

THE LIMITS OF THE FORMAL TREATMENT OF LANGUAGE*

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ABSTRACT. *The Limits of the Formal Treatment of Language.* Within the philosophy of language there is a distinction between the natural language philosophers and the ideal language philosophers. The distinction is drawn based on the way these philosophers reflect on language and the world. Natural language philosophers stress the context-based feature of meaning, while the ideal language philosophers emphasize the context-free feature of meaning. In my study I want to show that that even within the formal study of language, in the apparent absence of any context, the notions of valuation and interpretation help us to understand the meaning of sentences.

Keywords: *natural language, formal language, context, valuation, interpretation*

In one of his articles about semantics and pragmatics François Recanati stresses the fact, that when we speak of semantics, we think of literal meaning and truth functions, and when we speak of pragmatics, we think of speech acts and speaker meaning.¹

At the end of his article Recanati draws the conclusion that although we tend to think that we are dealing with a homogenous concept of meaning, this is in fact not the case. The difference itself between literal meaning and speaker meaning suggests that we have at least two concepts of meaning. This differentiation is rooted in the artificial separation of semantics from pragmatics. For when we speak of the literal meaning we are on the ground of semantics, and in the case of the speaker meaning we are on the ground of pragmatics. Recanati's presentation

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¹ François Recanati, *Pragmatics and Semantics*, in Laurence R. Horn–Gregory Ward (eds.), *The Handbook of Pragmatics*, Blackwell Publishing, 2006, p. 452.

of the concept of semantic meaning is based on Rudolf Carnap's concept of semantics, and the syntax–semantics–pragmatics differentiation made by Charles W. Morris. Carnap has borrowed the Morrisian tripartite division of semiotics, and arrived at the following conclusion: if we consider the speaker to be relevant during an analysis of language, we analyze language from a pragmatic point of view; in the case we make an abstraction from the speaker and we only consider the expressions of language and the things that they refer to, we analyze language from a semantic point of view; and finally if we just consider the symbols and their relations to one another, we analyze language from a syntactic point of view.²

Recanati divides philosophers of language into two camps. Gottlob Frege, Bertrand Russell and Rudolf Carnap belong to the first camp, the camp of the ideal language philosophers. These philosophers consider language from a formal perspective, and their central questions are about the logic and formal semantics of language. The other camp includes ordinary language philosophers, the likes of J. L. Austin, J. R. Searle, and H. P. Grice. These philosophers don't think that the logical analysis of language is suited for explaining many of the linguistic phenomena, hence they are not in favour of the logical and formal analysis of language. They have analyzed language through everyday examples, and developed their conception of language based on those examples.

Carnapian pure semantics studies the word–world relation not considering the context of utterances. Here the word 'context' is used in a wide sense including the speaker and the listener, their background knowledge, the intentions of the speaker, and the listener's ability to decode the whole cultural and institutional environment. Pragmatics, unlike semantics, studies the problem of meaning considering context as well. And thus we have arrived at a fundamental difference between semantics and pragmatics. Of course, not taking context into consideration is an abstraction, for it is not possible in everyday life to make an utterance without any context. Making an utterance presupposes that the utterance is made by a speaker, who is already part of the world, speaks a certain language, tries to deliver a message, has a certain linguistic, cultural and institutional background. Pure semantical investigation is made impossible by the fact that there are no utterances without a context. Communication without context is impossible.

It seems that the line between semantics and pragmatics is fluid. The more an investigation disregards the context of an utterance, and focuses on the conventional meaning of words and expressions, the more semantic it is; at the same time the more it recognizes that the meaning of an utterance is influenced by its context,

² *Ibid.* p. 444.

the more pragmatic it is. We can probably separate semantics from pragmatics in case of a Carnapian artificial language (although even in this case I have serious doubts), but the closer we get to natural languages, the more such a differentiation seems unnatural.³

As I have said, in his article Recanati speaks about two camps of language philosophers: the ideal language philosophers, and the ordinary language philosophers. The divide between these two camps is based on the way these philosophers reflect on the interrelation of language and world, the way they approach this problem.

