

Descriptive Statistics

Tyson S. Barrett, PhD

PSY 3500

Millions Of Acres Burned By Wildfires In The U.S. From 1985 To 2017

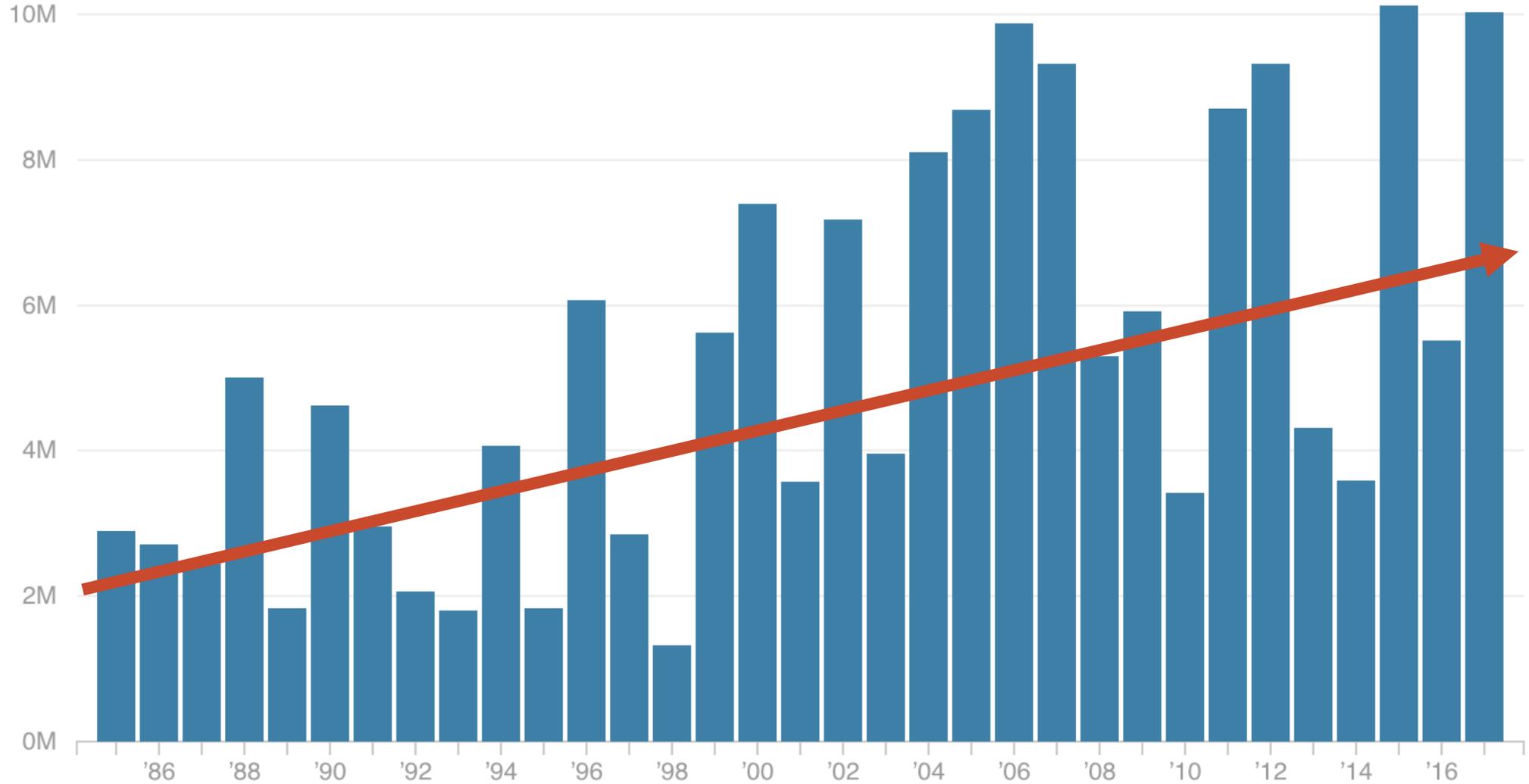
Statista

Not everyone

STATISTA
— KAY

[https://www](https://www.statista.com)

[https://www](https://www.statista.com)



Statistics...

