

Measure of Symmetry with Minimum Variance for Square Contingency Tables

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For analyzing square contingency tables with same row and column classifications, models on symmetry instead of independence have been used.

The simple symmetry model which represents the structure of symmetry with respect to the cell probabilities was introduced by Bowker.

When the symmetry model does not hold for a given data, we are interested in measuring the degree of departure from symmetry.

For square tables with nominal categories, a measure expressed by using Shannon entropy or Kullback-Leibler information was proposed by Tomizawa.

The present paper proposes a measure for symmetry which is different from Tomizawa's measure, in the class of weighted averages.

The proposed measure is an approximation to the measure in the class of weighted averages that has the smallest variance.

Key Words: Categorical data, Kullback-Leibler information, Shannon entropy