Inference

The process of extrapolation

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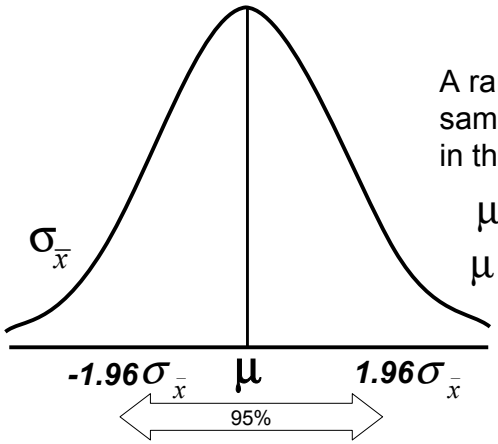
- Researchers study samples but want to know populations
- The process of extrapolating sample findings allows for inferences be made about the population parameters

Inferring means

The relationship between means

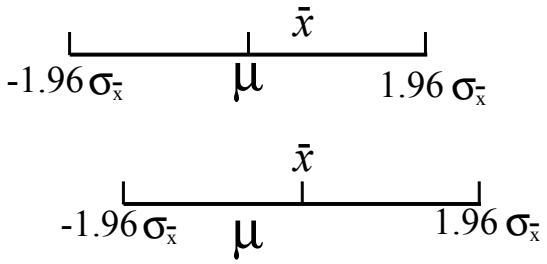


A randomly selected sample will have a mean in the following interval

$$\mu - 1.96\,\sigma_{\bar{x}}$$
$$\mu + 1.96\,\sigma_{\bar{x}}$$

Inferring means

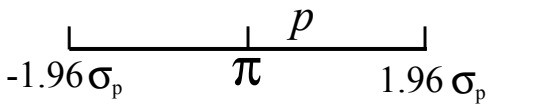
- If the sample mean is in the specified confidence interval, then the reverse must also be true. The population mean must fall in to the following interval:

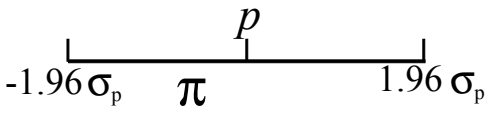


Inferring proportions

The same logic applies

- The same relationship holds true for inferring proportion parameters as well





Inference summary

Steps to follow

- Properly select a sample
- Calculate its statistics
  - Center (mean or proportion)
  - Standard deviation (estimates population)
  - Standard error
- Form the confidence interval for the desired level of confidence