Not everyone likes it, but it is an essential tool to understand the world

**STATISTICS IS THE GRAMMAR OF SCIENCE.
— KARL PEARSON**

https://www.ted.com/talks/hans_rosling_and_the_magic_washing_machine

https://www.ted.com/talks/arthur_benjamin_s_formula_for_changing_math_education

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**Use it to learn from your data and then to
communicate your findings**

Descriptive vs. Inferential

Descriptive: describes the data

**How many in the sample?
What is the average in the sample?**

Inferential: infers about the population

How many are there in the population? What is the average in the population?

Descriptive vs. Inferential

Descriptive: describes the data

**How many in the sample?
What is the average in the sample?**

We'll be talking about descriptive first and then inferential

Describing a single variable

Distributions

“the way the scores are distributed across the levels of that variable,”
(pg. 323)

Central Tendency

Where is the center?

- Mean (average), median, and mode

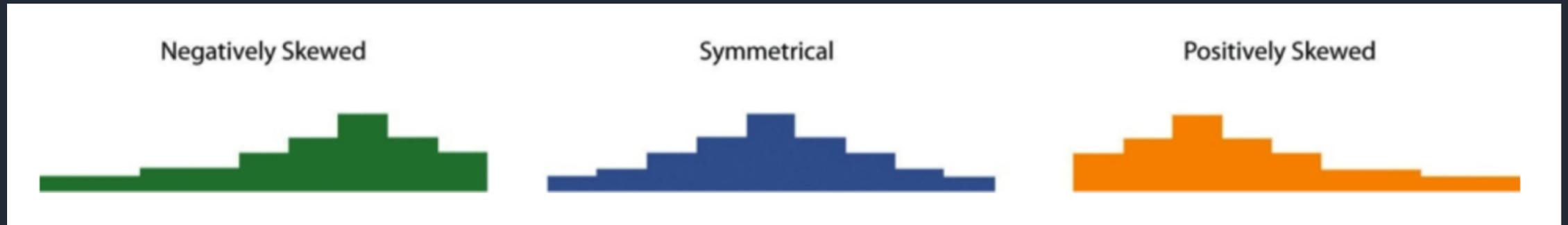
Variability

How much does it vary?

