

Invariance Properties of the Asymptotic Distribution of the Odds Ratio Parameter Estimator with respect to Different Sampling Schemes and Asymptotic Approaches in Semiparametric Odds Ratio Models with Log-bilinear Association

by
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Abstract

The association between two random variables is often of primary interest in statistical research. In this paper semiparametric models for the association between random vectors X and Y leaving the marginals arbitrary are considered. Given that the odds ratio function comprises the whole information about the association the focus is on bilinear log-odds ratio models and in particular on the asymptotic covariance matrix of the estimator of the odds ratio parameter vector. The covariance structure of the maximum likelihood estimator of the log-odds ratio parameter θ is of major importance for asymptotic inference. To this end different representations of the estimated covariance matrix are derived for conditional and unconditional sampling schemes and different asymptotic approaches depending on whether X and/or Y has finite or arbitrary support. Additionally, the invariance of the estimated asymptotic covariance matrix of the estimator $\hat{\theta}$ with respect to all above approaches is shown. Finally, applications to logistic and linear regression models are given.

AMS 2000 subject classifications

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