LESSON 27: CRITICAL VALUES
How Do Confidence Levels Affect a Confidence Interval?

PART A: CRITICAL VALUES (“CVs”)

We use two critical values (“CVs”) to construct a \((1 - \alpha)\) confidence interval (CI).

If we are using a \(z\) distribution, we denote the CVs \(\pm z_{\alpha/2}\).

- Here, “\(\pm\)” means “plus and minus.”
- \(\alpha\) is the total probability (area) in the two tails, and \(\alpha/2\) is the individual probability (area) in each tail.
- When graphing, we normally shade in the tails, even though the CI corresponds to the middle piece.

If we are using a \(t\) distribution, we denote the CVs \(\pm t_{\alpha/2}\).

We handle the \(\chi^2\) distribution differently.

PART B: COMMON “CVs” FOR THE \(z\) DISTRIBUTION

The most common confidence level is 95%. For the \(z\) distribution, the corresponding CVs are about \(\pm 1.96\).

- Remember the “68-95-99.7%” Empirical Rule. About 95% of approximately normal data will lie within 2 SDs of the mean. Actually, “1.96 SDs” would be more accurate.

For a 90% confidence level, the CVs are about \(\pm 1.645\).

For a 99% confidence level, the CVs are about \(\pm 2.58\).