Multi-way compositions and its analysis based on the elemental information

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Compositional data are commonly known as multivariate observations carrying relative information. The analysis of compositional data arranged in a table, resulting from two underlying factors, has been introduced in the literature as compositional tables approach [1]. Similarly to vector compositions, also the analysis of compositional tables is based on its coordinate representation. However, this can lead to unfavorable aggregation of information. The contribution therefore introduces the concept of backwards pivot coordinates, originally invented for vector compositional data [2], and its extension to the case of two-way compositions [3]. The main idea is to focus on elementary information about the compositional structure, which is contained in pairwise logratios for vectors and in four-part log odds ratios for tables. The use of methodology will be explained in terms of regression and principal component analysis, and its performance will be demonstrated in an application to movement behavior data.

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