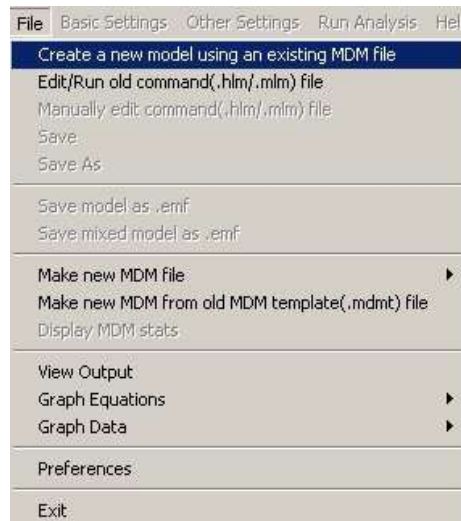
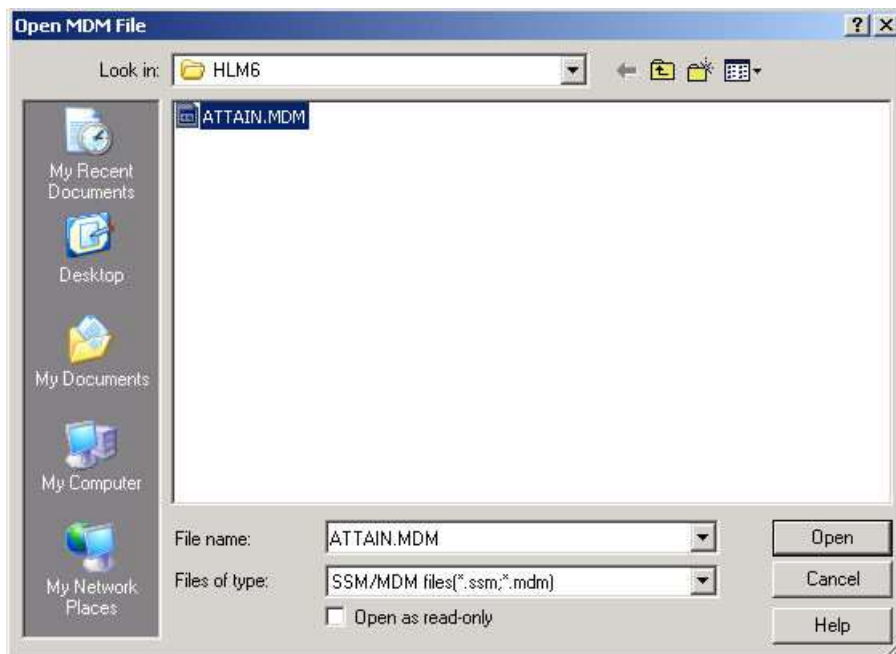


Example of an HCM2 analysis

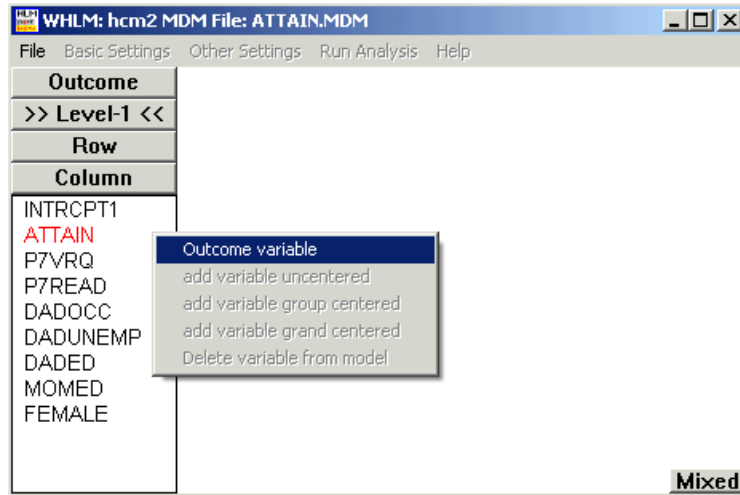
From the WHLM window, open the **File** menu and choose **Create a new model using an existing MDM file** to open an **Open MDM File** dialog box.