Ordinary language philosophers are convinced that a formal analysis of language doesn't help us better understand the nature of language and meaning. According to them a formal approach is reductive and unnatural. It is enough if we reflect on the fact that a formal approach doesn't take into consideration the context of an utterance. As a result of this the formal approach can only account for situations where an ideal speaker makes an utterance in an ideal situation, and in an ideal language. But this is hardly ever the case because there are no ideal situations.

Ideal language philosophers on the other hand think that their analysis of the nature of language and the nature of the world helps insofar as it considers the interrelation of the language and the world from a formal point of view. According to them the formal approach gives us a clear and explicit image of the language–world relation.

As representatives of logical atomism both Bertrand Russell and Ludwig Wittgenstein accepted the correspondence theory of truth.⁴ The reason for accepting the correspondence theory of truth was that they have both presupposed a structural isomorphism between the elements of language and that of the world. According to them the main function of language is to represent reality. Thus they have stressed the descriptive function of language. The statement that ideal language philosophers accepted a kind of picture theory of language, as did Wittgenstein in his *Tractatus*, doesn't seem to be an exaggeration. According to this theory language is a picture of reality, and whenever we make a statement we in fact create an image of the world. Thus we can say that language creates a model of reality, and there is a one to one correspondence between the elements of language and the elements of reality.

³ *Ibid.* p. 461.

⁴ Susan Haack, *Philosophy of Logics*, Cambridge University Press, 1978, p. 91.; Cf. Ludwig Wittgenstein, *Tractatus Logico-Philosophicus*, Routledge & Kegan Paul, 2002, pp. 9–11.; Bertrand Russell, *The Problems of Philosophy*, Oxford University Press, 2001, pp. 71–75; Richard L. Kirkham, *Theories of Truth. A Critical Introduction*, MIT Press, 2001, p. 124.

In the background of the thinking of the ideal language philosophers there lies the conception of meaning as truth-conditions. Thus to know the meaning of a sentence is to know the truth-conditions of the sentence.⁵ To know the meaning of the sentence 'the apple on the table is red' is to know the conditions under which the sentence is considered to be true: if there is a table (and only one table), and on the top of the table there is an apple (and only one apple), and that apple is red. But in order to be able to say that this sentence is true, we have to be able to identify that specific table, that specific apple, and the quality of being red, and establish a certain relation between these entities in such a way so they correspond to the facts.

Formal logic and formal semantics is a good theoretical framework for the analysis of sentence meaning. Because ideal language philosophers think that formal semantics – by creating models for languages and by applying the method of idealization – has a relevant say about the meaning of sentences in natural languages, they are more than happy to apply the methods of formal sciences.

Michael Dummett claims that there is a divide between semantics and logic. The core concept of semantics is the concept of truth, and the problem of meaning is understood as the correct or intended interpretation. The main concept of logic on the other hand is the concept of validity, and truth is understood as truth under a certain interpretation, and thus it is taken for granted.⁶

In what follows I will try and present those parts of formal logic and semantics that we can use in the analysis of sentence meaning. I hope that I will be able to show that there is a link between formal logic and formal semantics. This link exists because the working methods of formal semantics presuppose the use of the methods used in formal logic (in this sense I have already succeeded in showing the connection between these two areas of science), and also because the link is established by the operations of logical interpretation and that of logical valuation. The operations of logical interpretation and logical valuation are the operations that lead us from all possible interpretations (studied by logic) to the correct or intended interpretation (presupposed by semantics).

⁵ Michael Dummett, *The Logical Basis of Metaphysics*, Harvard University Press, 1994, p. 21.; François Recanati, *Pragmatics and Semantics*, in Laurence R. Horn–Gregory Ward (eds.), *The Handbook of Pragmatics*, Blackwell Publishing, 2006, p. 442.

