

Research Methods



It is actually way more exciting
than it sounds!!!!

Why do we have to learn this stuff?

Psychology is first and foremost a science.



Thus it is based in research.

Before we delve into how to do research, you should be aware of three hurdles that tend to skew our logic.

Hindsight Bias

- The tendency to believe, after learning the outcome, that you knew it all along.

Monday Morning
Quarterbacking!!!



After the Chris Brown/Rihanna incident....my wife said she knew Chris Brown was a violent kid!!!
Did she really?



Overconfidence

- We tend to think we know more than we do.
- 82% of U.S. drivers consider themselves to be in the top 30% of their group in terms of safety.
- 81% of new business owners felt they had an excellent chance of their businesses succeeding. When asked about the success of their peers, the answer was only 39%. (Now that's overconfidence!!!)



The Barnum Effect

- It is the tendency for people to accept very general or vague characterizations of themselves and take them to be accurate.



Applied V. Basic Research

- Applied Research has clear, practical applications.
- **YOU CAN USE IT!!!**



- Basic Research explores questions that you may be curious about, but not intended to be immediately used.



Studying how kissing changes when you get older is interesting...but that's about it.

Research on therapies for drug addicts has a clear purpose.

Terminology



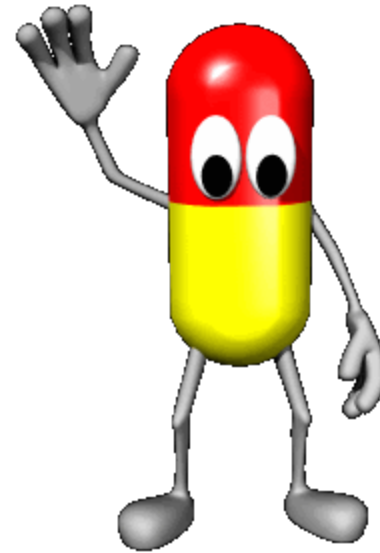
Hypothesis



- Expresses a relationship between two variables.
- A variable is anything that can vary among participants in a study.
- Participating in class leads to better grades than not participating.

Independent Variable

- Whatever is being manipulated in the experiment.
- Hopefully the independent variable brings about change.



If there is a drug in an experiment, the drug is almost always the independent variable.

Dependent Variable



- Whatever is being measured in the experiment.
- It is dependent on the independent variable.

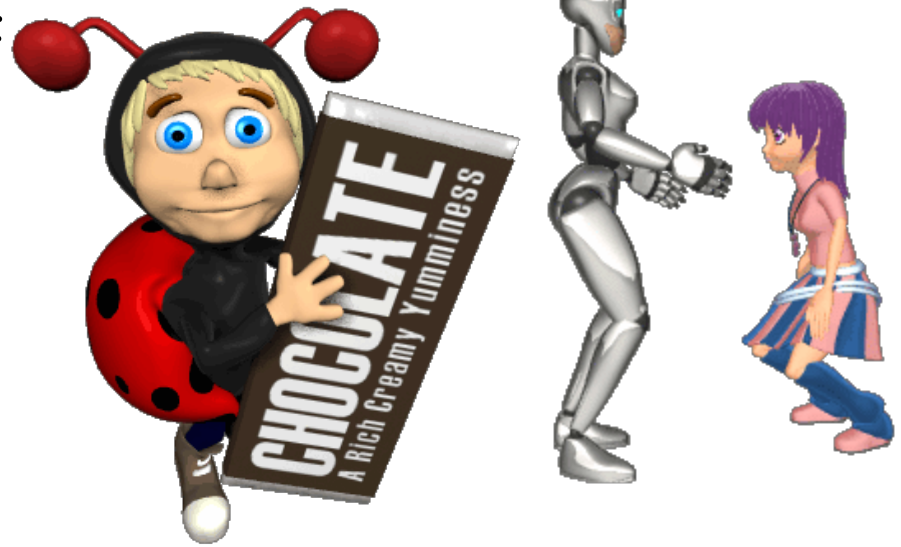
The dependent variable would be the effect of the drug.

Operational Definitions

- Explain what you mean in your hypothesis.
- How will the variables be measured in "real life" terms.
- How you operationalize the variables will tell us if the study is valid and reliable.

Let's say your hypothesis is that chocolate causes violent behavior.

