

## New Semantics for the Extensional but Hyper-intensional Part $\mathcal{L}_\alpha$ of the Modal Sense Language $\mathcal{SL}_\alpha^\nu$

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**Abstract** In a previous paper ("On the interpreted sense calculus  $\mathcal{SC}_\alpha^\nu$ ") the author constructed an interpreted modal sense language  $\mathcal{SL}_\alpha^\nu$ , in which a certain logical calculus is valid, in order to deal with, e.g., iterated belief sentences whose sense orders are smaller than the (possibly transfinite) ordinal  $\alpha$ . It contains descriptions, modal operators, nonlogical operators, and wfe's having both types (of all finite levels) and (arbitrary) sense orders  $< \alpha$ .

In the semantics of  $\mathcal{SL}_\alpha^\nu$  properties are represented by sets of QS's (quasi-senses), and paradoxes are avoided by considering any belief relation  $B^\beta$  sensitive only up to the sense order  $\beta$  ( $0 < \beta < \alpha$ ).  $\mathcal{SL}_\alpha^\nu$  differs from the languages considered by Church, Parsons, and Quine in that, for example, the notions of *possible world* or *the sense* (QS) of . . . need not be primitive in  $\mathcal{SL}_\alpha^\nu$ .

The present work concentrates on the extensional (but hyper-intensional) part  $\mathcal{L}_\alpha$  of  $\mathcal{SL}_\alpha^\nu$  deprived of nonlogical operators. By two successive changes in  $\mathcal{L}_\alpha$ 's semantics (and ontology) the interpreted extensional sense languages  $\mathcal{L}_\alpha^1$  and  $\mathcal{L}_\alpha^\omega$  respectively arise. In these the hyper-intensionality axiom  $f = g \equiv (\forall x_1, \dots, x_n). f(x_1, \dots, x_n) = g(x_1, \dots, x_n) (\models r = q \equiv. r \equiv q)$  [the instantiation axiom  $(\forall x)F(x) \supset F(\Delta)$  ( $x$  free for  $\Delta$  in  $F(x)$ )] is valid for more and more [for more] general choices of the sense orders for the wfe's  $f$ ,  $g$ , and  $x_1$  to  $x_n$  [ $x$ ,  $\Delta$ , and  $F(\Delta)$ ]. In  $\mathcal{L}_\alpha^\omega$  these choices are the most general ones for which, according to the present point of view, it is convenient to render these axioms valid.

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