

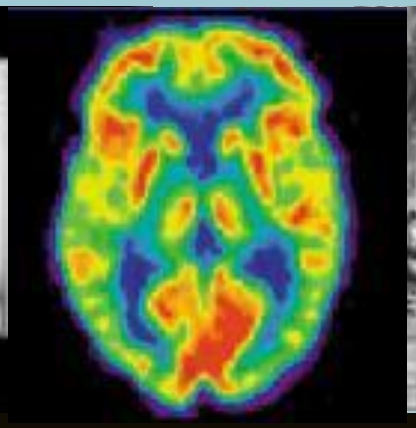

Research

how we figure stuff out

Methods

Let’s Make A Deal!

- One volunteer is needed for a chance to win $**1,334,499**!

Let's Make A Deal Shows Us That:

- Human Intuition is highly limited.

- Critical thinking rarely comes easily to us!

  - **Critical Thinking:** thinking that does not blindly accept arguments and conclusions
    - examines assumptions
    - discerns hidden values
    - evaluates evidence

Lack of Intuition

- **Hindsight Bias:** tendency to believe, after learning an outcome, that one would have foreseen it.

- the “I-knew-it-all-along” phenomenon

Lack Of Intuition

- **<u>Overconfidence:</u>** we tend to think we know more than we do.

Remember:

Psychology is a SCIENCE

It all starts with a **THEORY**

SCIENTIFIC THEORY

- A scientific **theory** explains behavior by organizing observations and predicting behaviors or events.

LET'S TRY TO MAKE A THEORY NOW

OBSERVE:

- I **observe** that in my classes, students that sit in the front do better than those that sit in the back.

THEORIZE:

- I **theorize**

LET’S TRY TO MAKE A THEORY NOW

OBSERVE:

- I **observe** that when I drink coffee in the morning I am more anxious.

THEORIZE:

- I **theorize**

LET'S TRY TO MAKE A THEORY NOW

OBSERVE:

- I **observe** that when I listen to music while reading, the task takes more time but when I listen to music while cleaning, the job gets done faster.

THEORIZE:

- I **theorize**

The SCIENTIFIC METHOD

Putting our theories to the test.

Now we have to take our theory and make it into something we can test, a **hypothesis**.

THEORIZE:

- I **theorize** that sitting in the front contributes to good grades.

HYPOTHESIZE: (IF _____ THEN _____)

- I **hypothesize**

The SCIENTIFIC METHOD

putting our theories to the test.

The key to having a hypothesis is having what scientists call **operational definitions**. An operational definition clearly identifies how variables will be measured and makes replication possible.

I observe that in my classes, students that sit in the front do better than those that sit in the back.

If students sit in the first row, then they will earn higher grades on AP Psych Unit Tests.

Our methods for researching fall into 3 categories:

DESCRIPTIVE

simply describes the event

CORRELATIONAL

describes the relationship between variables and allows one to predict behavior

EXPERIMENTAL

attempt to actually show a cause/effect relationship

CASE STUDY

studying one individual (or group or event) in great depth

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CASE STUDY - example

studying one individual (or group or event) in great depth

On November 4, 1970, a 13-year-old girl was discovered in Arcadia, California. She had never left her home, was beaten for making noise, and was never spoken to. She became known to the world by a pseudonym, “Genie.”

NATURALISTIC OBSERVATION

observing & recording behavior in a natural setting without trying to manipulate or control the situation

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NATURALISTIC OBSERVATION – example

observing & recording behavior in a natural setting without trying to manipulate or control the situation

Researchers compared the play of 76 children, ages four to six. Children from higher socioeconomic backgrounds were more likely to engage in imaginative / pretend play.

-2007 Journal of Cross-Cultural Psychology

SURVEY

asking people to report their behaviors or opinions

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SURVEY - example

asking people to report their behaviors or opinions

1992 survey –

The term Holocaust usually refers to the killing of millions of Jews during World War II. Does it seem possible or does it seem impossible to you that the Nazi extermination of the Jews never happened?

