**Mplus BASICS**

Syntax Properties:

* Syntax is **not** case sensitive
* **Code line length:** no greater than 80 characters/columns (90 in newest version)
* **Variable names:** 8 characters in length or less.
* **End of line:** All statements must end in a semicolon ( ; )
* **Variable entry:** Must input the correct number of variables in order or Mplus will read data incorrectly. When copying datasets with hundreds of variables this can be a cumbersome and error prone process. This makes it highly recommended to make smaller datafiles with a subset of the variables to be used in your analyses.
* **Sub-setting variables:** By default Mplus will include all variables in the variable list in your analysis. To override the default use the **‘usevar = ’** statement to specify the subset of variables.
* **Variable type:** By default all variables are treated as continuous. To change a variable to a factor or categorical variable use the **‘categorical =’** statement. This will be a necessary step for LCA in which items are categorical.
* **Add comments (!**)**:** Use exclamation marks to annotate commands (green text).

Data Entry:

* **No strings:** Mplus does not read strings! Must take out any string variables and recode missing as a number (e.g. “NA” or “ – “ must be recoded into a number)
* **Data location:** The data-file must be saved in the same location or file-path as your input files.
* **Data types accepted by Mplus:** Mplus can read **.txt** files, **.dat** files, **.csv** files

File Types:

1. **Input Files ‘.inp’ :** This is where you specify the model to be run. The format of an input file has some basic elements shown below.
2. **Output Files ‘.out’ :** After running an input file an output file will be generated in the same location as your input and data files. This output file will have the same name as your input file with the exception of the ‘.out’ at the end. **Note,** if you re-run an input file without changing the file's name **it will overwrite the corresponding output file**.
3. **Data Files:** Before running any analysis always check that the data file is in the correct format. Scan over the matrix for any letter strings or other character/symbols.

**\*What about ‘.gh5’ files?** If you include a plot command you will also generate **.gh5** files. For this workshop we can ignore these files but should leave them to reproduce plots.

Mplus workflow basics:

* **Organize Mplus files in folders:** As you will quickly learn, running mixture models will result in a large number of files. This can quickly become a mess that will hinder reproducibility in the future (e.g., forgetting which file-name corresponds with which model). For example, in enumeration the procedure of testing models with 1 through 8 classes will result in **a total of 25 files**.
* **Naming files:** Because of the inevitable proliferation of models that will be generated when using Mplus choose names carefully, file names should be:
  + Descriptive, something you will remember
  + Not too lengthy
  + Include reference to **model**, **class #**, **data**, and **date** for your future reference
  + e.g., **modelA\_c5\_LSAY\_6.15.19.inp**
* **Workflow spreadsheet:** Create a spreadsheet that documents all steps and corresponding files taken in your analyses. Mixture models are complex and consequently your analyses may take a long time to complete. Documentation can be a life-saver, especially when working on a project over the time-period required for most publications!

Mplus Input File Main Elements:

Title: Name of the analysis

DATA:

file is ... ;

VARIABLE:

names are ... ;

Usevariables = ... ;

missing = all( ... );

ANALYSIS: ... ;

MODEL: ... ;

MODEL CONSTRAINT: ... ;

OUTPUT: ... ;

PLOT: ... ;

