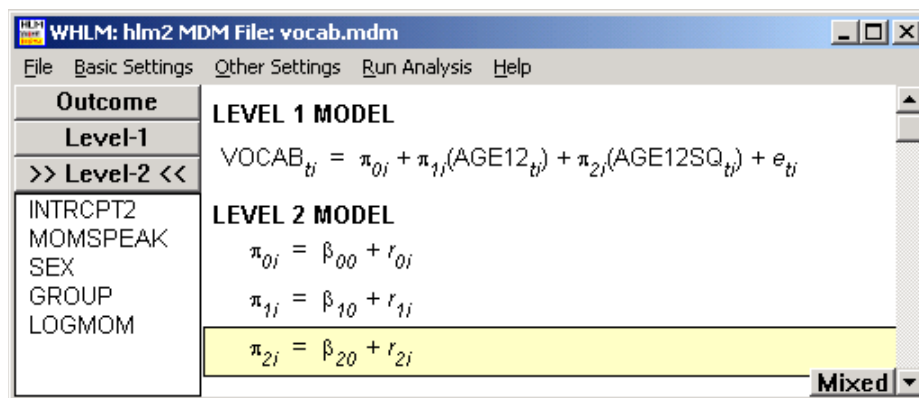


## Level-1 equation modeling

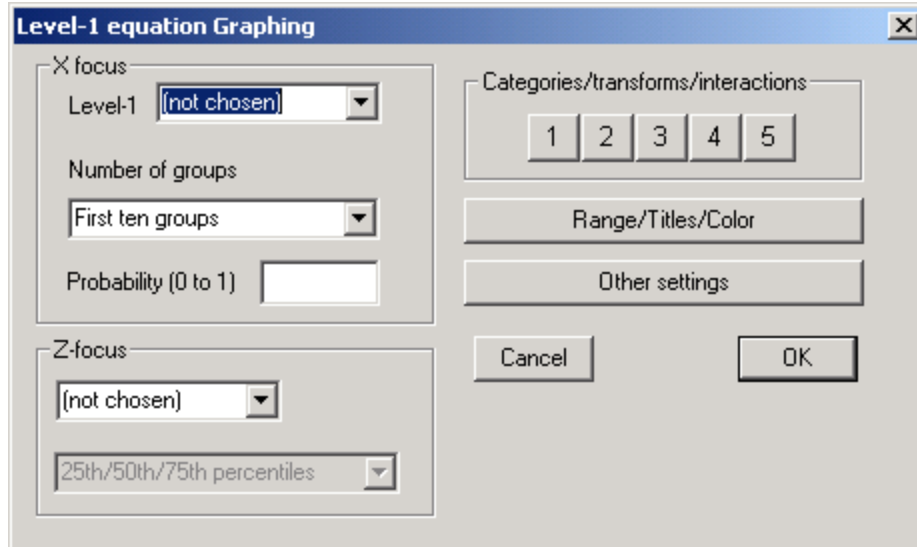
WHLM will also let us examine plots for individual level-2 units by just using the level-1 equation instead of the entire model. For this example, we will be using the vocabulary data, VOCAB.MDM, and have run the following model:



