

Topic 2: Analysis for One or Two Population Means

Inserts: “Ttools”, “Pvalue”, “TtoolsAssumptions”, “LogInt”, “TtoolsAssumGraphs”

Topic 2 begins with a review of some basic definitions and concepts for statistical inference. We will then develop our two main inferential procedures, hypothesis testing and confidence intervals, for the general T-tools. We will focus mostly on the two-sample case where we will review paired sample procedures and independent sample procedures for the difference between two population means. Then, we will have a detailed look at the assumptions behind the T-tools. We will assess the validity of the assumptions with a graphical analysis using probability plots, boxplots and histograms. If there is an indication of a clear violation in the model assumptions, we will consider data transformations as well as non-parametric (or distribution free) methods to complete the analysis.

Breakdown:

- 1. General Definitions:** Parameter, Estimate, Sampling Distribution, C.L.T., Standard Error
- 2. T-tools (general):** T-ratio, Hypothesis Testing, test-statistics, p-values, C.I., critical values
- 3. Two-Sample Procedures:** Independent Samples and Paired Samples, Pooled standard deviation
- 4. Assumptions:** Graphical Analysis, Normal Probability Plots, Box-Plots, Histograms
- 5. Transformations:** Log Transformation and Interpretation
- 6. Non-Parametric Alternatives (optional):** Wilcoxon Rank-Sum Test, Signed-Rank Test

Topics and Definitions YOU should review:

1. Sample vs. Population.
2. Graphical Techniques: Histogram, Box-Plot
3. Summary Statistics: Mean, Median, Standard deviation, Variance
4. Probabilities Under T and Z distributions
5. One-Sample Procedures