Research Methods

history

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.

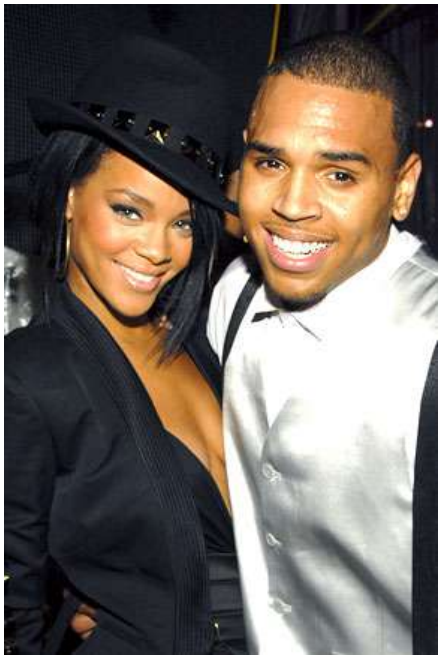
Hindsight Bias

intro only

- 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.

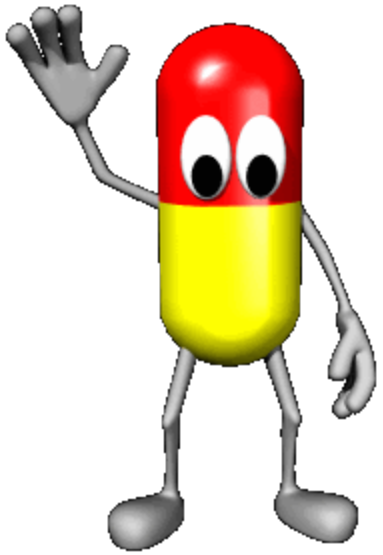
Terminology

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.

Identifying Independent and Dependent Variables

1. Developmental psychologists want to know if exposing children to public television improves their reading skills.

2. Behavioral psychologists want to know whether reinforcing comments will make people work harder on an assembly line.

3. A clinical psychologist wants to know whether people who have psychotherapy are more or less likely to have problems in the future.

4. A social psychologist wants to know whether being polite or rude to people tends to make them more cooperative.

5. A personality psychologist explores whether extroverted people have more fun at parties.

Experimental Vocabulary

- **Population**: the group from which your participants were drawn from

- **Experimental Group**: Group exposed to IV

- **Control Group**: Group not exposed to IV

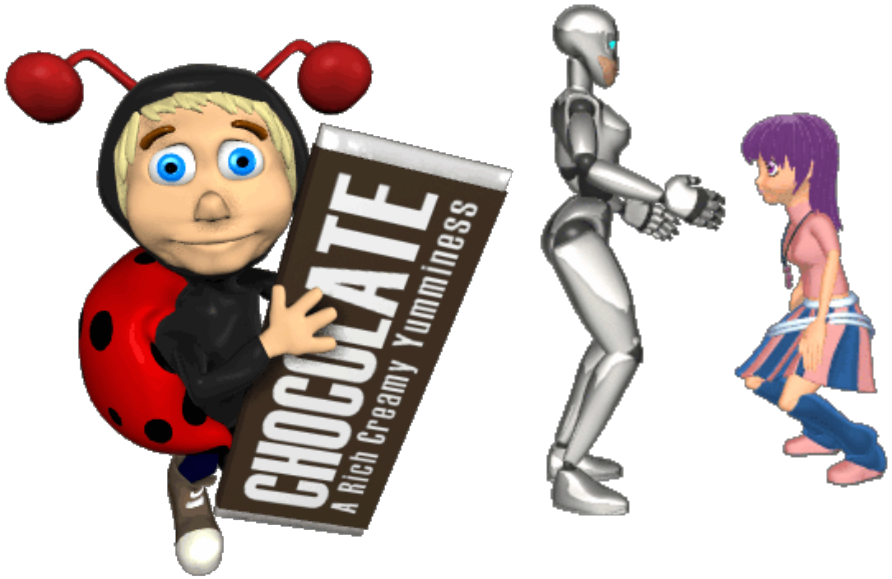
- **Replication**: to repeat an experiment

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?



How might we operationally define the following?

1.The teacher wants to find a way to help make Billy ***act more friendly*** toward the other children.

