Correlational Study

- <u>Definition</u>: examines RELATIONSHIPS between two variables
- Correlation DOES NOT PROVE causation!!!
- Correlational range from -1 to +1 (correlation coefficient).
 - The number is the STRENGTH of the correlation!
 - Positive (+) correlations mean that as one variable increases, so does the other
 - Negative (-) correlations mean that as one variable increases, the other decreases

• Examples:

- Temperature and ice cream eaten (+)
- TV watched and grade performance (-)

Types of Correlation

Positive Correlation

 The variables go in the SAME direction.

Negative Correlation

The variables go in opposite directions.

Studying and grades hopefully has a positive correlation.

Heroin use and grades probably has a negative correlation.

Correlation Coefficient

 a statistical measure of the extent to which two factors vary together, and thus how well either factor predicts the other



Scatterplot

- a graphed cluster of dots, each of which represents the values of two variables
- the slope of the points suggests the direction of the relationship
- the amount of scatter suggests the strength of the correlation
 - Iittle scatter indicates high correlation
- also called a scattergram or scatter diagram







Perfect positive correlation (+1.00)

No relationship (0.00)

Perfect negative correlation (-1.00)

Scatterplots, showing patterns of correlations

Height and Temperament of 20 Men

Subject	Height in Inches	Temperament	Subject	Height in Inches	Temperament
1	80	75	11	64	48
2	63	66	12	76	69
3	61	60	13	71	72
4	79	90	14	66	57
5	74	60	15	73	63
6	69	42	16	70	75
7	62	42	17	63	30
8	75	60	18	71	57
9	77	81	19	68	84
10	60	39	20	70	39



Scatterplot of Height and Temperament

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Three Possible Cause-Effect Relationships



Statistical Reasoning

Mode

• the most frequently occurring score in a distribution

Mean

- the arithmetic average of a distribution
- obtained by adding the scores and then dividing by the number of scores
- Could easily be thrown off by a couple of outliers

Median

- the middle score in a distribution
- half the scores are above it and half are below it

Statistical Reasoning

A Skewed Distribution





Statistical Reasoning

Range

- the difference between the highest and lowest scores in a distribution
- Standard Deviation
 - a computed measure of how much scores vary around the mean