What You Need to Know About Statistics and Correlation for AP Psychology

Correlation:
- correlation coefficient (*r*) can only range from -1.00 to +1.00
- The farther away from zero, in either a positive or negative direction, the stronger the relationship is
- Negative coefficients mean negative correlation
- Positive coefficients mean positive correlation
- Zero or close to zero means no correlation
- Also need to know what each scatterplot looks like

Inferential vs. Descriptive Statistics
- Descriptive- use when we want to summarize, organize or characterize. Central tendency, correlation, variability are examples
- Inferential- use when we want to compare differences, find out the statistical significance, or draw conclusions. Probability testing is an example

Graphing Experimental Data
- X axis- the horizontal line; where the independent variable goes
- Y axis- the vertical line; where the dependent variable goes

Central Tendency: the middle
- Mean- add up the values and divide by number of values (best when data is not skewed or normally distributed)
- Median- line them up smallest to largest and find the middle number (best when data is skewed or there are extreme score)
- Mode- most frequently occurring number

Shape of Data Distribution- Use the foot trick
- Normal/Bell Curve: mean, median, mode are all the same or close. Most scores are in the middle
- Negative Skew: Left Skew, most scores are in the high range. Test was too easy. Think all "e's"
- Positive Skew: Right Skew, most scores are in the low range. Test was too hard or impossible. Think all "I's"

Standard Deviation: a measure of variability
- Range- highest score minus the lowest score
- The bigger the range, the bigger the standard deviation
- If they ever give you the variance and ask you the standard deviation, just find the square root of the variance.

Probability Testing
- p can only range from 0 to 1.00
- $p < .05$ means it is statistically significant. We can reject the null hypothesis. We are 95% certain it wasn't due to chance.
- $p > .05$ means it is not statistically significant. We cannot reject the null hypothesis because we are not certain it wasn't due to chance.
- We always want to be 95% or better than 95% certain that it wasn't due to chance.
- Another way of saying it- we want a less than 5% probability that it was due to chance.

Normal Curve Cheat Sheet

Wechsler intelligence score
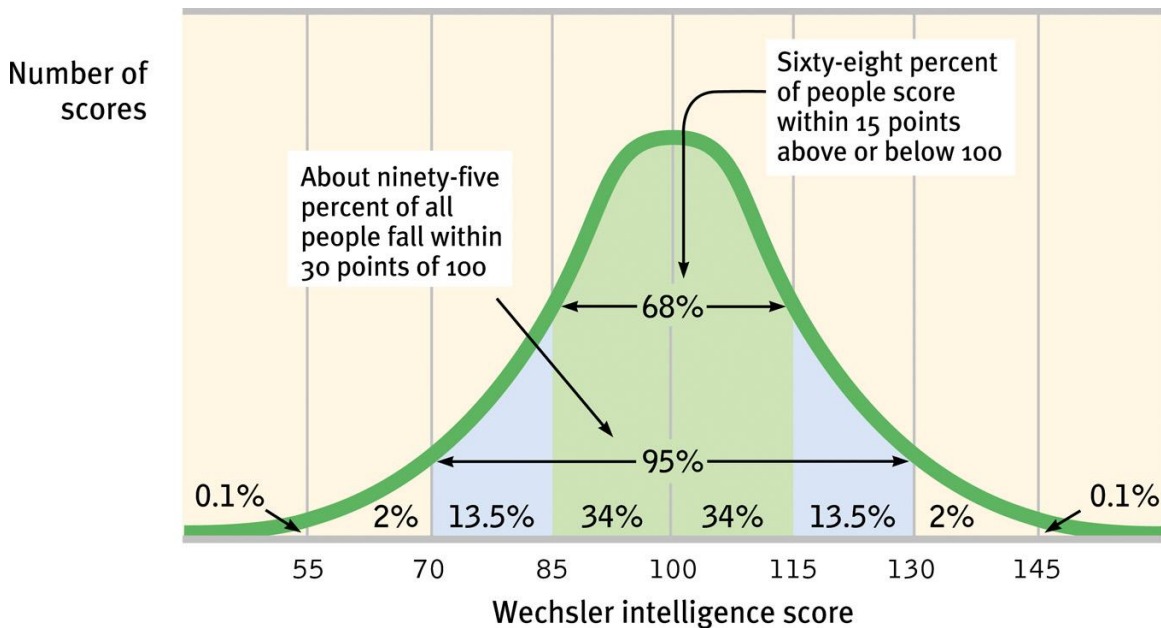
- 50% are above the mean, 50% are below the mean

- 68% are within one standard deviation of the mean (34% one standard deviation above + 34% one standard deviation below = 68%)

- 95% are within two standard deviations of the mean (13.5% + 34% below mean + 34% + 13.5% above mean = 95%)

- 99.7% are within three standard deviations of the mean (adding everything except the 0.1% on each send of the tails)

- 84% are one standard deviation away from the mean (50% + 34%)

Applied to IQ Scores

- mean is 100, standard deviation is 15
- 50% fall above 100, 50% fall below 100
- 68% of people fall between 85-115
- 95% of people fall between 70 and 130
- 2% fall between 55 and 70; another 2% fall between 130 and 145
- 0.1% fall below 55; another 0.1% fall above 145

Finding the Standard Deviation

- Just take the square root of the variance. They will always give you the variance.