

## Lab Exercise #7 One-way ANOVA and Factorial Designs

### Tutorial Objectives

- 1) Learn how to compare multi-group means data using one-way ANOVA
  - 2) Understand the F statistic and how to interpret SPSS ANOVA results.
  - 3) Understand the difference between ANOVA contrasts and post hoc tests.
  - 4) Know the strengths and weaknesses of various post hoc tests
  - 5) Know how to construct and test a factorial model in the SPSS GLM procedure
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- 1) Obtain the “U.S. Forest Service (1996) Survey” data set. This survey data represents the attitudes, beliefs, and preferences of U.S. Forest Service employees on various resource management issues. Employees were asked to place themselves somewhere on a land ethic variable (q14) whose values ranged from 0 (extreme biocentric position) to 5.5 (extreme anthropocentric position). Answer the following questions:
    - a. Is the land ethic variable (q14) normally distributed?
    - b. What is the mean value for land ethic variable?
    - c. What is the standard deviation?
    - d. Test the hypothesis that men differ from women (gender is variable q11a) on the land ethic variable. Whose land ethic appears to be more biocentric?
    - e. Do significant correlations exist between land ethic (q14) and attitudes toward resource management activities (q12\_1 through q12\_6)? Which relationship is the strongest? Which relationship is the weakest?
    - f. Do professional foresters (q5) statistically differ from wildlife biologists in their land ethic orientation (q14)?
    - g. Of the professions listed in (q5), which professions statistically differ in their land ethic (q14)?
    - h. Of the professions listed in (q5), which professions statistically differ in their preference for increased production of wood from national forest lands (q12\_1)?
  
  - 2) Obtain the googles.sav “ data set. This data represents an experiment to determine whether alcohol makes members of the opposite sex appear more attractive—a test of the “beer googles” effect. In this experiment, 24 men and 24 women were taken to a pub (gender is coded 0 for male, 1.0 for female). Eight men and eight women were given a placebo (non-achoholic) drink, eight men and women were given 2 pints of beer, and eight each were given 4 pints of beer. Each individual had a photograph taken of the person they spent the most time talking with. The next day, an expert panel rated the attractiveness of the individual on a scale of 0 to 100. You are to conduct statistical analysis of the data to determine if the effects of gender, alcohol, or the potential combination of the effects resulted in selecting chat partners that were more or less attractive. Note: this is a 2 x 3 factorial model (two independent variables with one dependent variable) and you will need to use the SPSS General Linear Model (Univariate).
    - a. Does chat partner attractiveness differ by gender? Provide evidence.
    - b. Does chat partner attractiveness differ by the level of alcohol consumption? Provide evidence.
    - c. Does the interaction of alcohol and gender affect chat partner attractiveness? Provide evidence.
    - d. Explain what you think is going on in the experiment.