Coefficient of Determination (R^2) for Generalized Linear Mixed Models

Hans-Peter Piepho[1]

Extensions of linear models are very commonly used in the analysis of biological data. Whereas goodness of fit measures such as the coefficient of determination (R2) or the adjusted R2 are well established for linear models, it is not obvious how such measures should be defined for generalized linear and mixed models. There are by now several proposals but no consensus has yet emerged as to the best unified approach in these settings. In particular, it is an open question how to best account for heteroscedasticity and for covariance among observations present in residual error or induced by random effects. This paper proposes a new approach that addresses this issue and is universally applicable for arbitrary variance-covariance structures including spatial models and repeated measures. It is exemplified using three biological examples.

Reference

Piepho, H.P. (2019): A coefficient of determination (R^2*) for generalized linear mixed models.* Biometrical Journal *(in revision).*

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[1] *Biostatistics Unit, Institute of Crop Science, University of Hohenheim, 70593 Stuttgart, Germany.*