Communicating Commitment?
A recent study (Ackerman, Griskevicius, and Li, 2011) examined expressions of commitment between two partners in a committed romantic relationship. One aspect of the study involved 47 heterosexual couples who are part of an online pool of people willing to participate in surveys. These 47 couples were asked about which person was the first to say “I love you.” For 7 of those couples, the two people disagreed about the answer to this question. But both people agreed for the other 40 couples, so those 40 responses were included in the analysis.

a) Identify the observational units and variable in this study. Also classify the variable as categorical (also binary?) or quantitative.

b) State the appropriate null and alternative hypotheses (in words) for testing whether one person or the other (male or female) is more likely to say “I love you” first.

We can express these hypotheses with symbols as: Null: $\pi = .5$ Alternative: $\pi \neq .5$.

c) Describe (in words) what the symbol $\pi$ stands for here.

It turned out that for 28 of the 40 couples in the sample (after the 7 couples who could not agree were excluded), the man said “I love you” before the woman did.

d) Determine the sample proportion of couples for whom the man was the first to say “I love you.” What symbol do we use to denote this proportion?

e) Use the Simulation-Based One-Proportion Inference applet to conduct a simulation analysis to assess the strength of evidence against the null hypothesis provided by the sample data. Report the values that you enter into the applet, describe how you approximate the p-value, and report the value of this (approximate) p-value.

f) Write a sentence or two interpreting this p-value: the probability of ____ assuming ____.

g) Would you reject the null hypothesis at the .10 significance level?

h) Summarize your conclusion from this p-value.

i) Now use the applet to test whether the sample data provide strong evidence to reject that the man is the first to say “I love you” in 80% of all heterosexual couples. Again report the values that you enter into the applet, describe how you approximate the p-value, and report the value of this (approximate) p-value. Also summarize your conclusion from this p-value.
j) Based on how the sample was selected, how broadly are you willing to generalize the result of this study? Explain.