**Figure 23** Model specification window for the vocabulary data

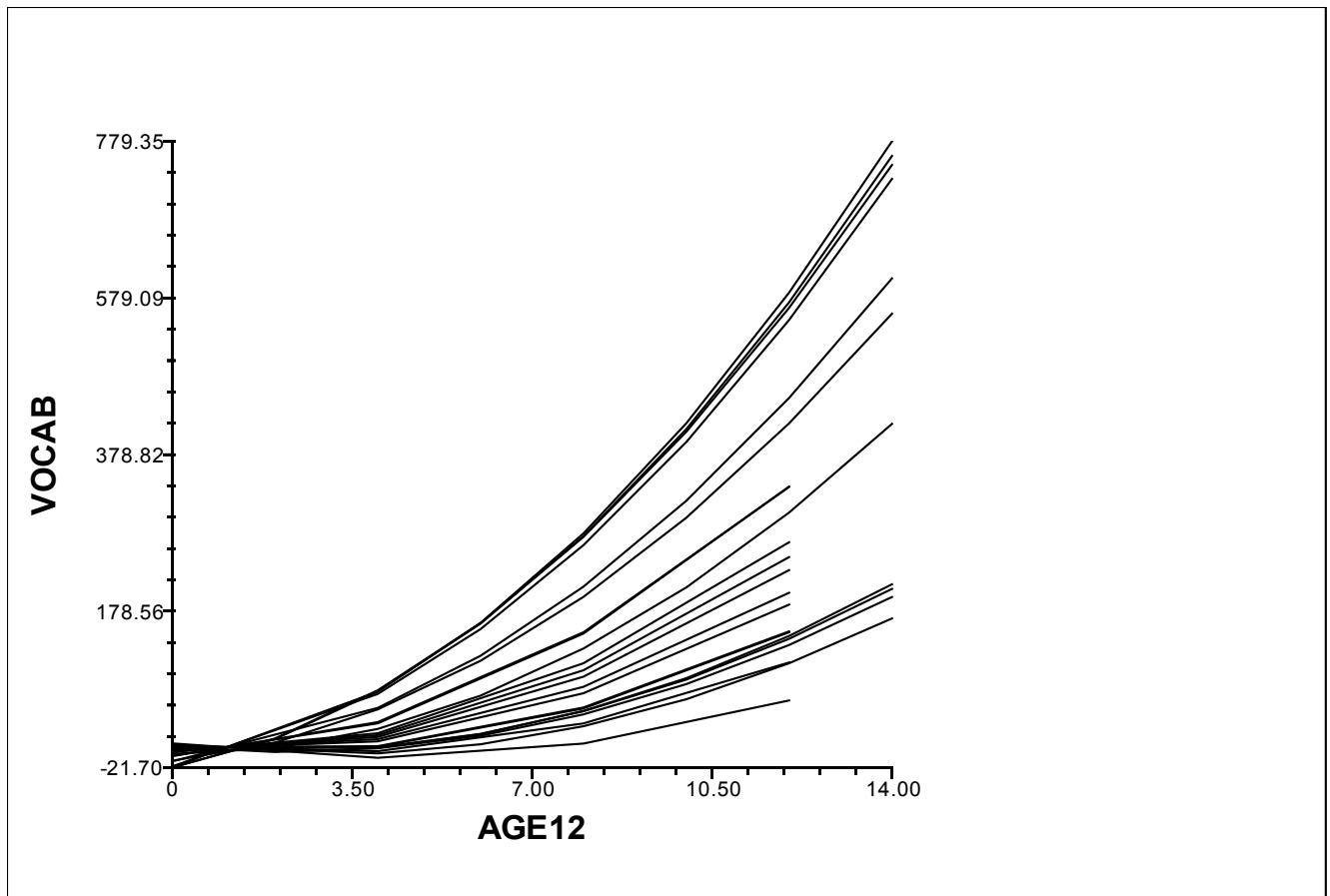
### To perform the level-1 equation graphing

1. After the model is run, select **Graph Equations...Level-1 equation graphing** from the **File** menu, which will give us the following dialog box.



