

Project Description Project Fall 2009

The Effect of a Bully Intervention Program on the Incidence of Being Bullied and the Self-Perception of the School Environment

Description

A school district in northwest Florida received a grant from the National Institute of Mental Health to evaluate the effectiveness of an 18-week intervention program to decrease the incidence of bullying behavior. The intervention program differed from previously implemented intervention programs in that parental training sessions were incorporated into the intervention program as suggested by Stevens, De Bourdeaudhuij, and Van Oost (2002) in their published research. A random sample of 300 sixth graders from the school district's population of 971 sixth graders was selected to potentially participate in the study. Both student and parent permissions to participate in the study were obtained.

During the first nine weeks of the school year, information on each potential student was collected. Each of the selected 300 students was asked to keep a weekly log of the number of incidents of bullying that were perpetrated against him/her. The students were given the following definition to help them decide if they had been bullied. A person is being bullied when he or she is exposed, repeatedly and over time, to negative actions on the part of one or more other persons. The log began the first week of the school year and continued through the end of the ninth week.

During the ninth week of the school year the students were asked to respond to the self-report *Bullying Inventory*. On the basis of each student's responses to the inventory, each student was classified as belonging to one of the four following classifications: victim, bully, bully/victim, and noninvolved. The teachers of the 300 students reviewed the resulting classifications. Students who were classified as a victim, a bully, or a bully/victim ($n = 195$) and for whom there was unanimous agreement among the teachers with the classification based on the self-report of the student ($n = 169$) were eligible for the study. All other students from the initial sample of 300 were not retained for the remainder of the study ($n = 131$). Of the 169 students who were eligible to participate in the study, 30 students, one-half of whom were male and one-half of whom were female, from each of the three classifications of victim, bully, and bully/victim were randomly selected to participate in the study. This last stage of sampling was necessary to enable the district's counselors to have sufficient time to offer the bully intervention sessions.

Self-reported measures of the quality of family functioning and self-perception of the school environment were obtained from each of 90 selected for the study during the ninth week of the school year. Students who had been classified as a bully or as a bully/victim attended weekly bully intervention sessions with the district's counselors. The bully intervention program lasted for 18 weeks. Additionally, the parents of the students who were classified as a bully or as a bully/victim attended weekly group parenting sessions with the counselors. After the intervention sessions ended, all of the 90 students were asked to keep a weekly log of the number of incidents of bullying perpetrated against him/her in the same manner as they had done previously. The logs were kept during the last nine weeks of the school year. Each student's self-reported perception of the school environment was obtained during the last week of school. Refer to Tables 1 and 2 for specific information related to the data collected for the study.

Table 1: Pertinent Information about the Data Collected in the Study

Variable Name	Data Set Name	Interpretation
Student ID	Student ID	No interpretation
Gender	Gender	Male or Female
Bully Classification	Classification	Victim, Bully, or Bully/Victim
Quality of Family Functioning	Family	Quality of family functioning reported as either generally positive or generally negative
Being Bullied	Pre Bully or Post Bully	The higher the number, the greater the number of being bullied incidents
Perception of the School Environment	Pre Sch or Post Sch	Range of scores possible 0 to 50 The higher the number the more positive the perception of the school environment.

General Instructions

You are required to perform the analyses shown in Part C of this document using StatCrunch and the Project Data that you used previously for Part A of this project. The point value for each analysis is shown in the parentheses. Sections 1 and 2 of this document describe the required steps for retitling the StatCrunch output and creating a report of your results.

Section 1: Retitling the StatCrunch Results

When you complete an analysis using StatCrunch, the output is saved in the “Results” folder with a generic title (i.e. bar plot, frequency table, etc.). For the sample project analyses that you have completed, you were required to retitle the output as “Sample Analysis 1”, “Sample Analysis 2”, and so on. The procedures for retitling an analysis are shown in a video titled “Retitling the Output.” This video can be located by clicking on the “StatCrunch” course button followed by clicking on the link to the “Instructional Videos.” Use the procedures described in the video to retitle the StatCrunch output for the project analyses, except retitle the output as “Project Analysis 13,” Project Analysis 14,” and so on. Please remove from your StatCrunch results folder any incorrect analyses.

