

Study Questions for Quiz #3

Design Varieties

1. Describe the dimensions/attributes used to organize the variety of single-factor research designs and explain under what conditions results from which of the resulting designs may be causally interpreted.

Design Conditions & Variables

2. Describe the advantages of multiple condition designs, the different kinds of conditions that may be included and how a researcher decides which conditions to include in a research project.
3. Tell the different types of variables involved in a design and how one decides the role of a variable in a particular study.
4. Differentiate between ways of controlling subject and procedural variables and tell why “equivalent on the average” is sufficient to allow causal interpretability of research results.

Pairwise Comparisons

5. What is the H_0 for ANOVA when applied to a multiple condition design? What is the limitation of this procedure, and what do we do to accompany this initial test? How do we choose what additional analyses to perform?
6. What are “alpha inflation” and “alpha correction”? Describe the three ways to assess Experiment-wise Type I error. Which of these do you prefer? Explain your answer carefully.
7. Be prepared to describe each of the following pairwise comparison methods, or to compare and contrast any pair.
Fisher's LSD Fisher's protected LSD Tukey's HSD Scheffe's Bonferroni/Dunn's

Analytic Comparisons & Trend Analyses

8. Distinguish between simple comparisons, complex comparisons, trend analyses and pairwise comparisons and tell when the results from each of these can be causally interpreted.
9. Distinguish the information obtained from a trend analysis versus from a series of pairwise comparisons and give a carefully explained example of each being used when the other should have been.

k-group Confidence Intervals & Power Analyses

10. Describe the different effect size estimates and how each can be applied to omnibus and various follow-up analyses. (Be sure to include the differences of the treatment of between and within-groups models).
11. Describe how to define S , N & n when using Friedman's power table for BG & WG k-group designs
12. Describe how to combine the information from pairwise NHST, CIs and effect size estimates to better understand your results.

BG & WG ANOVA

13. Describe “total variation” and explain how it is portioned differently by BG and WG ANOVA models. Describe how the F-test is computed differently for these two types of ANOVA and explain the effect this has on the F-value and effect size for the two models.
14. Tell how the “more realistic” ANOVA model partitions “total variation” for BG and WG ANOVA models. Why is this called “more realistic” and what warnings does it give us about applying ANOVA to our research data.
15. Describe how we can use the “more realistic” ANOVA model to anticipate how certain aspects of the research design will influence F .

k-group X^2

16. What is the H_0 for X^2 when applied to a multiple condition design? What is the limitation of this procedure, and what do we do to accompany this initial test? How do we choose which follow-up procedure to use?
17. What is “alpha inflation” and how does one calculate the extent of it for a given set of X^2 follow-up analyses? Describe the three ways to assess Experiment-wise Type I error. Which of these do you prefer? Explain your answer carefully.