

Measures of Central Tendency

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What do we mean –“average”?

- Grades - academic performance
- Sports - athletic performance
- “Average” Joe - non-descript
- Average temperature - Summarizes past data

Why do we need them?

- To summarize with a single number

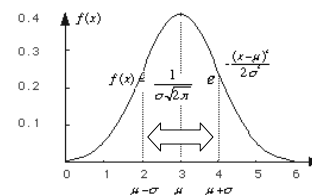
Averages

- One of the most common calculations: Add them all up, divide by the number you used
- Researchers call it the “mean”
- Salary example
- What happens when you add an extreme value?
- Add the President’s salary

Accounting for variability

- The measure is called “standard deviation”
- Describes the amount by which participants, subjects, or measures, vary from the “mean”
- A large SD means lots of variability
- Special relationship to the normal curve
- +or - 1 SD encompasses 68% of the observations

Standard deviation



68% between + and - 1 SD


Advantages/Disadvantages

- Familiar to most people
- Easy to calculate
- Takes into account all scores
- Effected by extreme scores

Median

- Looks for the mid-point
- Put the numbers in order from low to high
- Find the middle point
- Results from homework

R, R, R, R, R, R, R, R, R, B, B, A, A, A, A,
A, A, A, A, A, A, A, A, A, A, A



Accounting for variability

- Two possible measures
 - Range
 - Interquartile range
- Range
 - Uses very top and very bottom numbers
 - Impacted by extreme scores or measures
 - Very unreliable
- Interquartile range
 - Means “between quarters”
 - Divide the entire range into quarters
 - See page 115 for example

Advantages/Disadvantages

- Useful for highly skewed distributions
- Used for ordinal data
- Ignores most scores in the calculation

Mode

- Tells the most frequent score or measure
- Can be bi-modal
- Results from Homework 1
A, R, R, R, A, R, B, A, A, R, A, A, B, R,
R, R, A, A, B, R, A, A, A, A, A, A
- What’s the mode?
- Does that accurately reflect the class performance?

Accounting for variability

- The Mode doesn’t
- It’s unsophisticated

Advantages/Disadvantages

- Easy to calculate
- Lends itself to informal reports
- Not very informative
- Unstable
- Ignores most scores in the calculation

Which measure of central tendency is best?

- It depends
- Use the one that gives the truest picture of the data

Recap of averages & variability

- Mean - sum and divide by N
- Median - the midpoint
- Mode - most frequently occurring score
- Standard deviation
- Interquartile range or range
- No measure for variability