⁶ Michael Dummett, *The Logical Basis of Metaphysics*, Harvard University Press, 1994, p. 20.

The Example of Logic⁷

The basic categories of the grammar of logic are sentences and names. By sentences we always mean declarative sentences, and by names we always mean individual names. The characteristic feature of the individual names is that they denote entities, be they persons or objects, the declarative sentence says something about; and the characteristic feature of the sentences is that they have a truth value, that is they are either true or false. Sentences have truth values even in the cases when in the moment of speech we don't know their truth value. And here we also have to introduce the notion of statement. Logical discourse separates the notion of statement from the notion of sentence. A sentence can be defined as a string of characters with a full stop at the end. Unlike sentences, statements are seen as the bearers of explicit information. If a statement doesn't contain explicit information it is only considered a sentence, not a statement; in contrast: if it contains explicit information a sentence is considered a statement.

Let us consider the following two sentences:

(1) I saw him there yesterday.

(2) I, Alpár Gergely, saw Péter Nagy in front of the UBB main building yesterday, 29 February 2016.

In the first case the lack of context prevents us from understanding the sentence. The circumstances that the sentence was uttered in are not clear. We can ask the following questions: who uttered it?, when?, who did the speaker see?, and where?. So in the case of (1) we have a sentence that is not considered a statement. In contrast, in the case of (2) everything is made explicit. (2) is a statement if we suppose that there is only one person whose name is Alpár Gergely, another person (and only one) whose name is Péter Nagy, and a (only one) main building of UBB.

The notion of a statement differs from that of the notion of a sentence based on the fact that a statement is not dependent of a particular language. We can easily formulate our sentences in different languages and still make the same statement, as we did in the following two examples:

⁷ In what follows I made use of the examples and explanations presented in the following books: Madarász Tiborné–Pólos László–Ruzsa Imre, *A logika elemei*, Osiris Publishing House, 1999.; Ruzsa Imre, *Logikai szintaxis és szemantika, Vol. I.*, Akadémiai Publishing House, 1988.; Ruzsa Imre, *Bevezetés a modern logikába*, Osiris Publishing House, 2001.

(3) The die is cast.

(4) Alea iacta est.

After he crossed the Rubicon river Julius Caesar allegedly uttered (3). But most probably he uttered (4), for we suppose he didn't speak English.

And finally we can express the same statement in the same language using two different sentences, as in:

(5) Ann is Bella's daughter.

(6) Bella is Ann's mother.

Names denote individual entities. There is a double requirement when it comes to names. The first requirement is that a name has to name an entity, the second requirement is that a name has to name one and only one entity.

In (6) we have said that Bella is Ann's mother. It seems that the use of the name 'Bella' meets both requirements that we have listed above. Let us suppose that Bella is a real person, and we know that every person has only one mother. In the case of (5) and (6) we are dealing with an interesting situation. According to the grammar of logic both 'Ann' and 'Bella's daughter', and both 'Bella' and 'Ann's mother' are names. This is because according to the grammar of logic not only names (in the grammatical sense) are considered names, but also descriptions and pronouns. So in the following sentence the pronoun is also considered a name, if it refers to Bella:

(7) She is Ann's mother.

But if we suppose that Bella has at least one more daughter, other than Ann, whose name is Cecilia, then the description 'Bella's daughter' is not considered a name according to the grammar of logic. The expression is not considered a name (in the logical sense), because by hearing the description, we can't decide whether we are supposed to think of Ann or Cecilia. In case of a formal analysis we could use the method of indexing the name 'Bella's daughter' depending on how many daughters Bella has, and as a result we would get 'Bella's daughter₁', 'Bella's daughter₂', 'Bella's daughter₃', etc.

We can ask ourselves what happens in the case a certain name doesn't meet the requirements a name should meet, and it either refers to more than one entity, or it doesn't have a reference at all, as is the case in the following examples:

(8) The even number less than 10 is divisible by 2.

(9) The largest natural number is an odd number.

(10) The present king of France is bald.

