

Estimation and design strategies for inter-individual differences in an overparameterized paired comparison model

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Abstract

Motivated by psychological applications, we consider an overparameterized general linear paired comparison model with alternative-specific intercepts and respondent-specific vectors of trait parameters. We are interested in estimating contrasts of the trait parameter vectors. We study this problem both in the original model and in a transformed Gauss-Markov model arising from taking differences between response vectors. We show that the best linear unbiased estimator of a contrast in the original model coincides with the GLS and OLS estimators of the parameter vector in the transformed model. As an application, we discuss an optimal design problem that can be solved more easily in the transformed model setting.

Keywords

Paired comparison experiment, Linear model, Contrast estimation, Optimal design.

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