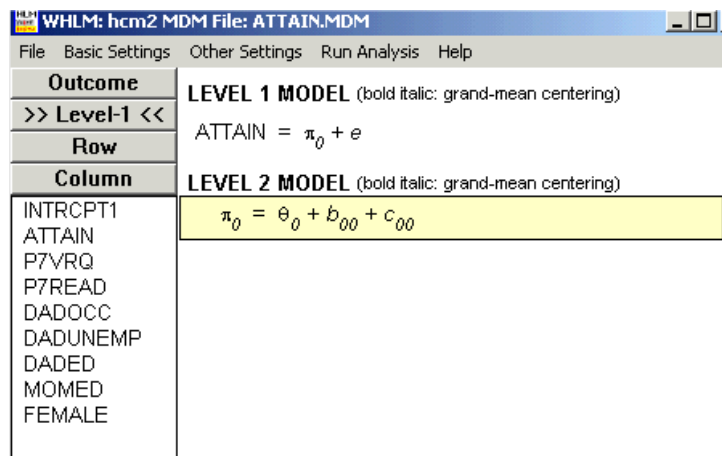
Open the existing MDM file (**attain.mdm** in our example).



After selection of the MDM, file, the list of level-1 variables is displayed on the left side of the main WHLM window. Click on the name of the outcome variable (ATTAIN in our example) and select **Outcome variable** from the pop-up menu.



The unconditional model will appear in equation format as shown below.

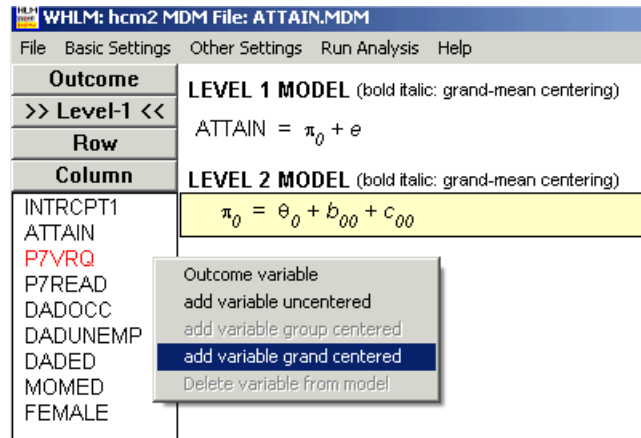


The next step is to set up the level-1 model. The variables available for inclusion are:

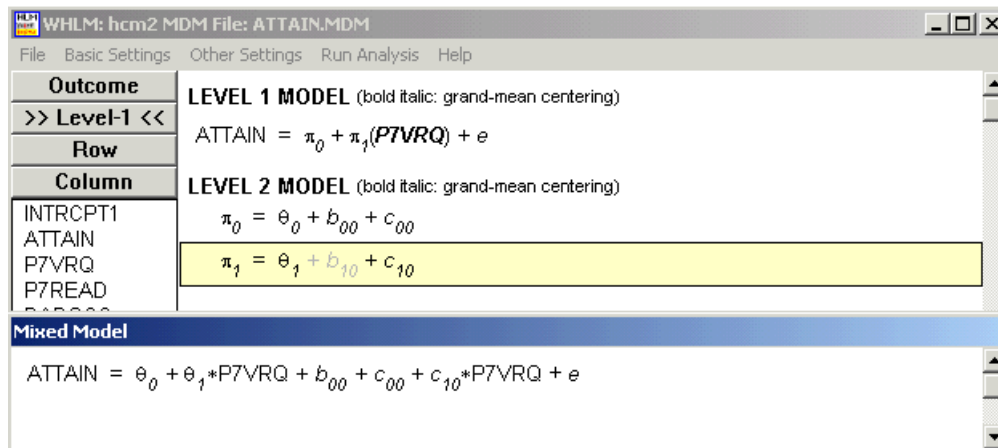
- ATTAIN, a measure of educational attainment
- P7VRQ, denoting primary 7 verbal reasoning quotient
- P7READ, denoting primary 7 reading test scores
- DADOCC, indicating the father's occupation scaled on the Hope-Goldthorpe scale in conjunction with the Registrar General's social-class index (Willms, 1986)
- DADUNEMP, an indicator for father's unemployment status (1 if unemployed, 0 otherwise)
- DADED, an indicator for father's educational level (1 if schooling past the age of 15, 0 otherwise)
- MOMED, an indicator for mother's educational level (1 if schooling past the age of 15, 0 otherwise)

