

Variables & Attributes

- ▣ Variables –elements, characteristics or qualities or observation (of a person, thing or situation) being study
- ▣ that can taken on different values or can be manipulated, measured and controlled in research study.
- ▣ Attribute...a specific value on a variable

Variables & Attributes

Variable

age

Attribute

18, 19, 20, etc...

Examples

Variable

Gender

Attribute

Examples

Variable

Gender

Attribute

Male, female

Examples

Variable

satisfaction

Attribute

Examples

Variable

satisfaction

Attribute

1 = very satisfied

2 = satisfied

3 = somewhat satisfied

4 = not satisfied

5 = not satisfied at all

Types of Variables

- **Independent variable (IV)...**
- **Dependent variable (DV)...**
- **Controlled variable (CV)...**

Independent variable (IV)...

- ▣ **What you as researcher (or nature) changed in some way**
- ▣ **What is being tested**
- ▣ **What is being manipulated**

Dependent variable (DV)...

- ▣ **What you presume to be influenced by the IV or**
- ▣ **Something that might be affected by the change in IV**
- ▣ **What is being Observed or measured**
 - **The data collected during the investigation**

Controlled variable (CV)...

- **A variable that remain unchanged**
- **Parameters that remained constant during investigation/or observations**
- **That allow a “fair test”**

Examples

Jigsaw Puzzle:

Students of different ages were given the same jigsaw puzzle of 32 to put them together. They were timed to see how long it took to finish the puzzle)

IV: Ages of the students were tested by researcher

DV: Time to put the puzzle was observed

CV: Same 32 Pieces game

Examples

Pound Heating:

The temperature of the pound was measured at different depths

IV: Depth of water pound

DV: Temperature

CV: Thermometers

Examples

Cooking:

The higher the temperature of water, the faster an egg will boil.

