

POLS 501: Class Exercises

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2016 Nevada Primaries

Consider this CNN poll of the Nevada Democratic and Republican Presidential Caucuses taken on Feb 10-12, 2016:

<http://elections.huffingtonpost.com/pollster/polls/cnn-23764>.

The full poll results are here:

<http://i2.cdn.turner.com/cnn/2016/images/02/17/topnv1.pdf>

- ▶ Calculate the standard error and 95% confidence interval of Donald Trump's proportion of support?
- ▶ Calculate the standard error and 95% confidence interval of Bernie Sanders proportion of support?
- ▶ Can you calculate the confidence interval of the difference between Ted Cruz and Marco Rubio's support? What assumption is violated.

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- ▶ Look at the most recent values of Huffpost Pollster Trend. Use a Chi-squared test to compare the poll-results to those in the Pollster trend.
- ▶ Is support for Hillary Clinton and Bernie Sanders independent of age? See p. 33 of the full poll results. Use a Chi-squared test of independence.
- ▶ Is support for Hillary Clinton different between men and women? Use a confidence interval and a hypothesis test for a difference of proportions.

Difference in Statistical Significance

Consider two samples of size 100 from independent populations. Sample 1 has a mean of $\bar{x}_1 = 0$, standard deviation of $s_1 = 10$. Sample 2 has a mean of $\bar{x}_2 = 2.3$, and standard deviation of $s_2 = 10$.

- ▶ For sample 1, calculate its 95% confidence interval. Can you reject $H_0 : \mu_1 = 0$ at the 5% significance level (assume a two-sided test)?
- ▶ Do the same for sample 2?
- ▶ Calculate the confidence interval for the difference $\mu_1 - \mu_2$? Can you reject $H_0 : \mu_1 = \mu_2$?

Overlapping Confidence intervals (1)

Consider two samples of size 100 from independent populations. Sample 1 has a mean of $\bar{x}_1 = 0$, standard deviation of $s_1 = 10$. Sample 2 has a mean of $\bar{x}_2 = 4$, and standard deviation of $s_2 = 10$.

- ▶ Calculate the 95% confidence intervals of μ_1 , and μ_2 ?
- ▶ Do the confidence intervals of the mean for sample 1 and sample 2 overlap? From this can you conclude that you can reject $H_0 : \mu_1 = \mu_2$ at the the 5% significance level?
- ▶ Calculate the confidence interval of $\mu_1 - \mu_2$. From this can you conclude that you can reject $H_0 : \mu_1 = \mu_2$?

Overlapping Confidence Intervals (2)

Consider two samples of size 100 from independent populations. Sample 1 has a mean of $\bar{x}_1 = 0$, standard deviation of $s_1 = 10$. Sample 2 has a mean of $\bar{x}_2 = 3$, and standard deviation of $s_2 = 10$.

- ▶ Calculate the 95% confidence intervals of μ_1 , and μ_2 ?
- ▶ Do the confidence intervals of the mean for sample 1 and sample 2 overlap? From this can you conclude that you can reject $H_0 : \mu_1 = \mu_2$ at the the 5% significance level?
- ▶ Calculate the confidence interval of $\mu_1 - \mu_2$. From this can you conclude that you can reject $H_0 : \mu_1 = \mu_2$?

Class Project

- ▶ What is your outcome variable? Numeric or categorical?
- ▶ What is your explanatory variable? Numeric or categorical?
- ▶ What are appropriate statistical methods to use with this data?
- ▶ What would be large (substantively significant) differences in outcome variable?