- Min/Max, Standard Deviation

Distributions and Frequencies

The way the scores are distributed across the levels of that variable



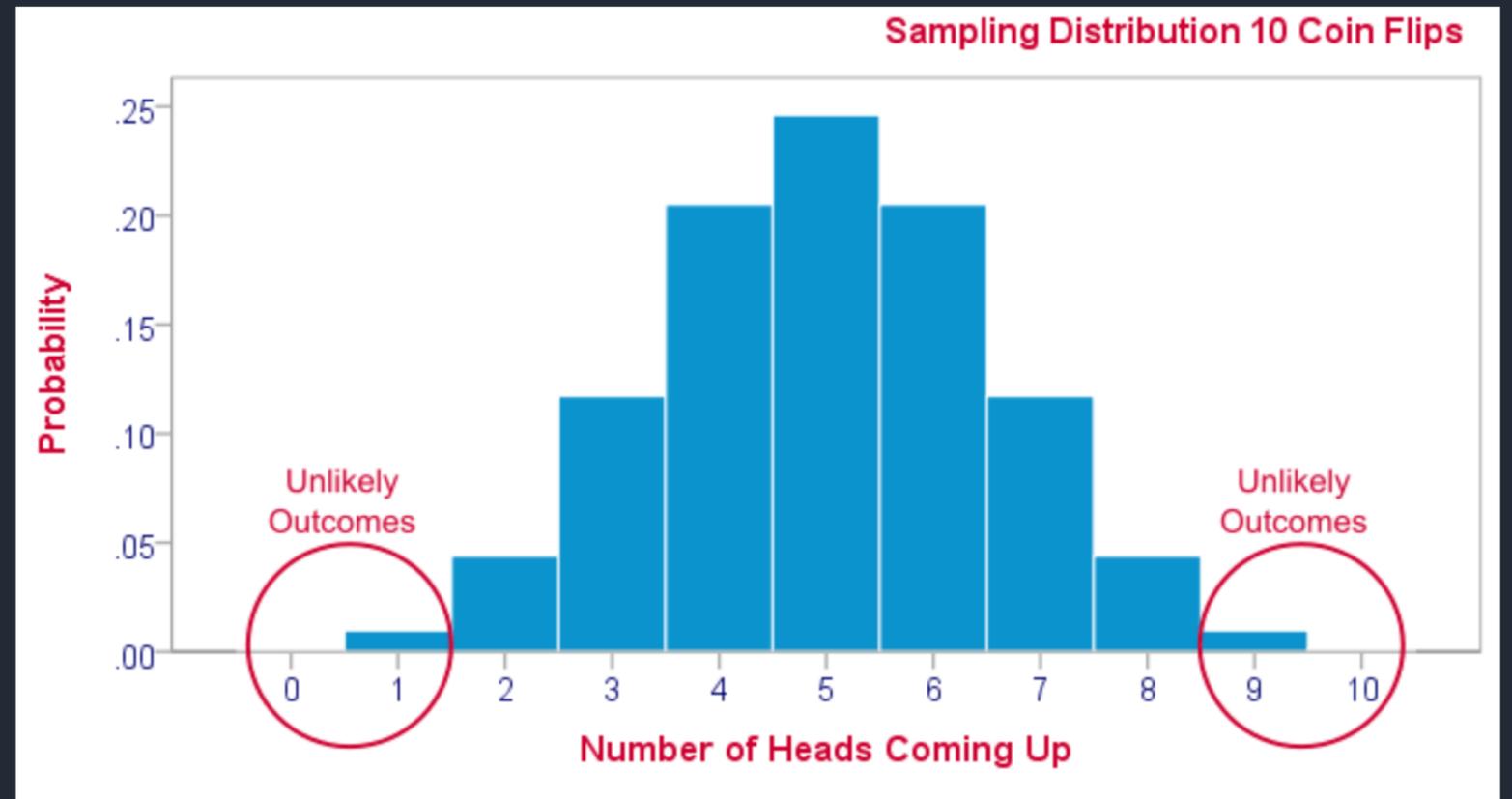
All are common in Psychology research

What do these distributions tell us about the variable?

Distributions and Frequencies

The way the scores are distributed across the levels of that variable

The
distribution of
10 coin flips



Central Tendency

Where is the center?

