

Constrain two or more fixed effects to be equal

A user may wish to constrain two or more fixed effects to be equal. For example, Barnett, Marshall, Raudenbush, & Brennan (1993) applied this approach in studying correlates of psychological distress in married couples. Available for each person were two parallel measures of psychological distress. Hence, for each couple, there were four such measures (two per person). At level-1 these measures were modeled as the sum of a "true score" plus error:

$$Y_{ij} = \beta_{1j}X_{1ij} + \beta_{2j}X_{2ij} + r_{ij},$$

where X_{1ij} is an indicator for females, X_{2ij} is an indicator for males, and r_{ij} is a measurement error. Hence β_{1j} is the "true score" for females and β_{2j} is the "true score" for males. At level 2, these true scores are modeled as a function of predictor variables, one of which was marital role quality, W_j , a measure of one's satisfaction with one's marriage. A simple level-2 model is then:

$$\begin{aligned}\beta_{1j} &= \gamma_{10} + \gamma_{11}W_j + u_{1j} \\ \beta_{2j} &= \gamma_{20} + \gamma_{21}W_j + u_{2j}.\end{aligned}$$

The four coefficients to be considered are γ_{10} , γ_{11} , γ_{20} , γ_{21} . We may, for instance, wish to specify some constraints of fixed effects.

To put constraints on fixed effects

1. Open the **Other Settings** menu.
2. Select the **Estimation Settings** option to open the **Estimation Settings – HLM2** dialog box.

Estimation Settings - HLM2

Type of Likelihood
 Restricted maximum likelihood Full maximum likelihood

LaPlace Iteration Control
 Do Laplace iterations Maximum number of iterations

EM LaPlace Iteration Control
 Do EM Laplace iterations Maximum number of iterations

Constraint of fixed effects Heterogeneous sigma^2 Plausible values Multiple imputation

Level-1 Deletion Variables Weighting Latent Variable Regression

Fix sigma^2 to specific value
 (Set to "computed" if you want sigma^2 random or if over-dispersion is desired)

OK

3. Click the **Constraint of fixed effects** button to open the **Constrain Gamma** dialog box. Enter **1** in the Sector boxes (see the figure below for an example). Click **OK**. The constraint imposed is $\gamma_{11} = \gamma_{21}$.

Constrain Gammas

OK Cancel

MEASURE1 slope, β_1
 INTRCPT2, γ_{10}
 MARITAL, γ_{11}
 MEASURE2 slope, β_2
 INTRCPT2, γ_{20}
 MARITAL, γ_{21}

These two coefficients are constrained to be the same

Constrain two or more fixed effects to be equal

Coefficients with 0s are not constrained, and those with 1s are. A user is allowed to impose multiple constraints up to 5. Each set of the constrained coefficients will share the same value from 1 to 5.