

Psyc 493 Workshop: Statistics for Senior Thesis

Exercise 1

1. Have 15 MSU–Billings students complete the survey.
2. Bring a 3.5" disc or jump drive to class/lab in second week of classes to download copy of blank Excel file in which to enter your survey results.
3. Bring disc or jump drive with completed Excel file to class/lab in third week of classes, to transfer data to class Excel file. Instructor will then transfer all compiled data from Excel to SPSS. Students may then copy the SPSS file to their own disk or jump drive.
4. Note: Exercise 1 is due at the beginning of class/lab during third week of classes and will not be accepted thereafter.

Exercise 2

1. Using SPSS, do the following:
 - a. Compute the mean and standard deviation for each of the interval or ratio variables.
 - b. Compute the median for each of the ordinal variables.
 - c. Compute the mode for each of the nominal variables.
2. Turn in printout of these statistical measures.

Exercise 3

1. Select five variables: one nominal variable, one ordinal variable, one scale variable (i.e., either interval or ratio). The remaining two variables may be any type.
 - a. Use SPSS to obtain an appropriate table of the results of our survey for each of these five variables.
 - b. Use SPSS to obtain an appropriate graph of the results for each of these same five variables. Remember: interval/ratio variables use line graphs, ordinal variables use histograms, and nominal variables use bar graphs.
2. Turn in printout of these tables and graphs.

Exercise 4

1. Using SPSS, use the *Recode* function to create a new variable from the old variable, *Age*. Create the following groups: 15 to 19 --> 17; 20 to 24 --> 22; 25 to 29 --> 27; 30 to 34 --> 32; 35 to 39 --> 37; and so on.
 - a. Print out graphs of the original *Age* data and the new *Age* data. Which graph do you think is easier to understand?
 - b. Compute the mean of the original *Age* data and the new *Age* data. Why are these two means not the same value? Which value would you use in writing a research report?
2. Create a new variable, *Number of Addictions*, as follows:
 - a. First use the *Recode* function to create a new variable from the old variable, *Alcohol*. Create the following groups: Score on alcohol of 1 --> 0; score on alcohol of 2 to 5 --> 1.
 - b. Use the *Transform* function to create a new variable, *Number of Addictions*, by adding together the scores for the variables, *Smoke Tobacco*, *Smokeless Tobacco*, *Marijuana*, *Other Drugs*, and your new *Alcohol* variable.
 - c. Create a bar graph of the new variable, *Number of Addictions*, showing the relative frequency.
3. Turn in printout of these results.

Exercise 5

1. Using SPSS, do the following steps, and obtain and printout of the output file:
 - a. Find the median for the variable, GPA.
 - b. Use the *Recode Into Different Variable* function to create a new variable, where 0 equals participants with GPAs below the median and 1 equals participants with GPAs at or above the median.
 - c. Using the *Crosstabs* function, find the value of chi square to see if there is a significant relationship between GPA (using the new variable) and (1) sex, (2) live on/off campus, and (3) marital status.
 - d. At the bottom of the printout, write your conclusions about which of these variables have a significant relationship to GPA.

2. Using SPSS, do the following steps, and obtain a printout of the output file:
 - a. Use the *Frequencies* function to get a frequency table for the variable, Major.
 - b. Use the *Split File* function to separate the file by the variable, Sex. Then use the *Frequencies* function again to get a frequency table for Major separately for males and females.
3. With SPSS, use the *Select Case* function to select just the Psychology majors in the variable, Major. Then use the *Frequencies* function to find out the number of freshman, sophomore, junior, and senior Psychology majors included in our survey. Obtain a printout of the frequency table.
4. Turn in printouts of these results.

Exercise 6

Use SPSS to do the following:

1. Use the one-sample t test to test the hypothesis that the mean number of credits taken by students at MSU-B is greater than 12 credits.
2. Use the Independent Samples t test to test the hypothesis that average GPA of non-traditional students is higher than that of traditional students. Use the variable, Age, as the grouping variable, defining traditional students as 21 and under and non-traditional as 22 and over.
3. Use the Paired-Sample t test to see if there is a significant difference between the number of hours students work per week and the number of hours they spend studying.

For each of these tests, obtain a printout of the results. Write on the printout whether the results enable you to reject the null hypothesis. Also, in a sentence or two, describe what the results tell us about our student population.

Exercise 7

Use SPSS to do the following:

1. Test the significance of Pearson's r for all possible pairs of the following variables: Age, GPA, Number of Credits, Number of Children, Hours Worked per Week, Number Social Activities per Week, and Hours Study per Week. As we have no prior hypotheses, these should be two-tailed tests. For each of the significant correlations, describe in a sentence what that correlation shows.
2. Test the significance of Spearman's ρ for all possible pairs of the 6 rating scales at the end of the survey (from "rate MSU-B" to "rate parking"). Again, these should be two-tailed tests. Write a summary paragraph, describing what the significant results reveal.

For each of these tests, obtain a printout of the results to turn in.

Exercise 8

Use SPSS to do the following:

1. Select three dichotomous variables (variables that have only two values). Use the *binomial test* to ascertain whether there is a significantly greater proportion in one group than the other for each variable.
2. Select a grouping variable other than Sex (e.g., GPA, live on/off campus, etc.). Use the *Two Independent Variables Non-Parametric Test* to conduct the Mann-Whitney U test to ascertain whether the two groups you have selected (or created) differ significantly on each of the rating scales (rate MSU-B to rate parking).
3. Use the *Two Related Samples Non-Parametric Test* (Wilcoxon option) to test 5 combinations of the ratings variables. (One comparison could be rate major courses versus rate Psych courses. There are 15 possible combinations from which you get to pick 5.) Can you find a comparison that shows that students rate one aspect of college life at MSU-B higher (or lower) than other aspects?

For each of these tests, obtain a printout of the results to turn in. On the printouts, describe briefly what your tests showed.

Exercise 9

Use SPSS to do the following:

1. Conduct a one-way ANOVA with GPA as the dependent variable and Marital Status as the independent variable (factor). Under *Options*, select descriptive statistics, so the output will include sample means. Under *Post Hoc*, select LSD (least significant difference test). Briefly describe what the results of this analysis show.
2. Use the General Linear Model function to conduct a two-way ANOVA with Number of Credits as the dependent variable and Sex and Live On/Off Campus as the independent variables. (Both independent variables are fixed effects.) Under *Options*, select descriptive statistics, so the output will include sample means. Describe what the results of this analysis show.

For each of these tests, obtain a printout of the results to turn in.

Exercise 10

Using the survey of MSU-B students (or any other data that you have available), formulate three hypotheses to test, using three different hypothesis tests. (Do not repeat any of the specific analyses from any of these exercises.) Test your three hypotheses, using SPSS, and describe briefly what the results of your tests show.