FEMALE, an indicator for student gender (1 if male, 0 if female)

Click on the variable P7VCRQ from the list of variables at the left of the screen, and select the **add grand-mean centered** option from the pop-up menu as shown.



The following model is now displayed in the main window. Note that, by clicking the **Mixed** button at the bottom of the main window, the complete model can also be displayed in mixed model notation, which shows the model as a single equation including all effects from the various levels.



Add the level-1 variables P7READ, DADOCC, DADUNEMP, DADED, MOMED, and MALE in the same way as P7VCRQ to obtain the following model:

The screenshot shows a software window titled "WHLM: hcm2 MDM File: ATTAIN.MDM". The menu bar includes "File", "Basic Settings", "Other Settings", "Run Analysis", and "Help". On the left, there is a list of variables under "Column": INTRCPT1, ATTAIN, P7VRQ, P7READ, DADOCC, DADUNEMP, DADED, MOMED, and FEMALE. The main area displays two models:

LEVEL 1 MODEL (bold italic: grand-mean centering)

$$\text{ATTAIN} = \pi_0 + \pi_1(\text{P7VRQ}) + \pi_2(\text{P7READ}) + \pi_3(\text{DADOCC}) + \pi_4(\text{DADUNEMP}) + \pi_5(\text{DADED}) + \pi_6(\text{MOMED}) + \pi_7(\text{FEMALE}) + e$$

LEVEL 2 MODEL (bold italic: grand-mean centering)