22% of respondents said it was possible the events never happened and 12% were unsure

When the question was reworded, *Does it seem possible to you that the Nazi extermination of the Jews never happened, or do you feel certain it happened?*

1% of respondents said it was possible the events never happened and 8% were unsure

Components of Survey

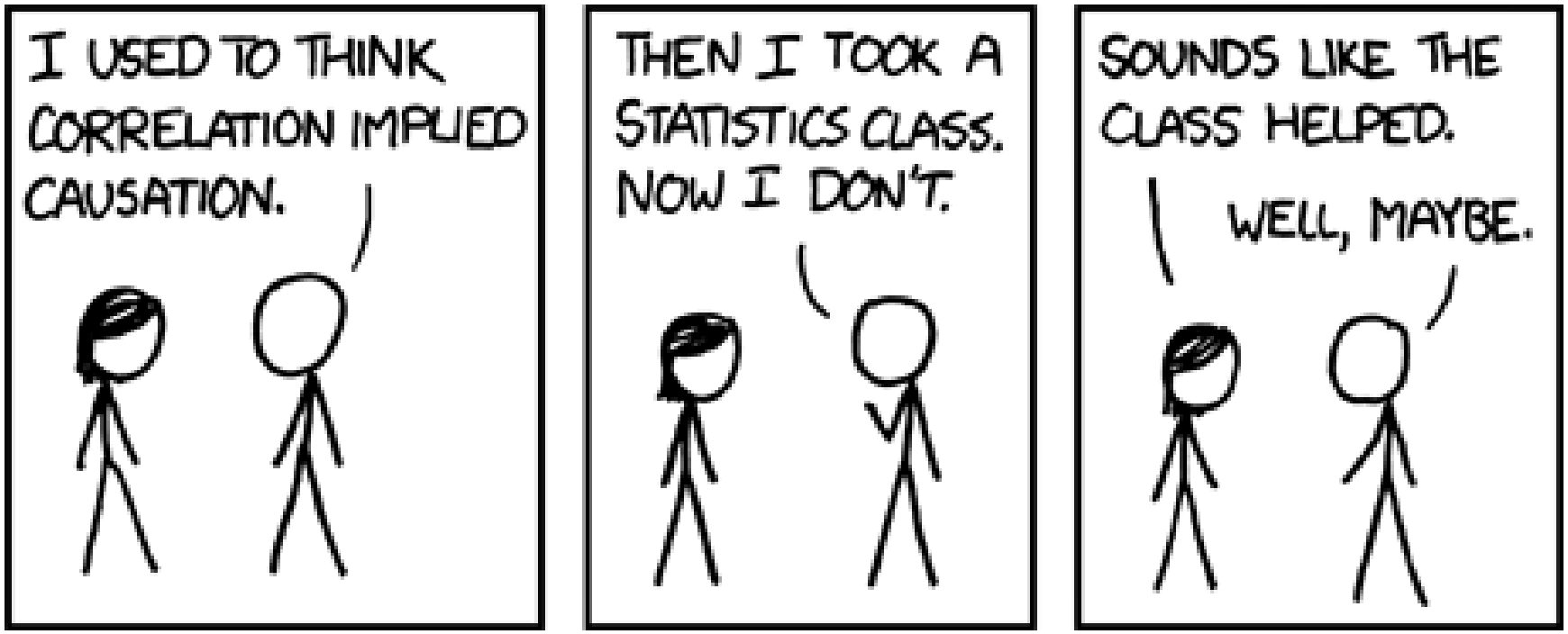
- **Population:** all the individuals you are interested in knowing something about.

- **Sample:** the individuals you actually question.

- Sampling should always be taken randomly from the population so that it is representative meaning each individual in the population had an equal chance of being selected.

Example of A Survey?

- Do teenage boys eat more than teenage girls?
- 1200 randomly selected teenagers were asked about their eating habits.
- What is population?
- What is sample?


I USED TO THINK CORRELATION IMPLIED CAUSATION.
THEN I TOOK A STATISTICS CLASS. NOW I DON'T.
SOUNDS LIKE THE CLASS HELPED.
WELL, MAYBE.

Correlation does NOT equal Causation

Just because there is a relationship between two variables does not mean one caused the other

Correlation does NOT equal Causation

Correlational Studies can help researchers predict behavior.

Think of it this way…

You and your brother are **related** (cor**relation**)

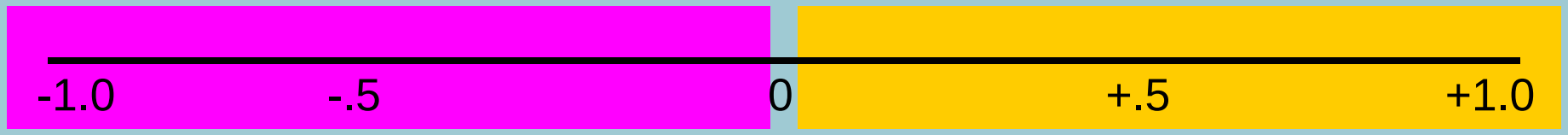
You did NOT **cause** your brother (causation)

positive correlation

indicates a direct relationship (as A ↑, B ↑ OR as A ↓ B ↓)

Ex: The more sit-ups you do, the more fat you will lose.

