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Towards an Ontology of Individuals: Comments on "Identity, Ontology and Frege's Problem" of William Greenberg

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Abstract

This paper draws parallels between Greenberg's paper "Identity, Ontology and Frege's Problem" published in this issue and papers of other authors, including the author of this paper, who grappled with problems concerning identity in ontology settings. The ideas of Greenberg are shown to relate with the areas of interest of computer scientists.

Keywords: identity, ontology, sense, reference, Meinongian ontology, substratum, thisness.

In his epoch-making article [1], Frege paved the way for the mathematical analysis of natural languages, but he also stated a problem, which for over 120 years has not been solved in a way that has enjoyed anywhere near unanimous acceptance on the part of semanticists, linguists, logicians, and ontologists who have grappled with it. Thus, there is an obvious difference between two forms of sentences used in mathematical discourse, "$a = a$" and "$a = b$" – the first is a truism which provides no new knowledge, and the second is highly informative, since all mathematical equations are presented in this form. Semantics of a language L is treated by logicians in terms of "interpretations" – functions from the set of expressions of the language L to the universe of discourse of L, and Frege showed that this kind of semantics – to the extent that it cannot account for the difference in meaning exhibited by such pairs of sentences – is inadequate. The aim of Frege was, thus, to lay the grounds for a semantics incorporating the means to distinguish

between the *sense* of a singular referring expression and the object that this expression signifies, its *reference*. This distinction accounts for the difference in meaning between sentences "$a = a$" and "$a = b$".

The first solution to Frege's problem was offered by Frege himself, who associated abstract entities, called "senses", to meaningful parts of a sentence in such a way that the thought expressed by the sentence was a function of the senses which composed it and their mode of combination. Following the tradition of formal logic, these abstract entities can be said to be "sense values" (similarly to "truth values"). A set-theoretic treatment of a different kind of "sense value" of a "name" – its "extensional sense" – was proposed in [2], where a "name" is either a "proper name" or a "common name", and an "extensional sense" of a name is treated as a name's extension. Frege's new semantics accounts for the difference in meaning between "$a = a$" and "$a = b$", where "a" and "b" stand for different "sense values". By contrast, the semantics offered in [2] does not account for this difference.

Another solution was proposed by Meinong [3] who associated an abstract entity called an "objective" with each meaningful phrase denoting an object, an objective being treated as a *complex* of some kind and the *object* belonging to it as a kind of a component. Obviously, two different proper names "a" and "b" have different "objectives", and so this semantics accounts for the difference between the sentences "$a = a$" and "$a = b$". While Meinong's semantics is adequate in this sense, his explanation of the other component of a complex was too "complex", giving rise to continuing polemics about the Meinongian ontology. Despite this, there is a value of Meinong's solution of the Frege's problem and this is that his approach is partially ontological.

To properly place Frege's account within the context of analytical philosophy, it is necessary to see what role the universe of discourse, a class distinguished from other classes by being the domain of interpretation of a language, plays in Frege's semantics. A universe of discourse of a theory is said by mathematicians to be a "class", but such a class has the special feature of being the range of an interpretation. Granted that a universe of discourse constitutes Frege's ontology, it is evident that Frege's account of the meaning of identity-statements has both a

linguistic and an ontological component. But senses, although part of Frege's ontology, are not autonomous: a sense only exists insofar as it is expressed by some linguistic expression.

Frege's solution did not meet Russell's expectations (see [4]) who, in particular, argued that a proper name cannot have a meaning if it does not denote an object. According to Russell, an empty name is therefore meaningless, as would be any sentence in which such a name occurred (by contrast, for Frege, every singular term has a sense, whether or not it has a denotation). Russell solves the problem of non-denoting names by paraphrasing sentences in which these occur in such a way that the expressions in question do not occur as constituents. Notice, that Frege solves the problem with empty names differently – by decreeing that sentences with non-referring names have no truth-value, although they still express thoughts, or propositions. It should be noticed that Russell proposed his solution in 1905, significantly before a mathematical approach to ontology was proposed by the "Polish school" initiated by Lesniewski and continued, in particular, by his student Tarski (who rarely used the word "ontology" in his papers – in mathematics; he is known to be more of a "semanticist" than an "ontologist", apart from being a great mathematician).

Greenberg's solution to Frege's problem employs a semantics which makes use of strictly defined "complexes", a complex consisting of two components: a *substratum* and a *thisness*. As with Frege, Greenberg's "singular terms" include both proper names and definite descriptions, but in Greenberg's semantics, a singular term is interpreted as standing for a complex consisting of a substratum and a thisness. Greenberg's solution to Frege's problem can thus be said to be *purely ontological*.

Greenberg's 'substratum' component of a singular term's reference can be compared to Frege's reference, and is comparable to an Aristotelian "substance". The term 'thisness' refers to a particular's identity with itself, a special individuating property. Here a parallel can be drawn both with natural languages, in which "this" is used to indicate the identity with a given object, and with the most pragmatical practice of "applied mathematics" – the computer science, where in object-oriented languages, the reserved word **this** is used to refer to

the current class (of objects), from which the other classes inherit their features. In terms of [2], thisness appears to be the extension of a proper name, which is a singleton. And obviously Greenberg's thisness manifests itself in any occurrence of a noun in a sentence. For example, in the sentence "Sam saw a cat, and Jane saw a cat, but they were not sure they saw the same cat", the two occurrences of the expression "a cat" refer to different objects. To say that the meaning of expression "a cat" is context-sensitive is incorrect, since the meaning of "a cat" is the same in both cases. What differs for the two occurences is their "thisness" – what for Sam is "this cat" is different from what for Jane is "this cat". This clearly sets apart Greenberg's thisness from the complement to an object in the Meinong "objective", which shows that Greenberg's semantics is totally different from the Meinong's one, but also from other semantics examined here.

Ontology, a discipline originating in Greek philosophy, has evolved through medieval philosophy, from Brentano – Meinong's teacher, into "mathematical ontology" through the Polish school, and has finally found its practical applications in computer science through the World-Wide Web as "OWL", the Web Ontology Language. Greenberg's singular terms can be treated as "individuals" of the OWL ontology, and this suggests that such individuals are to be interpreted as singletons, based on [2]. One of the semantical difficulties of OWL ontology is presented exactly by the individuals and their identity. Thus, Greenberg's work paves the way towards an ontology of individuals – a sub-ontology of the OWL.

References

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