

# Repeated Measures ANOVA using Proc Mixed

With no programming

# Pre- Post Test Experiment

A typical experimental design – subjects were either an experimental group or control group.

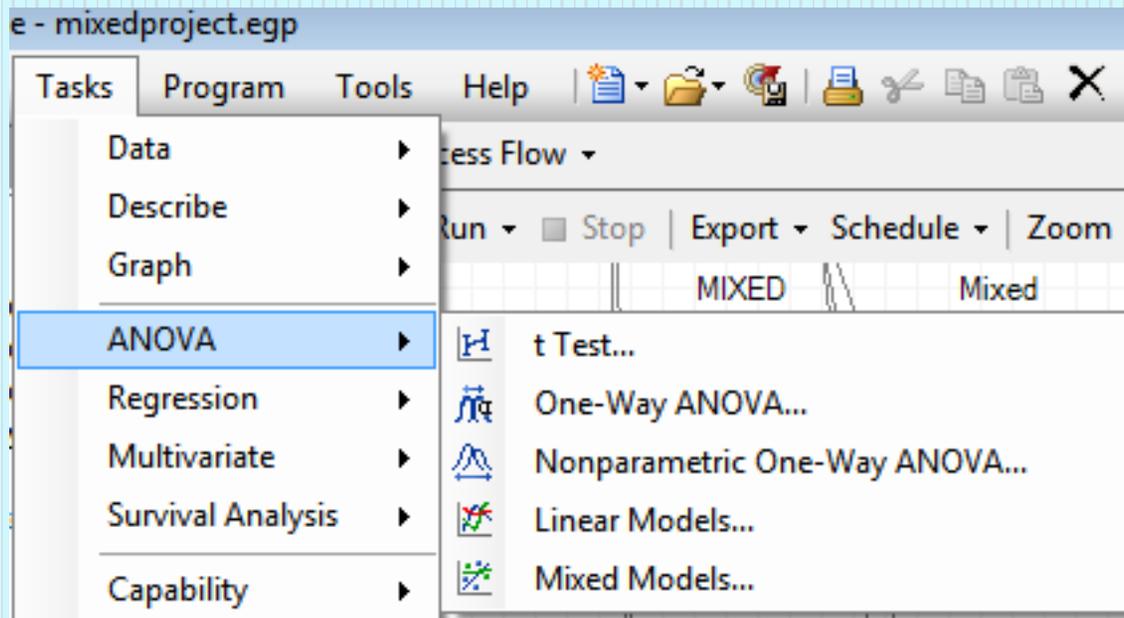
Both groups were given a pre-test and a post-test.

You want to test for significance of interaction between group and test. Your hypothesis is that such an interaction exists and the experimental group improved more.

# What to do & how to do it

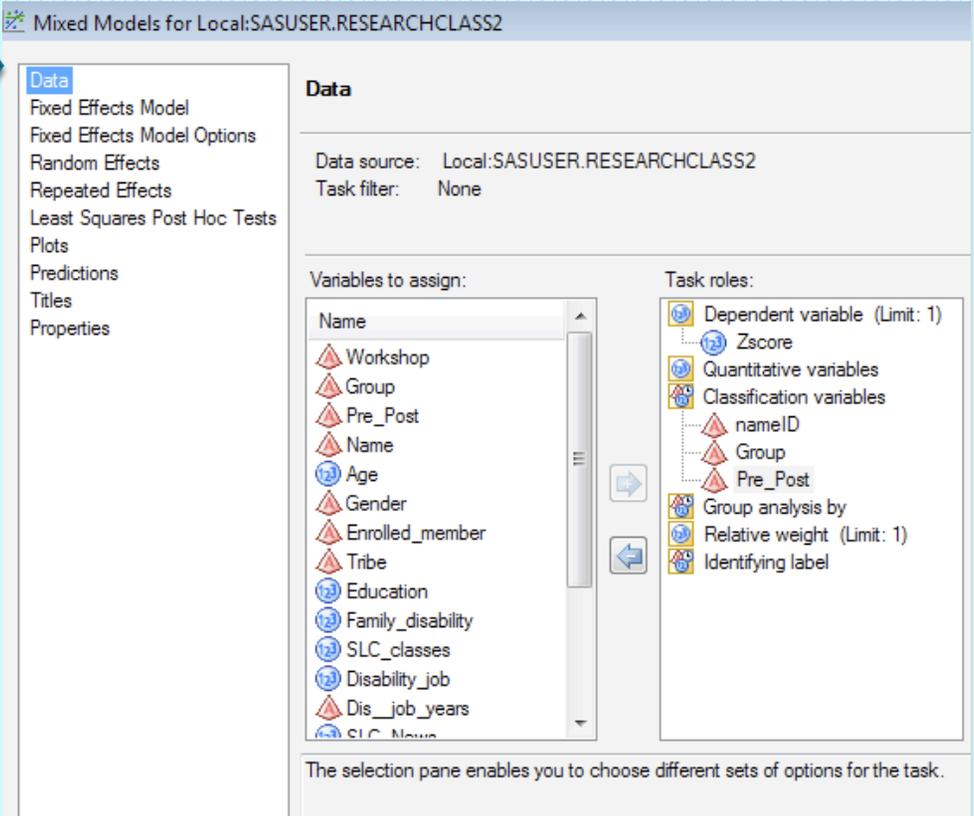
- You could do a mixed model ANOVA
- It is called mixed because it has two types of effects, fixed and random
- Your data should be in the format of one record for EACH measurement for each person, i.e., multiple records per person.