Ex: The fewer sit-ups you do, the less fat you will lose.

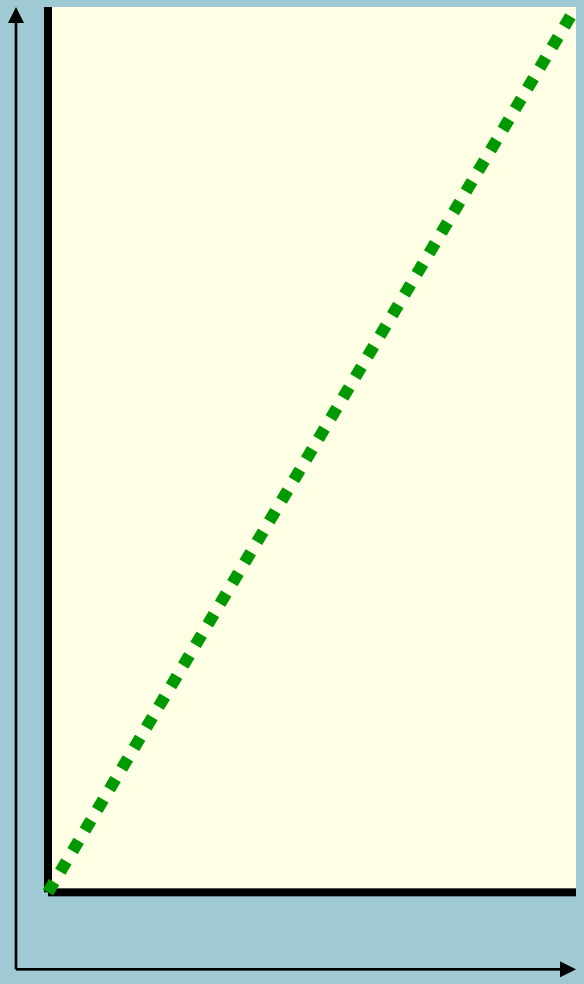


negative correlation

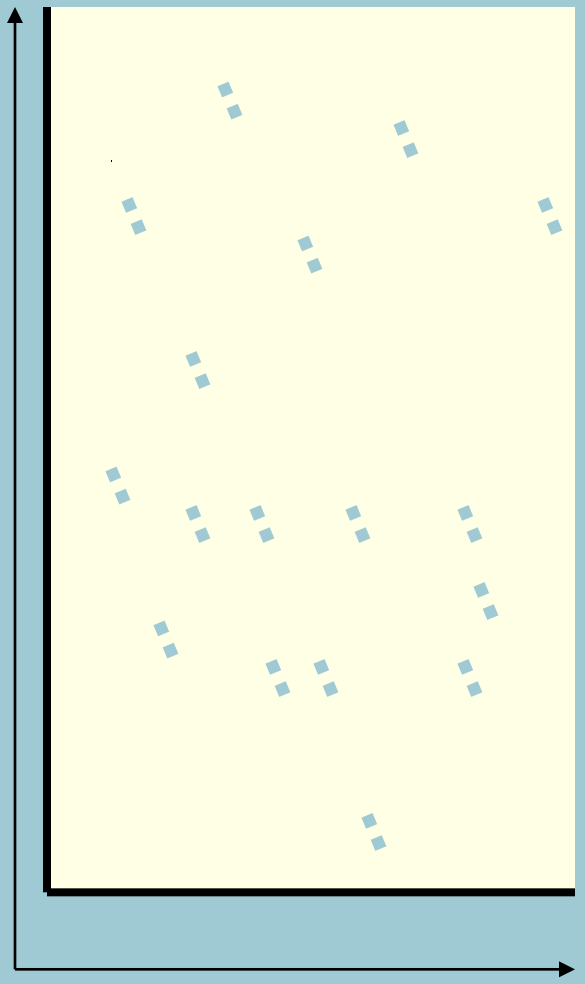
indicates an inverse relationship (as A ↑, B ↓)

Ex. The more ice cream you eat, the less fat you will lose.

