Generalized Linear Mixed Model Analysis

JMP PRO Use to build a linear model with both random and fixed effects along with the option of choosing a non-normal distribution for the response variable. A mixed model can also be analyzed in standard JMP, though fewer options are available.

Analysis of a Generalized Linear Mixed Model

Student Testing.jmp (Help > Sample Data Folder)

1. From an open JMP data table, select **Analyze > Fit Model**.

2. Select the **Generalized Linear Mixed Model personality**.

3. Add the response. Here we're using the binary outcome variable 'Grade' (Pass, Fail).

4. Choose a distribution for the response. Here we chose Binomial.

5. Add the fixed model effects under the **Fixed Effects Tab**. Here there is just one fixed factor – the categorical variable 'Program'.

6. Add the random model effects under the **Random Effects Tab**, Here we're specifying the two random factors 'School' and 'Class'. For these data, the 5 different classes are nested within the 10 different schools. To specify this, select 'Class' in the model effects window and select 'School' in the columns window, and click **Nest**.

Note: The Repeated Structure tab can be used if the response is repeated measurements on the same unit.

7. Click **Run**.

   By default, JMP will display table of results including estimates of variance components for the random effects, parameter estimates for the fixed effects, and test statistics with corresponding p-values to help determine the importance of the model terms.
   Additional options are available under the **top red triangle** such as displaing the Profiler, diagonistics plots, and saving model results to the data table.
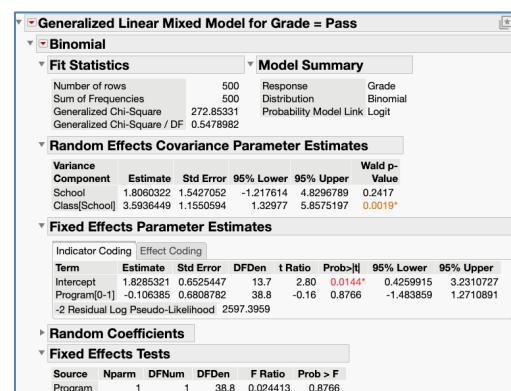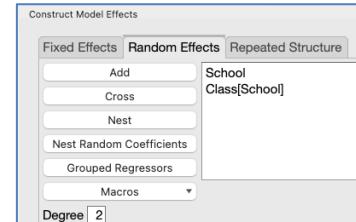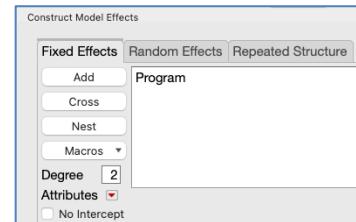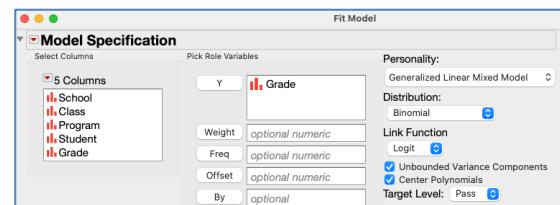
Interpretation:

The fixed effect 'Program' is not significant (p-value = 0.8766). The random effect 'School' is not significant (p-value = 0.2417 and a confidence interval [-1.22 , 4.83] that contains 0). The random effect 'Class' is significant (p-value 0.0019). The estimated variance components for that effect is 3.59 with a corresponding 95% Confidence Interval of [1.33 , 5.86].

See the guide **Mixed Model Analysis (Standard Least Squares)** to see how to fit a mixed model in standard JMP. Visit **Fitting Linear Models > Mixed Models** and **Generalized Linear Mixed Models** in **JMP Help** to learn more.