

Hand or Hammer?

On Formal and Natural Languages in Semantics

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Background I

Object of investigation:

The way in which semantics constructs its object

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Relevant elements:

Empirical facts

Philosophical assumptions

Borrowings from other disciplines

Background 2

Previous work:

In ‘Meaning, Interpretation, Semantics’:

Relative priority meaning – interpretation

Normativity of meaning

In ‘Why Compositionality?’:

Language as an infinite object

Competence as an individual property

Background 3

NL ('hand'):

Transparent

Indistinguishable from thought

Unreflective in use

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Transparent

Indistinguishable from thought

Unreflective in use

FL ('hammer'):

Present

Instrumental w.r.t. thought

Used intentionally

Formal language as:

- 1.Extension
- 2.Improvement
- 3.Reform ('ideal language')

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- 2.Improvement
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Basic opposition:

Instrumentalism (2) vs. ideology (1, 3)

Roots 2

... I found the inadequacy of language to be an obstacle; no matter how unwieldy the expressions I was ready to accept, I was less and less able, as the relations became more complex, to attain the precision that my purpose required. This deficiency led me to the idea of the present ideography.

Frege, *Begriffsschrift*, 1879

Assumption I

Availability Assumption

Thoughts/meanings are accessible independent from language

Roots 3

I believe that I can best make the relation between my ideography to ordinary language [Sprache des Lebens] clear if I compare it to that which the microscope has to the eye. Because the range of its possible uses and the versatility with which it can adapt to the most diverse circumstances, the eye is far superior to the microscope. Considered as an optical instrument, to be sure, it exhibits many imperfections, which ordinarily remain unnoticed only on account of its intimate connection with our mental life. But, as soon as scientific goals demand great sharpness of resolution, the eye proves to be insufficient. The microscope, on the other hand, is perfectly suited to precisely such goals, but that is just why it is useless for all others.

Frege, *Begriffsschrift*

Roots 4

If it is one of the tasks of philosophy to break the domination of the word over the human spirit by laying bare the misconceptions that through the use of language almost unavoidably arise concerning the relations between concepts and by freeing thought from that with which only the means of expression of ordinary language, constituted as they are, saddle it, then my ideography, further developed for these purposes, can become a useful tool for the philosopher. To be sure, it too will fail to reproduce ideas in a pure form, and this is probably inevitable when ideas are represented by concrete means; but, on the one hand, we can restrict the discrepancies to those that are unavoidable and harmless, and, on the other, the fact that they are of a completely different kind from those peculiar to ordinary language already affords protection against the specific influence that a particular means of expression might exercise.

Frege, *Begriffsschrift*

Claim I

Frege's Predicament

The Availability Assumption is incompatible with reform

Excursus I

Frege says: Every well-formed expression must have meaning, and I say: Every possible sentence is well-formed, and if it does not have meaning that can only be because we have not *assigned* a reference to certain parts of it. Even if we believe that we have done so.

Wittgenstein, *Notebooks 1914-1916*, 02/09/1914

Roots 5

Some kind of knowledge of logical forms, though with most people it is not explicit, is involved in all understanding of discourse. It is the business of philosophical logic to extract this knowledge from its concrete integuments, and to render it explicit and pure.

Russell, *Our Knowledge of the External World*, 1914

Philosophy I

On classical uses of the term logical form, as we find it in the grand tradition stemming from Frege, Russell, Wittgenstein, Tarski, Carnap, Quine, etc, there is a type of form which is distinct from logical form, namely grammatical form. In the classic example of Russell's Theory of Descriptions, the simple subject–predicate grammatical form of 'The present King of France is bald' cannot be its logical form, for if it were incorrect inferences would follow. Rather, through the method of contextual definition, the grammatical form can be 'translated' into another form, its *logical form* ... from which the correct inferences follow.

May, Comments on Lepore and Ludwig, 1998

Philosophy 2

The philosophy of language, or at least a core part of it, has matured to the point where it is now being spun off into linguistic theory.

Ludlow, Introduction, in: *Readings in the Philosophy of Language*, 1997

The first significant work in analysing and operating on claims with truth-functional logic is the work of translating them into symbolic form. Ultimately there is no substitute for a careful examination of what the claims are saying.

Translating a compound claim into symbolic form means making its internal logical relations clear and precise.

Because ordinary language often gives us compounds with implied or submerged logical relations, we have to begin by making sure we know what they mean. Especially with claims involving conditionals, a few rules speed up the process.

When 'if' appears by itself, what follows is the antecedent of the conditional. When 'only if' appears as a phrase, what follows is the consequent of the conditional. The placement of clauses in a sentence is not a reliable guide to their placement in a conditional. (Logical form often departs from grammatical form.)

