

Intrinsic Tests of Independence in Contingency Tables

George Casella and Elías Moreno
University of Florida and University of Granada

Abstract

A condition needed for testing nested hypotheses from a Bayesian viewpoint is that the prior for the alternative model concentrates mass around the small, or null, model. For testing independence in contingency tables, the intrinsic priors satisfy this requirement. Further, the degree of concentration of the priors is controlled by a discrete parameter m , the training sample size, which plays an important role in the resulting answer regardless of the sample size.

In this paper we study robustness of the tests of independence in contingency tables with respect to the intrinsic priors with different degree of concentration around the null, and compare with other “robust” results by Good and Crook. Consistency of the intrinsic Bayesian tests is established.

We also discuss conditioning issues and sampling schemes, and argue that conditioning should be on either one margin or the table total, but not on both margins.

Examples using real and simulated data are given.