

AP Statistics**CHAPTER 19****Confidence Intervals for Proportions****- Confidence Intervals:**

A confidence interval is an interval estimate of a population parameter. Instead of estimating the parameter by a single value, an interval likely to include the parameter is given.

Constructing Confidence Intervals**- Check Assumptions and Conditions**

All statistical models have assumptions. In order to determine the appropriate model, we must determine the plausibility of an assumption by checking a related condition.

- ✓ Plausible Independence Condition: Is it possible that the data values could affect each other?
- ✓ Randomization Condition: Were the data sampled at random or generated from a properly randomized experiment? Proper randomized data can ensure independence.
- ✓ 10% Condition: Does the sample exceed 10% of the population? If so, the sample changes quite drastically which indicates that Normal model may no longer be appropriate.
- ✓ Success/Failure Condition: Are there at least 10 “successes” and 10 “failures”? The sample must be large enough to make the sampling model for the sample proportions approximately Normal.

- Mechanics

Find the standard error. [It is called the Standard error because we don't know the population proportion (p), only the observed proportion (\hat{p})] -- (SE)

Find the margin of error. We could informally use 2 for our critical value, but 1.96 is more accurate. -- (ME)

Write the Confidence interval. [Ex. $n \pm ME$ or (0.344, 0.546)]

- Conclusion

Interpret the confidence interval in the proper context. [Ex: I am 95% confident that between 34.4% and 54.6% of Americans read books on a weekly basis]

$$(SE) \text{ Standard error} = \sqrt{\frac{p(1-p)}{n}} \quad (ME) \text{ Margin of Error} = z^*(SE)$$

