On Decomposition of Point-symmetry in Square Contingency Tables

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For the analysis of square contingency tables, the issues of various symmetry rather than independence arise naturally. The point-symmetry (PS) model that indicates the structure of point-symmetry of cell probabilities and the marginal point-symmetry (MP) model that indicates the structure of point-symmetry of marginal probabilities are considered. The quasi point-symmetry (QP) model that indicates the structure of point-symmetry of odds ratios is also considered. For these models, the theorem that the PS model holds if and only if both the MP model and the QP model hold was shown. The purpose of present paper is to give a different proof of this result by using the minimum discrimination information (MDI) approach. Also, the MDI estimates of the cell frequencies of a square contingency table under hypotheses of some point-symmetry are given. Moreover, the associated MDI statistics are given, and the relationships between these test statistics are shown.

Key Words: Marginal point-symmetry, minimum discrimination information, quasi point-symmetry