LOGICAL-SEMANTIC ANALYSIS AND GENDER PERSPECTIVE OF LANGUAGE
(Contribution to Sociology of Gender)

1. Compositionality of Meaning (semantic) and Syntax

The aim of this paper is to explain what we mean by the notion of „logical and semantic“ and what it includes? The four main points of this analysis are the following ones: first: the beginning of analysis through the notion of compositionality of meaning/semantic and syntax (and its variants), second: the difference between object and meta language and its correct use (with semantic closure), third: the difference between sense, meaning and reference and fourth: argument form and the principle of textbook or argument form. The logical-semantic analysis explained through these four main points has to serve as the fundament for deeper analysis especially within the context of gender perspectives, for example: sociolinguistic analysis (particularly feminist sociolinguistic analysis – the women discrimination can be observed in two ways: first, how the everyday use of language treat women, and second, how women are thought to speak about themselves and about the world), psycholinguistic analysis, anthropological linguistic, the discourse analysis, etc. To pay attention to this fundamental logical-semantic analysis of language is very important and has its sense in the fact that language is the communication device, the modus of expressing our identity, our understanding and reasoning of world, others and our selves, but the powerful device of power and control in general. After the short explanation of each point, it is pointed out which gender perspectives can be recognized in each context and why they are important.

At the very beginning it is necessary to explain what we mean by the notion of „logical and semantic“ analysis, and why we don’t use the notion „syntactic and semantic“ analysis, since the use of the word „semantic“ logically refers that beside semantic we have syntactic component of language as well. Term „syntactic and semantic analysis of language“ can lead us primarily toward the twofold-component language analysis, while intended analysis could not be accomplished at that level nor presented by those methods, principles and concepts found in that narrow (purely linguistic) context. The step forward to this specific analysis that involve logic, philosophy of language, and analytic philosophy as well, provide us with the deeper analysis of statements and sentences of natural language, and not just with surface grammatical analysis, or
Parsing, of course, should not be taken as unnecessary or idle analysis, but it is insufficient and/or inadequate as to the explanation of the connections existing between syntactic and semantic elements in the analysis of natural language sentences.

The analysis by means of the principle of compositionality is not just common way to do that analysis, but it is mandatory in order to illuminate those connections, which represents a deeper analysis of language. 130 years ago, in 1879., in his famous work *Begriffsschrift*, a well known German mathematician and logician/philosopher, Gottlob (Otto) Frege has formulated the principle of compositionality, and in its general form it states that the meaning of the composite or complex statement/s must be built up of the meanings of its constitutive elements (parts or simple/atomic sentences). Before Frege it was generally accepted that grammatical structures were also logical ones, and even all logical structures had to prove to be grammatical ones. The question that arises from such an ambiguity is the question how these structures are or should be established, and our attempt to resolve this leads us to answer that the structures which are relevant from logical point of view (from the point of view of deeper logical and semantic analysis) must have been created in the compositional way, which leads us to the principle of compositionality, of course.

So, what is compositionality and what is meant by it? In the contemporary literature of analytic philosophy we may find four formulations, each of which appears as the principle of compositionality, while different names for different versions are used to show small differences between them:

1. *The principle of compositionality* (in wide sense): the meaning of a complex expression is determined by the meanings of its constituents and by its structure.
2. *The function principle*: the meaning of a complex expression is a function\(^1\) of the meaning of its constituents and of its structure.
3. *The building principle*: the meaning of a complex expression is built up from the meaning of its constituents.
4. *The substitutivity principle*: if two expressions have the same meaning, then substitution of one for the other in a third expression does

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\(^1\) A function, to put it quite generally, is an attribution of a unique value to each entity of some specific kind, e.g. a valuation to each sentence of the language in question or natural/object language, to formulae and some formal logical language. The unique valuation ascribed by function is, for example, the attribution of the truth values to the sentence/statement. Each function has its specific domain and range. The entities of specific kind are called arguments of the function, and together they form its domain, and the entities which figure as the possible values of a function together form its range. For example, if function \(f\) is: *the date of birth of X* (the first element of function or 'X', that refers to class 'people'), then its domain is the class 'people', and its range (the second element of function or 'the date of birth', that refers to class 'dates') are dates. Beside their importance, the questions regarding the functions with more than one domain (binary functions,...), the relevance of the order of the arguments of the function, the relation between the domain of a function and its range, and the question of the properties of relations that any function may have (associative, commutative function, ...), for now, will not be regarded.
not change the meaning of the third expression (nor its truth value as well, having in mind Leibniz’s law of salve veritate).

