Multiple Comparison Procedures for Contingency Table and their Evaluation

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Abstract

Pearson’s $\chi^2$ test and Fisher’s exact test are used for testing the independence of a contingency table, but these tests tell us only whether two factors in a row and column are associated. If we reject the null hypothesis of independence and want to know which two categories in a row/column are associated, we need the concept of multiple comparisons. We chose the Scheffé method and Tukey method in Hirotsu (1992) and the closed testing procedure in Matsuda (2004) as known multiple comparison procedures for contingency tables. We devised a new procedure assuming ordered alternative hypotheses and evaluated its performance against known methods. We found that our procedure is useful for ordered alternative hypotheses and that the closed testing procedure in Matsuda (2004) is useful for general alternative hypotheses.

Key words: cumulative chi-squared, Monte-Carlo simulation

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