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Priors Comparison in Bayesian mediation framework with binary outcome

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In human sciences, mediation refers to a causal phenomenon in which the effect of an exposure variable X on an outcome Y can be decomposed into a direct effect and an indirect effect via a third variable M (called mediator variable).

In mediation models, the natural direct effects and the natural indirect effects are among the parameters of interest. For this model, we construct different class of prior distributions depending available information. We extend the X -priors from the regression to the mediation model. We also adapt an informative transfer learning model to include historical information in the prior distribution. This model will be relevant for instance in longitudinal studies with only two or three measurement times.

One of the usual issues in mediation analysis is to test the existence of the direct and the indirect effect. Given the estimation of the posterior distribution of the parameters, we construct critical regions for frequentist testing process. Using simulations, we compare this procedure with the tests usually used in mediation analysis. Finally, we apply our approach to real data from a longitudinal study on the well-being of children in school.

Keywords

direct and indirect effect; G -priors; mediation analysis; transfert learning; testing procedure.

Special/invited session

Causality

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