Formal logic and formal semantics have a very simple and categorical answer to this problem. According to them such a problem cannot occur.

Let us now consider another example:

(11) Ann is learning.

Based on the things we know thus far, we can assert the following things about the example: (11) is a sentence; in the sentence the name 'Ann' refers to Ann; the sentence contains explicit information, so it is a statement; and the statement is either true or false. We know a lot about (11), but we still didn't say anything about the expression 'is learning'. The reason for this is because we can't label the expression as a name or a sentence. The grammar of logic defines the expressions that are neither names, nor sentences – but are a building block of these two latter expressions – functors. There are different types of functors based on the category of expression that these functors are a part of: so there are name-functors, predicates, and sentence-functors. By definition name-functors are a type of functor that create names from names; predicates are functors that create sentences from names; and sentence-functors are functors that create sentences from sentences. Functors are expressions that contain a blank place, and if we fill out these blank places with the appropriate expressions of the logical grammar, that is with names or sentences, as a result we get certain other expressions of the logical grammar: names or sentences, of course. Thus if we take out the name 'Ann' from (11) we will get an expression that is a predicate:

(12) ... is learning

But the following expressions are also functors:

(13) mother of ... / ...'s mother

(14) ... is reading

(15) ... is taller than ...

(16) It is false that ... / It is not the case that ...

(17) ... and/or ...

(18) If ..., then ...

(19) If, and only if ..., then ...

The dots represent the places that can be filled out with the appropriate expressions. These are called places of arguments; the expressions that are put in these places of arguments are called arguments; and based on the number of arguments a functor requires we have unary (one-place), binary (two-place), n-ary (n-place) functors. Thus (12) is a one-place functor, as is (13); (12) is a predicate, (13) is a name-functor; (15) a two-place predicate; (16) a one-place sentence-functor; (17), (18), and (19) are two-place sentence-functors.

In case of the sentences the main question is whether they are true or false. But in order to be able to decide their truth value we have to go beyond the formal framework, for sentences are considered to be true or false based on their correspondence with the facts. Logic presupposes the acceptance of the correspondence theory of truth, and thus it links the language with the world. To express the link between language and the world we say that linguistic expressions have semantic value.

In order to determine the truth value of a sentence (although we have said that logic doesn't decide that, but presupposes it) we have to make the expressions that build up the sentence explicit. So in the case of (1) we have to determine who the speaker is, who did she see, when, and where. If we consider (1) and (2), we say that in the case of (2) we are dealing with the interpretation of (1). The notion of valuation is closely connected to the notion of interpretation. Defining the meaning of a vague expression by making it explicit is called valuation. In the case of (1) by assigning the value Alpár Gergely to the expression 'I', the value 29 February 2016 to the expression 'yesterday', and the value the square in front of the main building of UBB to the expression 'there', we give the valuation of the

expressions, and by doing so we also give the interpretation of the sentence, thus transforming it into a statement. So from now on whenever we use the notion of sentence, by that we mean statement.

In formal sciences (logic and formal semantics) the notions of valuation and interpretation play a key role. Seeing how these two operations work, ordinary language philosophers might say to the ideal language philosophers, that it is quite easy for them to analyze language. All they do is to create a complex system which deals with examples that lack any context, and then claim that their system works brilliantly. Ordinary language philosophers, in contrast, have to come up with solutions while in the process of analyzing language, and they are constantly reminded that the ordinary use of language is without regard to any system analyzing the language.

In the case of the analysis of everyday sentences the process of valuation and interpretation is the most difficult to sort out.

According to the grammar of logic the semantic value of a sentence is its truth values, in the case of a name the semantic value is its denotation. So, whenever we inquire for the semantic value of a sentence, we want to know whether that particular sentence is true or false; and respectively, when we want to define the semantic value of a name, we are curious about the entity in the real world that the name denotes. Although we have said that according to the grammar of logic every sentence must have a truth value, and every name must have a reference (an entity that exists in the real world), there are cases when the semantic values of these expressions are absent. In these cases we speak of a value gap. The best example for a value gap is (10). In a certain sense (10) doesn't have a truth value, because the expression 'the present king of France' doesn't have a reference, it doesn't denote anything. A similar situation occurs whenever a sentence contains an expression that doesn't denote an existing entity.

