Homework 1
Due Thursday, January 30 (10:00 AM)

For all questions, please show your work or include a copy of the output, whichever is relevant. I would like a paper copy, but let me know if that is going to be difficult for some reason. Please write your answers in report form including relevant statistics, as if you were describing results in a published study. Be sure to describe each finding in terms of the research problem. Most responses to a particular question should be approximately one paragraph in length. Text should be typed, but please do not waste your time typing hand computations. **All answers should be in your own words.**

1. The data for the questions below come from a study of health behaviors among students in grades six through ten (`schoolhb.sav`).[1] A random subsample of the full sample was used for this data set. There are four variables in the dataset that will be used in this or the next assignment: `use`, a composite index of the number of *unhealthy* behaviors the student has engaged in, such as smoking, alcohol, marijuana, other drugs inhalants, with index values ranging from 1 to 7; `support`, a composite social support index based on several questions about frequency of contact with family and friends in the student's social network, with possible values ranging from 1 to 5; `bullied`, a composite of several questions about whether the student has been bullied in various ways (bullied, called names, left out, hit, lied to, made fun of), also ranging from 1 to 5; `racecat`, indicating student self-identified race, simplified to three categories for this class (1 = "White," 2= "Black or African American," and 3="Other");

a. Use R <u>or</u> SPSS to obtain a correlation matrix of the correlations among the variables `support`, `bullied`, and `use`. (Skip any scatterplots for now—we will use some later.) Describe and explain your results. Include both printouts with your response (but only one write-up of the results is needed).

b. Use R <u>and</u> SPSS to conduct a simple regression analysis in which `bullied` predicts `use`. Be sure to obtain standardized and unstandardized coefficients, R-squared, and confidence intervals. Report the relevant statistics and interpret your findings in terms of the research problem. Include an interpretation of the standardized and unstandardized coefficients, significance test, and R-squared.

c. Using R <u>and</u> SPSS, run a *simultaneous* regression analysis with `bullied` and `support` predicting `use`. Report your results and include an interpretation of the standardized and unstandardized coefficients, significance tests, R-squared, and F-test.

d. Using R <u>or</u> SPSS, conduct a multiple regression analysis using `bullied` and `support` as predictors of `use`. Use a *hierarchical* approach, entering `bullied` in the first block and then `support` in the second block. Report your results and include an interpretation of the unstandardized slopes, standardized slopes, significance tests, R-squared, R-squared change, F-test and F change, and their significance tests. Include a comment that compares your results to those obtained in the simultaneous regression above. How are they similar or different and why? Be specific, give values.

e. Based on your results from the hierarchical multiple regression in the previous problem, sketch a Venn diagram and label it with the *approximate* percentage of variance in the dependent variable accounted for by each of the predictors and the percentage variance overlap in the two predictors (be sure to clearly indicate which quantity from the output goes with which percentage).

2. Use your own data for the following problems (if you don't have a data set you can use, I can find one for you). Make sure your dependent variable is a continuous variable (ordinal with at least 5 ordinal values, interval, or ratio scale). You will need to have at least two continuous predictors.

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[1] These data are derived from: U.S. Dept. of Health and Human Services, Health Resources and Services Administration, Maternal and Child Health Bureau. Health Behavior in School-aged Children Survey, 2001-02 [Computer file]. Calverton, MD: ORC Macro (Macro International Inc.) [producer], 2003.

a. Use SPSS <u>or</u> R to obtain a scatterplot and Pearson correlation between one continuous predictor and your outcome and test a simple regression model with one predictor of your outcome. Provide a very brief statement about the purpose of the analysis (no longer than one paragraph). Report your results in a second paragraph. In your regression analyses, be sure to obtain and interpret standardized and unstandardized coefficients, R-square, R-square significance, confidence intervals, and a scatterplot in terms of the research problem.

b. Use SPSS <u>or</u> R to test a simultaneous multiple regression with the predictor used in the previous problem plus one other predictor. Report your results, including standardized and unstandardized coefficients, significance tests, confidence intervals, R-squared, F-test, and provide an interpretation of the coefficients and R-squared.

3. Read **one** of the following articles (copies available from the class website (http://web.pdx.edu/~newsomj/mvclass/) and write **two paragraphs** summarizing the article. First, describe the study design (e.g., randomized experiment, non-equivalent control group design, cross-sectional survey; for a quick refresher, see https://www.appinio.com/en/blog/market-research/quasi-experimental-design) and purpose of the study **in your own words**. Be sure to include who/what was studied (e.g., who were the participants?) and the number of cases. Then, **choose one regression analysis** used in the article that you have learned about in the course so far (i.e., simple or multiple regression), and, **in your own words**, describe the hypothesis that is being tested, the results obtained, and what the findings mean. Be sure to **include the relevant statistical values** and whether the results were significant. Write your paragraphs as if you were describing results in a published article or reporting someone else's results as in a review article.

Conroy, D. E., Hyde, A. L., Doerksen, S. E., & Ribeiro, N. F. (2010). Implicit attitudes and explicit motivation prospectively predict physical activity. *Annals of Behavioral Medicine*, *39*, 112-118.

Coulombe, S., & Krzesni, D. A. (2019). Associations between sense of community and wellbeing: A comprehensive variable and person-centered exploration. Journal of Community Psychology, 47(5), 1246-1268.

Maguire, R., Egan, A., Hyland, P., & Maguire, P. (2017). Engaging students emotionally: The role of emotional intelligence in predicting cognitive and affective engagement in higher education. *Higher Education Research & Development, 36*(2), 343-357.

Niebuhr, F., Borle, P., Börner-Zobel, F., & Voelter-Mahlknecht, S. (2022). Healthy and happy working from home? Effects of working from home on employee health and job satisfaction. *International journal of environmental research and public health, 19*(3), 1122.