Mean

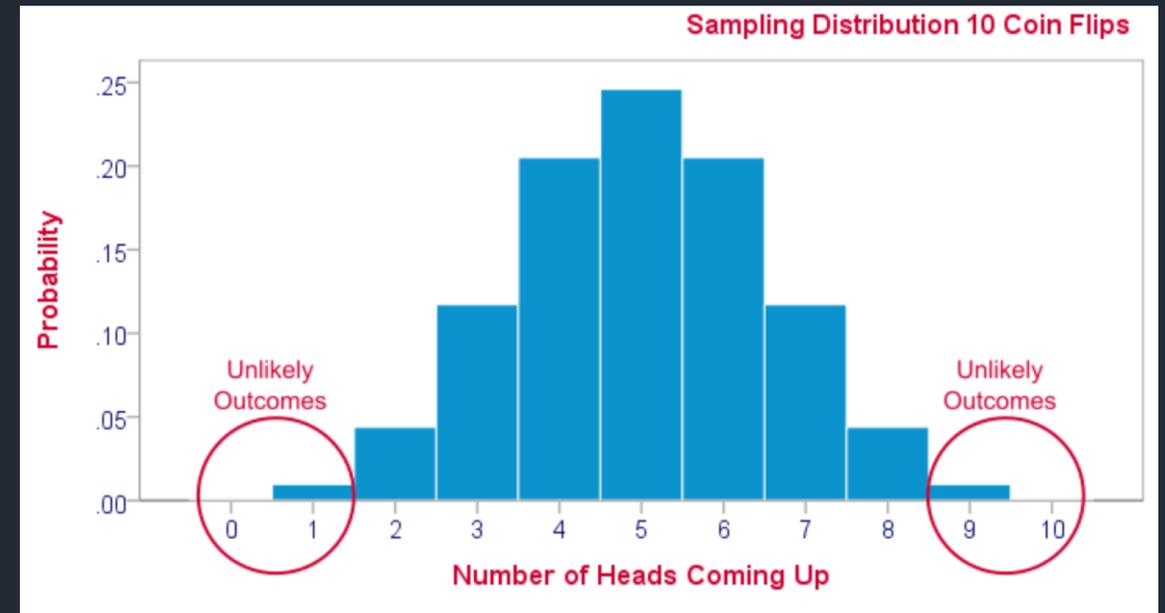
Sum them up and divide by the number of them

Median

Put the values in order, which is the middle value?

Mode

Which value is most common?



Variability

How much do the values vary?

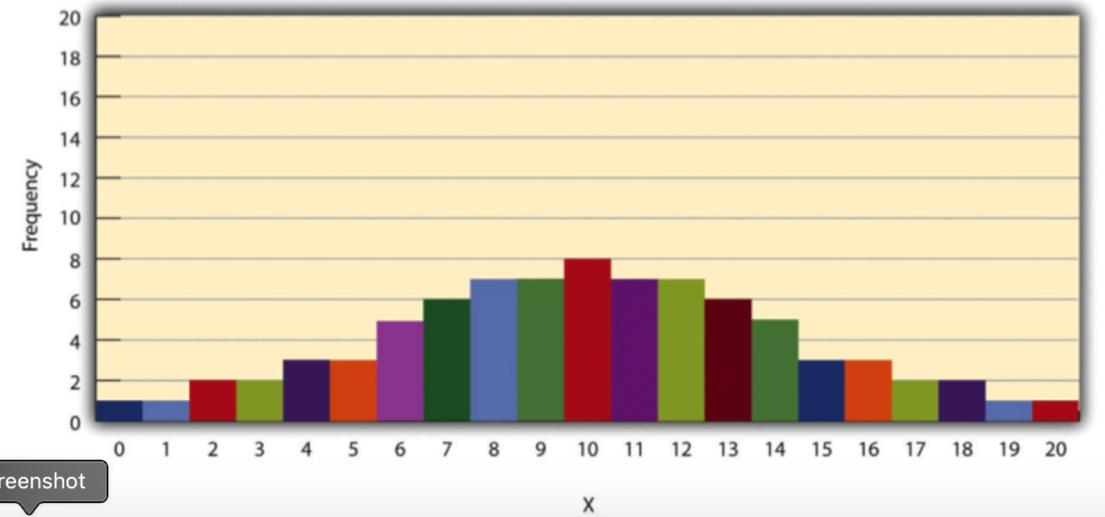
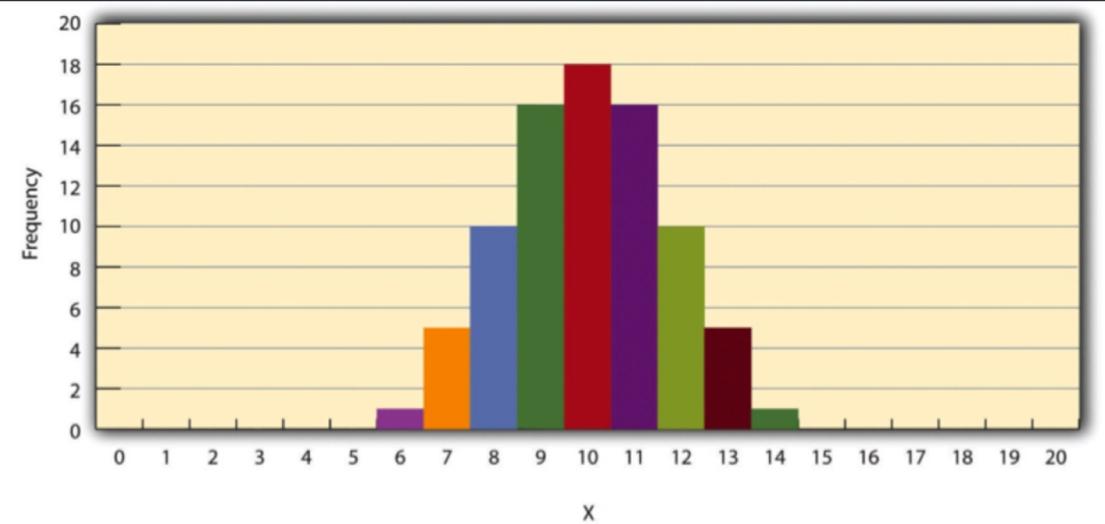
Min/Max (range)

