



# CONSTRUCTS, VARIABLES, AND OPERATIONALIZATION

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# Outline



- Understanding CONSTRUCTS
- Understanding the importance of OPERATIONAL DEFINITIONS
- Understanding VARIABLES

# CONSTRUCTS

- Broad concepts or topics of study
  - ▣ Abstract
  - ▣ Not directly observable
  - ▣ May be complex (have multiple parts)
- Examples of constructs:
  - ▣ Aggression
  - ▣ Love
  - ▣ Intelligence
  - ▣ Life satisfaction



# Researchers define constructs both “conceptually” and “operationally”

**Conceptual definition:** provides meaning to one construct in abstract or theoretical terms (What does it mean?)

BUT...

We have to make our abstract concepts concrete so we can study them!

**Operational definition:** defines a construct by specifying the procedures used to (How to measure it?) measure a construct.

“the assignment of numerals to objects, events”

Two ways to do this:

--Providing a clear definition

--Designating a particular measurement instrument to represent the concept

# Examples of definition

## Is intelligence related to happiness?

### Conceptual:

**Intelligence:** The capacity for abstract thought, understanding, communication, reasoning, learning, planning and problem solving.

### Operational:

**Intelligence:** The score resulting from performing the Raven's Progressive Matrices Test.



# Leggett's Intimacy Scale

1-Strongly Disagree 3- Neither agree or disagree, 5- Strongly Agree

- I trust my partner with my deepest secrets
- I feel that I can rely on my partner to protect my feelings and concerns
- I feel comfortable when my partner is on trips or outings without me
- My partner is the closest person to me
- I feel safe with my partners' suggestions, insights, and opinions

# Example

•Ex. 1: We are interested in the relationship between childhood depression and the divorce of one's parents during childhood...

•Divorce

•Depression

•Ex. 2: Aggression in adults



# Note...

- Operational definitions aren't always good... they may not accurately capture the intended construct (i.e., lack validity)
- An operational definition is simply how a researcher decides to measure (and thus define) a construct
- For example, intelligence is more than a score on a test...





# Practice makes perfect...

□ In small groups, you will operationalize the following variables. Be both creative and precise! Afterward, you will present your responses to the class.

1. Enthusiasm
2. Love
3. Popularity



# VARIABLES

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- When we operationalize a concept, we are creating VARIABLES!
- Definition: Any characteristic that varies (meaning it must have at least two values)
  - ▣ Any event, situation, behavior, or individual characteristic that varies

# Variables Examples

- Examples:
  - ▣ Height (participant or subject variable)
  - ▣ Age (participant or subject variable)
  - ▣ Stress (response variable)
  - ▣ Score on depression test (response variable)
  - ▣ Number of bystanders to an emergency (situational variable)

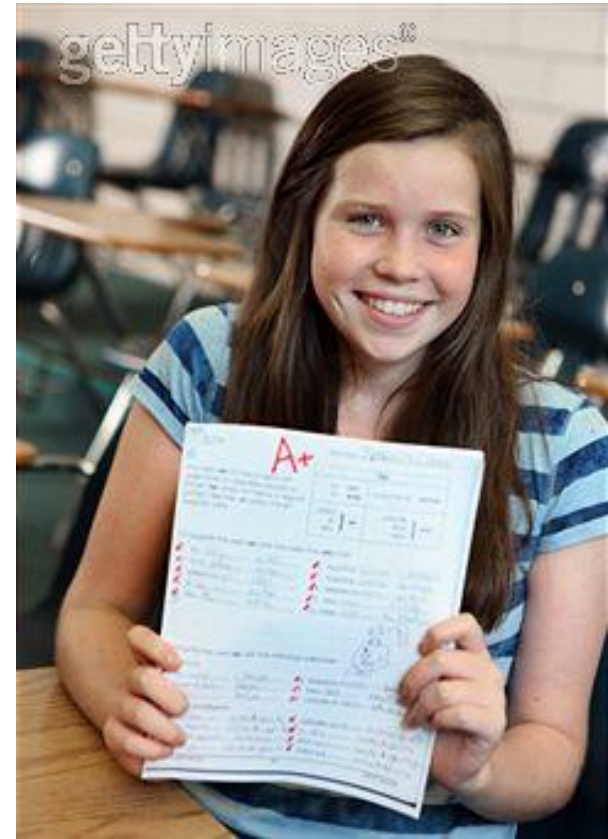


# Class Survey

- In the context of giving a survey to the members of this class, are the following entities variables?
  - ▣ What is your *gender*?
  - ▣ Which *university* do you attend?
  - ▣ What is your level of *extraversion*?

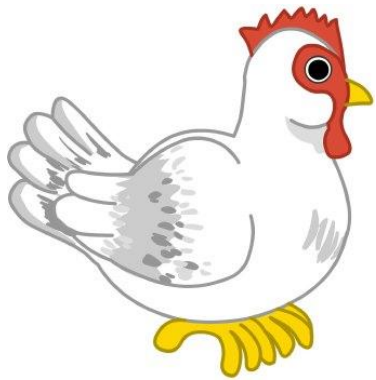
# Variables

- Research questions and hypotheses consist of  $x$  and  $y$  variables
- Is  $X$  related to  $Y$ ?
- Is studying related to school performance?