# Select MIXED MODELS task



# Mixed Model

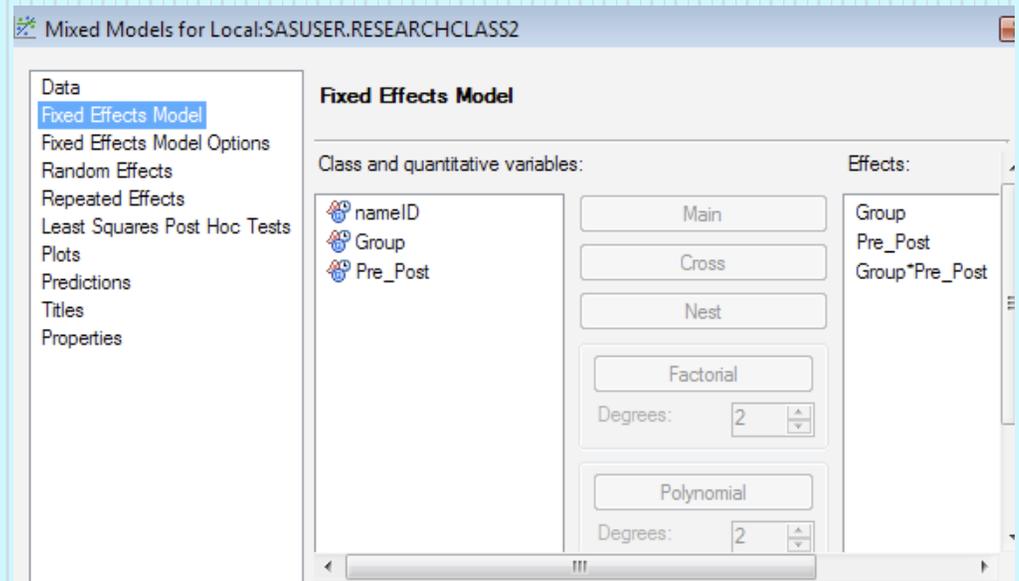
1. Click on Data
2. Drag ZSCORE under dependent variable
3. Drag NAMEID PRE\_POST & GROUP under classification



The screenshot shows the SAS Mixed Models software interface. A large blue arrow points from the first step of the instructions to the 'Data' tab in the software. The 'Data' tab is active, showing the 'Data source' as 'Local:SASUSER.RESEARCHCLASS2' and 'Task filter' as 'None'. The 'Variables to assign' pane lists various variables, including 'Workshop', 'Group', 'Pre\_Post', 'Name', 'Age', 'Gender', 'Enrolled\_member', 'Tribe', 'Education', 'Family\_disability', 'SLC\_classes', 'Disability\_job', 'Dis\_job\_years', and 'SLC\_News'. The 'Task roles' pane shows the following assignments: 'Zscore' is assigned as a 'Dependent variable (Limit: 1)'; 'nameID', 'Group', and 'Pre\_Post' are assigned as 'Classification variables'; 'Group analysis by' is assigned as a 'Relative weight (Limit: 1)'; and 'Identifying label' is assigned as an 'Identifying label'. A note at the bottom states: 'The selection pane enables you to choose different sets of options for the task.'

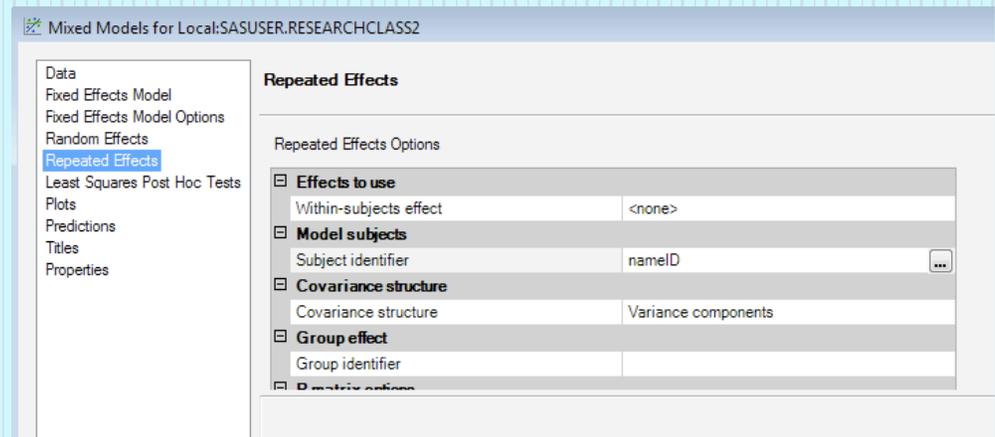
# Mixed Model: Continued

1. Select **FIXED EFFECTS MODEL**
2. Select **GROUP & PRE\_POST** and click on the **Main** button
3. Select **GROUP & PRE\_POST** at the same time by holding down the shift key and click on the **Cross** button



