Summary of Confidence Intervals and Hypothesis Testing

- Decision Script
- Requirements
- Understanding the Conclusion
- Understanding the Confidence Level
- Understanding the Significance Level
- Understanding the P-Value

Decision Script

1. Confidence Interval or Hypothesis Test? Estimation or Decision
2. Sigma Known or Sigma Unknown (Z or T)?
3. Proportion or Mean (Yes/No or Quantitative Question)?
4. 1 Sample or 2 Samples?
5. If 2 Samples, Mean: Independent or Dependent?

Requirements

- Proportions
  - np and nq greater than 5
- Means
  - If $n \leq 30$, need normal distribution for the population(s)

Understanding the Conclusion

- $p < \alpha$: At the … level of significance there is statistically significant evidence to show that … **all from the population** …
- $p > \alpha$: At the … level of significance there is insufficient evidence to show that … **all from the population** …

Understanding the Confidence Level

- If many samples are taken from this population all with sample size(s) … then a separate confidence interval will be produced from each. … percent of these confidence levels will contain the true population (mean, proportion, mean difference, difference in proportions). 1-… percent of them will not contain it.

Understanding the Level of Significance

- If the null hypothesis is true and if many samples are taken from this population all with sample size(s) then … percent of these samples will produce results that falsely tell us that the null hypothesis is false and that the alternative hypothesis is true. 1-… will correctly produce results that tell us to fail to reject the null hypothesis.

Understanding the P-Value

- If the null hypothesis is true and if a new sample is created with the same sample size(s), then … percent of these samples will have (means, proportions, differences) that are or differ by (less, more, as extreme) as the value that we obtained.