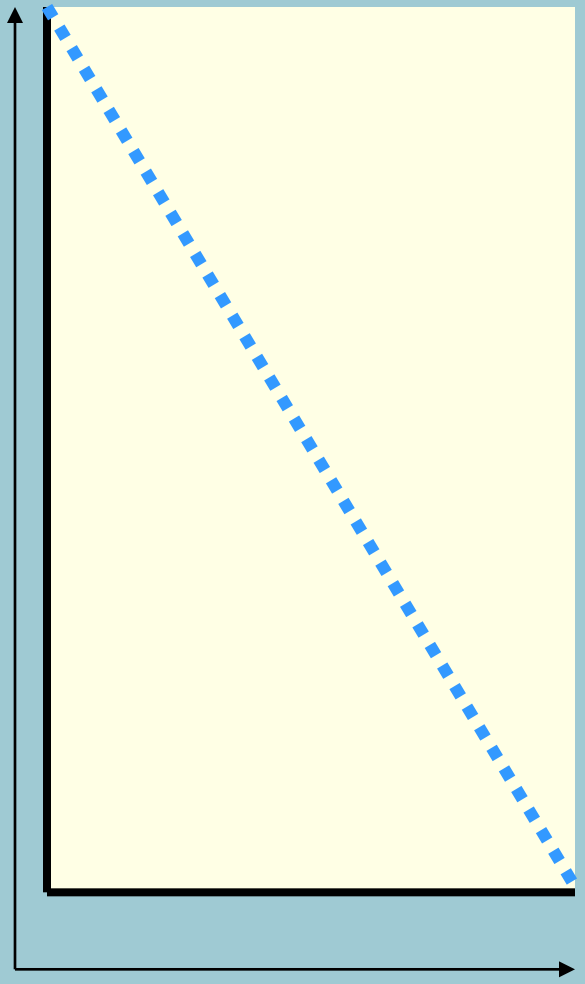
Correlation Scatterplots



Perfect positive correlation (+1.00)



No relationship (0.00)



Perfect negative correlation (-1.00)

EXPERIMENT

manipulating an independent variable in an attempt to determine if a cause-effect relationship exists

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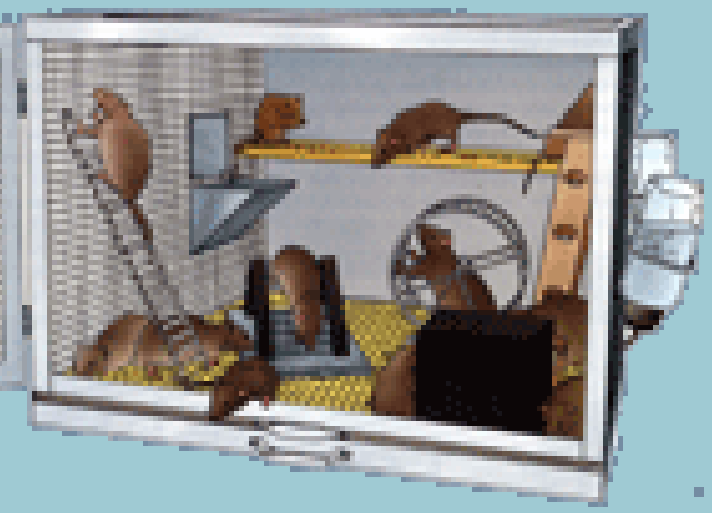
EXPERIMENT

an investigator manipulates one or more factors (independent variables) to observe their effect on some behavior or mental process (the dependent variable) while controlling other relevant factors by random selection and random assignment of subjects.

EXPERIMENT - example

manipulating an independent variable in an attempt to determine if a cause-effect relationship exists



If you have more books and toys and other stimuli in your environment, will you be smarter? In 1972, researchers created “impoverished” and “enriched” environments for lab rats. Rats in the enriched environment had significantly heavier and thicker cerebral cortexes than their counterparts in impoverished environments.

EXPERIMENT - terminology

manipulating an independent variable in an attempt to determine if a cause-effect relationship exists

- Hypothesis
- Operational Definition
- Independent Variable
- Dependent Variable
- Placebo
- Confounding Variables
- Double-blind Design

"What is the effect of_____ on_____?"

