Data Analysis Session

Methods Overview

- You were presented with spoken words paired with text at 4 levels of noise (0dB, 65dB, 67dB and 69dB).

- The words could be:
  - Matching (i.e. you heard 'dog' and saw 'dog').
  - Not Matching (i.e. you heard 'chisel' and saw 'burger').
  - Phonologically similar (i.e. you heard 'gown' and saw 'noun').
  - Semantically Similar (i.e. you heard 'studio' and saw 'workshop').

- After each word pair you were prompted to recall either what you heard or what you saw.

- You also performed auditory and visual controls at each of the 4 noise levels.

- You are only required to analyse the data where the participant was asked to recall what they heard.

Data Analysis

- Two excel files have been made available to you:
  - *'PHY3111 2014 Cohort 2 Percentage Data.'* Use this data to plot your graphs.

  - *'PHY3111 2014 Cohort 2 Transformed Data.'* Use this data to conduct ANOVAs'

- The percentage data file includes the data for the % of words which were correctly recalled at each of the tested noise levels and for each of the different text-speech relationships.

- The files also include the % of responses for which the subject mistook text for speech.
  - I.e. If a participant heard 'dog' and saw 'cat' and then incorrectly said 'cat' when prompted to recall what they heard.

- In the transformed data file the percentage data has been arcsin sqrt transformed .
  - So if a participant originally scored 90% this would become asin(sqrt(90/100))=1.25.

Data Analysis

- Use the files to plot and analyse the following:
  - % correct at no noise (single factor repeated measures ANOVA)

  - % wrong modality at no noise (single factor repeated measures ANOVA)

  - % correct at the 3 noise levels (two factor repeated measures ANOVA)

  - % wrong modality at the 3 noise levels (two factor repeated measures ANOVA)

  - We will go through how to do the required analysis for the correct at 3 noise levels data in GraphPad

Step 1: Create a new project

Step 2: Name the columns and the rows

Step 3: Create the 22 subcolumns for each of the participants

Step 4: Copy relevant data from the '…*Transformed Data.xlsx' file to graphpad using paste transpose*

Step 5: Click Analyze

Step 6: Select Two-way ANOVA and click OK
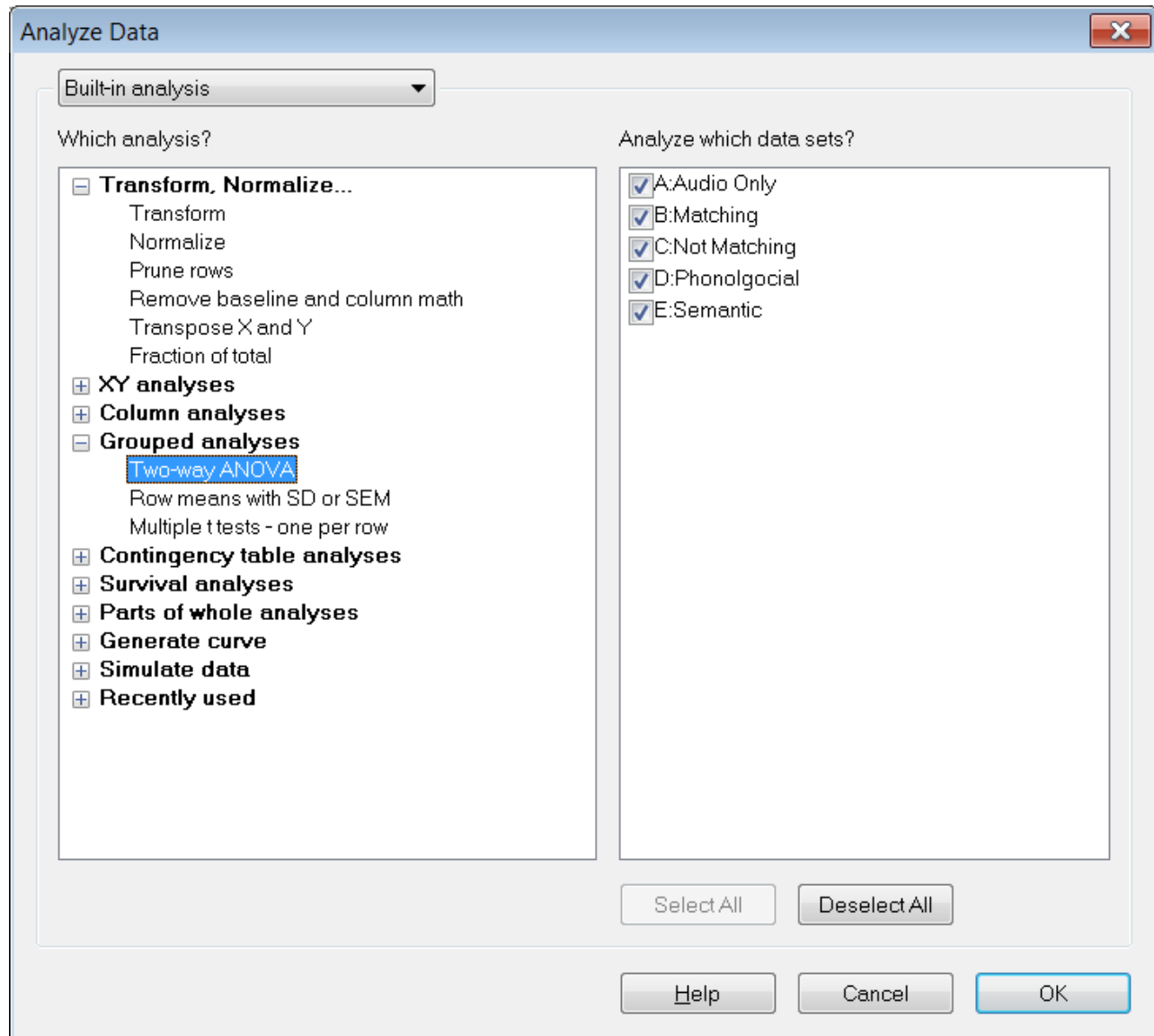
Step 7: In the Experimental Design tab choose Repeated measures by both factors and name the column and row factors.

Step 8: In the Multiple Comparisons tab choose the type of Multiple Comparison you would like to make.

- You can compare each cell mean with just the audio only condition.

    OR

- You can compare each cell mean with every other cell mean, if you require this comparison to check your hypotheses.
    - Note that as this option performs more comparisons, the significance tests may produce different results.

- When you perform this analysis for the wrong modality responses you will have to compare each cell mean with every other cell mean.

Step 9: In the Options tab choose to Report multiplicity adjusted P value for each comparison

Step 10:Press OK

Step 11: The repeated Measures ANOVA results will be in the Tabular results tab

- Report the F statistic, not just the p value.

- If there is a significant interaction the main effects cannot be interpreted reliably.

- You will need to use the multiple comparisons test results.

Step 12: The Multiple comparisons are in the Multiple comparisons tab.

Purpose

- Why does matching text rescue the recall of degraded speech?

- Your explanation should be grounded in the literature.

Word recall in auditory noise