Find the lowest and highest values

Standard Deviation

“The average distance between the scores and the mean,” (pg. 328)

SD helps us make z-scores

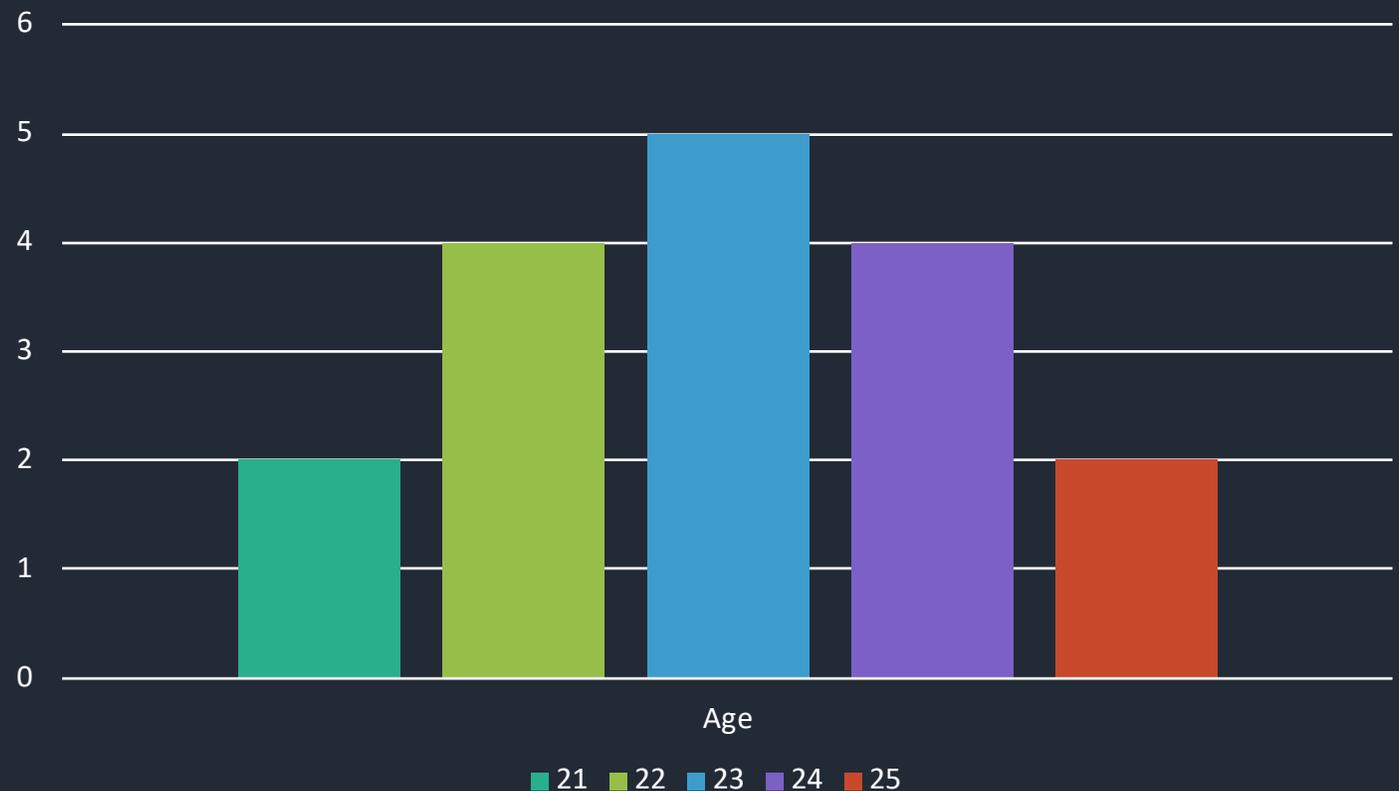


Same central tendency,
different variability

Describe this variable

Use the central tendency and variability to describe this variable

Age	Frequency
20	2
21	4
22	5
23	4
24	2



