

Descriptive Statistics

Can: Summarize data to find a pattern

cannot: make conclusions beyond data we've analyzed
→ can't reach conc. regarding hypotheses

MEAN
 μ

What: Single value of central tendency

When: multiple measures from one place or level

Standard Deviation σ

What: how much variation is in data set

When: multiple measures from one place

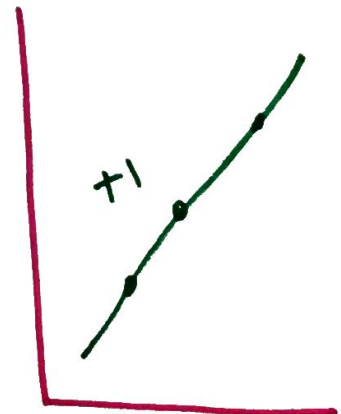
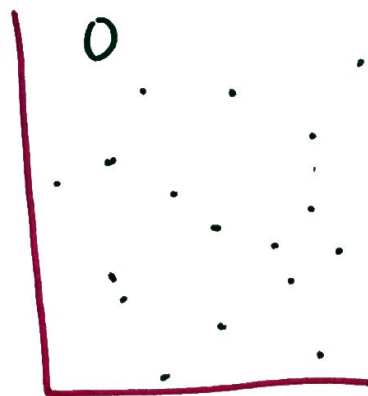
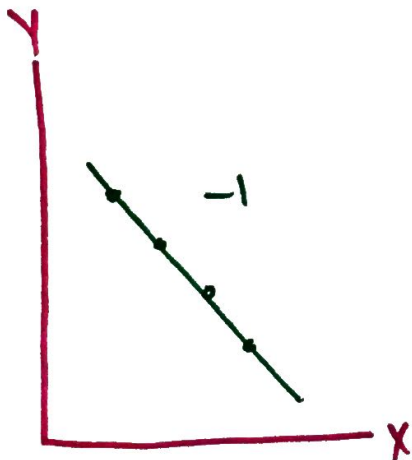
Correlation "r" coefficient

What: Degree of relatedness between 2 variables

- linear correlation

- ranges from -1 to 1

When: you've measured multiple data points for X + Y



→ Strength & direction of a linear relationship
ie Strong correlation

Inferential Statistics

T-Test

What: Compares the means of 2 groups
↳ are the means of 2 groups far enough apart to call them truly different

When: you have μ + σ of 2 data sets to compare

ANOVA

What: Compare μ of 3 or more data sets
When: "

Chi-squared "goodness of fit" χ^2

What: Comparison of what you observed vs expected

When: you have a theoretical or known trend you want to compare your results to.

Coefficient of Determination "r²"

What: Proportion of variance of one variable that is predictable from another variable ↙ not due to random chance

When: we need to measure how certain we can be when making a prediction.

Null vs Alternative Hypotheses

What: Statement regarding differences of effects that occur in a data set/Population

Null Hypothesis (H_0) usually the "devil's advocate"
→ no difference/change/causation/relationship

~~changing~~ **changing X does not change Y**

EX: taking the Summer ecology course has no effect on students' extended essay score

Alternative Hypothesis (H_A)

→ significant difference/causation/relationship

changing X will change Y

EX: taking the Summer ecology course will increase students' extended essay score