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Multivariate Stats Final

1. Of the numerous themes discussed in Rosnow and Rosenthal’s (1989) article, *Statistical procedures and the justification of knowledge*, which two are the most significant points (*p* < .05), in your assessment? (a) **Argue** for their importance and (b) develop some implications they have for one of **your own** (past, current, or future) research projects.

2. Orthogonality between two vectors is an essential concept in statistics. (a) Explain what orthogonality means and how one can assess it. (b) Discuss the importance and specific role of this property for **3 distinct topics** we covered in this class.

* 1. Describe (a) the **similarities and differences** between *logistic regression*, *loglinear analysis*, and *logit analysis* and (b) briefly describe, for each technique, one example (fictitious or real) for which the particular technique is **clearly** the best choice.

Logistic regression: binary outcome, continuous predictors

Loglinear: Is there a relationship between multiple (more than 2) categorical variables, tests interactions AND main effects. Variables aren’t selected to be IV or DV.

1. In factorial (multi-way) designs you have a choice between running either traditional main effects + interactions or simple effects instead. (a) **Define** interactions and simple effects and (b) **provide explicit arguments** for the strategy best suited for each of the following designs:

(I) Testing the effectiveness of an anti-depressant drug vs. a placebo for treating anxiety in depressed patients, obese patients, and anorexia nervosa patients (2 ́ 3 design).

(II) Examining the incidence of intentional childlessness among hetero vs. gay/lesbian couples who are either married or unmarried (2 ́ 2 design).

5. Researchers investigated the effects of wine drinking on depression and academic productivity, and you are hired as a consultant to analyze the data. The documentary material you look at reveals that the researchers tested 300 participants. Each participant received two cases of wine (= 24 bottles of 750 ml each) and was asked to have one 150 ml drink (about 5 fl. oz.) each day for four months. Participants were randomly assigned to receive either high- alcohol wine, low-alcohol wine, or nonalcoholic wine. Depression was measured by a person’s score on the CES-D (a depression scale for the general population); productivity was measured by a person’s overall score on a multi-item work activities survey. These two measures were administered on Day 0 (the day the study began), on Day 60, and on Day 120.

Your task is this:

1. (a)  Sketch the structure of the **data file** so you clearly see all the relevant variables.
2. (b)  Precisely describe the **design** of the study.
3. (c)  Devise the best possible **analysis technique** for these data that makes use of all collected information.
4. (d)  Write appropriate SPSS **syntax** for this analysis.
5. (e)  From the potentially long and complex output, identify those results that **best**

**answer** the wine researchers’ question: *whether wine intake showed any benefits*.

(It is helpful to create a small simulated data set and actually run the analysis to have the

output in front of you; but you are not obligated to do so.)