Section 2: Creating a Report of Results

Create a report using StatCrunch’s “My Report” function as you did for previous StatCrunch assignments. Title the report “Assignment 14”. The procedures for creating a report are shown in a video titled “Creating a Report.” This video can be located by clicking on the “StatCrunch” course button followed by clicking on the link to the “Instructional Videos.”

1. When you attach your results to the report enter them in numerical sequence (Project Analysis 13, Project Analysis 13, and so on).
2. For Assignments 14 you will need to attach more than five analyses. The video describes the procedure to attach more than five analyses to your report
3. When you have completed your report, send the report to ryonker@fsu.edu. The report must be received before the due date indicated on the course syllabus.

I have encouraged personal interactions among the course participants for Assignments 1-8 and Assignments 10-13. However, for Assignment 14 the required analyses and the questions related to the required analyses are to be completed by you without other human assistance of any kind. You may use your textbook, notes, previous assignments, any of the materials posted on our course, and any other printed or electronic resources. I expect you to adhere to the University’s academic honesty policy.

Part C: Complete Analyses 13-18

To help you set up the required project analyses in StatCrunch you may want to refer to the instructional videos that you used to analyze the “Sample Project Data” in previous StatCrunch assignments. Make sure you use the variables from the Project and not the variables from the Sample Project. **Only produce the information specifically requested in each of the following analyses.**

Project Analyses 13: (5 points)

Use a one-way ANOVA to determine if there is a difference among the three bully classifications’ means with respect to the pre perception of the school environment scores. Make sure to request the Tukey *post hoc* tests.

Project Analysis 14: (5 points)

Use a Chi Square test of independence to determine if there is a difference in the percentage of males and females (make this variable the rows) who reported the quality of family functioning as either generally positive or generally negative (make this variable the columns). Include the row and column percentages as well as the expected values for each cell in the contingency table.

Project Analysis 15: (5 points)

Obtain the Pearson correlation between the pre perception of the school environment scores and the post perception of the school environment scores. Include the two-sided p-value of the significant test on the output.

Project Analysis 16: (5 points)

Obtain the Spearman correlation between the pre perception of the school environment scores and the post perception of the school environment scores. Include the two-sided p-value of the significant test on the output.

Project Analysis 17A: (5 points) and 17B-17D (1 point each)

A. Develop a simple linear regression equation to predict the post perception of the school environment scores from the pre perception of the school environment scores. Additionally, given a pre perception of the school environment score of 50, and using the developed linear regression equation, predict an individual's post perception of the school environment score.

Additionally, produce the following graphics. Only produce the three graphs requested below. **One point will deducted from your score for each unrequested graph that you produce and attach to your report.**

- B. Produce the scatter plot showing fitted regression line.
- C. Produce the QQ plot of the residuals.
- D. Produce the fitted values vs. the residuals.

Project Analysis 18: (5 points)

Develop a multiple linear regression equation to predict the post perception of the school environment scores from the pre perception of the school environment scores and from the reported number of incidents of being bullied prior to the implementation of the bully intervention program.

Part D: Questions for the Project Analyses 1 through 11

Instructions:

1. Print a copy of the my StatCrunch analyses by clicking the link to "Dr. Yonker's StatCrunch Analyses for Assignment 14." Use my StatCrunch analyses to answer Questions 1-89.
2. Once you have printed the questions and the analyses, log off the course.
3. When you have answered all of the questions, log on to the course, click on the "Project" course button, and click on the link "Answer Sheet for Assignment 14."
4. Transfer your answers from your printed copy of the questions to the electronic answer sheet by clicking on the circle adjacent to your answer for each of the questions.
5. When you have finished entering your answers, click the "Submit" button at the end of the answer sheet.
6. Once you access the online answer sheet, you must enter your answers to all of the questions during one session. **DO NOT ATTEMPT TO ACCESS THE ANSWER SHEET UNTIL YOU ARE PREPARED TO SUBMIT YOUR ANSWERS.**
7. You need to answer the questions and submit your answers electronically before midnight on Friday, December 4th.
8. This document consists of 89 true/false, multiple-choice, and completion questions.
9. Each question is worth 1 point.
10. **I have permitted and have encouraged personal interactions among the course participants for Assignments 1-8 and Assignment 10-13; however, this assignment is to be completed by you without other human assistance of any kind. You may use your textbook, notes, previous assignments, any of the materials posted on our course, and any other printed or electronic resources. I expect you to adhere to the University's academic honesty policy.**

Note 1: When I refer to numerical values from the StatCrunch output, the values will have been rounded to the nearest hundredth.

