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# Probabilistic, Truth-Value, and Standard Semantics and the Primacy of Predicate Logic

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Hartry Field maintained the thesis that reference and conceptual role together could account for all facts about the notion of meaning: "Truth-theoretic [Tarskian] semantics and conceptual-role semantics must supplement each other: truth-theoretic semantics cannot account for certain differences in sense unaccompanied by differences in reference; and conceptual-role semantics, though it deals nicely with questions of intra-speaker synonymy, cannot properly answer questions about inter-speaker synonymy or about relations between language and the world" ([2], p. 380). In the course of developing this thesis he provided a probabilistic semantics for the predicate calculus. This semantics, unlike the standard Tarski approach, dispenses with the notions of truth and reference and uses only the epistemic notion of subjective conditional probability. In this paper we give a proof of the equivalence of these two semantic approaches which also demonstrates their equivalence to another non-referential semantics, the truth-value (or substitution-theoretic) semantics of Leblanc [4], Dunn and Belnap [1], and others. Indeed Field's probabilistic semantics, it will be seen, is most naturally viewed as a generalization of truth-value semantics, the conditional probability of a sentence (pair) being determined in much the same nonreferential way as the truth value of a sentence. We close by discussing the possibility (and impossibility) of developing a probabilistic semantics for extensions of predicate logic and the implications this has for its primacy among logics.

Let $L$ be a countable first-order language and let $Pr$ be a (conditional probability) function from pairs of sentences of $L$ to the interval $[0,1]$. "$Pr(A|B)$" is to be read "the probability of $A$ given $B$". Following Field we say $Pr$ is a *reasonable conditional probability function*[1] if there is some countable

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