Nonparametric Permutation-based Testing on Multivariate Paired Preference Sensorial Evaluations

Livio Corain [[1]](#footnote-1), Luigi Salmaso [[2]](#footnote-2)

# Introduction

Suppose that several assessors are evaluating two or more attributes of a set of sensorial stimuli, i.e. fragrances or foods/beverages etc., by testing their smell or taste or in general by sensorial evaluations. Quite often those stimuli are not presented all in a row but in pairs of two at time [1]; when the response variables are defined by ordered scores, this design is known as the Degree of Difference (DOD) test [2]. By emphasizing that the order in which the two stimuli are submitted to assessors is definitely relevant, the purpose of this paper is to propose a novel DOD data representation modelling that was inspired the so-called dyadic data modelling [3]. As hypothesis testing solution, permutation and combination-based tests [4] were compared to univariate traditional testing proposed in this field [5], and a novel method of combination of traditional tests was also proposed. Via an extensive Monte-Carlo simulation study we investigated the properties of the proposed novel testing methodology where we proved its validity under different random distributions.

**References**

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1. Department of Management and Engineering, University of Padova, Italy, E-mail: livio.corain@unipd.it [↑](#footnote-ref-1)
2. Department of Management and Engineering, University of Padova, Italy, E-mail: luigi.salmaso@unipd.it [↑](#footnote-ref-2)