Describing 2+ variables

Statistical Relationships

Group Differences

Quantifying the difference between groups regarding some variable

Correlations

The relationship between two variables

Group Differences

Very common analysis in Psychology

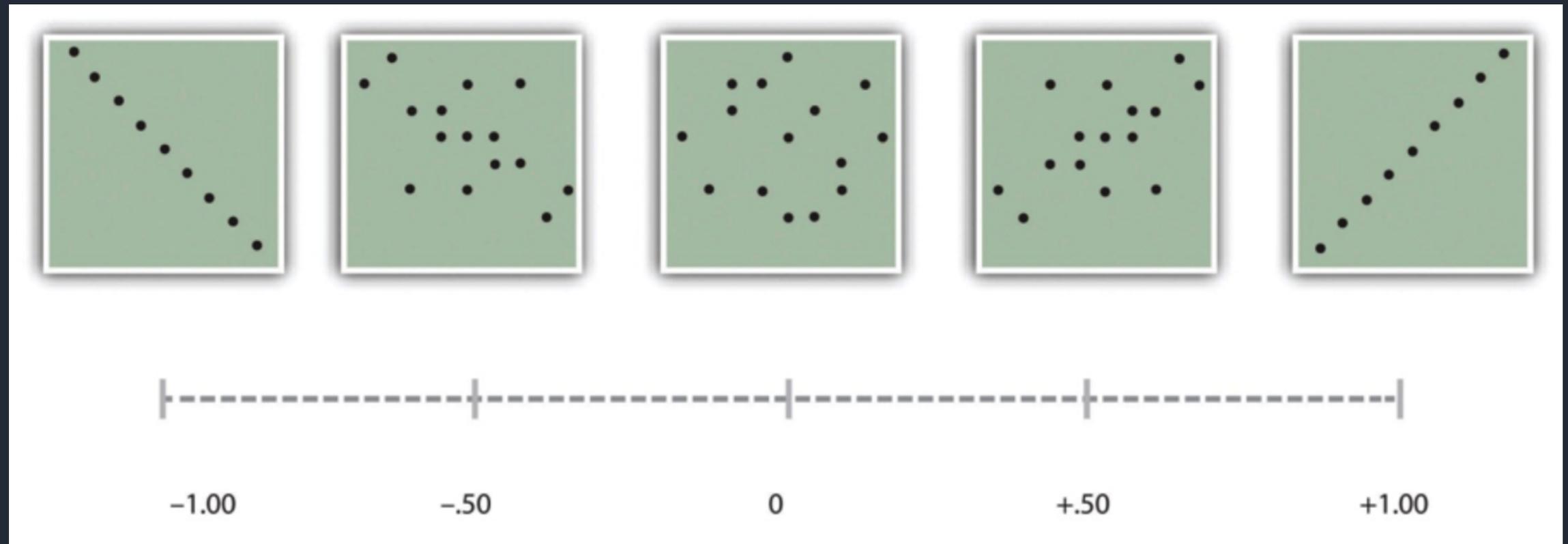
Do 2 or more groups differ regarding some other variable (often the outcome)?

