A Strategy for the Solution to the Gupta-Belnap Fixed-Point Problem

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The Fixed-Point Problem is one of the problems Anil Gupta and Nuel Belnap left open in their book *The Revision Theory of Truth* (MIT Press, 1993). In order to simplify the search for a solution, we define a propositional version of the problem, using the Stipulation Logic of A. Visser (cf. his "Semantics and the Liar Paradox", in Gabbay and Guenthner, *Hand. of Phil. Logic*, vol IV, Reidel, 1984). This version is refined applying the notion of a clone of operations. The definitive problem states: characterize the (k-valued) clones such that all their stipulations have a fixed-point.

The strategy for the solution consists in classifying the clones using a special relation (the Γ-relation) which is associated to the set of unary functions of the clone. Every Γ-relation determines a clone which includes all the clones with the same set of unary functions. Using properties of the inner automorfisms of the algebra of functions, the number of clones which have to be analyzed can be considerably reduced. This strategy succeeds in the solution to the Fixed-Point Problem in the two- and three-valued propositional cases. A generalization for the general k-valued case presents some difficulties that will be commented.

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