An operational definition is how we (the researcher) decide to measure our the variables in our study (variable = anything that can be measured).

- There are usually hundreds of ways to measure a DV (e.g. behavior).

- Understanding the scientific process:
  - http://undsci.berkeley.edu/article/0_0_0/howscienceworks_02
In Class Practice: *How will you operationally define the following 4 items.*

- Self-esteem
- Shyness
- Love
- Memory Loss

*Hint:* To operationally define the IV, you have to figure out how will you measure the IV. There is no one right answer. There are LOTS of ways to measure these items!
For all types of Research Designs We must choose Participants

- Population – The entire group of interest.

- Sample – A portion of any population selected for the study.

- Random Selection – Randomly choosing a sample from a population.

- Sampling Biases – Choosing a sample that does not represent your population.
Three Basic Types of Research

- **Descriptive**
  - Research method used to observe and describe behavior.

- **Predictive**
  - Explore mathematical relationships

- **Experimental**
  - To demonstrate a cause and effect relationships between two variables.
Descriptive Research Methods

- Observation (Naturalistic or Lab methods)
- Case study
- Ethnography
Naturalistic Observation

- Systematic people watching.
  - Advantages?
  - Disadvantages?
Case study

- An intensive study of 1 or 2 people.
- Advantages
  - For behavior that is RARE!
  - Very detailed!
- Disadvantages
  - You cannot generalize your results to all people.
  - Cannot determine cause and effect.

- Columbine “shooters”
Predictive methods

- Designs based on Correlation
- *Statistical* relationship between two events, measures, or variables.
- Allows for prediction but
  - Cannot determine cause and effect.
Correlation–Key points

- **Correlation Coefficient:** Ranges from -1.00 to +1.00.
- **Size** and the **direction used** to make predictions.
- Direction (Positive or Negative)

$x$
Positive correlation

- Increases in one measure predict increases in the other measure.
Negative Correlation

- **Negative correlation:** Increases in one measure predict decreases in the other measure.
Correlation

High positive correlation

+1.00

perfect positive
as one event increases, the second exactly increases

Positive
as one event increases, the second sometimes increases

+0.50

Zero correlation
no relationship between the events

Zero

-0.50

Negative
as one event increases, the second sometimes decreases

-1.00

Perfect negative
as one event increases, the second exactly decreases

High negative correlation
Advantages/ Disadvantages

- Allows for prediction.
- Ethical considerations
- Little or no control
- Cannot identify cause and effect relationships.
Examines how one variable CAUSES another variable to change.

What are advantages?
- A. ethical
- B. captures natural situations
- C. allows control over variables.
Independent/Dependent Variable

- **Independent Variable (IV)**: Altered by the experimenter.
- Hypothesized to cause behavior.
- **Dependent variable (DV)**: condition affected by the independent variable.
Experimental and Control Group

- Representative sample is divided into two groups based on random assignment
  - Control group
    - Not exposed to independent variable (for example, do not watch reality TV)
      - Measure change in dependent variable (for example, charitable behavior)
  - Experimental group
    - Exposed to independent variable (for example, watch reality TV)
      - Measure change in dependent variable (for example, charitable behavior)
Experimental Designs—Cont’d

- Placebo
- Random assignment of subjects to groups.
- Double blind conditions
- Extraneous variables
1. Dr. Smith examines daily exposure to a sun lamp (1 hour of exposure or no exposure) impacts people’s depression levels in the winter time.
   a) 1 hour exposure b) no exposure c) depression

2) Does age of child (4, 5, or 6) influence when children can learn to read?
   a) age of child b) level of reading

3) Time reading on exam performance
   a) time reading b) exam performance
Ethical Principles in Research

- Ethical Guidelines
- Institutional Review Board (IRB)
What Ethical Research Guidelines Do Psychologists Follow?

- The Institutional Review Board (IRB): They make sure that EVERYONE who conducts research follows the ethical guidelines.

- Ethical Guidelines:
  - Obtain **Informed Consent**— obtaining permission from the participate that they want to do study after the participant knows what the study involves and the risks and benefits to participating.
  - Protect participants from harm and discomfort
  - Protect confidentiality
  - Provide complete debriefing— revealing to participants anything information that was withheld during the study.