- What do you mean by chocolate?
- What do you mean by violent behavior?



Sampling

- Identify the population you want to study.
- The sample must be representative of the population you want to study.
- **GET A RANDOM SAMPLE.**
- Stratified Sampling



Experimental Method

- Looking to prove causal relationships.
- Cause = Effect
- Laboratory v. Field Experiments



Smoking causes health issues.



Beware of Confounding Variables



If I wanted to prove that smoking causes heart issues, what are some confounding variables?

- The object of an experiment is to prove that A causes B.
- A confounding variable is anything that could cause change in B, that is not A.



Lifestyle and family history may also effect the heart.

Random Assignment

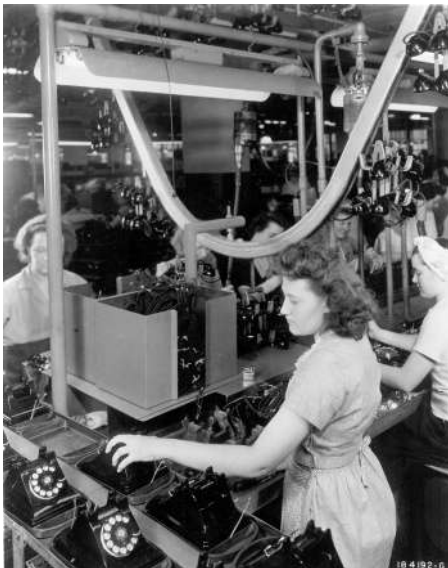
- Once you have a random sample, randomly assigning them into two groups helps control for confounding variables.
- Experimental Group v. Control Group.
- Group Matching



Hawthorne Effect



- But even the control group may experience changes.
- Just the fact that you know you are in an experiment can cause change.



Whether the lights were brighter or dimmer, production went up in the Hawthorne electric plant.

Experimenter Bias



- Another confounding variable.
- Not a conscious act.
- Double-Blind Procedure.



Other Confounding Variables

- Placebo effect



- Order Effects

Correlational Method

- Correlation expresses a relationship between two variables.
- Does not show causation.



As more ice cream is eaten,
more people are murdered.

Does ice cream cause murder, or murder cause people to eat ice cream?

Types of Correlation

Positive Correlation

- The variables go in the **SAME** direction.



Studying and grades hopefully has a positive correlation.

Negative Correlation

- The variables go in opposite directions.



Heroin use and grades probably has a negative correlation.



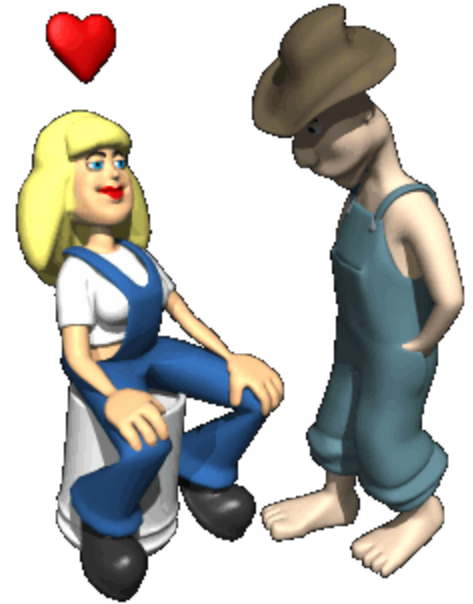
Survey Method



- Most common type of study in psychology
- Measures correlation
- Cheap and fast
- Need a good random sample
- Low-response rate

Naturalistic Observation

- Watch subjects in their natural environment.
- Do not manipulate the environment.
- The good is that there is Hawthorne effect.
- The bad is that we can never really show cause and effect.



Correlation Coefficient

- A number that measures the strength of a relationship.
- Range is from -1 to +1
- The relationship gets weaker the closer you get to zero.

Which is a stronger correlation?