Note 2: When you are required to perform calculations, round all the values obtained from the StatCrunch output to the nearest hundredth prior to entering the values into the appropriate formula. Round all final answers to the nearest hundredth.

Note 3: When rounding to the nearest hundredth, if the number in the thousands place is a 5,6, 7, 8, or 9, round the number in the hundredths place to the next higher number; otherwise, just leave the number in the hundredths place at its current value.

Note 4: For all completion questions, the answer should be expressed as a numerical value, not as a word, unless you are instructed to do otherwise.

Note 5: Use an alpha level of 0.05 for all of the questions.

Note 6: Assume that all statistical tests are two-tailed unless stated otherwise.

Project Analyses 1 and 2: The score that is being analyzed in Analysis 1 is the difference between the pre and post reported number of incidents of being bullied, and in Analysis 2 the score that is being analyzed is the difference between the pre and post perception of the school environment. For both scores the pre was subtracted from the post.

1. The null hypothesis for the analysis shown in Analysis 1 is that in the population there is no difference among the means of the three bully classifications with respect to their difference between the pre and post reported number of incidents of being bullied.
 - a. true
 - b. false
2. The alternate hypothesis for the analysis shown in Analysis 1 is that in the population there is at least one difference among the means of the three bully classifications with respect to their difference between the pre and post reported number of incidents of being bullied.
 - a. true
 - b. false
3. The treatment and error variances shown in Analyses 1 and 2 appear in which one of the following columns in the ANOVA table?
 - a. df
 - b. SS
 - c. MS
 - d. F-Stat
 - e. P-Value
4. The F-ratio (F-Stat) shown in the ANOVA table in Analysis 1 is the ratio of the variance among the means of the difference between the pre and post reported number of incidents of being bullied for the three bully classifications divided by the variance of the difference between the pre and post reported number of incidents of being bullied for the three bully classifications due to sampling error.
 - a. true
 - b. false
5. The F-distribution is a symmetrical and skewed positive distribution.
 - a. true
 - b. false
6. Using the formula sheet that can be located by clicking on the "Stat Documents" course button in Blackboard, the number corresponding to the formula that produced the sum of squares for the treatment shown in the ANOVA table in Analysis 1 is _____.
7. Using the formula sheet that can be located by clicking on the "Stat Documents" course button in Blackboard, the number corresponding to the formula that produced the sum of squares for the error term shown in the ANOVA table in Analysis 1 is _____.
8. Using the formula sheet that can be located by clicking on the "Stat Documents" course button in Blackboard, the number corresponding to the formula that produced the total sum of squares shown in the ANOVA table in Analysis 1 is _____.
9. The results shown in the ANOVA table in Analysis 1 indicate that there is at least one statistically significant difference among the means of the three bully classifications with respect to the difference between the post and pre reported number of incidents of being bullied.
 - a. true
 - b. false
10. If the null hypothesis associated with the analysis shown in the ANOVA table in Analysis 1 were to be rejected, the probability of having committed a Type I error is equal to _____. (Express your answer as a decimal value to the nearest hundredth and include the 0 to the left of the decimal point, for example 0.17)
11. A Type II error occurs when a false null hypothesis is rejected.
 - a. true
 - b. false

