

LESSON 27: CRITICAL VALUES

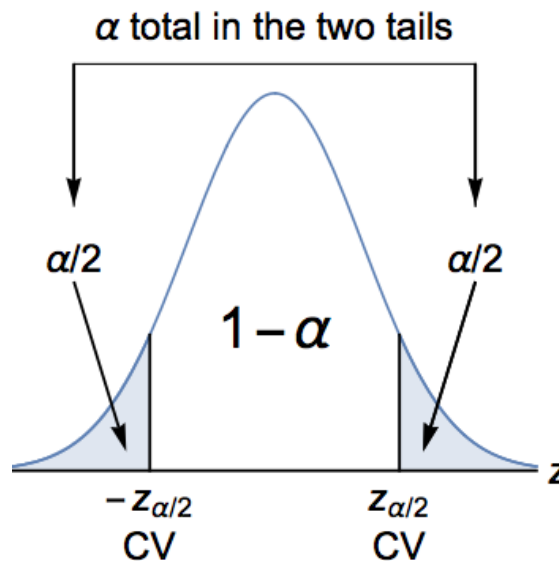
How Do Confidence Levels Affect a Confidence Interval?

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.”
- α 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.

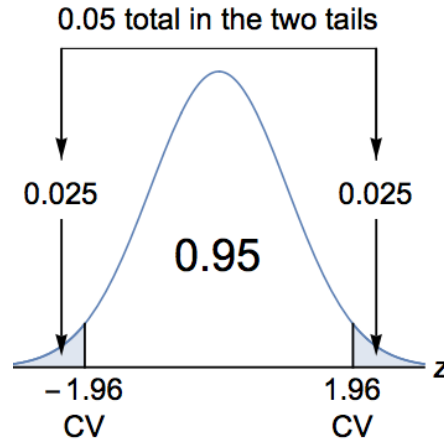


If we are using a t distribution, we denote the CVs $\pm t_{\alpha/2}$.

We handle the χ^2 distribution differently.

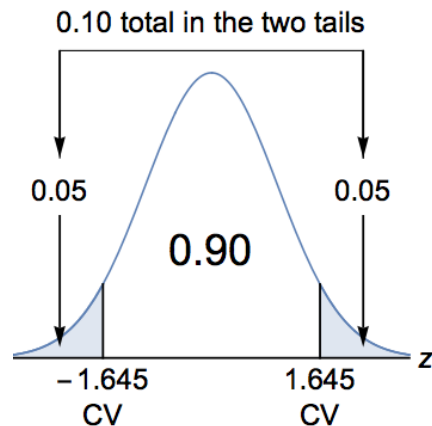
PART B: COMMON “CVs” FOR THE z DISTRIBUTION

The most common confidence level is **95%**. For the z distribution, the corresponding **CVs** are about ± 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 ± 1.645 .



For a **99%** confidence level, the **CVs** are about ± 2.58 .