The principle of compositionality of meaning has important consequences for the relationship between syntax and semantic. Usually in a logical system the definition of the semantic interpretation of expressions closely follows the lead of their syntactic construction. The reason for this is that the semantics must specify the interpretation of an infinite number of expressions, but in a finite manner. The obvious way to proceed, then, is to let the definition of the semantics parallel the finite, recursive (or inductive) definition of the syntax. This method ensures that for every syntactic rule which allows us to construct a certain type of expression out of one or more simpler ones, a semantic rule corresponds, which states how the interpretation of the newly formed expression is to be obtained from the interpretations of its component parts.

Of course, we have to make distinction between the compositionality of meaning of logical system/language from that of natural language. The actual formulation of a logical system may not always carry its compositionality, but every such system actually conforms to, or can be reformulated so as to conform to, the principle of compositionality. In fact, compositionality is so basic a starting point for the logical way of doing semantics that in logic it almost always goes unnoticed.

If we consider natural language, however, the compositionality of meaning requires more attention, and the reasons for that are the following ones. It is evident that compositionality provides a finite method for the semantic interpretation of an infinite number of expressions of a given language. Given that a model specifies the interpretation of the basic components, the semantic rules which correspond to the syntactic rules uniquely determine the interpretation of every complex expression. But, it should be noticed that in effect, compositionality puts heavy constraints on the syntax, the semantics, and their relations to each other. On the one hand, every syntactic rule should have semantic interpretations; and on the other hand, every aspect of the semantics which is not related to the interpretation of basic expressions should be linked to a syntactic operation. In a logical system, we obtain these requirements simply by setting things up in accordance with them, but a natural language is not something we construct, it comes as given.

Gender perspectives

What gender perspectives can be recognized within the context of the principle of compositionality? To provide an answer to this question would be to conduct an analysis of original texts (in politics, art, literature, science) written by woman, or about woman. It is more than obvious that in their speeches, public performances, or articles women use complex and composite expressions/sentences, and from that reason it is very important to be familiar with general principles of compositionality and relations existing between constitutive elements of those expressions.
Each version of the principle of compositionality shows in what mode/manner women utter their statements. There is a difference if we use the function principle of compositionality than any other, which refers to the notion of function and the notion of function to precise elements of such complex expression. In this case we have to deal with the domain and the range of our complex expression/s, which direct our analysis (logical and semantic analysis) toward the scope of domain and the scope of range, and in that way the understanding and the interpretation of our complex expression/s is rigor (or strict, or uniform) and there is no place eaten for misunderstanding or misinterpretation (which makes our communication possible). We are able to know, in rigor or strict way, the elements of domain and range of our expression/s, that is, to what we refer and in what way by our expression/s.

If we, on the other hand, use the substitutivity principle of compositionality, in that case it is important to notice that the accent is/has to be put on the notion of substitution of one for the other expression in a third complex expression. The substitution needs to provide the same meaning and the same truth value of our complex expression/s, which is one of the most important requirements in any context of the communication.

The main issue here is that the mode of our utterances imply a strict or rigor meaning, determine the main (domain or range) elements of our complex expression/s whose meanings have to fit to the general meaning of that expression/s, and it has no room for the question as to whether women use more emotive and other value statements (which primarily have an emotive force in the sense of manipulation with the audience, and in that case need not be true, or with an uniform and unambiguous meaning) rather than cognitive ones (which provide all necessary and relevant information and unambiguous meaning of our utterances/statements).