12. The η^2 effect size for the ANOVA results shown in Analysis 1 is _____. (Express your answer as a decimal value to the nearest hundredth and include the 0 to the left of the decimal point, for example 0.17)
13. The minimum possible value for η^2 is _____ and the maximum possible value is _____? (Express your answers as a **whole** number, for example 5)
14. Given the results shown in Analysis 1, it is necessary to proceed with the calculation of Tukey tests to determine which of the means of the difference between the pre and post reported number of incidents of being bullied for the three bully classifications are statistically significantly different from each other.
- true
 - false
15. From the results shown in Analysis 1 and Supplemental Tables 1, 2, and 5, it can be concluded that the victim's mean difference between their pre and post reported number of incidents of being bullied was statistically significantly different from the bully's mean difference between their pre and post reported number of incidents of being bullied such that the victims reported a greater decrease in the number of incidents of being bullied after the bully intervention than did the bullies.
- true
 - false
16. From the results shown in Analysis 1 and Supplemental Tables 1, 2, and 5, it can be concluded that the bully/victim's mean difference between their pre and post reported number of incidents of being bullied was statistically significantly different from the bully's mean difference between their pre and post reported number of incidents of being bullied such that the bully/victims reported a greater decrease in the number of incidents of being bullied after the bully intervention than did the bullies.
- true
 - false
17. From the results shown in Analysis 1 and Supplemental Tables 1, 2, and 5, it can be concluded that the victim's mean difference between their pre and post reported number of incidents of being bullied was statistically significantly different from the bully/victim's mean difference between their pre and post reported number of incidents of being bullied such that the victims reported a greater decrease in the number of incidents of being bullied after the bully intervention than did the bully/victims.
- true
 - false
18. The results shown in the ANOVA table in Analysis 2 indicate that there is at least one statistically significant difference among the means of the three bully classifications with respect to their difference between the pre and post perception of the school environment.
- true
 - false
19. The η^2 effect size for the ANOVA results shown in Analysis 2 is _____. (Express your answer as a decimal value to the nearest hundredth and include the 0 to the left of the decimal point, for example 0.17)
20. **Assume** the η^2 obtained for the previous question was 0.20. This effect size means that 20% of the variation in the difference between the pre and post perception of the school environment can be accounted for by the bully classification variable (the treatment variable).
- true
 - false
21. Using the formula sheet that can be located by clicking on the "Stat Documents" course button in Blackboard, the number corresponding to the formula that is used to calculate η^2 is _____.
22. From the results shown in Analysis 2 and Supplemental Tables 3, 4, and 6, it can be concluded that the victim's mean difference between their pre and post perception of the school environment was statistically significantly different from the bully's mean difference between their pre and post perception of the school environment such that the victim's perception of the school environment became more positive after the bully intervention and the bully's perception of the school environment became less positive.
- true
 - false

23. From the results shown in Analysis 2 and Supplemental Tables 3, 4, and 6, it can be concluded that the victim's mean difference between their pre and post perception of the school environment was statistically significantly different from the bully/victim's mean difference between their pre and post perception of the school environment such that the victim's perception of the school environment became more positive after the bully intervention and the bully/victim's perception of the school environment became less positive.
- true
 - false
24. From the results shown in Analysis 2 and Supplemental Tables 3, 4, and 6, it can be concluded that the bully/victim's mean difference between their pre and post perception of the school environment was statistically significantly different from the bully's mean difference between their pre and post perception of the school environment such that the bully/victim's perception of the school environment became more positive after the bully intervention and the bully's perception of the school environment became less positive.
- true
 - false

Project Analyses 3 and 4

25. The null hypothesis for the Analysis 3 is that in the population there is a relationship between the bully classifications and the quality of family functioning variables.
- true
 - false
26. The alternate hypothesis for Analysis 3 is that in the population, there is a difference in the proportion of bullies, bully/victims, and victims who indicate the quality of family functioning as either positive or negative.
- true
 - false
27. Using the formula sheet that can be located by clicking on the "Stat Documents" course button in Blackboard, the number corresponding to the formula that produced the Chi-square value shown Analysis 3 is _____.
28. The value of the chi-square statistic for Analysis 3 is _____. (Express your answer as a decimal to the nearest hundredth, for example 1.12)
29. Would you agree or disagree with the following statement. As the degrees of freedom (df) increase, the shape of the Chi-square distribution changes from a non-symmetrical, skewed positive distribution to a more symmetrical distribution that is less positively skewed.
- agree
 - disagree
30. The chi-square value shown in Analysis 3 was computed by subtracting the expected frequency from the observed frequency in a cell, squaring this difference, dividing this result by the expected frequency for the cell, and after completing this process for all cells, summing the quotients for each of the cells.
- true
 - false
31. From the results of Analysis 3, it would be correct to conclude that there is evidence to indicate a statistically significant difference in the proportion of bullies, bully/victims, and victims who indicate the quality of family functioning as either positive or negative.
- true
 - false
32. If the null hypothesis associated with the Analysis 3 is rejected, then the probability of erroneously rejecting the null hypothesis is equal to the alpha level.
- true
 - false
33. In Analysis 3, the effect size via Cramer's V statistic is _____. (Express your answer as a decimal value to the nearest hundredth and include the 0 to the left of the decimal point, for example 0.17)