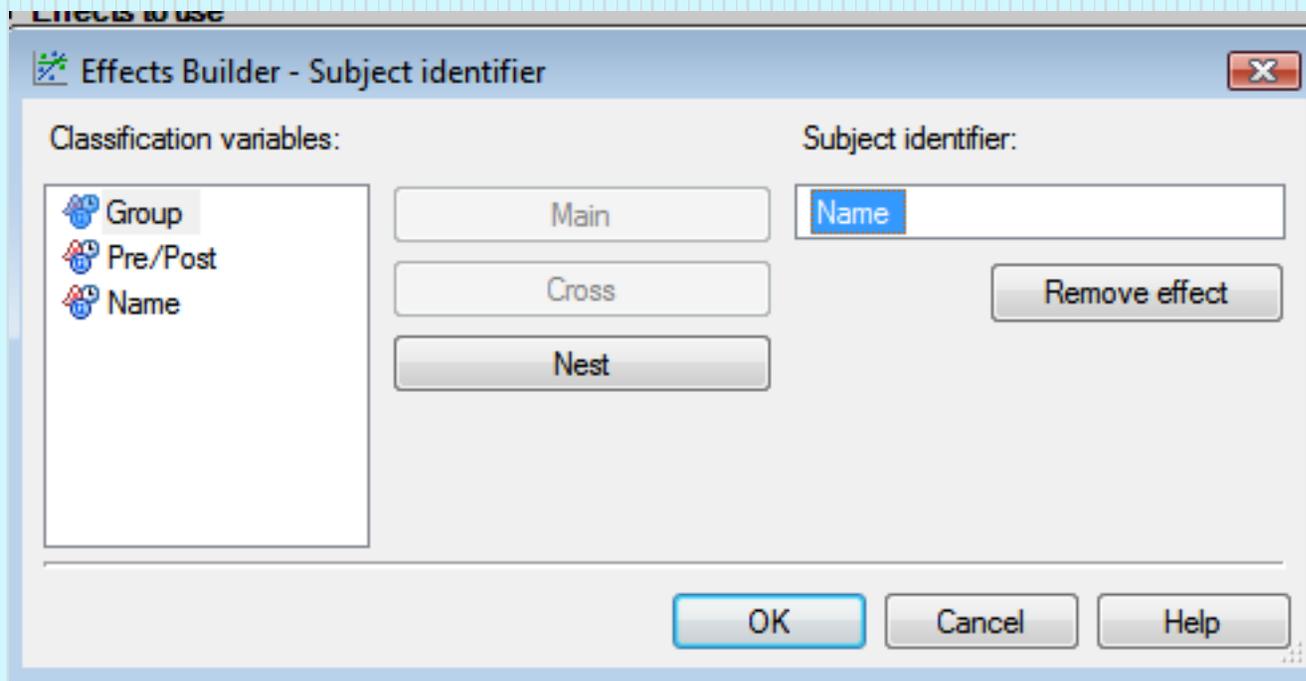
# Mixed Model: Repeated

1. Click on REPEATED EFFECTS
2. Click on the ... next to Subject Identifier
3. Select NAMEID as the Subject Identifier.



# Mixed Model: Repeated

1. Click on Name, the NEST button will no longer be grayed out
2. Click on Group
3. Click NEST



# Mistakes not to make

1. Even though it makes perfect sense to think of the subject identifier as a random effect (which it is) do NOT identify it as a random effect. The random effect is for random effects that are not repeated. In this example, there were no such random effects.
2. Know the difference between crossed & nested effects. Here we have both crossed and nested effects

[http://support.sas.com/learn/statlibrary/statlib\\_eg4.2/eg\\_anova\\_4.htm](http://support.sas.com/learn/statlibrary/statlib_eg4.2/eg_anova_4.htm)

My point !



## Sorry, but ...

- Whether you use REPEATED vs RANDOM, the type of covariance, whether you use PROC GLM vs PROC MIXED. None of it matters a great deal unless your model is borderline.
- What does matter is if your model is completely WRONG, that is if you leave out the repeated effects, don't realize that subjects are nested within schools

So, Chris Rock was wrong. You need  
to know why\*

