

(possibly incomplete list of)

Topics Covered in Chapters 7 and 8

Chapter 7 – One-Way Analysis of Variance

The one-way ANOVA table and notation (including how to make the table)

The assumptions for the one-way ANOVA

What hypothesis the basic ANOVA F-test tests

What a dummy variable is, and that you can do an ANOVA using dummy variables and regression

How you can tell what the different F statistics are used for by looking at the E(MS)

That the one-way ANOVA and two-sample t-test are identical for two samples

That the modified Levene's test (a.k.a. Brown and Forsythe test) can be used to test the variances are equal

Family-wise type I error, α_F , versus comparisonwise type I error rate, α

What it means for a statistical test to be conservative and liberal

Which of Bonferroni and Fisher's LSD is conservative, and which is liberal

How the Holm Test works

Making a display from the Holm test on all pairs of treatment levels*

How to construct contrasts*

How to show contrasts are orthogonal* (only works when the ANOVA is balanced)

What the estimates and tests corresponding to contrasts tell us*

Making confidence intervals from contrasts*

When to use each of the following: the basic ANOVA test, Holm test for each pair of tests, and Contrasts

Interpreting the SAS output

Chapter 8 – Two-way Analysis of Variance

What Factorial, Fixed Effect, Balanced, and With Replications mean*

How to tell when these do not hold*

How to use the ANOVA table and how it fits together (you should know the equation for the SS_{wit} and SS_{bet} and SS_{tot} because they are the same as for regression, but not the other equations)

The model for the two-way ANOVA with interactions, and what the terms in the model mean

The relationship of the 2 by 2, two factor ANOVA table with interactions to the orthogonal contrasts in a one way ANOVA with factor levels A-I, A-II, B-I, B-II (for example).

What about the interpretation gets more complicated when there is an interaction, and how you can represent the output of a two-way ANOVA

What to do when there are no replications (get rid of the interaction term), and why this is necessary

That the usual formulas (and some programs) do not work correctly if the design is unbalanced, but that PROC INSIGHT and PROC GLM will still work correctly

Interpreting the SAS output

NOT: Supplement to Chapter 8

*=not in text