- $-.13$ or $+.38$
- $-.72$ or $+.59$
- $-.91$ or $+.04$

Case Studies

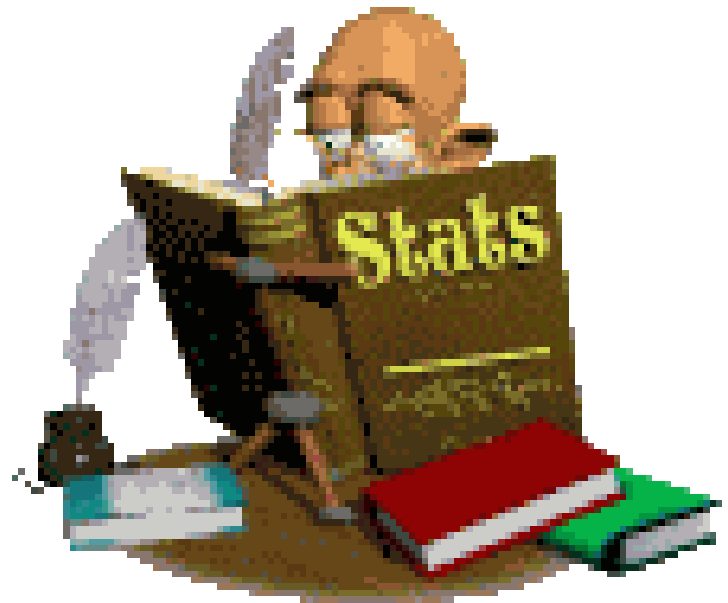
- A detailed picture of one or a few subjects.
- Tells us a great story...but is just descriptive research.
- Does not even give us correlation data.



The ideal case study is John and Kate. Really interesting, but what does it tell us about families in general?

Statistics

- Recording the results from our studies.
- Must use a common language so we all know what we are talking about.



Descriptive Statistics



- Just describes sets of data.
- You might create a frequency distribution.
- Frequency polygons or histograms.

Central Tendency

- Mean, Median and Mode.
- Watch out for extreme scores or outliers.

Let's look at the salaries of the employees at Dunder Mifflin Paper in Scranton:

\$25,000- Pam
\$25,000- Kevin
\$25,000- Angela
\$100,000- Andy
\$100,000- Dwight
\$200,000- Jim
\$300,000- Michael



The median salary looks good at \$100,000.

The mean salary also looks good at about \$110,000.

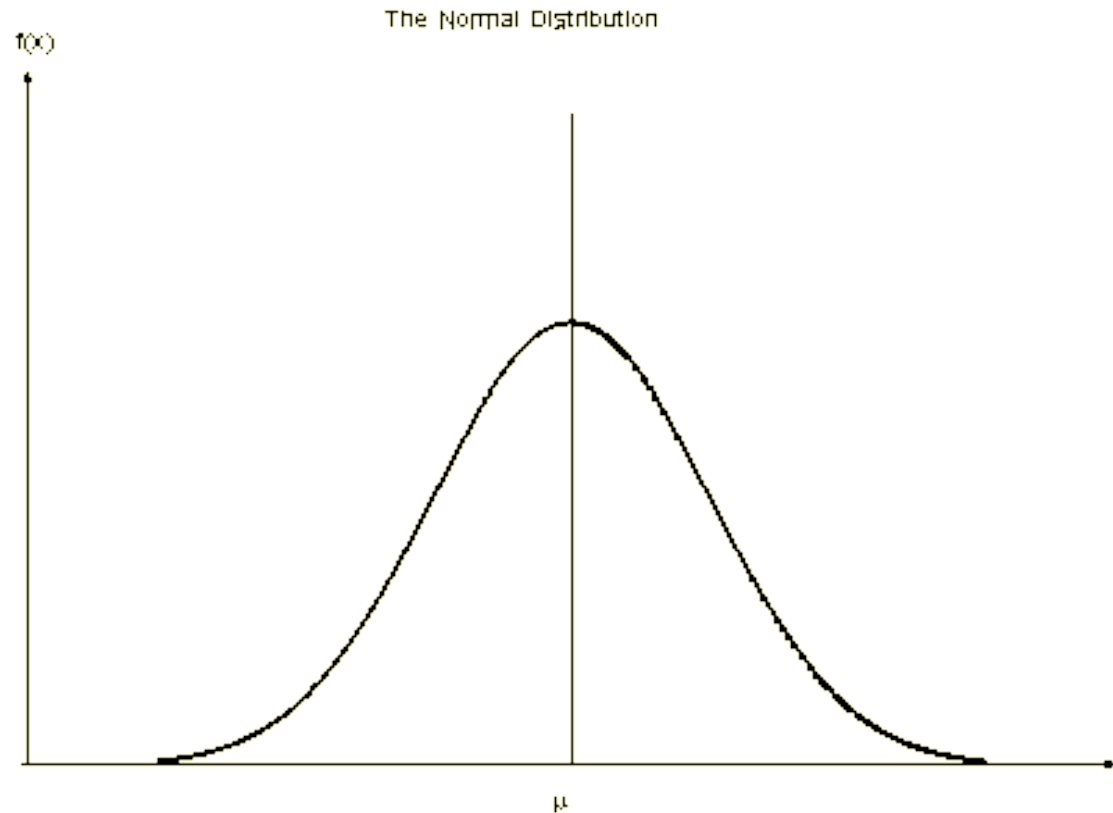
But the mode salary is only \$25,000.