2. Object Language and Metalanguage: Semantic Closure

There is a one more technical condition that language must fulfill in order for it to be possible to define its semantics along the lines of a logical system. It concerns the relationship between the language we want to give a semantics for, which is called the object language, and the language we formulate the semantics in, which is called the metalanguage. These two languages may actually be different, but it is possible for object language to be part of the metalanguage. Of course, both terms ‘object language’ and ‘metalanguage’ refer to different functions of language (which may be performed by different languages but also by one and the same language).

The interesting question here is that of whether it is possible for object language and metalanguage to be identical, and at first sight, nothing seems to speak against the supposition that this can be the case, but closer insight will show that this leads to some unexpected problems.

In describing the semantics of an object language it is necessary to state in the metalanguage the truth condition of sentences in the object language.
Working in the well known A. Tarski style, this means that in the meta-language, names are available for object language sentences, meaning that it is possible to define in the metalanguage a truth predicate. A truth predicate is a predicate of the metalanguage which holds of an object language sentences if and only if that sentence is true. But, when object language and metalanguage are identical, then the truth predicate would ipso facto be part of the object language as well (as would the names of object language sentences), and this would give rise to semantic paradoxes. In that case, it would contain its own truth predicate is true and would contain names for all its sentences – this would mean that we could formulate sentences such as:

(1) Sentence (1) is not true. This sentence is just one of the versions of the liar paradox, which arises when we try to assess the truth of a sentence or proposition that asserts its own falsity.

This sentence yields a paradox, for (1) to be true, (1) should not be true, for this is what (1) asserts. But if (1) is not true, then the assertion expressed by (1) is true, and so (1) is true. – We may conclude that we cannot formulate a semantic theory for an object language in a metalanguage which is identical to that object language without getting into trouble. But the problem is more serious than that, because in the situation in which object language and metalanguage are different, the same problem may arise: if we describe the meaning of (1) in some other language, say Serbian, the paradox would not disappear: it would just get a different wording. So, the real trouble arises with any object language which allows self-reference (by containing names for its own sentences and by containing its own truth predicate, of course). Why is it important? Because, such a language is called semantically closed, and it follows that for any semantically closed language it will not be possible to give a consistent semantic theory. One possible solution is to formulate the semantics not for the entire language, but only for those fragments of it which are not semantically closed.

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What gender perspectives can be recognized within the context of distinction between object language and metalanguage, and semantically closed language? The fact is that in our everyday and context depended (political, scientific, professional, ...) speech we use both object and metalanguage without knowing it. There is a big difference if we use object language to speak about something or to make the utterances with respect to our use of metalanguage. Object language is our natural language known to all of us, and it provides a necessary understanding and communication, and it is easy to verify natural/object language sentences. The use of metalanguage, on the other hand, leads us to use specific, professional terminology not so common or widely used, which may require some additional explanations. Why than use it? The metalanguage statements or sentences have a status of logical statements, which means that they are sound or valid (if we deal with arguments or composite expressions), and they are true. They don't require direct verification based on sense data or...
our experience, they have valid logical form, they are true, they need no proof. When to use these kinds of statements/sentences, depends upon what we utter or conclude, and which mode of valid argument we are going to use. The use of metalanguage will provide us with sound, valid and true statements and could serve as conclusion/s that could not be refuted nor denied. It is common opinion that woman usually use a simpler language, that is they are more inclined to use natural/object language, natural language sentences which have correct grammatical form but do not provide the requirement for soundness, validity nor truth value. These kind of sentences are easily verifiable, easily understandable and in that sense easily used.

The notion of ‘semantic closure’ reminds us of the possibility of making the logical (syntactic, semantic and mathematical) paradoxes if we do not use both the object and the metalanguage in a proper way. It is important to use both languages, since in that way we will provide an adequate analysis of object language sentences in a metalanguage, which is the language where the analysis of object language sentences is possible and should be taken.

