Section 9.2 Comparing 2 Population Proportions

In 2010 & 2011 surveys were conducted by Gallup to measure concern for global warming.
- 2010 data: 359 people, 233 were concerned.
- 2011 data: 352 people, 194 were concerned.

Test the claim that the pop. proportions were different for these years. ($\alpha = .01$)

Hypotheses: $H_0: p_1 = p_2$, $*H_1: p_1 \neq p_2$.

Gather: $\hat{p}_1 = \frac{x_1}{n_1} = \frac{233}{359} = .649$, $n_1 = 359$
$\hat{p}_2 = x_2/n_2 = \frac{194}{352} = .551$, $n_2 = 352$.

Pooled data: $\bar{p} = \frac{x_1 + x_2}{n_1 + n_2} = \frac{233+194}{359+352} = .601$

$\bar{q} = 1 - \bar{p} = .399$.

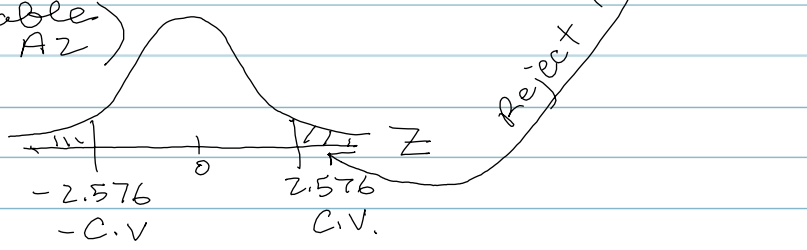
Requirements: At least 10 successes & failures in each sample ✓

Test Statistic:

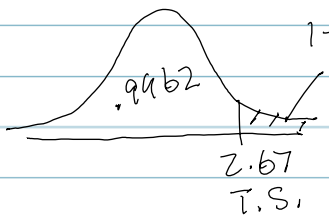
$$Z = \frac{(\hat{p}_1 - \hat{p}_2) - (p_1 - p_2)}{\sqrt{\frac{\bar{p}\bar{q}}{n_1} + \frac{\bar{p}\bar{q}}{n_2}}} = \frac{.649 - .551 - 0}{\sqrt{\frac{.601 \cdot .399}{359} + \frac{.601 \cdot .399}{352}}} = 2.67$$

Critical Values (Table A2)

$\alpha = .01$



P-value (Table A1)



p-val = 2(.0038)
= .0076

p-val < $\alpha = .01$
Reject H_0
Support H_1.

Conclude

The data support the claim that the proportions of those concerned about global warming differed in 2010 & 2011.