34. Of the bullies, the percentage who indicated a negative quality of family function is _____. (Express your answer to the nearest hundredth of a percent and include the % sign in your answer, for example 12.64%)
35. Of the students who indicated a negative quality of family functioning, the percentage who were victims is _____. (Express your answer to the nearest hundredth of a percent and include the % sign in your answer, for example 12.64%)
36. From the results of the Analyses 3, it would be appropriate to conclude that a higher percentage of the bullies indicate a negative quality of family functioning than did the victims, and that a higher percentage of victims indicates a positive quality of family functioning than did the bullies.
- true
 - false
37. The null hypothesis for Analysis 4 is that in the population, there is no difference in the proportion of males and females who indicate the quality of their family functioning as either positive or negative.
- true
 - false
38. From the results of Analysis 4, it would be correct to conclude that there is evidence to indicate a statistically significant difference in the proportion of males and females who indicate the quality of family functioning as either positive or negative.
- true
 - false
39. If the null hypothesis associated with the Analysis 4 is rejected, then the probability of erroneously rejecting the null hypothesis is equal to _____. (Express your answer as a decimal probability value to the nearest hundredth and include the 0 to the left of the decimal point, for example 0.17)

Project Analyses 5 and 6: The gender and family variables shown in Analysis 5 were changed into dichotomous variables prior to correlating these two variables with the other variables shown in the correlation matrix. The males were assigned a value of 0 and the females were assigned a value of 1. Negative family functioning was assigned a value of 0 and positive family functioning was assigned a value of 1. Prior to the calculation of the correlation coefficients shown in Analysis 6, the original scores for each of the three variables were ranked separately from 1 to 90 where a rank of 1 was assigned to the highest score and a rank of 90 was assigned to the lowest score.

40. The correlation coefficient between the gender and family variables shown in Analysis 5 would be considered to be a _____ correlation coefficient.
- Pearson
 - phi
 - point-biserial
 - contingency
 - Spearman
41. The correlation coefficient between the gender and pre bully variables shown in Analysis 5 would be considered to be a _____ correlation coefficient.
- Pearson
 - phi
 - point-biserial
 - contingency
 - Spearman
42. The correlation coefficient between the pre bully and post bully variables shown in Analysis 5 would be considered to be a _____ correlation coefficient.
- Pearson
 - phi
 - point-biserial
 - contingency
 - Spearman

43. The correlation coefficient between the ranks of the pre bully and post bully variables shown in Analysis 6 would be considered to be a _____ correlation coefficient.
- Pearson
 - phi
 - point-biserial
 - contingency
 - Spearman
44. The correlation of $r = 0.72$ between the pre and post bully scores shown in Analysis 5 indicates that a graph of the data points would show a swarm of data points contained within
- an elliptical shape geometric figure that slopes up to the right.
 - an elliptical shape geometric figure that slopes down to the right.
 - a circular shaped geometric shape.
 - a trapezoidal shaped geometric figure.
45. A correlation of -0.75 between the pre and post bully scores is indicative of a weaker correlation between the pre and post bully scores than is a correlation of $+0.75$.
- true
 - false
46. From the results shown in Analysis 5, the correlation between the pre bully scores and the post perception of the school environment scores is _____. (Express your answer as a decimal value to the nearest hundredth and include the 0 to the left of the decimal point, for example 0.17)
47. Given the value of the correlation between the pre and the post perception of the school environment scores shown in Analysis 5, the coefficient of determination is _____. (Express your answer as a decimal value to the nearest hundredth and include the 0 to the left of the decimal point, for example 0.17)
48. From the results shown in Analysis 5, the percent of variation in the post bully variable that can be accounted for (explained by) by the post perception of the school environment variable is _____. (Express your answer to the nearest hundredth of a percent and include the % sign in your answer, for example 12.64%)
49. From the results shown in Analysis 5, the correlation between the pre and the post perception of the school environment scores indicates that there is a tendency for the post perception of the school environment scores to decrease as the pre perception of the school environment scores decrease.
- true
 - false
50. The Pearson correlation procedure that was utilized to produce some of the correlation coefficients shown in the correlation matrix in Analysis 5 is capable of accurately quantifying linear and nonlinear relationships.
- true
 - false
51. The null hypothesis to determine if the correlation between the pre and post bully scores is statistically significantly different from zero is as follows: "In the population there is no relationship between the pre and post bully scores."
- true
 - false
52. From the results shown in Analysis 5, the null hypothesis should be rejected, and the alternate hypothesis that in the population there is a relationship between the pre and post perception of the school environment scores should be accepted.
- true
 - false
53. The StatCrunch output for Analysis 6 indicates the exact probability of making a decision error if you were to conclude that there is a statistically significant correlation between the ranks of the pre bully and pre perception of the school environment scores, when indeed there is no correlation between these two variables. The probability of making this decision error is equal to _____. (Express your answer as a decimal probability value to the nearest hundredth and include the 0 to the left of the decimal point, for example 0.17)