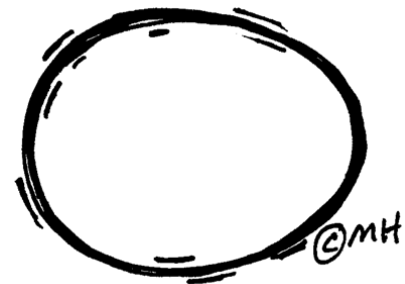


# Independent vs. Dependent

- Independent variable (IV)– the “x” variable
  - ▣ Considered the “cause” of a behavior (the DV)
  - ▣ Variable that is manipulated in experimental design
    - The predictor variable in an observational/correlational study
- Dependent variable (DV)– the “y” variable
  - ▣ The variable that is the “effect”
  - ▣ The “outcome” or “response” variable
    - The outcome variable in an observational/correlational study



*Ask yourself: Which (do you think) comes first?*



# IV and DV example...

- Researchers are interested in examining the effect of cooperative learning (i.e., working in groups) on math skills. They observe study hall sessions and compare students who work in dyads to those who work alone according to their performance (% correct) on a specific math test.
  
- Independent Variable?
  - ▣ What are the categories of this variable?
  
- Dependent Variable?

# Example...

Is stress related to health?

X

Y

Conceptual (what does it mean?):

**Stress:** Emotional and physical strain that results when a person is confronted with a threat or challenge that exceeds their coping ability.



Operational Definition (how to measure it?):

**Stress:** Emotional and physiological response to public speaking;  
The score on the Perceived Stress Scale.



# Trier Stress Test:



Some individuals in the experiment have to give an impromptu speech!

Other individuals in the experiment have to do something less stressful...

The researcher controls the level of stress in participants

# Perceived Stress Scale

The questions in this scale ask you about your feelings and thoughts during the last month. In each case, you will be asked to indicate by circling *how often* you felt or thought a certain way.

Name \_\_\_\_\_ Date \_\_\_\_\_

Age \_\_\_\_\_ Gender (*Circle*): M F Other \_\_\_\_\_

0 = Never    1 = Almost Never    2 = Sometimes    3 = Fairly Often    4 = Very Often

- |   |   |   |   |   |   |
|---|---|---|---|---|---|
| 1. In the last month, how often have you been upset because of something that happened unexpectedly?.....                 | 0 | 1 | 2 | 3 | 4 |
| 2. In the last month, how often have you felt that you were unable to control the important things in your life?.....     | 0 | 1 | 2 | 3 | 4 |
| 3. In the last month, how often have you felt nervous and "stressed"? .....   | 0 | 1 | 2 | 3 | 4 |
| 4. In the last month, how often have you felt confident about your ability to handle your personal problems?.....         | 0 | 1 | 2 | 3 | 4 |
| 5. In the last month, how often have you felt that things were going your way?.....                                       | 0 | 1 | 2 | 3 | 4 |
| 6. In the last month, how often have you found that you could not cope with all the things that you had to do? .....      | 0 | 1 | 2 | 3 | 4 |
| 7. In the last month, how often have you been able to control irritations in your life?.....                              | 0 | 1 | 2 | 3 | 4 |
| 8. In the last month, how often have you felt that you were on top of things?.....  | 0 | 1 | 2 | 3 | 4 |
| 9. In the last month, how often have you been angered because of things that were outside of your control? .....          | 0 | 1 | 2 | 3 | 4 |
| 10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?..... | 0 | 1 | 2 | 3 | 4 |

Let's say we operationalize Stress as the score on the Perceived Stress Scale.



Let's say we operationalize Health by the measurement of an individual's blood pressure after sitting quietly for 5 minutes.

What type of X variable is perceived stress?

**Predictor** (not under researcher control)

What type of Y variable is blood pressure?

**Outcome** (because X is a Predictor variable)

Let's say we operationalize Stress by whether participants had to give a public speech

Let's say we operationalize Health by the measurement of an individuals' blood pressure after giving the speech.

What type of X variable is public speaking?

**Independent** (under researcher control)

What type of Y variable is blood pressure?

**Dependent** (because X is independent variable)

# Pulling it all together:

## American Proverbs Activity

- For this attendance activity we are going to look at some common American proverbs.
- Take each proverb and transform it into a research question and hypothesis.
- Next, identify the variables and operationalize or define the variables.

# Class Example: Like father, like son

- We will start with a class example...
  - ▣ Like father, like son.
- Research Question
- Hypothesis
- IV- operationalized
- DV- operationalized



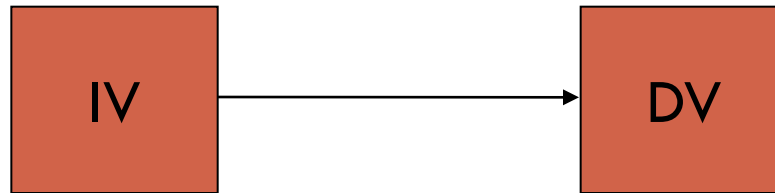
# You try...

- An apple a day keeps the doctor away.
- Time heals all wounds.
- Absence makes the heart grow fonder.

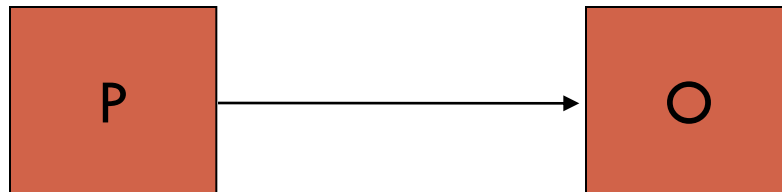


# Review

- Independent variable (IV) **“causes”** the Dependent Variable (DV) “outcome”



- The predictor variable precedes the outcome





# What's important?

- Which are the independent/predictor and dependent/outcome variables?:
  1. I predict that there is a relationship between lower self-control in pre-school and poorer academic performance in adolescence.
  2. I predict that males drink more alcohol than females.
  
- Operationalize “academic performance in adolescence.”

# What's important?

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- True or False. Operational definitions provide valid representations of constructs.
  
- True or False. Predictor variables are presumed to precede outcome variables.

# Tomorrow

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- Measurement
- Reading Assignment: pg 143-145