Maybe not the best place to work.

Then again living in Scranton is kind of cheap.

Normal Distribution

- In a normal distribution, the mean, median and mode are all the same.



Distributions

- Outliers skew distributions.
- If group has one high score, the curve has a positive skew (contains more low scores)
- If a group has a low outlier, the curve has a negative skew (contains more high scores)



Other measures of variability

Range: distance from highest to lowest scores.

Standard Deviation: the variance of scores around the mean.

The higher the variance or SD, the more spread out the distribution is.

Do scientists want a big or small SD?



Shaq and Kobe may both score 30 ppg (same mean). But their SDs are very different.

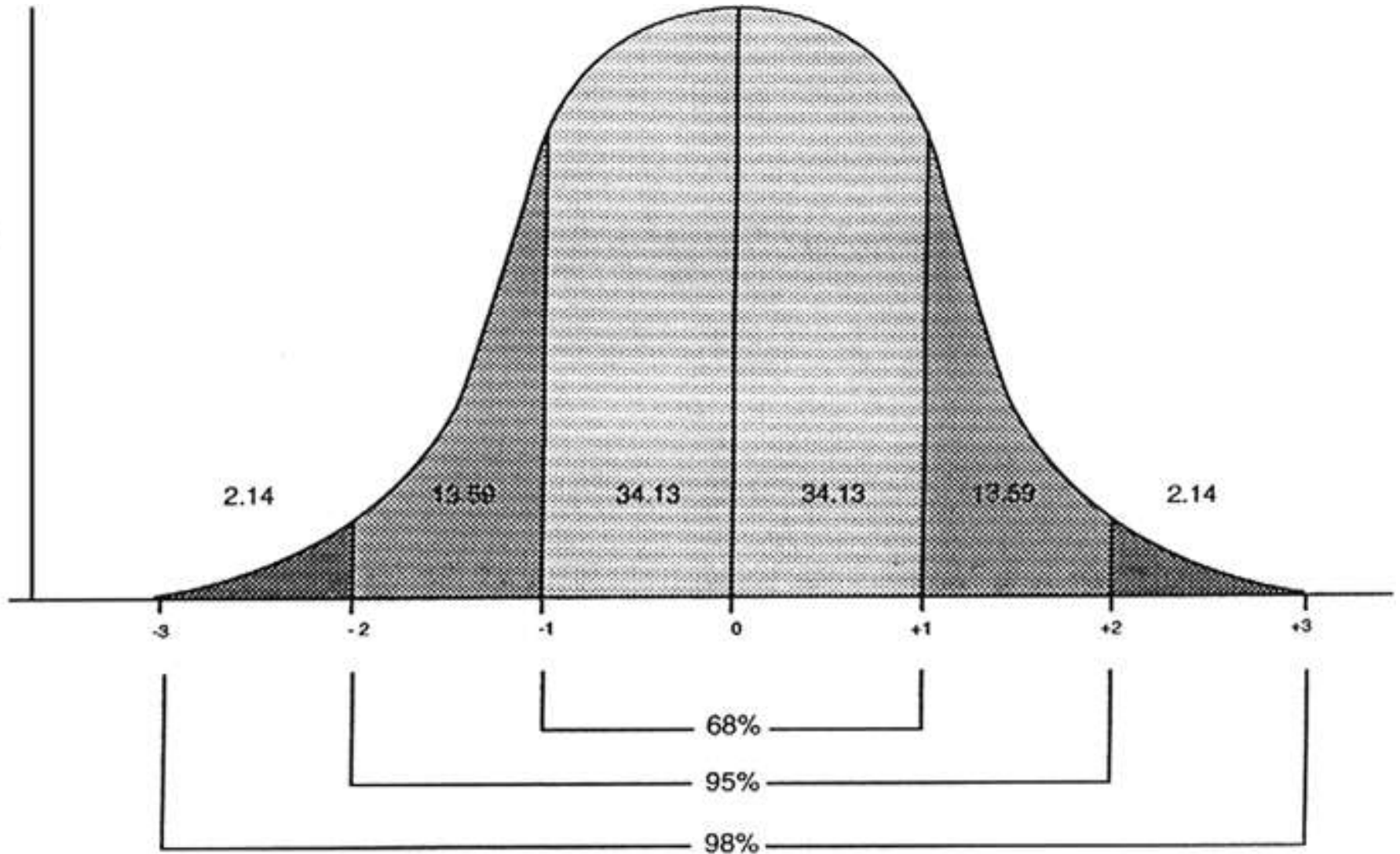


Z Scores



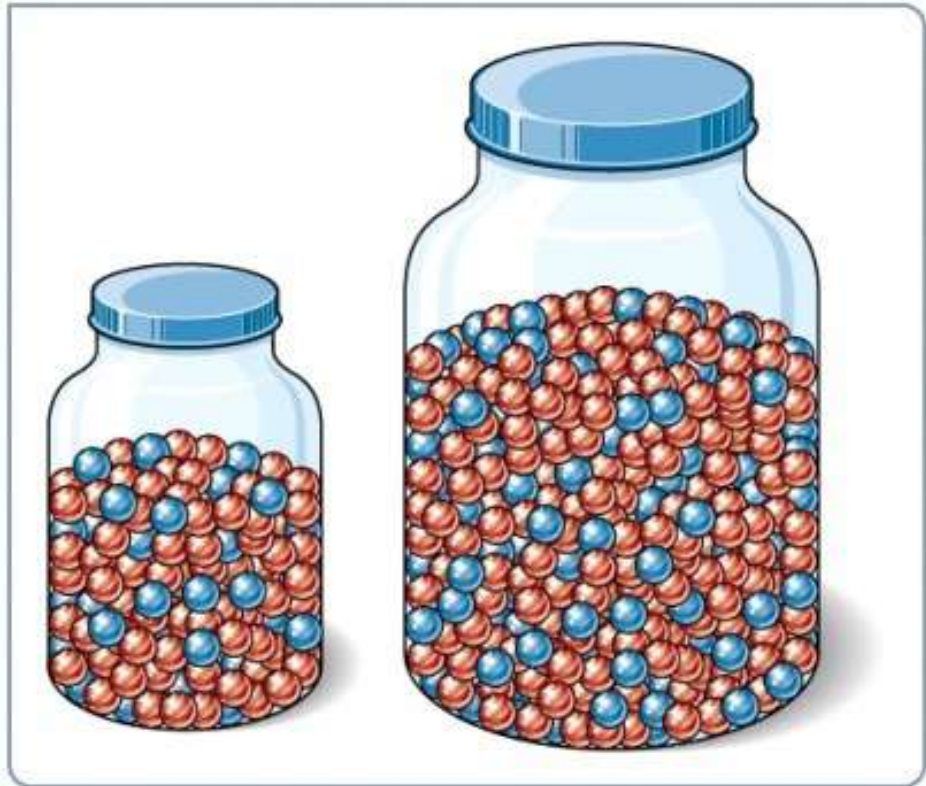
- A unit that measures the distance of one score from the mean.
- A positive z score means a number above the mean.
- A negative z score means a number below the mean.

Normal Distribution



Inferential Statistics

- The purpose is to discover whether the finding can be applied to the larger population from which the sample was collected.
- T-tests, ANOVA or MANOVA
- P-value= .05 for statistical significance.
- 5% likely the results are due to chance.



APA Ethical Guidelines for Research



- IRB- Internal Review Board
- Both for humans and animals.



Animal Research

- Clear purpose
- Treated in a humane way
- Acquire animals legally
- Least amount of suffering possible.



Human Research



- No Coercion- must be voluntary
- Informed consent
- Anonymity
- No significant risk
- Must debrief