▸ ROUSSANKA LOUKANOVA, *Computational intension, denotation and propositional intention in the languages of acyclic recursion.*

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In a sequence of papers, Moschovakis developed a class of languages of recursion, which opens a new type-theoretic approach to the semantic concepts of sense and denotation. In essence, Moschovakis defined the concept of sense by an abstract, mathematical notion of algorithm and its syntactic representation by recursion terms in canonical forms. In particular, the language and theory of acyclic recursion L^{λ}_{ar}, introduced in Moschovakis [2], are intended for modeling the concepts of meaning and synonymy, from computational perspective, by targeting adequateness of computational semantics of natural languages spoken by humans (and commonly denoted by NL). The type theory of L^{λ}_{ar} has a highly expressive language, an effective reduction calculus, and elegant mathematical properties for modeling recursive computations of denotations. Independently form the development of the languages of recursion, representation of semantic underspecification is a major effort of contemporary works on semantics of NL, see Bunt [1] for an overview of the field. In particular, for efficiency and adequateness, e.g., due to lack of resolving context information, it is preferable to represent scope ambiguities as underspecified. Typically, this is achieved by metatheoretic means. Distinctively, L^{λ}_{ar} has its own inherent facilities for modeling scope ambiguity and other semantic underspecification in NL, at the level of its own language and semantics, with respect to lexical and syntactic structure of NL expressions.

The first part of the paper introduces the syntax of L^{λ}_{ar} and its two semantic layers. The usefulness of L^{λ}_{ar} for computational semantics of NL is reviewed by rendering representative NL sentences into L^{λ}_{ar}-terms. The focus is on demonstrating the expressiveness of L^{λ}_{ar} for resolving major problems in semantics, in particular, such as: distinction of strict co-reference from anaphora–antecedent naming, and, semantic underspecification in representing quantifier scopes. The second part of the paper shows that Thomason's technique, revised by Muskens (2005), can be incorporated within an extended language of acyclic recursion. The propositions are introduced as primitives, with a corresponding, newly introduced, propositional type. A transformation operator reinforces Tarski's style of truth conditions into the object level of type theory, which gives a possibility for using L^{λ}_{ar} in applications with logic programming. Furthermore, the result is a formal notion of propositional *intention*, as a part of the denotational semantics of the extended language and a sub-layer of the notion of referential intension. The propositional intention of a propositional term distinguishes the denoted proposition P from its corresponding extension, i.e., from the set of states (possible worlds), where the proposition P is true. The result is a treatment of various modals and propositional attitudes in the extended language L^{λ}_{ar}.

[1] Harry Bunt, *Semantic Underspecification: Which Technique for What Purpose?*, ***Computing Meaning, vol. 3*** (Harry Bunt and Reinhard Muskens, editors), Studies in Linguistics and Philosophy 83, Springer, Dordrecht, 2007, pp. 55–85.

[2] Yiannis N. Moschovakis, *A logical calculus of meaning and synonymy*, ***Linguistics and Philosophy***, vol. 29, pp. 27–89.

[3] Reinhard Muskens, *Sense and the Computation of Reference*, ***Linguistics and Philosophy***, vol. 28, pp. 473–504.