Penalizing power-divergence tests statistics for testing linear by linear association

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Abstract

Two different families of penalized power-divergence test statistics have been defined to find alternatives to the likelihood ratio and Pearson chi-squared statistics for testing linear by linear association in twoway contingency tables with empty cell/cells. The exact size and power properties of these statistics and the ordinary power-divergence test statistics have been studied based on extensive designed simulation study. Different penalized test statistics have been proposed depending on their exact size and power performances.

Keywords

Contingency table, Empty cells, Ordinal categorical variable, Log-linear model, Penalization.