54. Of the fifteen unique correlations shown in Analysis 5, how many of these correlations are statistically significant?

55. Using the formula sheet that can be located by clicking on the “Stat Documents” course button in Blackboard, the number corresponding to the formula that produced the Pearson correlation coefficients shown in Analysis 5 is _____.
56. Several factors can influence the magnitude of the Pearson correlation between two variables. Which one or more of the following factors can influence the magnitude of the Pearson correlation coefficient?
- A. whether the relationship between the variables is linear or nonlinear
 - B. the presence of outliers
 - C. the variability of one or both variables is restricted
 - D. the reliability of the measurement of the two variables
 - E. the size of the sample
- a. A and C only
 - b. B and D only
 - c. A, B, and E only
 - d. A, B, C, and D only
 - e. B, C, D, and E only
57. The method that produced the correlation coefficients shown in Analysis 6 considers the consistency of the direction of the relationship between the variables, but does not considers the degree to which the variables are linearly related.
- a. true
 - b. false

Project Analyses 7 through 10

58. From the results shown in Analysis 7, the equation to predict the post school environment scores from pre bully scores rounded to the nearest hundredth is
- a. Predicted Post School Score = $0.64(\text{Pre Bully Score}) - 17.96$
 - b. Predicted Post School Score = $17.96(\text{Pre Bully Score}) - 0.64$
 - c. Predicted Post School Score = $17.96(\text{Pre Bully Score}) + 0.64$
 - d. Predicted Post School Score = $0.64(\text{Pre Bully Score}) + 17.96$
59. From the results shown in Analysis 7, the value of the slope for the regression line is _____. (Express your answer as a decimal to the nearest hundredth, for example 1.12 or -1.12)
60. From the results shown in Analysis 7, the value of the Y-intercept for the regression line is _____. (Express your answer as a decimal to the nearest hundredth, for example 1.12 or -1.12)
61. From the results shown in Analysis 7, if a student had a pre bully score of 10 the student’s predicted post school environment score would be _____. (Express your answer as a decimal to the nearest hundredth, for example 21.12)
62. Using the regression equation shown in Analysis 7, if a student had a pre bully score of 20, the student’s predicted post school environment score would be _____. (Express your answer as a decimal to the nearest hundredth, for example 21.12)
63. From the results shown in Analysis 7, on the average, the distance between the predicted school environment scores and the actual school environment scores is _____. (Express your answer as a decimal to the nearest hundredth, for example 21.12)
64. From the results shown in Analysis 7, if a student has a pre bully score of 10, one could be 95% confident that a student’s predicted school environment score would be between 12.76 and 35.99 to the nearest hundredth.
- a. true
 - b. false