Independent Variable (IV) **Dependent** Variable (DV)

EXPERIMENT - Components

manipulating an independent variable in an attempt to determine if a cause-effect relationship exists

- Every experiment has at least two variables:

1. **The Independent Variable:** is the experimental factor that is being manipulated (changed by the investigator). **Example:** a pill.

2. **The Dependent Variable:** the experimental factor that may change in response to manipulations of the independent variable. In psychology, it is usually a BEHAVIOR OR MENTAL PROCESS. The dependent variable must have an operational definition.

   Example: intelligence, strength, etc.

POPULATION

SAMPLE

Experimental Group

Control Group

ASSIGNMENT

Steps for A Perfect Experiment

1. After defining research variables, investigators should find participants by **randomly sampling from a representative population**.

2. Once the researcher has their representative sample, they should **randomly assign** the participants to the **control and experimental conditions**.

RESEARCHERS SHOULD NEVER SELF SELECT THEIR SAMPLES OR GROUPS!!

Groups Within An Experiment

- **Experimental Condition:** refers to the group of participants that is exposed to the independent variable (treatment).
- **Control Condition:** refers to the group of participants that does not receive the independent variable. This group is used to compare the results of treatment vs. no-treatment.

The control condition is often given a **placebo:** inert substance (usually in form of a fake pill)

Steps for A Perfect Experiment (cont.)

3. Set up control procedures to stop possible bias and confounding variables:
   - **Double Blind Procedure:** experimental procedure in which both the research participants and the research staff are ignorant (blind) about whether the research participants have received the treatment or a placebo.

   - What is meant by bias?

Experiments Want to Avoid Confounding (Lurking) Variables

- **Confounding Variable(s):** refers to a “hidden” or uncontrolled aspect of an experiment that can distort the results of an experiment.

Example: Having the experimental group tested in a different room than the control group would be a confounding variable. Why?

Last Step for A Perfect Experiment

4. Investigators should compare the results using statistics between the experimental condition and the control condition and see if the differences between the two groups of the experiment are **statistically significant:** means differences between groups could not have happened by random chance; helps establish causation.

Even after a successful experiment, investigators should **replicate** the experiment again with different participants.

Apply What You Learned!

- Researchers are interested in finding out whether eating a healthy breakfast increases school performance. Identify:
  - IV (including operation definition)
  - DV (including operational definition)
  - How to Sample?
  - Describe Experimental and Control Group
  - A Control Procedure

Survey: Half of US doctors use placebo treatments

By MARIA CHENG, AP Medical Writer Maria Cheng, Ap Medical Writer Thu Oct 23, 7:18 pm ET

LONDON – About half of American doctors in a new survey say they regularly give patients placebo treatments — usually drugs or vitamins that won't really help their condition. And many of these doctors are not honest with their patients about what they are doing, the survey found.

That contradicts advice from the American Medical Association, which recommends doctors use treatments with the full knowledge of their patients.

"It's a disturbing finding," said Franklin G. Miller, director of the research ethics program at the U.S. National Institutes Health and one of the study authors. "There is an element of deception here which is contrary to the principle of informed consent."

The study was being published online in Friday's issue of BMJ, formerly the British Medical Journal.

Placebos as defined in the survey went beyond the typical sugar pill commonly used in medical studies. A placebo was any treatment that wouldn't necessarily help the patient.

Scientists have long known of the "placebo effect," in which patients given a fake or ineffective treatment often improve anyway, simply because they expected to get better.

"Doctors may be under a lot of pressure to help their patients, but this is not an acceptable shortcut," said Irving Kirsch, a professor of psychology at the University of Hull in Britain who has studied the use of placebos.

Researchers at the NIH sent surveys to a random sample of 1,200 internists and rheumatologists — doctors who treat arthritis and other joint problems. They received 679 responses. Of those doctors, 62 percent believed that using a placebo treatment was ethically acceptable.

Half the doctors reported using placebos several times a month, nearly 70 percent of those described the treatment to their patients as "a potentially beneficial medicine not typically used for your condition." Only 5 percent of doctors explicitly called it a placebo treatment.

Most doctors used actual medicines as a placebo treatment: 41 percent used painkillers, 38 percent used vitamins, 13 percent used antibiotics, 13 percent used sedatives, 3 percent used saline injections, and 2 percent used sugar pills.

In the survey, doctors were asked if they would recommend a sugar pill for patients with chronic pain if it had been shown to be more effective than no treatment. Nearly 60 percent said they would.

Smaller studies done elsewhere, including Britain, Denmark and Sweden, have found similar results.