



**RELATING SENSORY ACCEPTANCE TO DESCRIPTIVE 1 ATTRIBUTES BY
THREE-WAY EXTERNAL PREFERENCE MAPPING OBTAINED BY PARALLEL
FACTOR ANALYSIS (PARAFAC)**

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External preference mapping derives a multidimensional representation of products based on their sensory profile or a set of other external data, such as instrumental measures of color, texture, or flavor, called descriptive attributes. This representation is usually obtained through PCA of a data matrix with products as rows and external data as variables or columns. The second step in the analysis is to fit the consumer data (i.e. global acceptance data) in the descriptive space. In order to do this, a model is used to regress the hedonic scores given to the products on to the coordinates of the products in the descriptive space. PARAFAC is a method employed for the decomposition of higher-order data and can be considered to be a generalization of PCA for multidimensional data. PCA provides an exploratory analysis of i samples as a function of j variables, whereas PARAFAC provides an exploratory interpretation of these samples and variables, considering the different K conditions where in these data were generated. The hypothesis of using PARAFAC for relating sensory acceptance to descriptive attributes by using a three-way external preference map was considered in this work. The objective of the method was simultaneously analyzing the interactions among consumer preferences (i.e. global aspect, flavor, smell and color acceptance), products, and different evaluated attributes, besides correlating it to descriptive parameters. A pilot case study using a real data set from five commercial samples of grape juice was conducted. The results revealed that PARAFAC was useful for relating sensory acceptance to descriptive attributes, by simultaneously considering the various analyzed attributes by three-way external preference maps. PARAFAC was useful for relating sensory acceptance to descriptive attributes by simultaneously considering the various analyzed attributes by a three-way external preference map. A three-way external preference map provides a more general and evidence-based interpretation of the type of data, and makes it possible to simultaneously relate consumer preferences, sensorial attributes, and descriptive characteristics. It also enables the comparison of the real overall performance of the samples in the consumer acceptance tests, because the influence of all sensory attributes are considered simultaneously. Acknowledgment to FAPEMIG and CNPq, Brazilian government entities, promoters of scientific and technological development.