SPSS Lab 12

Factorial ANOVA and ANCOVA

Demo

Solve the Bil 311 homework problem 10-1:

- Run SPSS or SAS for the 1-way ANOVA problem 12.50 using **iqp_raw** as the IQ dependant variable (***not iqf!***) and lead_typ as the independent factor. Use LSD and Bonferrroni Post Hoc Tests. Run ANCOVA with age as the covariate and compare to your previous results (post hocs do not work here). Run a 2-WAY ANOVA with lead_typ and area (proximity to site of exposure) as the independent variables. Paste the results' tables to a Word file, where you will describe the tests performed and discuss and compare the results. Page 33 in book has more study details.

Repeated Measures ANOVA

Lab Assignment 2

In order to study the situation when the same people or subjects contribute to the different means we run ANOVA on repeated measures data. If we had only 2 measurements it would be "paired" data, but because we have more than 2 measurements we say we have repeated measurements on the same subjects.

- We will test the pain effect of Botox injections on two groups of people, cases and controls. People in the control group receive Botox injections and people in the control group receive placebo injections. The participants are asked to score the level of pain they experience at different times during the next few months on a scale of 0 to 100. Open file botox1.sav. It contains a field group, which indicates if the participant received the placebo (2) or Botox(3) and several fields with prefix "pain", that contain the pain score for each month.

    a. We see several missing values. Delete all records (rows, participants data) with missing values in fields pain0.5, pain1, pain2, pain3. Do you remember how that was done? Check out past Lab demos and assignments.
    b. We also see several zero values. Delete all records that contain a zero in any of the 4 fields: pain0.5, pain1, pain2, pain3.
    c. Delete all records for participants of group 1.
    d. Go to Analyze\General Linear Model\Repeated Measures.
        i. Where it says factor1, type in pain. Where it says number of levels type in 4. Why? Because we are testing 4 different pain levels. Click Add. Click Define.
        ii. Now select fields pain0.5, pain1, pain2, pain3 and move them to the within-subjects variables box.
        iii. Move field "group" to the Between-Subjects Factors box
        iv. Click on contrasts. In the selection box contrast select "repeated" and click change. Click on continue.
        v. Click on Plots, and add pain to horizontal axis and groups as separate lines and click add. Click continue

vi. Click Post Hoc and move group to the Post Hoc test box and select LSD and Bonferroni.
vii. Click Options and select all factors and move them to the right box. Check "compare main effects" and choose Bonferroni as the confidence interval adjustment. Click on descriptive statistics and on transformation matrix. Click on continue.
viii. Now click OK.

- Let's analyze the results now.
  a. In "Descriptive statistics" you can double click on the table and then choose "Pivot" and "pivoting trays" from the top menu to get a list of the pain means by group. Describe the results. You should obtain this if you select group 3 (the placebo group):

Descriptive Statistics

group: 3.00

	Mean	Std. Deviation	N
pain05	50.3000	34.00670	10
pain1	57.5000	31.90698	10
pain2	70.5000	26.81728	10
pain3	71.0000	26.85351	10

  b. Let's look at Mauchy's test of sphericity. This test is equivalent to the homogeneity of variance tests (Levene test) of regular factorial ANOVA. It tests that the "Differences" between the repeated measurements have equal variances. If Mauchy's test is significant we conclude the variances are significantly different and we must be wary of the F-ratios produced by the computer. What is your conclusion?
  c. SPSS produces corrected F-values when the sphericity assumption is violated. Look at the Tests of Within-Subjects Effects table. The first row shows the F-test results when equal variances (sphericity) are assumed. The other rows "Greenhouse-Geisser", "Huynh-Feldt," "Lower-bound" shows corrected F-test that are valid even when the sphericity assumption is violated. Look at the p-values and describe how they compare to the first row.