dictionaries
- explaining translation should be among the goal of semantics
- An ideal translation would be one that translates the whole communicative value of a text into another language. But this is generally impossible
- Let's take the example of English to Hindi itself
- he is a chef > वह एक बावर्ची है
- in this translation we have lost the gender of the subject

SEMANTIC TESTING

- Help the investigator to go beyond his own intuition and to discover how far his own findings have general validity among the linguistic community at large.
- necessary when the linguist is studying a language of which he is not a native speaker.
- Such tests have to be presented in a way that can be understood by people with no technical knowledge of the language
- For example,
 - Does sentence x entail sentence y
 - if sentence x is true, does sentence y have to be true?

Instructions:

Assuming X is true, judge whether Y is true or not.

If you think Y must be true, write 'YES'.

If you think Y cannot be true, write 'NO'.

If you think Y may or may not be true, write 'YES/NO'.

If you don't know which answer to give, write '?'.

The responses 'YES' and 'NO' in this test are taken to be diagnostic of entailment and inconsistency respectively.

Entailment and inconsistency

Instructions:

If the statement would be true whatever the situation, write 'YES'.

If the statement would be false whatever the situation, write 'NO'.

If the statement could be true or false, write 'YES/NO'.

If you don't know which answer to give, write '?'.

Here again it is the first two responses ('YES' and 'NO') which are diagnostic: they indicate tautology and contradiction respectively.

Tautology and contradiction

Test Sentences	Percentages			
	Yes	No	Yes/No	?
1. X: Someone killed the Madrid chief of police last night. Y: The Madrid chief of police died last night.	96	0	3	1
2. X: Every radio made by Stumpel carries a 12-month guarantee. Y: Some radios made by Stumpel do not carry a guarantee.	4	88	7	1

- Cannot expect 100 percent confirmation (metaphorical interpretations and other ‘nuisance factor’ inevitably interfere)
- Quantitative results
- *tend* to confirm or falsify basic statements.
- confirm or disconfirm what the investigator has an intuitive evidence for.
- Problem with ambiguous sentences
- find wider, more systematic evidence rather than just individual intuition

ANALYTIC AND SYNTHETIC

- How to draw the line between ‘semantic knowledge’ and ‘factual knowledge?’
- Analytic truth vs synthetic truth
- Consider the following sentences,
 - Ophthalmologists are doctors
 - Ophthalmologists are rich
- Analytic: truth depends upon the meanings of its constituent terms (and how they’re combined)
- Synthetic: truth depends also upon the facts about the world that the sentence represents

- The dog had eighty legs.
- Dogs have horns.
- Some dogs talk sensibly.

- If we want our semantic theory to explain the absurdity of these propositions we should have included such features in our definition of dog.
- But if we try to include all the features, we will end up not with a dictionary entry but with an encyclopedia entry of infinity length.
- Two possible solutions:
 - Include some such features, but not others
 - Exclude all such features
- The first, leaves us with arbitrary demarcation.
- The second, refuses to anatomize the meaning of dog any further than ‘an animal of the canine species’

The oddity of the propositions like the dog has eighty legs is something that zoology has to explain rather than conceptual semantics.

PROTOTYPIC CATEGORIES

- From the viewpoint of cognitive psychology, the analytic/ synthetic problem is the problem of how man's mental dictionary(part of his language using capability) interrelates with his mental encyclopedia (his general capacity for assimilating, storing and implementing experience of the word)
- Our ability to interpret and organize depends heavily on mental blueprints called categories.
- So we can treat propositions about properties of dogs as synthetic
- They reflect our cognitive ability to recognize the properties about the category 'dog'. Basically, whatever we interpret a dog to be

- Nominal view of meaning says that the relation of a word to its meaning is simply a naming relation. Just like Berlin names a particular place, cup, dogs, birds also each name a particular category.
- this would reduce the role of conceptual semantics to just matching a word to a category
- But the nominal view appears to be too restricted.
 - it can only be applied to common nouns and not adjectives or verbs
 - it does not allow us to look at analytic propositions which show relation between categories
 - Milk is not a metal.
 - Skyscrapers are tall buildings.

- In addition to category recognizing abilities, humans also have the cognitive ability to recognize structural relations between categories.
- It is an aspect of of our semantic competence rather than something that belongs to a more general cognitive process
- Psychological viewpoint discourages us from assuming too absolute a boundary between analytic and synthetic

The coordination between human minds with experience thought and language is incredible!

ELEMENTS OF A SEMANTIC DESCRIPTION

- Let's look at the overall shape of an ideal semantic description:
- This is an ideal semantic description, it seems beyond realistic contemplation
- unless all four points are included the description will be incomplete
- The theory that:
 - predicts basic statements of synonymy entailment, tautology, contradiction for some language.
 - Relates meaning to syntax
 - Relate meaning to pragmatics
 - Must be a part of a more general theory

Major difficulties:

- all existing descriptions of languages – both in semantics and in linguistics are fragmentary
- The delimitation of the domain of semantics – of what semantics is trying to explain– is uncertain i.e how to delimit the semantics of a language from
 - Real world knowledge
 - Syntax
 - Situational knowledge
 - The semantics of human language in general

CONCLUSION

What is the answer to the question posed in the title of this chapter: Is semantics scientific?

- Quine has quoted Neurath's comparison of science to a boat 'which, if we are to rebuild it, we must rebuild it plank by plank while staying afloat in it'. The leaky ship of semantics is still making headway, even though there are some planks missing in important places.
 - preference for talking about models rather than theories.
 - Theories claim to tell us what reality is like, models claim to tell us what the reality could be like given certain speculative assumptions
 - 'Bold conjectures' are the springboard of science
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