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Assignment 2

Part I

1. Below are 3 experimental designs. Please tell me the following for each:
    a. What type of experimental design is being implemented and reasons why you think it is that design
    b. What are/is the independent variable(s) and what type of independent variable(s)
    c. What is the dependent variable

Experimental Design 1: A researcher is interested in whether or not different name brands of workout clothes that claim to keep the exerciser "drier" are different .To explore this, the researcher gathered a group of 10 individuals who run at least 3 miles daily. For a week, each individual tried Nike brand workout clothes while running. The next week, each individual tried Reebok brand workout clothes while they ran. The last week, each individual tried New Balance brand workout clothes during their daily runs. Data was collected and analyze to see if a difference exists between the three name brands and level of dryness and individual had during their run.

1) Within Subject Design because data is coming from the same individual (subject receives multiple treatment conditions)
2) Independent variable: type of workout clothes being worn
3) Dependent variable: amount of dryness experienced by the subjects

Experimental Design 2: A researcher is interested in the number of college students living off campus. The researcher believes that the number of students living off campus depends on whether or not the student has a car and whether or not the student is from out of state. To test if a relationship exists between living off campus and whether a student has a car and is from out of state, the researcher gathered data from 400 college students.

1) Factorial Design because each factor is crossed with each other factor
2) Independent variables: own a car & out of state status
3) Dependent variable: live off campus

Experimental Design 3: Suppose a mathematics specialist wishes to compare elementary students' responses to 4 new methods of teaching multiplication over a 6 week period. He randomly assigns the students to one of four groups. The students in each group receive a different math program and their mathematic ability for solving multiplication problems is tested at the end of the 6 weeks.

1) Between Subject Design because each subject only receives one treatment condition
2) Independent variable: 4 teaching methods
3) Dependent variable: multiplication ability

2. Read the following passage and answer each question;

Foorman, Fletcher, Francis, Schatschneider, and Mehta (1998) investigate the Role of Instruction in Learning to Read to prevent Reading Failure in At-Risk Children. In their study, first and second graders (N = 285) receiving Title I services received 1 of 3 kinds of classroom reading programs: direct instruction in letter-sound correspondences practiced in decodable text (direct code), less direct instruction in systematic sound-spelling patterns embedded in connected text (embedded code), and implicit instruction in the alphabetic code while reading connected text (implicit code). [Foorman, B.R., Francis, D.J., Fletcher, J.M., Schatschneider, C., and Mehta, P. (1998), The role of instruction in learning to read: Preventing reading failure in at-risk children, *Journal of Educational Psychology*, 90, pp. 37-55.]

a. State the null hypothesis and alternative hypothesis of this study
   H_0: There is no difference among three instructions on reading comprehension for At-Risk kids in first and second grade. ($\mu_{direct}=\mu_{embedded}=\mu_{implicit}$)
   H_A: There is difference among three instructions on reading comprehension for At-Risk kids in first and second grade. (Not all μ's are equal.)

b. Which of the following could be an unavoidable source of experimental error?
   A. variation in students' age
   B. variation in students' cognitive ability
   C. variation in teachers' teaching experience
   D. length of instructions during the study

Part II (SPSS)

A study was conducted in a graduate statistics course to determine the effectiveness of the inclusion of tutors on students' quiz scores. The class was split into two groups. Group one was allowed to have assistance from a tutor once a week prior to taking a quiz. Group two was not allowed help outside of collaboration with classmates. At the end of one month the two quiz scores were entered into a spreadsheet and prepared for analysis.

1. Import the Excel file "Homework 2 Data" into SPSS. **(Remember use "File" then "read text data")** Be sure that variables are named "Group", "Score1" and "Score 2.

2. Once the data is imported, obtain descriptive statistics on the data including: mean, median, and standard deviation on the entire sample. Record those values here: Mean _____ Median _____ and Standard Deviation _____. **(Remember: "Analyze", "Descriptive Statistics", "Descriptives")**

   SCORE1:mean= 8.87 median =8.79 std dev=1.01, SCORE2: mean=9.58 median=9.53 std dev=.84

3. After obtaining the descriptive on the data, use the "Split file" option to compare group one and group two. **(Remember use "Data" then "split file". "Compare groups based on " Group").**

4. Once the file is split, repeat the step for obtaining Descriptives. Record the new information: Mean G1_____, Median G1_____, Standard Deviation G1_____, Mean G2_____, Median G2_____, Standard Deviation G2_____

   G1: Score 1 mean=9.43 median =9.52 std. dev=.81, Score 2 mean=9.74 median =9.73 std. dev=.85
   G2: Score 1 mean=8.31 median =8.33 std. dev=.90, Score 2 mean=9.40 median =9.33 std. dev=.83

5. Are there differences in the new values obtained? Why or why not?

   Yes, because the groups are split so that they are more homogenous and treatment effects are removed per group.

6. Return to "split file" and select to analyze all groups.

7. Now go to "Analyze" and compare the means of the groups**. (Remember: "Analyze", "Compare Means", "Means")**. Is there a difference in the group means based on tutoring? What is the evidence for this?

Yes there is a difference in group means, it is assumed that this is based on tutoring and evidence is the higher mean scores for "Group 2" for the group which received the tutoring.