

Ellipsoidal methods for adaptive choice-based conjoint analysis

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© 2019 INFORMS. Questionnaires for adaptive choice-based conjoint analysis aim at minimizing some measure of the uncertainty associated with estimates of preference parameters (e.g., partworths). Bayesian approaches to conjoint analysis quantify this uncertainty with a multivariate distribution that is updated after the respondent answers. Unfortunately, this update often requires multidimensional integration, which effectively reduces the adaptive selection of questions to impractical enumeration. An alternative approach is the polyhedral method for adaptive conjoint analysis, which quantifies the uncertainty through a (convex) polyhedron. The approach has a simple geometric interpretation and allows for quick credibility-region updates and effective optimization-based heuristics for adaptive question selection. However, its performance deteriorates with high response-error rates. Available adaptations to this method do not preserve all of the geometric simplicity and interpretability