

EPSY 8310

Optional Midterm Bonus Exam – Due Wednesday, October 21st at 4:40 PM

In order to help exam scores and to provide more practice on the material from the first half of class, I am providing this optional midterm bonus exam. The exam is a take-home test where you will have the chance to analyze the data at your own pace. It is meant to mimic the real world statistical environment which you may face when not in this class. The exam will be scored by me and will provide you with a bonus of up to 25% of the midterm score. For instance, if you received a 70% on the midterm, if you complete this exam and receive a 100%, then you will have your midterm score changed to a 95%.

This bonus midterm consists of one data set: data from the General Social Survey from 2008 (see <http://www.norc.og/GSS+Website/>). Imagine you are a consultant brought in to help investigators of the study with their statistical conclusions. On the next page you will find a set of questions posed the investigators prior to collecting the data. These questions are not directly statistical in nature, in that they do not ask for specific analyses to be run. They are, however, the questions that drove the research, and resulted in the data that were collected. Each question can be answered using statistical tools taught in this course up to this point (Chapter 8 in the textbook). *Note that there is not necessarily a single best way to answer each question, although there most certainly are wrong ways of doing so.* Furthermore, note that this midterm bonus is the statistical equivalent to an essay test, with answers evaluated not only for technical correctness, but also for the motivating reasons for using the statistical methodology – so describe the motivation for your choice of analysis fully. Your job is to present an answer to each question in the form of an argument that is supported with evidence culled from the statistical analyses. In your mind, consider me as either a journal editor evaluating a manuscript or as a reviewer of a technical report.

Directions:

Your job is to answer the questions given for each data set using statistical techniques you have learned in this class. For **each part of each** question:

- Describe the analysis you have selected to perform (for example, explain why you are using the variables you are using).
- Describe the assumptions of the analysis.
- Report any diagnostic tests of assumptions you may have run.
- Perform the analysis and report the results. Supplying graphs can be helpful to describe your findings.
- Interpret the results.
- Provide an answer to the question using the statistical evidence you have gained via the analysis.
- Describe any limitations of the analysis you performed.
- **Direct tabular output from SPSS or any other stat package is not allowed (and will lead to zero points on that section of the analysis);** however graphs and figures are encouraged.
- NOTE: Please post your questions to ELC's discussion board rather than email them to me.

Scoring:

For each question, your score will depend upon these factors:

- Did you choose an analysis that will provide an accurate answer to the question? (10 points)
- Did you explicitly state all assumptions? (10 points)
- Did you perform the appropriate analysis correctly? (20 points)
- Did you check the assumptions, when applicable? (up to 10 points)
- Were your interpretations consistent with the information the analysis provides? (30 points)
- Were your conclusions well explained (how well did you use the statistical evidence to create an answer to the question)? (20 points)

Problem #1

Socioeconomic Status and the Zodiac

A consortium of astrologers had developed an idea that people born under certain signs of the zodiac were predisposed to have a greater earning potential than people born under other signs. The astrologers were pleased to find that the General Social Survey (GSS) asked respondents for their Zodiac sign. As such, the astrologers have commissioned an analysis of the GSS data and have posed the following questions:

Variable Name	Description
SEI	A measure of a respondent's socioeconomic status. Higher scores indicate a higher socioeconomic status.
Zodiac	Astrological sign of respondent.

Researchers want to know:

- Are there differences in socioeconomic status of people born under different astrological signs?
 - For astrological researchers in the future, report and describe the effect size.
- Do earth signs (Taurus, Virgo, and Capricorn) have significant differences in mean socioeconomic status as a whole from water signs (Cancer, Scorpio, and Pisces)?
- Do any two astrological signs have a difference in means of socioeconomic status?