

## Psychological Science (CH 1)

- 1 - the scientific method
- 2- description of behavior
  - case study
  - survey
  - sampling
  - naturalistic observation
- 3 - correlation
- 4- experiment

### Scientific Method

- uses the process/method/logic of inquiry to solve problems and generate a body of knowledge
  - logic of inquiry
- Scientific knowledge
- type acquired via scientific method

### 3 Characteristic's

**control** (most important) variables are within your control,  
done to control all factors except the one of interest  
purpose - to isolate the cause and effect  
variable - any factor that can take on different values along some dimension

**operations definition** - define terms by the steps or operations used to measure them

**replication** - observations must be reproducible

Scientific theory - an explanation describing a relationship between a phenomena and the factors assumed to influence it

- organizes principles
- predicts behavior or events

### Hypothesis

- a test prediction
  - usually arise out of a theory
- can be tested and rejected or tested and supported (used to modify theory)

### **Description of Behavior**

#### Descriptive Research

approaches/techniques

to provide accurate description of: particular situation, phenomena, no cause and effect relationship in the inquiry, simply describe relationship between Var's

useful when - initially investigating  
testing effectiveness of a solution to a problem

Case Study: intensive study of a single subject  
purpose to determine nature and cause of individuals behavior  
understand individual and similar future cases  
usually clinical studies

Four main problems w/ a case study

- 1) lack of generalizability  
-small sample size (only 1 person)
- 2) non standardization of data collection  
-comparisons difficult
- 3) retrospective data (after its happened, recollecting) what accuracy ? memory is subjective
- 4) bias - in observation & interpretation

Survey: to describe behavior or opinions of people by taking a self report (questionnaire or interview) on a sample

Sampling:

**Representative sample:** a random selection of a sample from population (whole group)

**Random sample:** each person in the population has an equal probability of being included

**naturalistic observation:** observe and record behavior in natural settings

- no intervention or manipulation of situation
  - can provide accurate description
  - time consuming
  - cannot determine cause and effect
- correlation:** expresses the relationship between measures (variables)  
-in terms of direction and strength  
anything that can take on different measures can be a variable\*\*\*\*

Scatterplot:

graph plotting two variable's

The correlation coefficient - a statistic expressing relationship symbol (r)

range -1 to +1

sign indicates direction or relationship

+when both increase or decrease together

-when var's move in opposite directions

values indicate strength

higher values means stronger relationships

indicates direction of relationship (pos or neg)

indicates the strength of the relationship (0.00-1.00)

values indicate strength (higher the value stronger relationship)

can have strong neg or pos correlation

How used ?

no manipulation or treatment involved, simply measure two var's  
can enable prediction

Correlation alone cannot determine causality: two problems

1) reverse causation: does var a cause b? or does b cause a?

2) the third variable problem: a third var could be causing both a and b but it was not measured

EXAMPLE

low self esteem could cause depression

depression could cause self esteem

distressing events or genes could cause both

Why use correlational design?

-when you cannot ethically manipulate certain var's

-not possible to manipulate var's

Experiment:

objective observation of phenomena which are made to occur in a strictly controlled situation in which one or more factors are varied and the others are kept constant

experimentation:

researcher makes systematic changes to one var and looks for effects of these changes on a second var

can investigate cause and effect relationships

3 advantages

-control

-ability to manipulate variables precisely

-able to determine cause and effect relationships

3 disadvantages

-artificiality

-design difficulties

-time consuming

independent var - the one that is manipulated

dependent var - the one that is measured (dependent "depends" on the independent)

experimental condition

-treatment conditions

-exposure to independent var.

control condition

-no exposure to the independent var.

random assignment  
-no assign subjects to conditions

True experimental study:  
experimenters assign subject to conditions  
after experimental condition applied scores on the dependent var assessed for all conditions

experimental control  
all factors controlled (kept equivalent for all groups) except the independent var  
e.g. random assignment

Placebo  
-inert substance or treatment  
placebo effect- any effect on behavior as a result of the placebo

placebo control group  
a group who receives a placebo for comparison purposes

Blind procedure - keep blind (unaware) of whether or not receiving treatment or not  
controls for subject BIAS

tendency to respond to cues and try to figure out the hypothesis and try to HELP

double blind procedure  
both subjects and research staff are blind  
controls for experimenter bias  
influences outcome with motives  
communicating cues to the subject