IV: Temperature of water

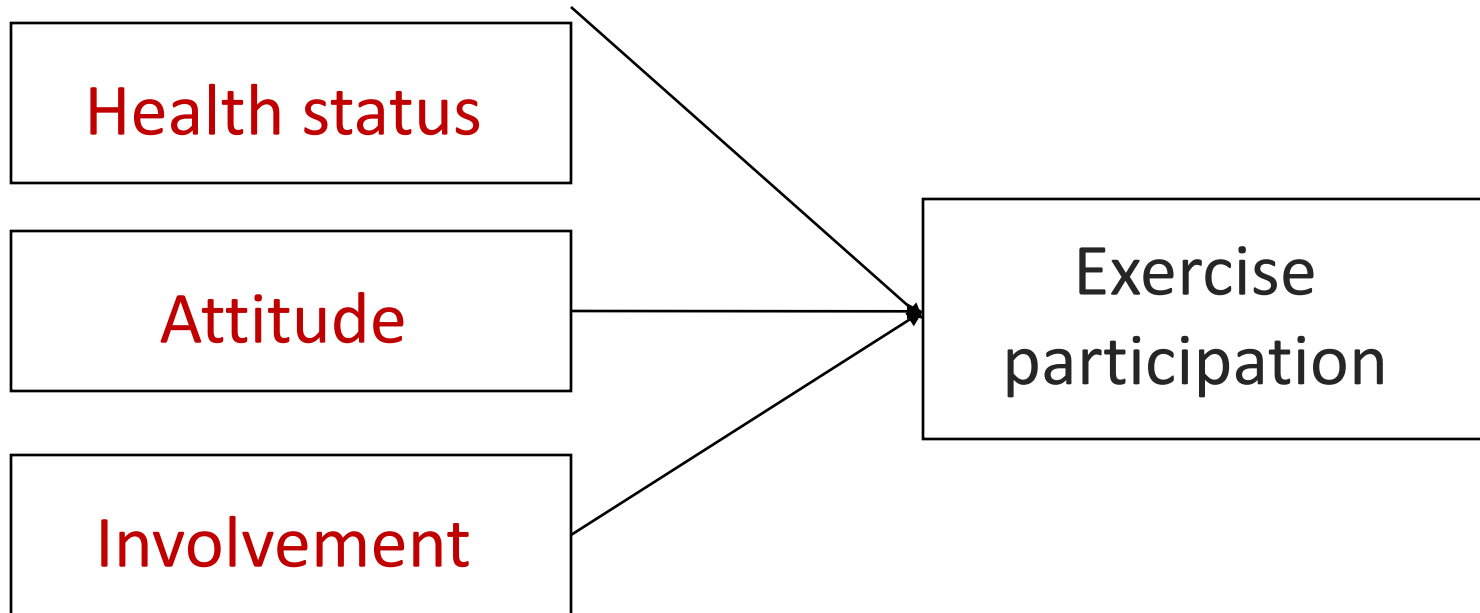
DV: Time to boil the eggs

CV: Type of egg/size of egg

Examples

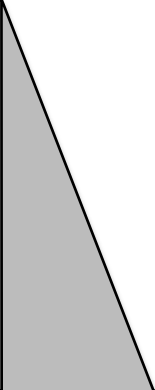
IV

DV

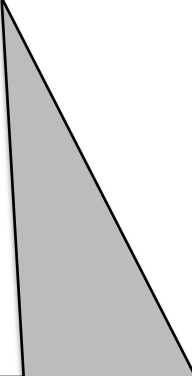


Types of Relationships

□ Correlation vs. Causal relationships/Causation



variables perform
in a synchronized
manner



Causes of An Act or
A change to other
variable due to
unknown reason

Correlation

- Correlation is a statistical technique that can show
- ✓ whether and how strongly pairs of variables are related to each other.

Correlation Coefficient

- The main result of a correlation is called the **correlation coefficient** (or "r"). It ranges from -1.0 to +1.0.
- The closer "r" is to +1 or -1, the more closely the two variables are related.
- If r is close to 0, it means there is no relationship between the variables.

Correlation Coefficient

- If r is positive, it means that as one variable gets larger the other gets larger.
- If r is negative it means that as one gets larger, the other gets smaller (often called an "inverse" correlation).

Correlation Co-efficient

- While correlation coefficient is reported as $r =$ (a value between -1 and +1),
- Squaring them makes them easier to understand.
- The square of the coefficient (or r square) is equal to the percent of the variation in one variable that is related to the variation in the other.

Correlation Co-efficient

- Suppose r is 0.5
- After squaring r , ignore the decimal point.
- An r of 0.5 means 25% of the variation is related ($.5$ squared = $.25$).
- An r value of $.7$ means 49% of the variance is related ($.7$ squared = $.49$).
- Like all statistical techniques, correlation is only appropriate for certain kinds of data. **Correlation works for quantifiable data** in which numbers are meaningful, usually quantities of some sort.

Correlation Co-efficient

- The second caveat is that the Pearson correlation technique works best with linear relationships: as one variable gets larger, the other gets larger (or smaller) in direct proportion.
- It does not work well with curvilinear relationships (in which the relationship does not follow a straight line). An example of a **curvilinear relationship** is age and health care.
- They are related, but the relationship doesn't follow a straight line. Young children and older people both tend to use much more health care than teenagers or young adults.

