

## Display the Mixed Model

A HLM model can be displayed in a mixed model formulation as illustrated below.

The screenshot shows the WHLM software interface. The main window displays the following equations:

**Level-1**  

$$\text{MATHACH}_{ij} = \beta_{0j} + \beta_{1j}(\text{SES}_{ij} - \overline{\text{SES}}_j) + r_{ij}$$

**Level-2 MODEL**

$$\beta_{0j} = \gamma_{00} + \gamma_{01}(\text{SECTOR}_j) + \gamma_{02}(\text{MEANSES}_j) + u_{0j}$$

$$\beta_{1j} = \gamma_{10} + \gamma_{11}(\text{SECTOR}_j) + \gamma_{12}(\text{MEANSES}_j) + u_{1j}$$

A **Mixed** button is located at the bottom right of the main window.

The **Mixed Model** section shows the combined equation:

$$\text{MATHACH}_{ij} = \gamma_{00} + \gamma_{01} * \text{SECTOR}_j + \gamma_{02} * \text{MEANSES}_j + \gamma_{00} * (\text{SES}_{ij} - \overline{\text{SES}}_j) + \gamma_{11} * \text{SECTOR}_j * (\text{SES}_{ij} - \overline{\text{SES}}_j) + \gamma_{12} * \text{MEANSES}_j * (\text{SES}_{ij} - \overline{\text{SES}}_j) + u_{0j} + u_{1j} * (\text{SES}_{ij} - \overline{\text{SES}}_j) + r_{ij}$$

The mixed model is obtained by clicking the **Mixed** button at the bottom of the main window. The model is shown as a single equation, obtained by substituting the equations for  $\beta_0$  and  $\beta_1$  in the level-1 equation. This notation shows the model in a familiar linear regression format, and also draws attention to any cross-level interaction terms present in the combined model.