3. Sense, Reference and Meaning

How to define a meaning? To provide an answer to this crucial question we will represent some the most important theories of meaning:

1. there are theories which say that the meaning of a symbol (word, sentence) reside in the use which is made of that symbol, and such theory is so called ’meaning is use’ theory (for example, the one defined by later L. Wittgenstein);
2. there are theories which define the meaning in terms of the disposition of language users to display certain kinds of behavior, and as examples we have the behavioristic theories of meaning of Bloomfield, Morris and Skinner;
3. there are theories which accept the correspondence theory as a partial account of meaning, in the sense that correspondence to entities represents just one aspect of the total meaning of symbols, and H. P. Grice’s theory of implicatures is an example of such a theory.

It has to be noticed that these correspondence theories of meaning differ on two main points.

   a) The nature of the relation between symbols and entities.

The traditional debate on this relation centers on whether this relation is a natural one or purely a matter of convention, which is known as naturalism-conventionalism debate; the debate between naturalism and conventionalism is later developed into a controversy between anomalists and analogists as to whether language is regular or not: irregularity was supposed to yield an argument in favor of naturalism, and on the other hand, if language is purely a matter of convention, then there would be no need for it to have any irregularities; beside the conclusion that the relation of meaning obtaining between a word and a thing is not natural but conventional, there are of course limits to
conventionality, since one is not free to change the meanings of words at will, and such changes have to be in the interest of convenience, familiarity, and alike.

b) The *nature of the entities themselves* and within this context different variants have evolved with divergent ideas on the nature of the entities, and here we have to make important distinction between three of them. The first can be referred to as *conceptualism*, and according to this variant of the correspondence theory of meaning, meaning is a relation between symbols and the contents of consciousness. Concepts (expressed by means of predicates) and propositions (expressed by means of sentences) are mental entities, and with language functioning as a system of observable symbols which mediates between individuals, make a communication possible. Conceptual conceptions of meaning may still be found in modern linguistic, since linguistic communication consists in the production of some external, publicly observable, acoustic phenomenon whose phonetic and syntactic structure encodes a speaker's inner, private thoughts or ideas. Second variant may be referred as *Platonism*, according to which concepts and propositions are not mental entities but real things, only they do not belong to the world of observable phenomena but to the world of ideas. As we know, linguistic symbols refer to things in the observable world but in an indirect manner, via the reflections of the world of ideas in the observable world. And third variant is what we may call *realism*, according to which the entities to which linguistic symbols bear the relation of meaning all belong to the concrete, observable reality around us (a typical example of this position is the 'picture theory of meaning' which was presented by Wittgenstein in his *Tractatus Logico-Philosophicus*). If we extract the main idea that the meaning relation is one of reference, we arrive at a *referential theory of meaning*, which is compatible with any of above three views on the nature of the entities. On the contrary to this, the main idea of the *correspondence theory of meaning* is that the meaning is a relation between the symbols of a language and certain entities which are independent of that language.

The fundamental distinction between *sense* and *reference*, and that there is a specific *relation between reference and meaning*, is drawn in Frege's theory of meaning. According to Frege, there is more to the full meaning of a sentence than just its sense: there is also *force* (*Kraft*) and *tone* (*Färbung*). The force of a sentence is known as „illocutionary force“, and it is that part of its meaning which determines the function it is to have. The force indicates whether we are dealing with an assertion, a question, an imperative, suggestion, request, command, a favor, etc. The tone of an expression, on the other hand, is the idea/s which a language user associates with an expression, and Frege emphasizes that these mental associations are subjective, and that they can therefore not play a part in communication. Why is that? In communication we can only convey objective things, things which are common to everyone we can communicate with and it is the objective part of meaning that is called *sense*. Sense and reference are to be distinguished from each other, but that does not
mean that they have nothing to do with each other. Reference, we may say, is what explains the function of sense: expressions have a sense only by virtue of the fact that they also have a reference, and in this way their sense is nothing more than the way their reference is presented. Thus sense determines reference, and two expressions with the same sense have ipso facto the same reference, but not vice versa. The reference of a term, (a logical term could be: proper name, common name, and definite description), in general, is an entity and its sense is the mode of presentation of that entity, or it is the way the reference is presented.

