

# Estimating parameters of dichotomous and ordinal item response models with `gllamm`

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**Abstract.** Item response theory models are measurement models for categorical responses. Traditionally, the models are used in educational testing, where responses to test items can be viewed as indirect measures of latent ability. The test items are scored either dichotomously (correct–incorrect) or by using an ordinal scale (a grade from poor to excellent). Item response models also apply equally for measurement of other latent traits. Here we describe the one- and two-parameter logit models for dichotomous items, the partial-credit and rating scale models for ordinal items, and an extension of these models where the latent variable is regressed on explanatory variables. We show how these models can be expressed as generalized linear latent and mixed models and fitted by using the user-written command `gllamm`.

**Keywords:** `st0129`, `gllamm`, `gllapred`, latent variables, Rasch model, partial-credit model, rating scale model, latent regression, generalized linear latent and mixed model, adaptive quadrature, item response theory