A Generalization of Giles's Game

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Already in the 1970s Robin Giles presented a combination of a dialogue game and a particular betting scheme that characterizes Lukasiewicz logic. Variants of this type of game semantics for other important fuzzy logics, including Goedel and Product logic have been described in the literature. However these versions of the game suffer from major drawbacks. In particular the one-one relation between risk values and truth values of Giles's game is lost. We will discuss a way to generalize Giles's game in a more conservative, yet at the same time also more open and systematic manner. Quite general conditions on the evaluation of final states and on the form of dialogues rules are stated. These conditions turn out to be sufficient to guarantee that optimal strategies for the proponent of a formula correspond to a truth functional evaluation in a many valued logic over some subset of the reals as truth values. We will also discuss to which extend our conditions are necessary to characterize a many valued logic.