

Practice Problems

Exam 2

The news website MSNBC.com reports that one week during the Clinton-Lewinsky scandal, readers of the site were invited to vote in an unscientific poll that asked whether President Clinton should leave office. The site received over 200,000 votes, of which 73% said “yes.”

(a) Describe the population and parameter of interest here.

(b) Use these sample data to determine a 99% confidence interval for the proportion of adult Americans who felt during the week in question that Clinton should leave office. Also report the margin-of-error.

During the same week, an NBC News–Wall Street Journal poll contacted a random sample of 2005 people, with 34% answering that Clinton should leave office.

(c) Re-answer question (b) based on these sample data.

(d) Which interval do you think provides a more reasonable estimate of the proportion of adult Americans who felt that Clinton should leave office? Explain.

The ancient Greeks made extensive use of the “golden rectangle” in art and literature. They believed that a width-to-length ratio of 0.618 was aesthetically pleasing. Some have conjectured that American Indians used the same standard. The following data from Hand et. al. (1994) (also in shoshoni.txt) are width-to length ratios for a sample of 20 beaded rectangles used by the Shoshoni Indians to decorate their leather goods:

0.693 0.662 0.690 0.606 0.570 0.749 0.672 0.628 0.609 0.844
0.654 0.615 0.668 0.601 0.576 0.670 0.606 0.611 0.553 0.933

- (a) Produce a boxplot of these ratios.
- (b) What is the appropriate notation for the mean (0.661) and standard deviation (0.093) of these ratios?
- (c) Conduct a one sample t-test of whether the mean population ratio is 0.618 or not. Report the hypotheses, the p-value, and your conclusion at significance level 0.01.
- (d) Are the conditions for the t-test satisfied?
- (f) Was a random sample used? What are the implications for your conclusion

Redelmeier and Singh (2001) wanted to see whether the increase in status from winning an Academy Award is associated with long-term mortality among actors and actresses. They found 235 actors and actresses who had won at least one academy award and 527 who had been nominated but never win. At the time of the analysis, the average life expectancy for the winners was 79.7 years compared to 75.8 years for the nominees. In identifying the actors and actresses for this study, nominated actors/actresses were paired with a person of the same sex and similar age from the same film.

- (a) What is the name of an appropriate method from Math 361 to answer the question?
- (b) What sampling method was used, convenience or simple random?
- (c) What was the study design, observational or experimental?
- (d) Suppose the p-value from the test was 0.0012. Summarize the conclusions you would draw from this study, commenting both on who the results may generalize to and whether or not a cause and effect relationship can be drawn.