$$\pi_0 = \theta_0 + b_{00} + c_{00}$$

$$\pi_1 = \theta_1 + b_{10} + c_{10}$$

$$\pi_2 = \theta_2 + b_{20} + c_{20}$$

$$\pi_3 = \theta_3 + b_{30} + c_{30}$$

$$\pi_4 = \theta_4 + b_{40} + c_{40}$$

$$\pi_5 = \theta_5 + b_{50} + c_{50}$$

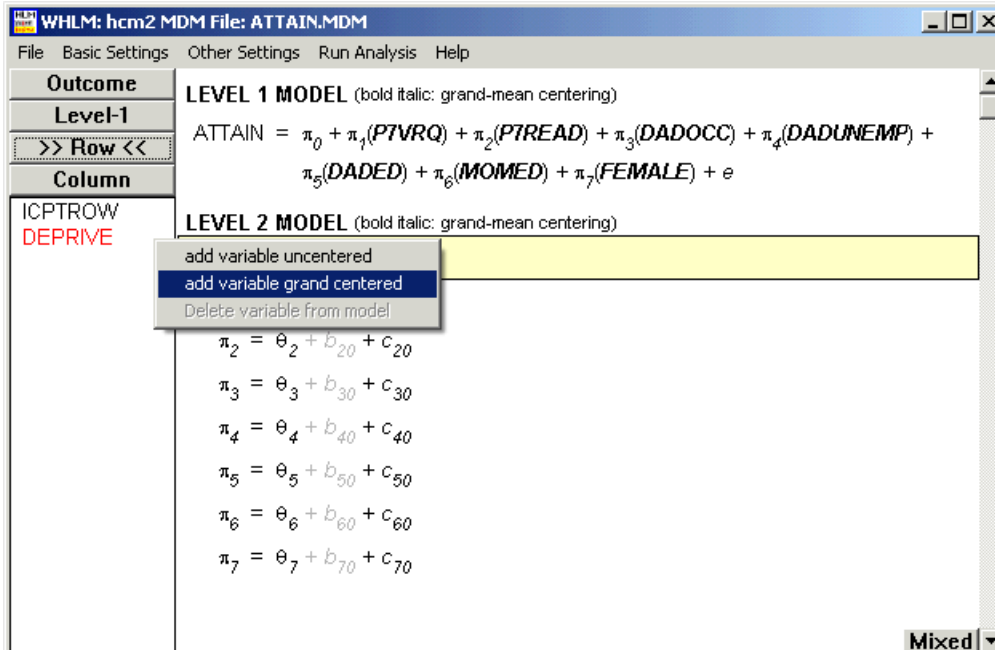
$$\pi_6 = \theta_6 + b_{60} + c_{60}$$

$$\pi_7 = \theta_7 + b_{70} + c_{70}$$

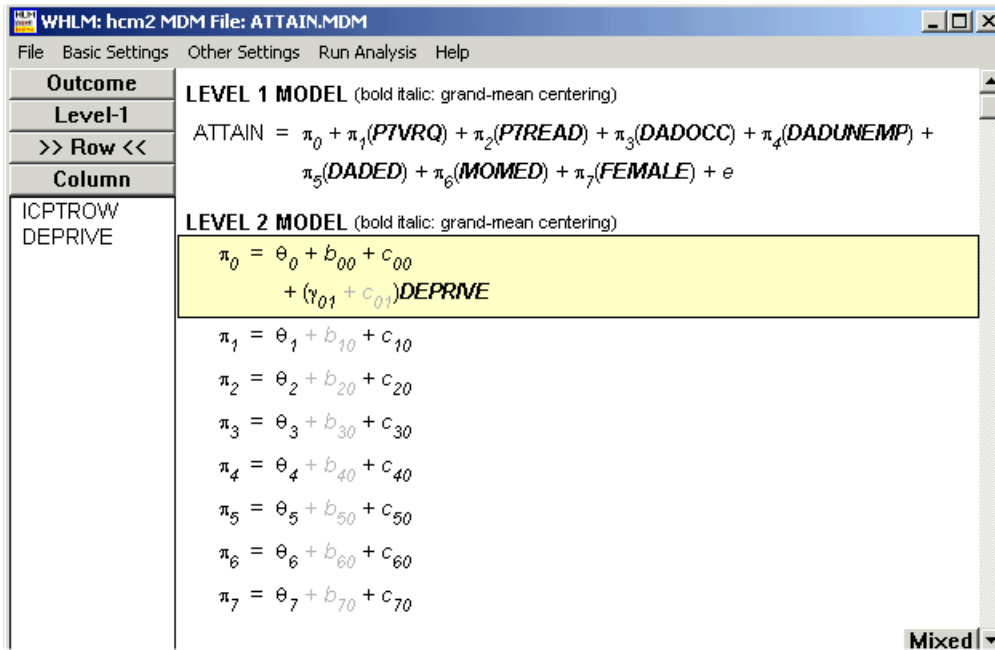
The equation for π_7 is highlighted in yellow. A "Mixed" dropdown menu is visible at the bottom right.

In the interest of parsimony, given the small cell sizes and within-neighborhood sizes, all level-1 coefficients are fixed. (To specify any of them as randomly varying, select the equation containing a specific regression coefficient, π_p , and click on b_{p0}).

To set up the level-2 row-factor prediction model, select the equation containing π_0 . A list box for row-factor variables (>>**Row**<<) will appear. Click DEPRIVE and apply the grand-mean centering scheme.



to obtain the model shown below.



The model can now be saved using the **Save As** option on the **File** menu. This enables the user to recall this model and make further modifications to it at a later date. To run the analysis, the **Run Analysis** option on the main WHLM window is clicked.