Effect Size

- **The size of the differences**
- **Communicates the importance and meaningfulness of the difference**

Correlations

The linear relationship between two variables



<https://shiny.rit.albany.edu/stat/rectangles/>

Communicating the Results

One of the most important aspects of a study

In writing

E.g., The treatment group had a mean of 23.40 (SD = 9.33), and the control group had a mean of 20.87 (SD = 8.45).

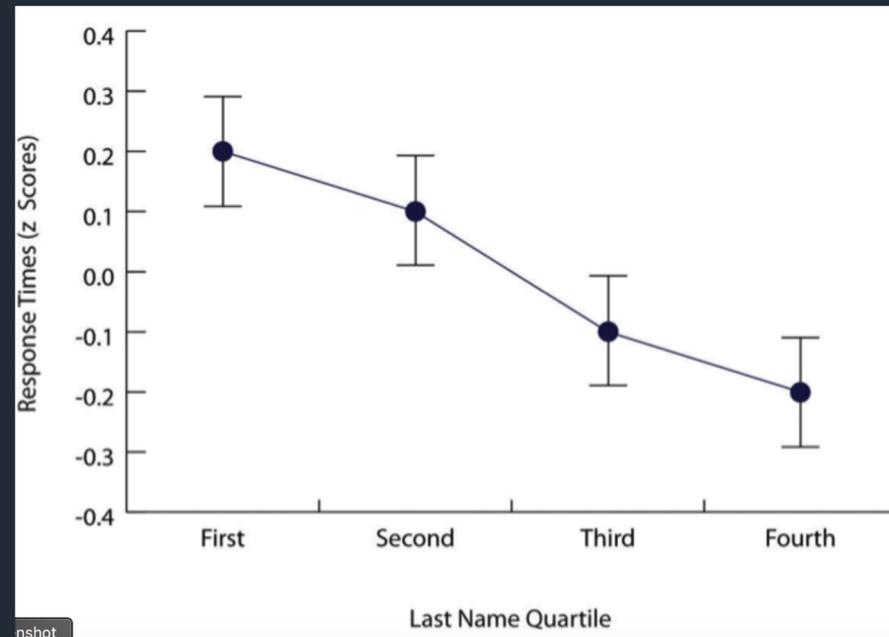
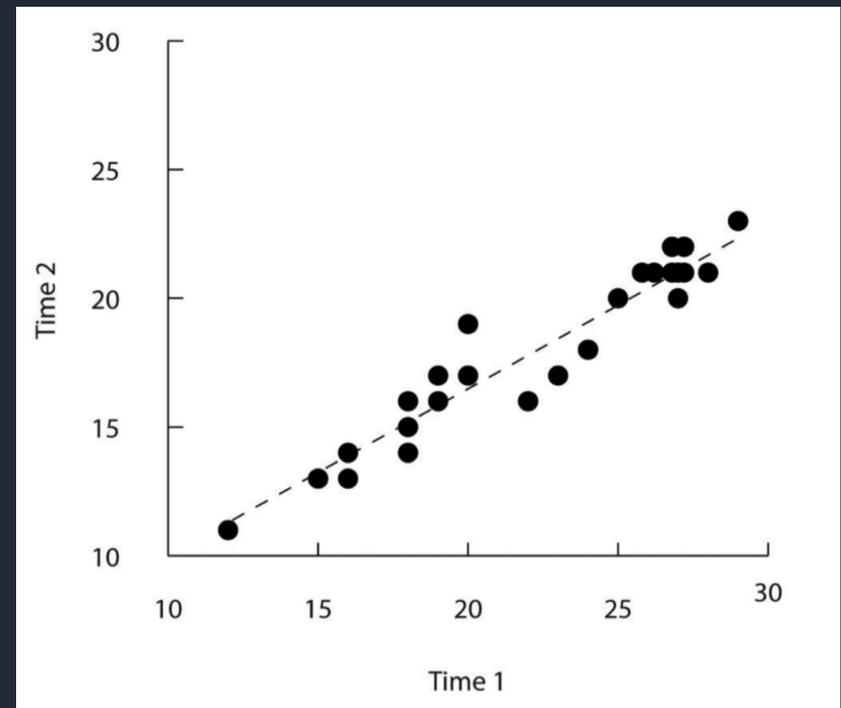
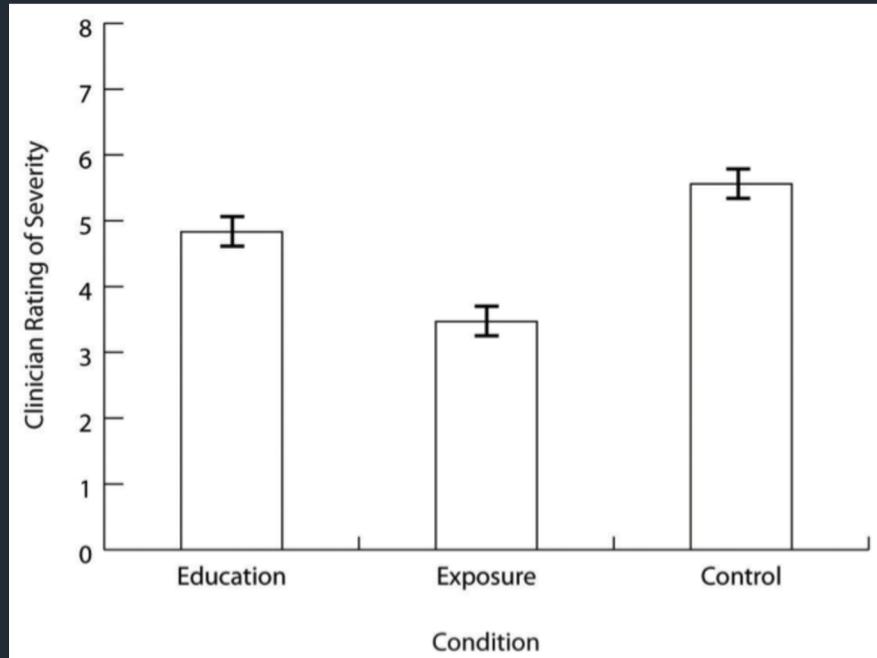
Graphs

Bar graphs, line graphs, scatterplots,

Tables

Frequency, descriptive, correlations

Graphs



Tables

Table X

Correlations Between Five Cognitive Variables and Age

Measure	1	2	3	4	5
1. Working memory	—				
2. Executive function	.96	—			
3. Processing speed	.78	.78	—		
4. Vocabulary	.27	.45	.08	—	
5. Episodic memory	.73	.75	.52	.38	—
6. Age	-.59	-.56	-.82	.22	-.41

Table X

Means and Standard Deviations of Intentions to Have Unprotected Sex and Attitudes Toward Unprotected Sex as a Function of Both Mood and Self-Esteem

Self-Esteem	Negative mood		Positive mood	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
	Intentions			
High	2.46	1.97	2.45	2.00
Low	4.05	2.32	2.15	2.27
	Attitudes			
High	1.65	2.23	1.82	2.32
Low	1.95	2.01	1.23	1.75