

Number of parameters estimated by HMLM and HMLM2

In some cases, the program may prevent the user from adding additional random effects to the model. This indicates that there is not enough data to allow estimation of the level-1 error structure and higher level random effects. The number of parameters to be estimated by HLM can be calculated and compared to the amount of data available for analysis. The formulae for the number of parameters estimated are:

Unrestricted level-1 variance:

$$\frac{T(T+1)}{2} + f$$

Homogeneous level-1 variance:

$$\frac{r(r+1)}{2} + f + 1$$

Heterogeneous level-1 variance:

$$\frac{r(r+1)}{2} + f + T$$

Autoregressive level-1 variance:

$$\frac{r(r+1)}{2} + f + 2$$

Log-linear level-1 variance:

$$\frac{r(r+1)}{2} + f + S + 1$$

where T is the number of time points, f is the number of fixed effects, r is the number of random effects (only in non-restricted) and S is the number of "predictors of level-1 variance" chosen.