

# THINKING AND WRITING IN PSYCHOLOGY Psychology 204

East-West University/Fall 2022

# Statistics in Psychology

- Frequency distributions
- Measures of central tendency
- Measures of variation
- Normal distributions

# Frequency distributions

- Scores in order of highest to lowest

# Measures of central tendency

- Mode
- Mean
- Median

# Mode

- Most frequently occurring score(s) in a distribution
- Possible for the mode to not be near the center of the distribution

Five students take a test

2 score 100%

3 score 68%

Mode is 68%



# Mean

- The average of a distribution

Five students take a test

2 score 100%

3 score 68%

$$68 \times 3 + 200 / 5 = 80.8\%$$

$$68 \times 3 = 204$$

$$100 \times 2 = 200$$

$$204 + 200 = 404 / 5 = 80.8$$

# Median

- The middle score in a distribution (half above, half below)
- Better if there are a few high or low scores

10 students take a test

One scores 100%

Two score 80%

Six score 70%

Two score 60%

# Measures of variation

- Range
- Standard deviation



# Range

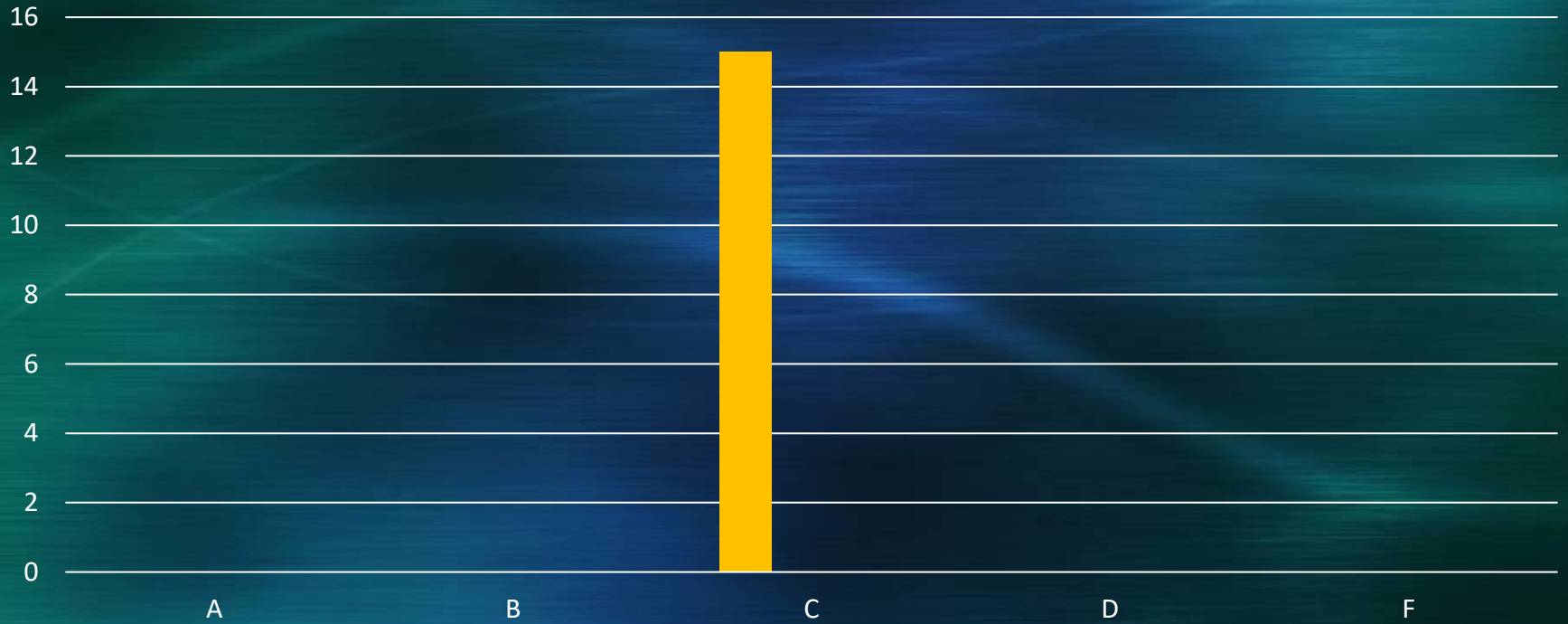
- The difference between the highest and lowest scores in a distribution

