

# Research Methods (Psy 360)

## Variables in Research



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## What We Will Cover in This Section

- Nature of variables.
- Experimental Variables.
- Controlling for Extraneous variables.



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## What Does Variable Mean?

*Any object or event that can take on more than one form or value.*



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## Bewildering Use of *Variable*

- Experimental Research
  - Independent Variable.
  - Dependent Variable.
  - Extraneous Variable.
  - Nuisance Variable.



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## Basic Design

Treatment Groups	Independent Variable	Dependent Variable
Group A	Treatment (s) manipulated by the experimenter	Measurement(s) made after the treatments are applied.
Group B		

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## Question?

Suppose you were asked to design a study to evaluate the impact of sleep deprivation on recall.

How would you assess recall?



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## Operational Definition

**Defining a variable in terms of the techniques the researcher will use to measure or manipulate it.**

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## Operationalizing

- Benefits
  - Removes vagueness.
  - Focuses on measurement.
  - Clear description.
  - Aids in communication
  - Helps replication.

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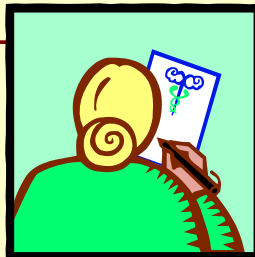
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## Independent Variables



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## Physiological I.V.

*The physiological state of the participant is manipulated by the experimenter.*

### Examples.

- *Hunger.*
- *Fear.*
- *Drug level.*

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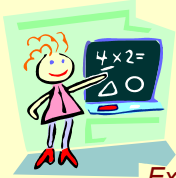
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## Experience I.V.



*Manipulation of the amount or type of training or learning.*

### Examples.

- *Teaching style.*
- *Cramming vs. Distributed studying*

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## Stimulus (Environmental) I.V.

*Some aspect of the participant's surrounding (environment) is manipulated.*

### Examples.

- *Heat vs. cold.*
- *Number of participants.*
- *Type of music.*

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## Participant I.V.

*Some aspect, usually a demographic characteristic such as age gender, or personality, are treated as if they were manipulated.*

*Examples.*

- Gender.
- Race.
- Marital status.

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## Confounding Variable: Example

**Confounded  
by time of  
day.**

Independent Variable	Dependent Variable
Given orange juice in the morning	Alertness two hours later.
Given distilled water in the evening	

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## Extraneous Variable(s)

*Uncontrolled variable(s) that can cause unintended changes in one group and not the other.*

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## Confounding

*A situation that results when the results of an experiment can be attributed to either the desired I.V. or an extraneous variable.*

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## Example

Justa Minute decided to assess the effects of caffeine on the ability to estimate time. Justa got two groups of volunteers. The first group, from her General Psych class, drank two cups of coffee and their recall was assessed. Group B, from her Statistics Class, drank water and their recall was assessed.

- What is the independent variable?
- What is the dependent variable?
- What is the possible problem with this design?

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## Dependent Variable(s)



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## Count Correctness

*Tabulate the number of correct and incorrect responses.*

### *Examples.*

- *Number of words recalled.*
- *Driving accuracy.*

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## Measure Rate or Frequency

*Count how often something happens over a specific time period.*



### *Examples.*

- *Bar pressing in a learning study.*
- *Number of times your dog brings your slippers.*

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## Measure the Degree or Amount



*Measure how much.*

### *Examples.*

- *Overall satisfaction with a restaurant.*
- *Blood pressure after treatment.*
- *GPA in senior year.*

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## Assess Latency or Duration

*Measurement of how long it takes for something to happen (latency) or how long the response lasts (duration).*

### *Examples.*

- *Time to learn a group of words*
- *Length of time a bar is pressed.*

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## Characteristics of a Good Dependent Variable

- Valid.
  - It measures what it is supposed to measure.
- Reliable.
  - It can be measured consistently.

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## Nuisance Variables

*Characteristics of the participants or unintended influences in the experimental situation.*



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## Controlling Extraneous Variables

1. Randomization.
  - Randomly assign participants to different conditions.
2. Elimination.
  - Remove the extraneous variables.
3. Constancy.
  - Control variables to keep them consistent.
4. Balancing.
  - Equally distribute extraneous variables to all groups.

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# The End

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