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Husserl and the Development of Semantics

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Abstract. This paper investigates the role of Edmund Husserl in the development of formal or model-theoretic semantics through glasses of the distinction of language as calculus vs. language as universal medium, introduced by Jaakko Hintikka and Martin Kusch. In particular, the paper raises the question of possible Husserl's influence on the conception of language accepted in Polish philosophy, in particular by Lesniewski and Tarski.

Résumé. Cet article examine le rôle d'Edmund Husserl dans le developpement de la semantique formelle ou de la sémantique fondée sur la théorie des modèles à travers la distinction, introduite par Jaakko Hintikka et Martin Kusch, du langage comme calcul et du langage comme moyen d'expression universel. L'article soulève en particulier la question d'une influence possible de Husserl sur la conception du langage partagée par la philosophie polonaise, notamment par Lesniewski et Tarski.

Semantics can be understood more or less restrictively. If it is taken *sensu largo*, it covers syntax, semantics *sensu stricto* and pragmatics. In this paper, I am interested in Husserl's role in the development of semantics sensu stricto. However, the term 'semantic *sensu stricto*' also requires some comments. Quine's well known remark points out that we should sharply distinguish between the theory of meaning and the theory of reference [Quine 1953, 130]. Traditionally, both are counted as subdomains of semantics, even sensu stricto. My next qualification restricts genuine semantics to the theory of reference. Finally, semantics can be projected more or less formally, and my concern here is formal semantics. According to the above explanations, I intend to state some remarks on Husserl's influence on the development of formal semantics, that is model theory in the understanding of mathematical logic.

Before going to my main issue, let me note that two Husserl's ideas influenced the development of logical syntax. I think here of his notion of semantic category as a set of expressions which mutual substitutivity in sentences does not lead to a nonsense, and his division of nonsense (*Unsinn*, for example, 'Peter is or') and countersense (*Widersinn*, for example, 'Rational numbers are red'). Lesniewski, Ajdukiewicz and Tarski, who developed the theory of semantic (or syntactic) categories explicitly refer to Husserl as the inventor of the related idea. Bar-Hillel sees the countersense/nonsense distinction as an anticipation of Carnap's distinction of formation and transformation rules [Bar-Hillel 1970, 130]. Bar-Hillel also guesses that Husserl could influence Carnap as far as the matter concerns the idea of formal syntax. However, we have no textual evidence for this connection.

Certainly, Husserl also anticipated the principal construction of formal semantics, namely that of a model of a given language. He uses the concept of manifold as a domain of elements defined by a given system of axioms. However, it seems that this idea did not influence further investigations in the field of semantics.

Formal semantics arose in Poland in the twenties and thirties of our century in hands of Stanislaw Lesniewski and Alfred Tarski. Quite recently, there appeared an attempt to show how Husserl could influence the Polish school. This is done by Martin Kusch in his book on theories of language of Husserl, Heidegger, and Gadamer [Kusch 1989].

In his study, Kusch follows Hintikka's distinction of language as calculus and language as universal medium. A brief comparison of both conceptions is this [Kusch 1989, 6-7]:

	The language as universal medium conception (LUM)	The language as calculus conception (LC)
(1)	Semantics is inaccessible	Semantics is accessible
(2)	Different systems of semantic relations are inconceivable	Different systems of semantic relations are conceivable
(3)	Model theory is rejected	Model theory is accepted
(4)	Semantic Kantianism is adopted	Semantic Kantianism is rejected
(5)	Metalanguage is illegitimate	Metalanguage is legitimate
(6)	Truth as correspondence is not intelligible	Truth as correspondence is intelligible
(7)	Formalism is linked with the thesis that semantics is not accessible	Formalism is linked with the thesis that semantics is accessible

Perhaps one important thing should be noted in this context. For Hintikka and Kusch, the label 'language as calculus' does not mean that language must be considered as an uninterpreted system of expressions. Language, on this conception, is rather a system which is re-interpretable. In general, under the LUM-conception, semantics understood as the whole of semantic relations holding for a given language is ineffable. The LC-conception gives the precisely contrary picture of languages and their semantics. The fate of the correspondence theory of truth in both conceptions is perhaps the most spectacular mark of how they differ.

The LUM/LC distinction leads Hintikka and Kusch to an ordering of the contemporary philosophy of language: Frege, Russell and Wittgenstein are prominent proponents of the LUM-conception, but Husserl, Godel and Tarski can be ranked as leading exponents of the LC-conception; Hintikka remarks that Tarski accepted the LC-conception for formalized languages, and the LUM-conception for natural language [Hintikka 1988, 97].