# Standard deviation

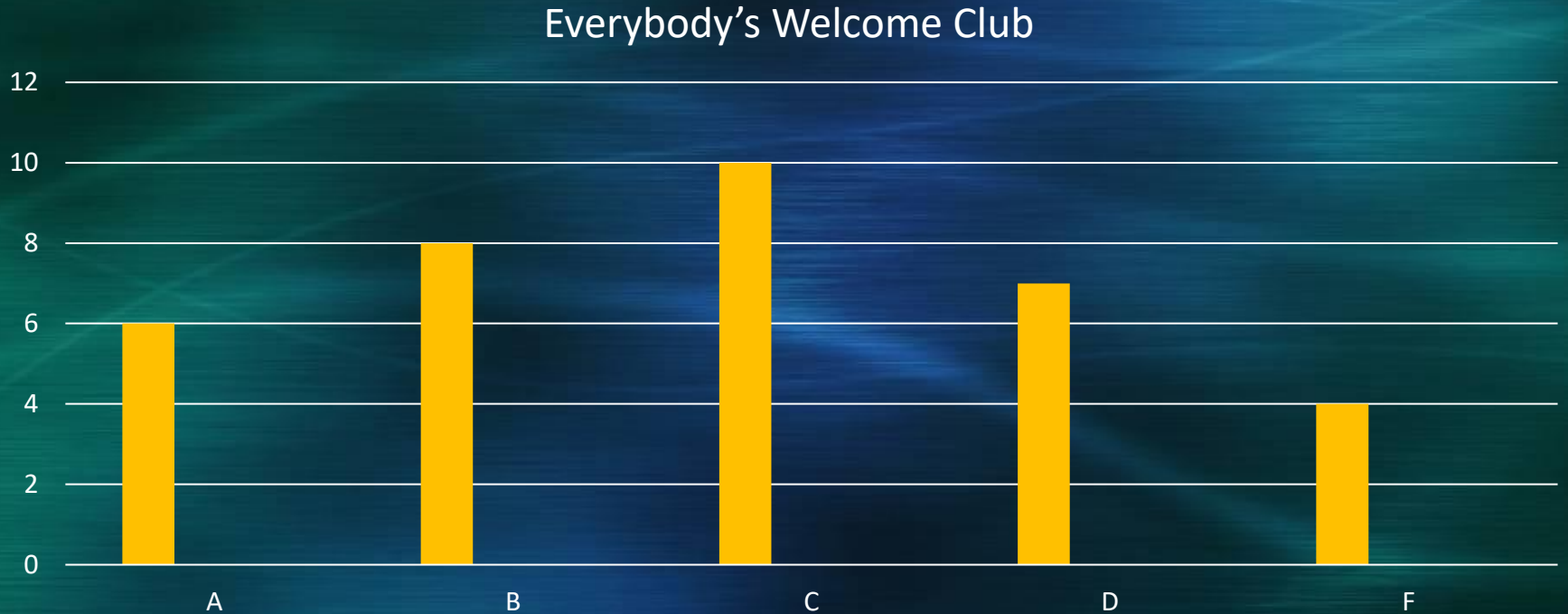
- Tell us how much scores vary around the mean score of a distribution
  - The higher the standard deviation, the more spread out the scores are
  - The lower the standard deviation, the closer together the scores are
  - If a distribution has a standard deviation of zero, it means everyone got the same score/grade (“Cs-only club”)

# Cs-only Club

Chart Title



# Everybody's Welcome Club



# Standard deviation

- Tells us how spread out scores are

1. Calculate the mean

36 yards

38 yards

41 yards

45 yards

Mean =  $160/4 = 40$  yards

2. Determine the deviation from the mean

- 4 yards

- 2 yards

+ 1 yards

+ 5 yards



# Standard deviation

## 3. Square the deviation

- 4 yards      16 yards

- 2 yards      4 yards

+ 1 yards      1 yard

+ 5 yards      25 yards

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Sum of deviation      46 yards

$46/4 = 11.6$  yards

Square root = 3.4 yards (standard deviation)

# Normal distribution

- Bell-shaped curve
  - More scores fall near the mean than at the extremes
  - Not *skewed* (left and right side are mirror images)
  - 68% of score fall within one standard deviation
  - 96% of score fall within two standard deviations
  - 99.7 % of scores fall within three standard deviations