

ABSTRACT

Sensory evaluation plays a remarkable role in maintaining the quality standards of beverages such as tea. The quality of tea, the major determinant of the price of tea, is evaluated generally by professional tea tasters. Uncertainty and vagueness of sensory evaluation has been a serious issue in selection of a good quality tea. An issue existing when analyzing sensory data to detect panel disagreement is that data of three dimensional (three-way) or higher are often reduced to two-way data. Present study aimed to explore the panel dis-consensus in tea sensory evaluation by three-way analysis methods; Clustering around Latent Variables for three-way data (CLV3W) method and two factor Multivariate Analysis of Variance (MANOVA) with Canonical Variate Analysis (CVA). A data set with 8 tea tasters, 13 tea growing regions and 6 sensory attributes assessed for each month with four replicates (4 factories per region) and for a period of one calendar year were used for the study. When CLV3W analysis was performed separately for each month data, it was found two-clusters (two-latent components) exist for the data. Attribute loadings of colour and strength indicated that they are represented by the first latent component, and those loadings for brightness, flavour, aroma, and quality indicated that they are represented by the second component. Region scores for the two latent components revealed a grouping of regions with similar tea quality attributes. However, by examining assessor weights it was possible to identify assessors those who were in agreement and those who were in disagreement for each component. When MANOVA and CVA were performed separately for each month of data, a clear graphical interpretation on disagreement among assessors for each region were disclosed in canonical plots of first two canonical variates. Malwatta Valley and

Bandarawela were the mostly reported regions for which assessors were in consensus throughout the year. Different groups of assessors were identified for each region in which assessors were in consensus. Mainly, it was found two groups of assessors in agreement, assessor 4 and 6 in one group and assessor 1, 5, 7, and 8 in other group. Finding of CLV3W demonstrated the fact that certain assessors are more sensitive to certain attributes and thus in order to detect tea with certain attributes, appropriate assessors can be employed. Therefore, CLV3W method is a useful method to detect disagreement between assessors, especially in 3-way data, and it can effectively be used when selecting assessors for sensory evaluation. Conversely, it can be recommended that two factor MANOVA and CVA as a better suggestion to identify the assessor groups with dis-consensus for each region and for all attributes.

Key words: canonical variate analysis, clustering around latent variables, higher dimensional array, multivariate analysis of variance, panel disagreement,