Kusch writes:

> Concerning investigations three and four [in Husserl's Logical Investigations - J. W.] the first noteworthy fact relates to the historical role these studies have played in the development of semantical approaches in formal logic. As is well known, the main gate through which these ideas entered modern logic was the work of Tarski and other Polish logicians [...] it is remarkable that it was Husserl's *Logical Investigations* and especially the third and fourth investigation that exerted a strong influence in Warsaw between the two wars. This influence has been described as comparable to the influence of Wittgenstein's Tractaus in Vienna in the twenties and thirties [...] It can be considered as indirect evidence for attributing to Husserl the calculus conception that a precise formal semantical theory was developed where his influence was the strongest. And this influence did not only remain on an abstract unspecific level [...] Ajdukiewicz's and Lesniewski's seminal work on categorial grammar had as its starting point Husserl's fourth investigation concerning the ideal logical grammar. [Kusch 1989, 60]

Kusch is right that Husserl exerted an influence on Poles. However, although this influence was quite strong, I think that Kusch exaggerates when he compares Husserl's role in Poland with that of Wittgenstein in Vienna. In fact, one should be careful with Husserl's influence on Polish logicians. Lesniewski writes on his early research:

> Stepped in the influence of John Stuart Mill in which I mainly grew up, and 'conditioned' by the problems of 'universal-grammar' and of logico-semantics in the style of Edmund Husserl and by the exponents of so called Austriam School, I infectually attacked the foundations of 'logistic' from this point of view. [Lesniewski 1992, 181]

This is obviously negative evaluation of Husserl's idea of pure logical grammar. This suggests that, except the particular case of semantic categories, Husserl's formal grammatical ideas had no special importance for Polish logicians.

Neverthless, I think that it is something to say about the possible (I stress the word 'possible') Husserl's influence on Lesniewski and Tarski. In order to attack this question, let me list

two conditions under which formal semantics arose. First of all, its fathers had to find an efficient way of solving semantic antinomies. This task was achieved via the language/metalanguage distinction and the concept of semantic categories. Lesniewski's remarks illuminate this point:

> In 1922 I outlined a concept of semantical categories as a replacement for the hierarchy of types, which is quite unintuitive to me. Frankly, I would still today feel obliged to accept this concept even if there were no antinomies at all. From a formal point of view, my concept of semantical categories is closely related to the well-known theory of types [...] especially for their theoretical consequences. Intuitively, however, the concept is more easily related to the thread of tradition running through Aristotle's categories, the parts of speech of traditional grammar, and Husserl's meaning categories [...]. [Lesniewski 1992, 421-422]

This quotation shows that Husserl's influence on Lesniewski with respect to the concept of semantic category, although important, was linked with other historical paths. Thus, the devices against antinomies arose as a result of various historical connections: Aristotle's table of categories, traditional grammar, Husserl's concept of semantic category, Frege's practice of distinguishing of language-levels, and Russell's theory of types.

Applying proper mathematical methods into formal semantics was the second condition of the development of this field. This was done by Tarski who understood as the first that formal semantics requires set theory. After years Tarski summarized the point in the following way:

> As an essential contribution of the Polish school to the development of metamathematics one can regard the fact that from the very beginning it admitted into metamathematical research all fruitful methods, whether finitary or not. [Tarski 1986, 713]

Incidentally, Tarski's diagnosis explains why formal semantics did not arise in the Hilbert school, although the Hilbertians had in their hands all formal tools for semantics, including the concept of model, and even they stated one of the most important semantic problems: the problem of completeness for first-order logic. The Hilbertians did not develop semantics, because they were too restricted by the ideology of finitism.

Thus, semantics arose in Poland as a child of logic and set theory. However, there was probably still one ingredient, namely a philosophical climate in which semantics arose in Poland. And Husserl's influence can be located at this point. First of all, a success of semantics seems to require overcoming psychologism to the same

extent as it happened in the case of logic itself. In order to build semantics, language and its semantic relations to the world, have to be regarded as stable and apsychological. In this respect, Husserl's influence in Poland was of a fundamental importance, because it was Husserl, not Frege, who was perceived in Poland as someone mainly responsible for the ultimate victory of antipsychologism in logic and other fields involving language. Secondly, semantics requires considering language as inherently referring to something transcendent to it. There are several ways which can lead to this effect. Intentionality is one of them and perhaps it is the simplest one. Although connection goes back to Brentano, and to Twardowski in the case of Poland. The Husserlian antipsychological treatment of intentionality seems particularly suitable for semantics. I do not claim that Husserl's explanation of referential relations of language is proper. However, it is a historical fact that this explanation was known and very highly evaluated in Poland. This statement has its direct evidence by the popularity of the versions of the theory of meaning-intention given by Ajdukiewicz and Czezowski with an explicit reference to Husserl.

