CI and HT for differences via CLT

Difference in proportions

A survey asked 827 randomly sampled registered voters in California: Do you support or oppose drilling for oil and natural gas off the Coast of California? We have the following distribution of responses separated by whether the respondent graduated from college:

position	no	yes	total
oppose	126	180	306
support	132	154	286
total	258	334	592

Confidence interval

Let population 1 be college attendees, and population 2 be non-college attendees. We want a 95% CI for $p_1 - p_2$, where p_i is the proportion of population i who support offshore drilling.

- Obtain useful statistics:

- Check conditions for CLT:

- Are conditions for CLT met?

- Collect the components of confidence interval:

- Construct interval:

- Interpret:

Hypothesis test

Do the data provide strong evidence at the 0.05 level that the proportion of college graduates who support off-shore drilling in California is different than that of non-college graduates?

- Define hypotheses

- Obtain pooled proportion

- Check conditions for CLT

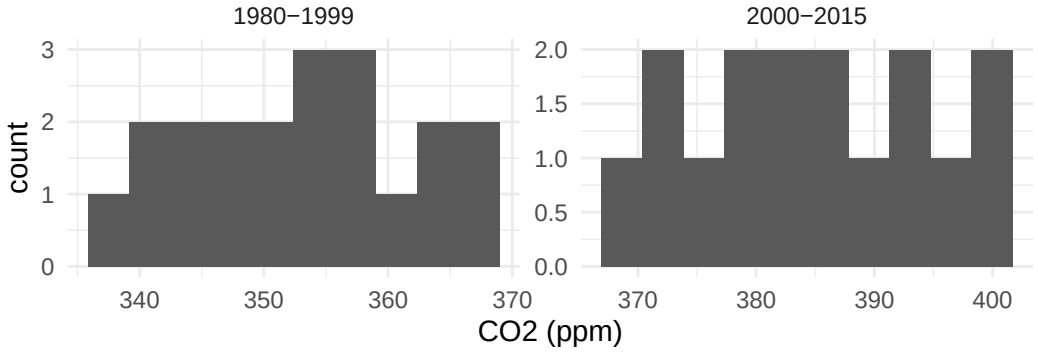
- Are conditions for CLT met?
- What is the null distribution of $\hat{p}_1 - \hat{p}_2$?

- Find the value of the test-statistic

- Draw picture and write code to obtain p-value

Difference in means

The Mauna Loa Observatory in Hawaii of monitors atmospheric solar, atmospheric, and meteorological parameters. We have data on annual atmospheric CO2 concentrations from 1980-2015. Specifically, we are interested in comparing CO2 levels between years 2000-2015 and years 1980-1999.



group	n	xbar	s
1980-1999	20	353.12	9.0
2000-2015	16	385.02	9.9

Confidence interval

Obtain a 90% confidence interval for the difference between the average atmospheric C02 levels (ppm) from years 2000-2015 and years 1980-1999.

- Define parameters

- Check conditions for CLT

- Are conditions for CLT met?

- Collect the components of confidence interval:

- Construct interval:

- Interpret:

Hypothesis test

- Define hypotheses

- We already checked conditions!
- Find the value of the test-statistic and its distribution

- Draw picture and write code to obtain p-value