65. From the results of the regression analysis shown in Analysis 7, if the number of incidents of being bullied increases by one, the post school environment score would be expected to increase by _____ units. (Express your answer as a decimal to the nearest hundredth, for example 2.12)
66. From the results shown in Analysis 7, the percent of variance of the post school environment scores that can be accounted for by the pre bully scores is _____. (Express your answer to the nearest hundredth of a percent and include the % sign in your answer, for example 12.64%)
67. Using the formula sheet that can be located by clicking on the “Stat Documents” course button in Blackboard, the number corresponding to the formula that produced the standard error of estimate shown in Analysis 7 is _____. (Note: There are many formulae that can be used to calculate the standard error of estimate; however, only one such formula is shown on the formula sheet.)
68. The slope of the regression equation shown in Analysis 7 can be obtained by calculating the value of $r_{XY}(s_Y/s_X)$.
- true
 - false
69. The results shown in Analysis 7 indicate that there is evidence upon which to conclude that in the population the slope of the regression line is not equal to zero.
- true
 - false
70. Of the total sum of squares for the post school environment scores shown in Analysis 7, the pre bully scores cannot account for what percent of this total? _____ (Express your answer to the nearest hundredth of a percent and include the % sign in your answer, for example 12.64%)
71. From the results shown in Analysis 7 and using the formula sheet that can be located by clicking on the “Stat Documents” course button in Blackboard, the number corresponding to the formula that can be used to calculate the value of the sum of squares that the pre bully scores can account for of the total sum of squares for the post school environment scores is _____.
72. From the results shown in Analysis 7, the value of the test statistic that indicates that the pre bully scores account for a statistically significant proportion of the variance of the post school environment scores is _____. (Express your answer as a decimal to the nearest hundredth, for example 21.12)
73. When constructing a scatter plot of the correlation between two variables that includes a regression line, the criterion variable should be shown on the _____ axis and the predictor variable on the _____ axis. (For this completion question use the letters X and Y)
74. Each dot on the scatter plot shown in Analysis 8 represents one or more students’ predicted school environment score.
- true
 - false
75. The error made in predicting a student’s post school environment score from his/her pre bully score is smaller for those dots that are closer to the regression line than for those dots farther away from the regression line, measured vertically from the dot to the regression line as shown in Analysis 8.
- true
 - false
76. The regression line shown on the scatter plot in Analysis 8 is one of many possible lines that could be drawn through the swarm of dots that would minimize the squared difference between a student’s actual score and the student’s predicted score summed across all 90 individuals.
- true
 - false
77. Using the formula sheet that can be located by clicking on the “Stat Documents” course button in Blackboard, the number corresponding to the general formula that produced the regression line shown in Analysis 8 is _____.

78. Analysis 9 addresses the assumption that the residuals are normally distributed.
- true
 - false
79. An assumption of linear regression is that the residuals ($y - \text{predicted } y$) should not be correlated with the predicted (fitted) values. Analysis 10 addresses this issue. Does there appear to be a statistically significant correlation between the Studentized residuals and the standardized predicted (fitted) scores.
- yes
 - no

Project Analysis 11

80. Multiple regression has more than one independent (predictor) variable.
- true
 - false

Questions 81-83: The general form of the multiple regression equation is as follows: $\text{predicted } Y = b_1X_1 + b_2X_2 + a$. From the results shown in Analysis 11, and given that $b_1 = \text{pre bully scores}$ and $b_2 = \text{post bully scores}$, the value of

81. b_1 is _____. (Express your answer as a decimal to the nearest hundredth, for example 1.12)
82. b_2 is _____. (Express your answer as a decimal to the nearest hundredth, for example 0.12)
83. a is _____. (Express your answer as a decimal to the nearest hundredth, for example 9.12)
84. From the results shown in Analysis 22, if a student had a pre bully score of 15 and a post bully score of 10, the student's predicted post school environment score would be _____. (Express your answer as a decimal to the nearest hundredth, for example 21.12)
85. From the results shown in Analysis 11, the multiple correlation (R) between the post school environment scores and the combination of the pre and post bully scores is _____. (Express your answer as a decimal value to the nearest hundredth and include the 0 to the left of the decimal point, for example 0.17)
86. From the results shown in Analysis 11, the standard (average) distance between the predicted post school environment scores and the actual post environment scores is _____. (Express your answer as a decimal to the nearest hundredth, for example 21.12)
87. From the results shown in Analysis 11, the percent of variance in the post school environment scores that can be accounted for by the pre and post bully scores is _____. (Express your answer to the nearest hundredth of a percent and include the % sign in your answer, for example 12.64%)
88. From the results shown in Analysis 11, is there any evidence that the pre bully variable accounts for a statistically significant percent of variance of the post school environment scores.
- yes
 - no
89. From the results shown in Analysis 11, is there any evidence that the addition of the post bully variable accounts for a statistically significant percent of the variance of the post school environment scores that had not already been accounted for by the pre bully variable?
- yes
 - no