The third aspect of the story is perhaps the most important.

From the contemporary perspective, the problem of semantics is this. We have a formal (formalized, formalizable) language which is, to use a nice Hintikka's term, re-interpretable and its model (or a set of models). Thus, semantics is given by a pair <L, M>, where L is a language and M its model. However, the historical development of semantics was much more complicated. Fathers of semantics considered language as something inherently equipped with meaning. Lesniewski writes:

> Having no predilection for 'various mathematical games' that consist in writing out according to one or another conventional rule various more or less picturesque formulae which need not be meaningful, or even — as some of the 'mathematical gamers' might prefer — which should necessarily be meaningless, I would not have taken the trouble to systematize and to often check quite scrupulously the directives of my system, had I not imputed to its theses a certain specific and completely determined sense, in virtue of which its axioms, definitions, and final directives [...], have for me an irresistible intuitive validity. I see no contradiction therefore, in saying that I advocate a rather radical 'formalism' in the construction of my system even though I am an obdurate 'intuitionist' [...] By no means do theories under the influence of such formalization cease to consist of genuinely meaningful propositions which for me are intuitively valid. [Lesniewski 1992, 487]

It sounds very Husserlian. Although we have no textual proof that Lesniewski was influenced by Husserl at the point, his (Lesniewski's) intellectual history makes quite probable that he simply followed Husserl's conception of a linguistic expression as inherently meaningful and the unity of formal and material properties. This point of view was also shared by Tarski:

> [...] my personal attitude [...] agrees in principle with that which has found emphatic expression in the writings of S. Lesniewski and which I would call intuitionistic formalism. [Tarski 1983, 62]

And one more quotation from Tarski:

> It remains perhaps to add that we are not interested here in 'formal' languages and sciences in one special sense of the word 'formal', namely sciences to the signs and expressions of which no meaning is attached. For such sciences the problem here discussed [i.e. the problem of truth - J. W.] has no relevance, it is not even meaningful. We shall always ascribe quite concrete and, for us, intelligible to the signs which occur in the language we shall consider. [Tarski 1983, 166]

As a matter of fact neither Lesniewski nor Tarski explained which conception of meaning they accepted. We have no data to know whether both shared the same conception of meaning either. Although, as I already noted, the theory of meaning-intention was popular in Poland, I do not suggest that both fathers of formal semantics were influenced by Husserl in their thinking about the concept of meaning. Nevertheless, both developed semantics for languages with fixed intuitive meaning. And this seems a possible Husserl's influence on the development of semantics in Poland. Briefly, he essentially contributed to the philosophical climate in which language was regarded as a system of items directed to the world via meanings. This philosophical environment, together with the mentioned logical and set theoretical devices, generated formal semantics. This field arose in Poland, just because these three ingredients together occurred in Poland.

It is not my intention to discuss in a detailed way whether the contrast between two conceptions of meaning distinguished by Hintikka and Kusch is sharp. However, some remarks seem to be in order. I think that Hintikka is right when he expresses some reservations toward the term 'calculus' in this context. His remark that the matter concerns re-interpretable calculus does not save the situation. A closer inspection seems to suggest that language for Lesniewski and Tarski was also a medium between our thinking and the world. The point is perhaps in an interpretation of universality. For Tarski, universality inevitably leads to antinomies. Wittgenstein

considered language as a fairly complete picture of reality. Thus, for Wittgenstein, semantics must be rejected for its inconsistency. What Tarski effectively showed is that semantics is perfectly expressible provided that we accept definite limitations of the universal definability of semantic concepts. Nobody, even Gödel, was conscious before Tarski that this is the price for a successful doing of formal semantics. Thus, I think that the contrast proposed by Hintikka and Kusch should be replaced by the distinction of language as universal medium and langauge as stratified medium, because our language is always a medium. Husserl was not aware of the problem in which stratification is involved, but he contributed to a view on which language is a semantic medium.

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