SUFFICIENCY AND FUZZINESS IN RANDOM EXPERIMENTS

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Abstract. In previous papers, the consequences of the "presence of fuzziness" in the experimental information on which statistical inferences are based were discussed. Thus, the intuitive assertion ⟨⟨fuzziness entails a loss of information⟩⟩ was formalized, by comparing the information in the "exact case" with that in the "fuzzy case". This comparison was carried out through different criteria to compare experiments (in particular, that based on the "pattern" one, Blackwell's sufficiency criterion). Our purpose now is slightly different, in the sense that we try to compare two "fuzzy cases". More precisely, the question we are interested in is the following: how will different "degrees of fuzziness" in the experimental information affect the sufficiency? In this paper, a study of this question is carried out by constructing an alternative criterion (equivalent to sufficiency under comparability conditions), but whose interpretation is more intuitive in the fuzzy case. The study is first developed for Bernoulli experiments, and the coherence with the axiomatic requirements for measures of fuzziness is also analyzed in such a situation. Then it is generalized to other random experiments and a simple example is examined.

Key words and phrases: Blackwell's sufficiency, fuzziness, fuzzy information, random experiment, probability of a fuzzy event.