All we have to do now is to define the semantic value of a functor. The semantic value of a functor is a function, that is a rule that based on the arguments of a functor gives us the value of the expression according to the grammar of logic: the reference in case of a name-functor, and the truth value in case of a predicate or a sentence-functor. In the case of (13) if we fill out the blank space with the name 'Ann', we will get the expression 'Ann's mother' as a result, and if in the real world Bella is Ann's mother, then we successfully refer to Bella with the expression; and similarly, in the case of (12): if we fill out the blank space of the one-place predicate with the name 'Ann', we will get the sentence 'Ann is learning' as a result, and if in the real world Ann is indeed learning, (12) will be true, otherwise false, and so on, and so forth.

We have arrived at a crucial point in this article: to the essence of propositional calculus, the truth functions. Truth functions are expressions that contain a blank space, that if filled out with sentences, give us sentences as a result. The semantic values of these expressions calculate the truth value of more complex sentences from the truth value of simple sentences, those that are the building blocks of the more complex ones.

Let us now consider the classic connectives (sentence-functors) of the propositional calculus: negation, conjunction, disjunction, conditional, and biconditional. If we think of the truth table of the aforementioned connectives, we can remark the following: by looking at the truth table of the connectives we are able to formulate the rules according to which these truth functions work; logic being unable to decide about the truth value of a certain sentence, assigns truth values to the propositional variables in such a way that it exhausts every possible situation; after which the rule of the connective calculates the truth value of the compound sentence from the truth value of the sentences that the compound sentence is composed of. The truth value of the output of the negation will be true, if and only if the input is false, false if the input is true. As a result, the truth function of the conjunction will give us the truth value true, if and only if the truth value of both input sentences is true, false otherwise. In contrary, the truth function of the disjunction will be false, if and only if both input sentences are false, true otherwise. The truth function of the conditional will be false, if and only if the antecedent of the conditional is true, and the consequent false, true otherwise. And finally, the truth function of the biconditional will give us the truth value true, if and only if the truth values of the two input sentences are the same, false otherwise.

I only have one more task at the end of this article: to show that ideal language philosophers make use of a trick when analyzing language.

This trick is the self-evident use of the operations of valuation and interpretation mentioned at the beginning of the article. We have defined interpretation as the operation that makes the ambiguous expressions of sentences explicit. This procedure of making expressions explicit supposes the valuation of these expressions. It should be obvious, that during the analysis of language the ideal language philosophers use expressions such as 'let us suppose that ...', 'given the following ...', 'let symbol x mean thus-and-thus', etc. These formulations suggest that the ideal language philosophers analyze language within the framework of a well-elaborated, and well-functioning system, in which every expression is clearly defined. And this is the case indeed. We can think here either of the system of the propositional calculus or the system of the predicate calculus. Every possible interpretation is outlined in these systems (e.g.: the rows in a truth table for one

of the truth functions in propositional calculus). This is what logic deals with. And the main concept of semantics is the correct and intended interpretation. The link between these two areas is established by the concept of interpretation, which is a result of the operation of valuation. The fact that from every possible interpretation we point out just one interpretation, which we then name the correct or intended interpretation, means that we make a step that leads from formal logic to formal semantics.

If it is true that the formal analysis of language is based on a clearly defined system, we are entitled to think that all the problems that the ordinary language philosophers face during their study of language can easily be solved. As far as the operations of valuation and interpretation are well-regulated, they by themselves solve these problems by presenting us the context of the utterances. By assigning values to variables and expressions, we in fact make the context of the sentences clear. A problem occurs though: with such an approach it is feared that the issues and questions concerning language never arise in their full complexity.

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