Multivariate Statistics - Revision Notes

Topic list – contents explained throughout the definitions

1. *Correlation and regression*
2. *Theory behind regression; testing assumptions and dichotomous variables*
3. *SPSS data modification and data screening*
4. *Introduction to multiple regression*
5. *Hierarchical Regression, Mahalanobis and Historical Regression*
6. *Factor Analysis*
7. *Factor Analysis with SPSS*
8. *SPSS to produce a factor analysis*
9. *Refining and assessing a factor analysis*
10. *ANOVA and single factor MANOVA*
11. *Within-subjects MANOVA, Single Factor within – subjects MANOVA*

Notes

<0.05 - is significant relationship

IV and DV - It helps to consider the variables of interest in terms of the effect you are attempting to measure. The DV is really an outcome that you are interested in looking at based on the effects of the IV/s. Sometimes it is helpful to think of it in terms of which variables are *causing* a change in another variable. E.g., If I wanted to examine the effect of rainfall on pasture growth, I could think about this in terms of the rainfall causing the pasture to grow. Thus, the IV would be amount of rainfall, and the DV would be amount of pasture growth. /The DV (Y) should be represented on the vertical axis. The IV (X) should be represented on the horizontal axis. /DV - what I want to predict

No. of Participants – Use the ANOVA Table, df total +1. N = df+1

Predictor Variable = IV

Correlation - A correlation analysis seeks to determine the strength and direction of the relationship between two metric variables. It is not easy to tell between an independent and a dependent variable in a correlation. One should look at the shape, direction, and strength of a relation in a correlation. The sign of a coefficient indicates whether or not the shape is positive or negative./ A correlation is an analysis that looks at the relationship between two variables./ In a correlation it is not always possible to distinguish between your IV and DV / When doing a Pearson correlation, the shape of the correlation should always be linear and it's a measure if strength of the relationship. Always check the scatterplot first to check for nonlinear, before using Pearsons r / Pearsons correlation is rsquared = SS regress divided by SSy . Thus, rsquared measures the proportion of variation in the DV can be explained by the regression equation.

Partial Correlation Coefficients – refers to the relationship between the IV and DV after accounting for the other IVs /This is used to help understand the relationship between three or more variables / It is able to measure the relationship between two variables while controlling for the effect that a third (or more) variable has on them both. The cause in the IV and the effect is the DV and then you have in the middle confounding factors /the zero column relates to out Pearsons r, The Pearson correlation for Palm size is *r* = .63, this is found under zero order column and you round up to two decimals. This is a moderate positive relationship. This represents the linear relationship between palm size and verbal ability, calculate to only two decimals. Then you look at the Partial column which may represent a very different relationship re stat being less than which means that it is effected by other variables (confounding variables)

Steps involved - Compare zero-order to partial correlations in the 'Coefficients' table /If the partial correlation is lower than the zero-order correlation….need to investigate why! /Check the 'Correlations' table /Identify IVs significantly related to the DV /Identify IVs significantly related to the variable in question /Conclude what has caused the correlation to decrease