

Seeing the trees AND the wood

- methods for visualising multiquestion survey responses

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Keywords: Visualisation, Mosaic Plots, Surveys

Abstract

Survey are a traditional and very successful method of gathering information, but the data collected are often not used to the full. Sometimes there is little time to analyse survey results in depth (political surveys have a particularly short half-life) and sometimes the dataset owners are reluctant to rely on sophisticated analytic procedures, whose rationale is not clear to them. There is not much that can be done about the first cause, but visualisation methods can help a lot with the second. Various graphics have, of course, been used before, but primarily in association with dimension reduction approaches. In this paper we will only consider multivariate visualisations which do not require a reduction of dimensionality.

Surveys with many questions require several forms of analysis: results for individual questions, analyses of related groups of questions, and general summaries of the whole questionnaire. Modern visualisation methods can help especially with understanding the responses to groups of questions by using Mosaic plots and their variants. mosaic plots were introduced over twenty years ago as a means of displaying complex relationships in multivariate categorical data, but they have only become practicable more recently as interactive implementations in software have become available. There are many more possibilities in mosaic plots than just the “classic” variant and we shall describe and illustrate not just new developments in interactive tools for mosaic plots but also the range of alternative displays, including fluctuation diagrams and doubledecker plots. We shall show how issues such as missing values, aggregation of minor categories, grouping of survey questions can be handled in an intuitive and flexible way.

The main example used in the paper will be data on preferences for candidates in the last Irish presidential election. There are many interesting features in data of this kind, which can best be revealed using a variety of different displays.