

Chapter 1 Review Questions

1. A student is gathering information about students at her college for a statistics project. She asks students in each of her classes about how they feel about the Federal Government forcing insurers to provide birth control to all women that they insure. 85% of the students she asked feel that this is appropriate.
 - a. In what population is she interested?
 - b. What is her sample?
 - c. Is the data she gathered quantitative or categorical?
 - d. In what parameter is she interested? If she knows its value, what is it?
 - e. In what statistic is she interested? If she knows its value, what is it?
 - f. What method of sampling is she using?
 - g. Are her methods likely to introduce bias in her sample? If so, what biases?
 - h. Is this study observational or experimental?
 - i. Would it be appropriate to use the results of this study to make an inference about the entire college?
2. In a recent study researchers randomly gathered a collection volunteers and put them into two groups based on whether or not they drink diet soda. One group consisted of people who drink at least one can of diet soda each day. The other group consisted of people who do not drink diet soda. Each member was weighed, and then they were weighed again 1 month later. The non-diet soda drinkers had no change in weight. The diet soda drinkers gained 1 pound each, on average.
 - a. Is this study experimental or observational?
 - b. What is the explanatory variable? Is it quantitative or categorical?
 - c. What is the response variable? Is it quantitative or categorical?
 - d. Are there confounding variables? If so, what might they be?
 - e. Was a placebo implemented?
 - f. Which group is the control group?
 - g. Which group is the treatment group?
 - h. Explain whether it would be appropriate to conclude that diet soda causes members to gain weight? If not, what logical error has been made?
 - i. Is the sampling method likely to create bias in the data? Explain.

3. In the *Abecedarian* project, inner city children, 3 years of age, were randomly selected. Their parents were all from the same socio-economic background. Each child was assigned randomly to one of two groups. In one group, children were provided with high quality preschool education. In the other group, children received childcare without preschool learning. The children in both groups were provided with healthy food supplements. The students were followed for years, and many differences were noted. Among these, it was found that the children who had quality preschool were 4 times more likely to graduate from a four-year college (23% vs. 6%).
 - a. Is this study experimental or observational?
 - b. What is the explanatory variable? Is it quantitative or categorical?
 - c. What is the response variable? Is it quantitative or categorical?
 - d. Was blinding introduced into the study? How might this have affected the results?
 - e. Are there confounding variables? If so, what might they be?
 - f. Which group is the control group?
 - g. Which group is the treatment group?
 - h. Would it be appropriate to conclude that quality preschool causes children to be more likely to graduate from college? Explain.

Chapter 2 Review Questions

For questions #25 through #34, please refer to the sample data below. The following are GPA's of randomly selected students. The values are sorted from low to high.

{0.94, 1.69, 1.77, 1.91, 2.14, 2.26, 2.58, 2.64, 2.83, 2.83, 3.01, 3.13, 3.25, 3.42, 3.62, 3.74, 3.80, 3.81, 4.00}

1. Construct a frequency table and histogram, with the first lower class limit equal to 0.94. Use 5 classes.
2. Sketch a boxplot, noting any outliers. Show work.
3. Describe the center, shape, and spread of the distribution. How does the shape affect the mean in relation to the median?
4. Compute the sample mean (no need to show work).
5. Compute the sample standard deviation and variance.
6. Compute the usual range, and note any values that are *outside* the usual range (show your work)?
7. Compute the z-score of 0.94. Would this score be unusually low? Explain.
8. Compute the percentile of 3.80.
9. Compute the median.
10. Compute the mode.
11. Compute the midrange.
12. Compute the range.
13. Compute the lower and upper quartiles, and the inter-quartile range.