Moore & Parker, *Critical Thinking*

Logic 2

Premisses:

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Logic is the study of (valid) reasoning

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Validity of reasoning depends on particular features ('logical constants')

Conclusion:

We need a formal language to bring out those features

Logic 3

NL is *not perspicuous* (w.r.t. those features that are relevant for reasoning), or even: NL may be *misleading*

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Assumptions:

We are able to determine the features independently from their NL- expression and evaluate the latter in those terms

There is a standard that we can apply

Assumption 2

Assumption 2

Determinacy Assumption

Thoughts/meanings are determinate, *prior* to their expression in language

Semantics I

The logical form of a sentence (or utterance) is a formal representation of its logical structure; that is, of the structure which is relevant to specifying its logical role and properties. There are a number of (interrelated) reasons for giving a rendering of a sentence's logical form. Among them is to obtain proper inferences (which otherwise would not follow; cf. Russell's theory of descriptions), to give the proper form for the determination of truth conditions (e.g. Tarski's method of truth and satisfaction as applied to quantification), to show those aspects of a sentence's meaning which follow from the logical role of certain terms (and not from the lexical meaning of words; c.f. the truth functional account of conjunction), and to formalise or regiment the language in order to show that it has certain meta-logical properties (e.g. that it is free of paradox, or that there is a sound proof procedure).

May, Logical Form in Linguistics, in: *MIT Encyclopedia of Cognitive Sciences*

Semantics 2

Given that *direct interpretation* of natural language with respect to the outside world (or some model of it) is not always easy, many semanticists opt for the *indirect* approach. We know that a translation can sometimes help us to determine the meaning of an expression. Suppose I speak French, but you don't, and we both speak English. In that case, I can teach you something about the meaning of a French expression by translating it into English [...]. The same 'trick' can be used with the translation of natural language into some formal language. Suppose I can describe the meaning of an English expression by translating it into an expression of a formal language. Because there will be a full and explicit interpretation procedure for the expressions of this formal language, I will immediately have grasped the meaning of the English expression. Of course, I will only have access to it in an indirect way, namely via a translation procedure, but as long as the translation is perfect, the exact meaning will be captured.

De Swart, *Introduction to Natural Language Semantics*

Semantics 3

Is it possible to regard logical form so construed as providing us with a theory of semantic interpretation, with a theory that characterises what we grasp in processing a sentence? This question is very controversial. For many the answer is no. We think it is possible, as our logical forms do meet the main requirements that semantic representations are generally expected to meet.

Chierchia & McConnell-Ginet, *Meaning and Grammar*

Coming out I

Difference:

Formal language as a construction (philosophy)

Formal language as a choice (semantics)

Difference:

Formal language as a construction (philosophy)

Formal language as a choice (semantics)

Consequence:

The idea of semantics as an empirical discipline

Claim 2

Formal Semantics' Surprise

Montagovians are closet Chomskyeans
(but they don't know it)

Coming out 2

Psychologism 1:

Linguistic competence is a cognitive faculty

Psychologism I:

Linguistic competence is a cognitive faculty

Psychologism II:

Linguistics is a descriptive theory of linguistic competence

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Methodological correlate of II:

Intuitions, i.e., *phenomenon equals data*

Claim 3

Formal Semantics' Predicament

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Abandon current methodology, or renounce 'innocent' psychologism

There is in my opinion no important theoretical difference between natural languages and the artificial languages of logicians; indeed, I consider it possible to comprehend the syntax and semantics of both kinds of languages within a single natural and mathematically precise theory. On this point I differ from a number of philosophers, but agree, I believe, with Chomsky and his associates.

Montague, *Universal Grammar* (1970)

On the one hand it is clear that every sentence in our language 'is in order as it is'. That is to say, we are not *striving after* an ideal, as if our ordinary vague sentences had not yet got a quite unexceptionable sense, and a perfect language awaited construction by us.—On the other hand it seems clear that where there is sense there must be perfect order.—So there must be perfect order even in the vaguest sentence.

Wittgenstein, *Philosophical Investigations*, 98

[A]sk yourself whether our language is complete;—whether it was so before the symbolism of chemistry and the notation of the infinitesimal calculus were incorporated in it; for these are, so to speak, suburbs of our language. (And how many houses or streets does it take before a town begins to be a town?) Our language can be seen as an ancient city: a maze of little streets and squares, of old and new houses, and of houses with additions from various periods; and this surrounded by a multitude of new boroughs with straight regular streets and uniform houses.

Wittgenstein, *Philosophical Investigations*, 18

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Wittgenstein, *Lectures on the Foundations of Mathematics*, Lecture 5

Consequences

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‘Self-image’ of semanticists
(And indirectly: semantics itself)

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Defence of empirical status:

Not: ‘everyone is entitled to a little abstraction’
But: change the methodology

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Awareness of the nature of the object:

Meaning as one (of many) invariants over socially
constructed behaviour