Further important thing is to make the following distinction between sense and reference regarding the specific kind of logical term: proper name, common name and definite description. Each kind of logical term has specific semantic behavior: a proper name is known as rigid designation, which does not hold neater for a common name nor for a definite description.

**Gender perspectives**

The numerous gender perspectives can be recognized within this context. If we take into consideration the above parameters, it would be interesting to analyze what kind of expressions is used by women? Are they more inclined to use the assertions, questions or disguised questions, imperative forms, suggestions, requests, command forms, hedges, discount forms, or favors? The form or the mode of expression shows whether we deal with expressions that may be qualified as sound, proved, true, and valid. Are the women capable of using those kinds of expressions that will provide the soundness, truth and validity of their attitudes in the same way, and in the same extent, as men do? Or, given the picture that they are more emotive then men, they are more directed toward suggestions, hedges, discounts, and favors? Is their mode of expression, or their language, is a less strong, and does their language mirror their mental state? What is the tone of their expression/s? Are they more subjective then men? Is it common to the women to establish the sense and the meaning of their statements by means of reference, and what does it mean? Does the reference provide a necessary evidence or proof for their statements? Whether women's language and speech is different from that used by men? Does, and in what way, belonging to the different sexes effect the verbal performance and expression? Is there any specific relation between the language tool and the gender of a language user? How women speak, and in which way it is spoken about women? The answers to these questions could be found in different disciplines, like: sociolinguistic, psycholinguistic, anthropological linguistic, discourse analysis, rethoric, aesthetic, sociology of culture, etc. The logical-semantic analysis of language has to be taken as a fundament or a base for such further analyses, since all above analyses intending to consider the gender differences with respect to certain relevant variables in a given context.
4. Argument and the Principles of Putting Arguments into Textbook Form

We think, reason, argue and make inferences all the time and in every situation. It is inherent to us to behave in that way, and that is the reason why we have to deal with arguments and the principles of putting them into textbook, or proper or adequate, form. Since the argument is the set of statements one of which is affirmed on the basis of others, it is important to determine do we make sound and valid arguments. Arguments are used frequently in our verbal and written interactions with other, and we may use arguments either to persuade others (for example, to believe our political or ethical views) or to discover truth (persuasion and truth seeking are often compatible goals).

In this context it is important to make distinction between valid and invalid, sound and unsound argument. Valid argument is one such that it is impossible for its conclusion to be false while its premises are true, and this feature is its essential characteristic. But, we have to point a few things in order to prevent some common misunderstandings:

a. an argument can have one or more false premises and still be valid,
b. even if an argument has true premises and a true conclusion, it isn't necessarily valid, for the premises may not support the conclusion in the right way,
c. validity does preserve the truth, meaning that if we start with truth and reason in a valid fashion, we will always wind up with truth,
d. validity does not preserve falsehood, in fact, false premises plus valid reasoning may lead to either truth or falsity.

These distinctions lead us directly to the notion of invalid argument: an argument in which it is possible for its conclusion to be false while its premises are true.

It is obvious that true premises and valid reason are not the only requirements that we need here. It is not enough to have true premises to claim our argument as valid, nor is enough to reason in valid way to claim that our theses/premises are true. We need our argument to be sound, meaning that a sound argument must satisfy both having all premises true and being valid. The example of this kind of argument is deductively sound argument which has two essential features: it is valid and all its premises are true (both premises and conclusion). Deductively unsound argument falls into one of the following three categories:

- it is valid but has at least one false premise
- it is invalid but all its premises are true
- it is invalid and has at least one false premise.

