

A general approach to de Finetti's criterion for uncertainty measures on many-valued events

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ABSTRACT. Bruno de Finetti's foundation of Subjective Probability Theory is based on the notion of *coherent betting hods*. In an abstract betting game between two players, Bookmaker and Gambler, given a class of events $\{e_1, \dots, e_k\}$ – for the classical case being elements of an arbitrary Boolean algebra – a book $\beta : e_i \mapsto \beta_i \in [0, 1]$ chosen by Bookmaker is *coherent* (or *not Dutch*) if it is impossible for Gambler, to arrange a system of bets on the e_i 's leading her opponent, Bookmaker, to a sure loss. De Finetti's Theorem shows that a book β is coherent iff the chosen β_i are extracted from the values which a finitely additive probability measure would assign to the events, i.e. iff the β_i 's satisfy Kolmogorov's axioms of probability theory.

In this talk we shall present variants of de Finetti's coherence criterion for the e_i 's being $[0, 1]$ -valued events. Each notion of coherence that we shall introduce characterizes a class of generalized uncertainty measure. Among others we will deal with *states*, *belief functions*, *possibility measures*. Our approach is uniform in the following sense: once the general coherence criterion will be established, each particular case will be described by asking the basic ingredients of the betting game to fulfill some natural constraints.

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