ANALYSIS OF TRIANGULAR CONTINGENCY TABLES

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Received 12.07.2002 : Accepted 21.10.2003

Abstract

This paper compares two methods involving the uniform association model and the quasi-independence model. These models can be described in terms of the association parameters for the analysis of triangular contingency tables having ordered categories. A simulation study based on 30,000 random triangular tables was performed for this comparison. Proportions of the rejected and accepted hypothesis under these models were obtained. From the results of the simulation study, the behaviour of the association parameters was discussed with respect to their coefficient of variations. The homogeneity of the coefficients of variance was also tested.

Keywords: Triangular contingency tables, Uniform association model, Quasi-independence model.

1. Introduction

Triangular contingency tables are a special class of incomplete contingency table which contain structural zeros in one or more cells above or below their main diagonals.

Triangular contingency tables were first analyzed in [7] by partitioning the table into a set of rectangular sub-tables, each of which can be analyzed in an elementary way. Bishop and Fienberg [4] illustrated this kind of table using the classical example of disability of stroke patients.

Altham [2], Mantel [11] and Bishop et.al. [5] also discussed the quasi-independence model. Goodman [10] introduced various tests of the quasi-independence model against an alternative hypothesis of positive or negative quasi-dependence. We consider $R \times R$ tables, where the row and the column categories are ordinal, numbered from 1 to $R$, and denote the probability that an observation falls in the $i$th row and $j$th column of the table.

Sarkar [12] defined four types of triangular contingency table using the following conditions: An upper-right (left) triangular (URT (ULT)) table is described by the condition that $\pi_{ij} = 0$ for $i > j$ (for $i+j > R+1$), and a lower-left (right) triangular (LLT (LRT))

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