Individual differences in replicated multi-product experiments with Thurstonian mixed models for binary paired comparison data

Often sensory discrimination tests are performed with replications for the assessors. In this paper, we suggest a new way of analyzing data from a discrimination study. The model suggested in this paper is a Thurstonian mixed model, in which the variation from the assessors is modelled as a random effect in a generalized linear mixed model. The setting is a multi-product discrimination study with a binary paired comparison. This model makes it possible to embed the analyses of products into one analysis rather than having to do an analysis for each product separately. In addition, it is possible to embed the model into the Thurstonian framework obtaining d-prime interpretations of the estimates. Furthermore, it is possible to extract information about the assessors, even across the products. More specifically, assessor specific d-prime estimates are obtained providing a way to get information about the panel. These estimates are interesting because they make it possible to investigate if the assessors are assessing in a specific way.

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