1. In a study of children's behavior problems, 20 children were rated on the level of aggressive behavior. They were rated by their parents, their teachers and themselves. Data are in the file `BehaviorRating.dat`. Use SPSS or R for this problem.

1.1 Present the outputs that include Mauchly's test, estimates of correction factors and the univariate corrected and uncorrected tests. What is the purpose of Mauchly's test? Use Greenhouse-Geisser correction to test the null hypothesis that the three ratings have equal population means. Draw conclusion in terms of the research background.

1.2 From the information in the output, recover the ANOVA table in the format of Problem 1 of HW10.

1.3 Present the multivariate tests. Do you get the same conclusion as 1.1?

1.4 Test the three pairwise comparisons. Present the two-sided (uncorrected) p-values. Use Bonferroni correction to draw conclusions.

2. An experiment with one balanced between-subject factor Group (G) and one within-subject factor Treatment (R) yields following sum of squares and dfs:

$SS_S = 60$ $(df = 23)$; $SS_G = 21$ $(df = 2)$; $SS_R = 36$ $(df = 3)$;

$SS_{R \times G} = 90$ and $SS_{R \times S(G)} = 60$.

2.1. Construct an ANOVA table in the same format as in my notes. Note: not all cells in the table require an entry. Obtain CVs for the three tests.

2.2. How many groups are there in the experiment? How many subject are there in each group? How many repeated measures are there?

3. In a study comparing different treatments of an anxiety disorder, clients were randomly assigned to three balanced groups, each receiving a different treatment. The clients were measure before, after and 3.5 months after the treatment on the severeness of their symptoms. Data are in the file `PTSDmixed.dat`. Group labels are 1 = Stress Inoculation (SIT); 2 = Prolonged Exposure (PE); 3 = standard Supportive Counseling (SC). Assume homogeneity of variances and covariances across groups.

27 3.1 Obtain and display an interaction plot with groups as separate lines and time on the X

1 axis. You only need to show the group average profiles, not the individual persons' profiles.

2 Make sure to properly label the axes and their ticks and include an legend with labels for

3 the different lines.

4 3.2 Do the three groups differ in their pre-treatment level? Run a one-way ANOVA on the

5 pre-treatment measure and display the ANOVA table. Draw conclusion.

6 3.3 Run ANOVA to test the interaction between treatment and measurement time. Dis-

7 play the relevant outputs including the correction factors and the univariate corrected and

8 uncorrected tests. Draw conclusion with G-G correction.

36 3.4 Display the multivariate test of interaction. Do the four statistics yield the same p-values?

37 Which statistic should you use?