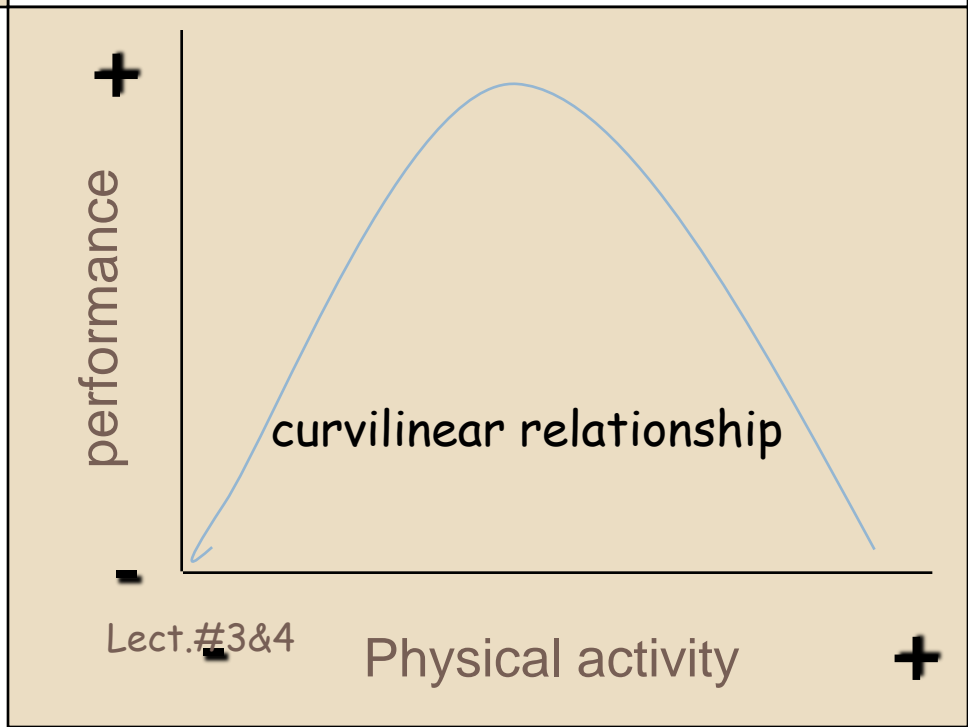
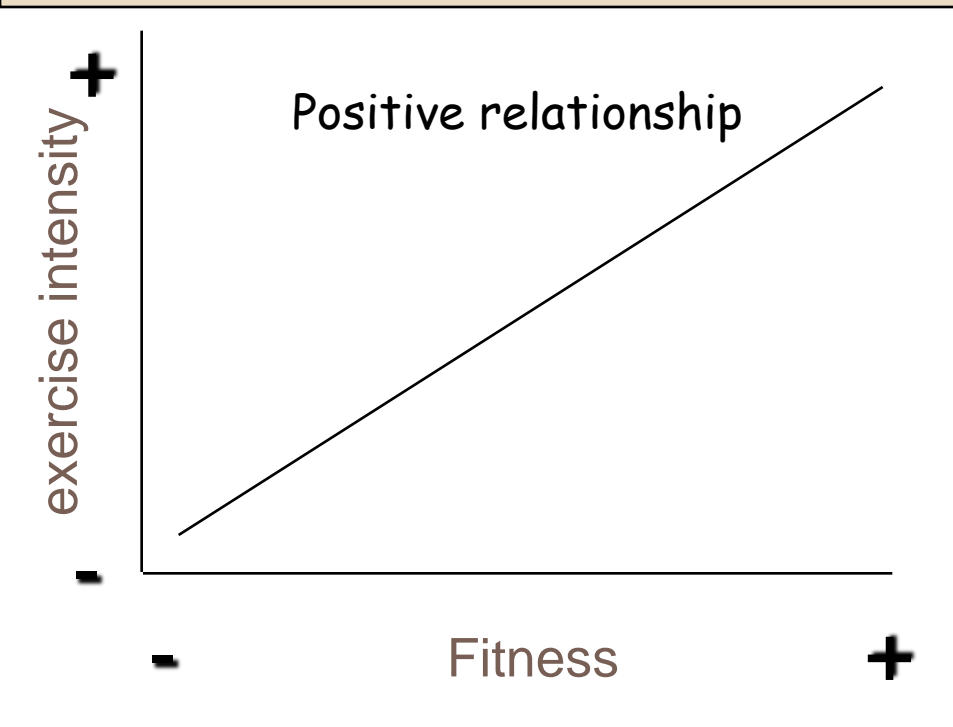
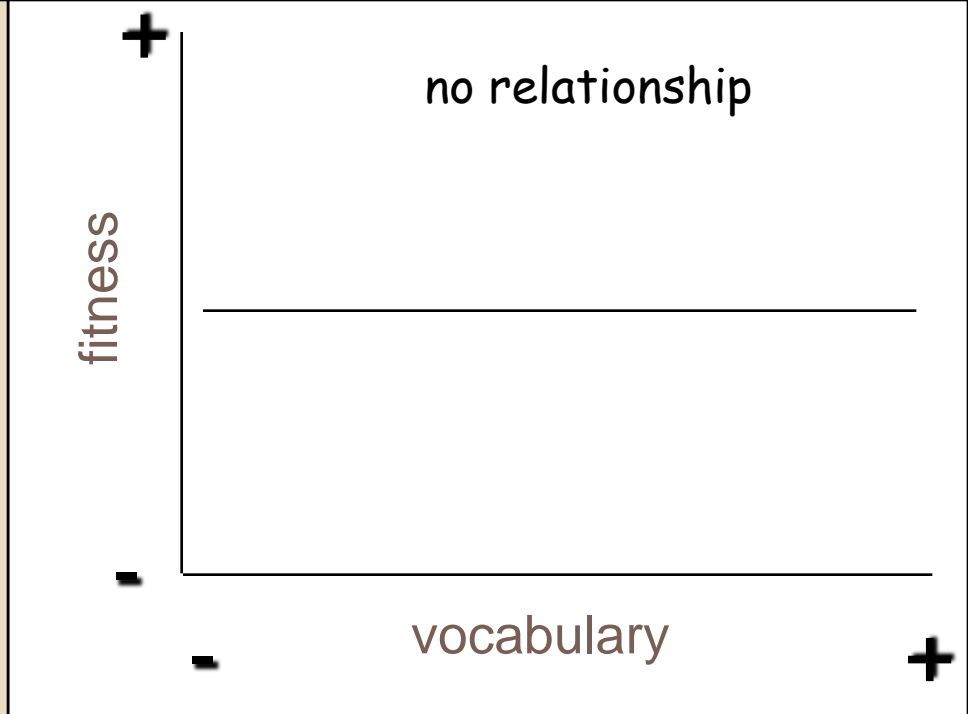
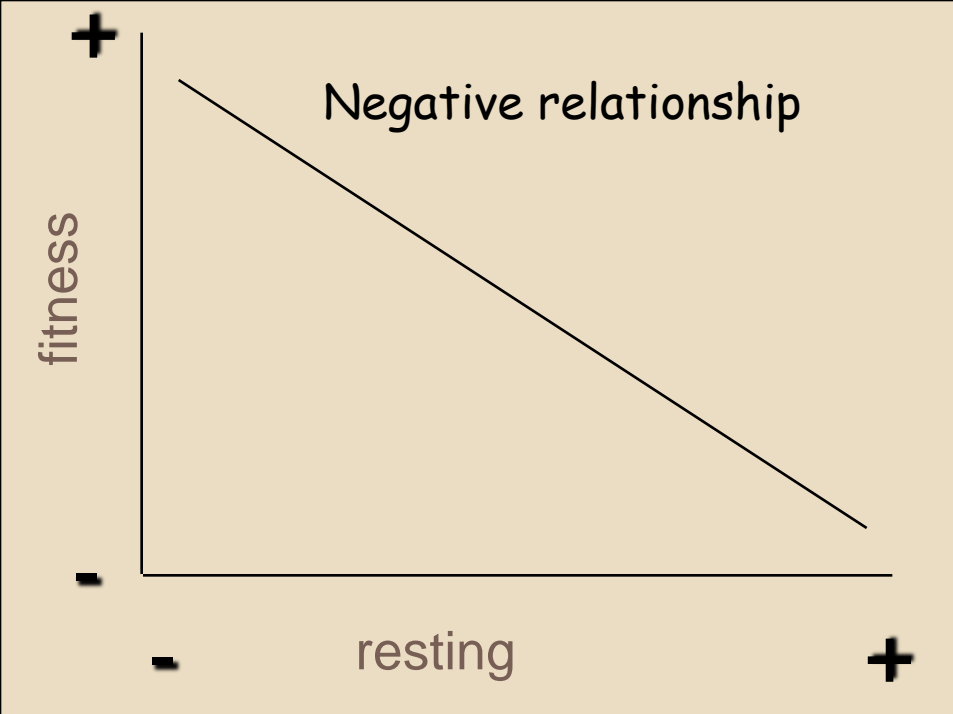
Pattern of Variance Relationships

- Patterns of relationships...

1. Positive relationship
2. Negative relationship
3. Curvilinear relationship

Or

- There is no relationship between the two variable



Causation

- Cause of an act, or something happening or changing due to unforeseen reasons or accidentally