But, even if an argument is not valid, its premises may still provide significant support for its conclusion. A strong argument is one in which the premises provide partial support for its conclusion, an argument in which it is unlikely (though possible) that its conclusion is false while its premises are true, or in other words: it is probable (but not necessary) that if its premises are true,
then its conclusion is true. A weak argument, on the other hand, has essential feature that it is not likely that if its premises are true that its conclusion is true as well. This distinction leads us to the inductive argument and to the concept of strength, or the degree of strength of the argument, according to which we can differ inductively sound (it has two essential features: it is strong and all its premises are true) and inductively unsound argument (it is either weak or strong, but with at least one false premise).

Speaking about deductive and inductive, sound and unsound argument is to speak about the argument forms, valid and invalid ones. Knowing all these forms, and being able to differ valid from invalid ones is one of the key requirement in making distinction between arguments and nonarguments or unsupported assertions. Why this is important? It is because some types of unsupported assertions may be confused with arguments, for example: reports (a set of statements intended to provide information about something, and no inferences are drawn), illustrations (are statements with an explanatory or clarifying example), explanations (are statements used not to provide evidence for another statement, but to provide explanation or reasons for the occurrence of some phenomenon) and conditionals (are statements having hypothetical nature, but no argument form).

All these implications to the different argument forms, the questions of their validity and soundness, and the question of having true premises, explain the need of putting an argument in textbook form. What does it mean? Putting an argument into textbook form involves identifying an argument’s premises and conclusion, eliminating nonessential verbiage, and putting the steps of the argument in proper order. Being able to put arguments into textbook form is a powerful tool for evaluating arguments. We have five main principles for putting arguments into textbooks form:

1. identify the premises and the conclusion (using common premise indicators like: because, since, for, as, after all, the reason is that,..., and conclusion indicators like: so, therefore, hence, implies that, it follows that, thus, accordingly, consequently, we may infer that, which proves that,...),
2. eliminate excess verbiage (like: discounts, repetition, assurances, hedges),
3. be fair/correct and charitable/informative and clear in interpreting an argument,
4. employ uniform language,
5. do not confuse subconclusions (they are supported by premise/s but they also support at least one further statement) with final conclusions (they are the final steps in an argument, nothing follows further).

Gender perspectives

What gender perspectives can be recognized within this context? Soundness, validity, deductive or inductive kind of argument, valid forms of argu-
ment, the main principles of putting argument in textbook form, all these features have important role regarding the mode or the manner of our expressions/utterances. Any kind of expression, no matter how complex it may be, it can be analyzed according to above parameters. Such an analysis provides us with correct, true, meaningful and understandable statements. Are women capable of such a mode of argumentation and expression? If we take for granted that women are more emotive, does it affect their statement, the mode of their expression? Does it make their statements, utterances, inference,... more weak and fragile, with no sound or valid support and evidence? Do they often use deductive or inductive argument, do they stay in magic circle of deductive proof or they make a stepforward in some inductive freedom of predictions? Are their arguments strong, or they filled up with excess verbiage, is this a 'privilege' of women only? Is their language has clear and transparent meaning or it is ambiguous as consequence of their specific women's mental state/s?

Answer to these questions could represent an overall picture of how women speak, and what kind of relation there is between the verbal expression and female sex, and does it, and in which way, it mirror women's mental state. The modes of verbal expression analyzed according to all parameters of logical-semantic analysis tell us what kind of statements are often used by women and why. Taking all these parameters into consideration we can make further important distinction regarding the mode of expression:

1. the metaphysical context, and here we deal with the nature of the mode of our statements or expressions, and here we have necessary and possible or contingent statements,

2. the logical-semantic context, and here we deal with the nature of truth of our statements, and here we have analytic and synthetic statements,

3. the epistemological context, and here we deal with the way in which we get to know the truth of our statement, and here we have a priori and aposteriori statements.

Regarding these three contexts it is possible to determine a certain type of language users, and whether is he/she inclined to ontological commitments of his/her mode of speech, to formal or material mode of speech, and what consequence it has regarding the meaning of his/her statements.

The above presented logical-semantic analysis of language, together with gender perspectives that could be recognized in each parameter of such an analysis, could be taken as fundamental tool for analyzing woman's language, and try to compare it with man's language in order to find the differences, and to better understand the gender-language relation.
References

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