



Intro to Stats

Measures of
Central Tendency

Measures of Central Tendency (an “average”)

- ▶ Number that best represents a group of scores
- ▶ Represents the “typical” individual
- ▶ Describes a large amount of data with a single number
- ▶ No single measure is best

- ▶ Mean
- ▶ Median
- ▶ Mode

- ▶ Each gives different information about a group of scores

Mean

- ▶ A measure of where most values tend to fall in a dataset
- ▶ What we often refer to as an “average”

Mean

- ▶ Sum the values in a group & divide by number of values
- ▶ *Every score is represented
- ▶ $\bar{X} = \Sigma X/n$
- ▶ \bar{X} = mean value of a group of scores
- ▶ Σ = summation sign
- ▶ X = each score in the set
- ▶ n = sample size in set

Mean Properties

- ▶ 1. Most reliable and most often used
- ▶ 2. Isn't necessarily an actual score
- ▶ 3. Strongly influenced by outliers
- ▶ 4. Sum of the deviations equals zero

Weighted Mean

- ▶ Multiply the value by the frequency of occurrence for each value, sum all the values, then divide by total frequency

First Sample	Second Sample	Combined Sample
$n = 12$	$n = 8$	$n = 20$
$\Sigma X = 72$	$\Sigma X = 56$	$\Sigma X = 128$
$M = 6$	$M = 7$	$M = 6.4$

Median

- ▶ Midpoint in a set of scores
- ▶ 50% above and 50% below the median value
- ▶ No formula to compute

- ▶ List values in order, from lowest to highest & find the middle score

- ▶ If there are 2 middle scores, find the mean of these 2 scores

Mean vs. Median

- ▶ The median is not sensitive to extreme scores and can be the most accurate centermost value (i.e., average)
- ▶ Means can skew due to extreme scores

Mode

- ▶ Value that occurs most frequently
- ▶ No formula to compute

- ▶ List all values once, tally the number of times each occurs, find the value that occurs most frequently

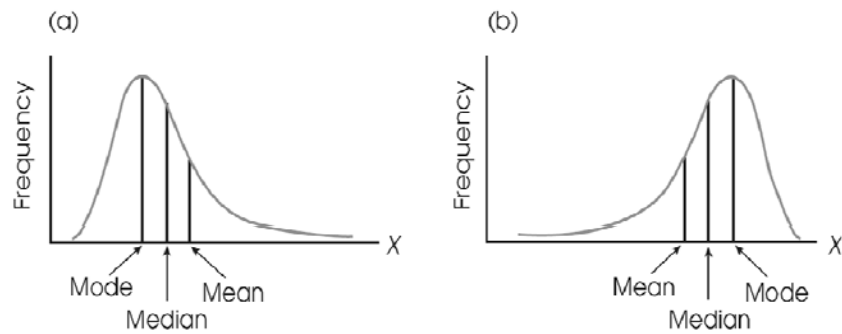
- ▶ Can have bimodal or multimodal sets

How do you choose?

- ▶ Nominal data can only be described with the mode
- ▶ The mean is usually the most precise with interval/ratio data
- ▶ Median is best in the presence of extreme values or if some values are imprecise

- ▶ *You might report more than one

Effects of Skew



When to use the median

- ▶ 1. When you have extreme scores or skew
- ▶ 2. When you have undetermined values
- ▶ 3. When you have an ordinal scale

When to use the mode

- ▶ 1. When you have a nominal scale (and sometimes ordinal)
- ▶ 2. When you have discrete variables
- ▶ 3. When you are interested in describing the shape of a distribution