Confidence Intervals for Differences in Proportions

Returning to Pew . . .

Was there really an increase in the proportion of Democrats that view Republicans as lazy or is that just sampling variability?

The Data

The Data

Visualization

Point estimate

Point estimate

Bootstrapping the SE

The Bootstrap Distribution

The Bootstrap SE

Construct the CI

Alternative: Normal Approximation

Conditions for the sampling distribution of $\hat{p}_1 - \hat{p}_2$ to be normal:

- each proportion separately follows a normal model
- the two samples are independent of one another

The standard error can be estimated with:

$$\widehat{SE} = \sqrt{\frac{\hat{p}_1(1-\hat{p}_1)}{n_1} + \frac{\hat{p}_2(1-\hat{p}_2)}{n_2}}$$