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What Is a Confidence Interval?

In this lesson, we focus exclusively on interval estimation.

Perhaps the most common type of interval estimate is a confidence interval. Most people are already familiar with confidence intervals, without specifically knowing the term.

A confidence interval is a range of values that reflects both an approximation of a population attribute, like a mean, and the amount of uncertainty attributable to sampling.

A common example is political polling results, which are often reported with a value referred to as the margin of error. The margin of error is a measure of the uncertainty in the polling results.

For example, suppose a political poll of 1,000 likely voters finds that 45% of the surveyed voters support a specific candidate.

However, this is a sample from a large population. You can't infer that exactly 45% of likely voters support the candidate. The true proportion, or percentage, is unknown. In order to quantify the uncertainty in the knowledge of the true proportion, pollsters provide a margin of error.

For a poll of 1,000 likely voters, the margin of error is plus or minus 3%. From this you can infer, with 95% confidence, that the true proportion of likely voters who support the candidate is between 0.42 and 0.48, or between 42% and 48%. The term "confidence" refers to the statistical confidence that the calculated interval includes the true proportion.

Note that you learn more about the technical interpretation of confidence intervals, and what it means to be "confident" in upcoming videos.

The polling example involves the estimation of a population proportion. But, you can calculate interval estimates for a wide range of parameters. In this lesson, you learn about confidence intervals for means.

However, the concepts you learn apply to confidence intervals in general, regardless of the parameter you are estimating.

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