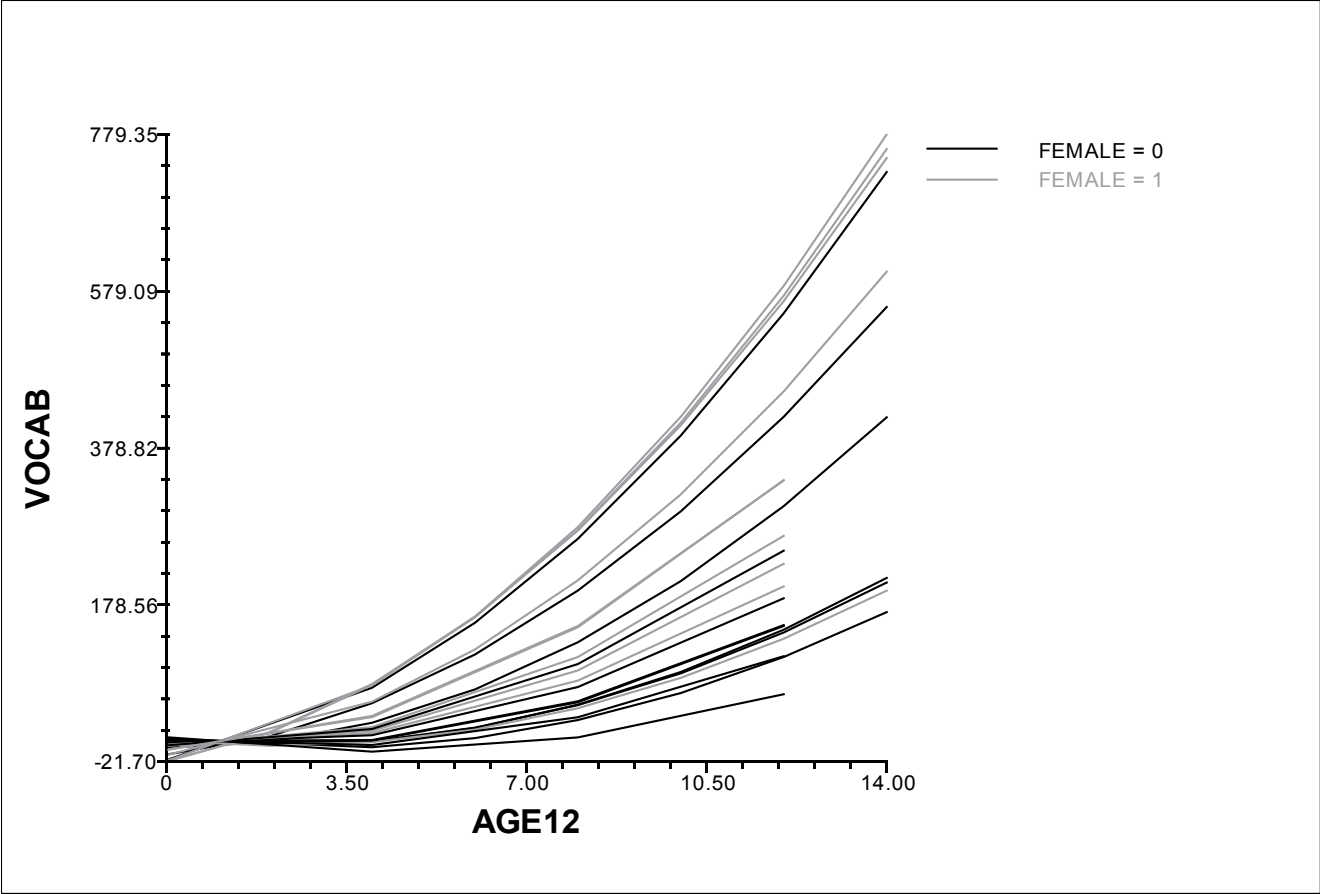
**Figure 24** Level-1 equation Graphing dialog box

2. Select an **X focus** variable. In our example, we want the age of the child in months minus 12 to be the **X focus**. Choose AGE12 from the **X focus** drop-down list box.
3. Select number of groups. We will include all the children. Choose **All groups (n=22)** in the **Number of groups** drop-down list box.
4. Specify the relationship between the transformed and the original variable. The transformed variable is AGE12S and the original variable is AGE12. Click 1 in the **Categories/ transforms/interactions** section and select **power of x/z** for Polynomial relationships. An **Equation Graphing - power** dialog box will open. Select AGE12S from the drop-down list box to the left of the equal sign. AGE12 will appear in the drop-down list box as it is the only level-1 variable left. Enter 2 in the text box for the **power** to be raised. Click **OK**.
5. (Optional) click **Range/Legend/Color** to specify the ranges for x- and y-axis (the default values are those computed from the data), to enter legend and graph titles, and to select screen color.
6. Click the **Other settings** button and click the selection button for **Smooth** in **For continuous x** section to display a set of smooth curves. Click **OK**.
7. Click **OK** and we get the following figure that shows vocabulary size accelerates during the second year of life. Note that the individual trajectories, as expected, are "smoother" than in the comparable data-based graphs.



**Figure 25 Predicted trajectories of vocabulary growth for individual children  
To include a level-2 classification variable**

8. Click **Graph Settings** on the menu bar to open the **Level-1 equation Graphing** dialog box.
9. Choose MALE from the **Z-focus** drop-down list box as the level-2 classification variable.
10. Click **OK**. The following figure will appear. A colored version of the graph (not shown here) indicates that girls on average have a greater acceleration rate in vocabulary growth over the course of the study.



**Figure 26** Predicted trajectories of vocabulary growth of individual children grouped by gender