

AP Statistics

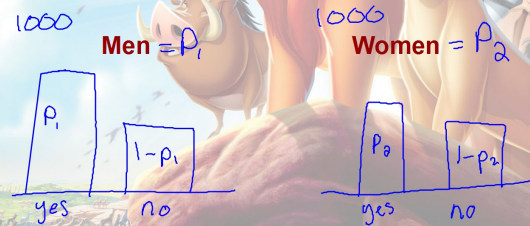
Chapter 10: Comparing Two Populations

Day 1

HW: Lesson 1 Practice Worksheet

Confidence Intervals for Single-Samples

There is an election coming up. We take two samples. One is the number of men who will vote for a certain candidate and the other is the number of women who will vote for that candidate as well.



Confidence Intervals for Single-Samples

Standard Deviation:

$$\sigma_p = \sqrt{\frac{p(1-p)}{n}}$$

Confidence Interval:

$$CI = p \pm z * \sqrt{\frac{p(1-p)}{n}}$$

Confidence Intervals for Single-Samples

We sample 1000 men and 1000 women. 642 men and 591 women said they would vote for a specific candidate. Find a 95% confidence interval for the proportion of men who will vote for this candidate. Then, find a 95% confidence interval for the proportion of women who will vote for this candidate.

Men	Women
$n = 1000$	$n = 1000$
$x = 642$	$x = 591$
$CL = .95$	$CL = .95$
$(.6229, .6711)$	$(.56053, .62147)$

Confidence Intervals for Single-Samples

We sample 1000 men and 1000 women. 642 men and 591 women said they would vote for a specific candidate. Let's say I want to find out if there is a difference between the proportion of men and women who vote for this candidate and what might that proportion be.

$$p_1 - p_2$$

Confidence Intervals for Two-Samples

Standard Deviation:

Difference between

$$\sigma_{p_1 - p_2} = \sqrt{\frac{p_1(1-p_1)}{n_1} + \frac{p_2(1-p_2)}{n_2}}$$

Confidence Interval:

$$CI = (p_1 - p_2) \pm z * \sqrt{\frac{p_1(1-p_1)}{n_1} + \frac{p_2(1-p_2)}{n_2}}$$

Confidence Intervals for Single-Samples

We sample 1000 men and 1000 women. 642 men and 591 women said they would vote for a specific candidate. Let's say I want to find out if there is a difference between the proportion of men and women who vote for this candidate and what might that proportion be.

CI for $p_1 - p_2$ (The difference in the proportion of men and woman who vote for a specific candidate.)

p_1 (men)

$x_1 = 642$

$n = 1000$

p_2 (woman)

$x_2 = 591$

$n = 1000$

(.00844, .09356)

we are 95% confident that the difference in the true proportion of men and woman who vote for this candidate falls between .84% and 9.356%. This suggests that more men than women will vote for this candidate.

The Conditions for $\hat{p}_1 - \hat{p}_2$

- Must be an SRS.
- 10% condition must be met.
- Make sure there are at least 10 successes and failures in each sample.