2. A psychologist wants to know if his new form of psychotherapy will make people ***less depressed.***

3. College athletes are not as ***smart*** as regular students.

4. Overall, senior girls are ***prettier*** than junior girls.

5. The ***school spirit*** is at an all-time low.

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 variable.
- 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.

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

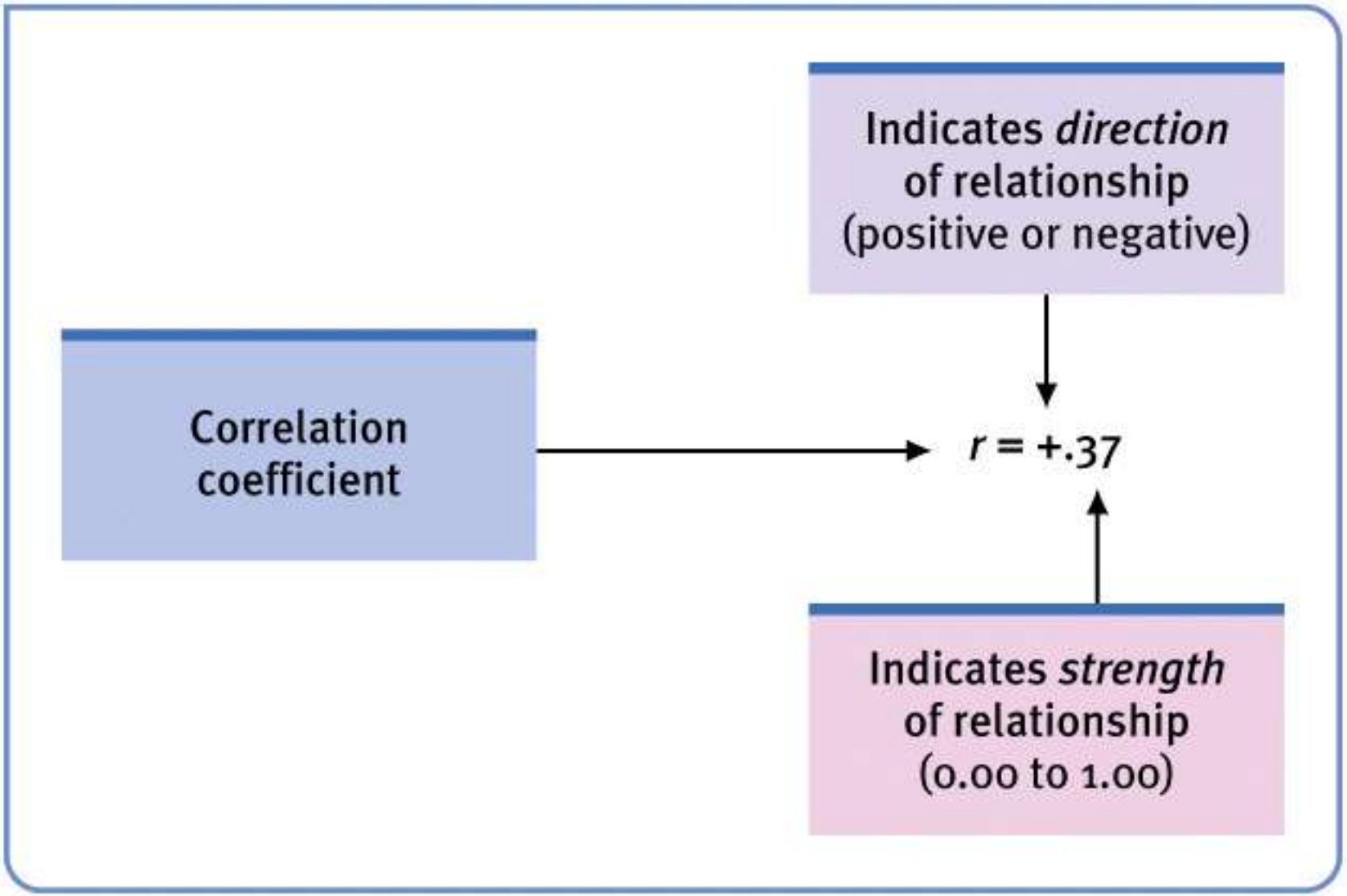
Positive Correlation

- As the value of one variable increases (or decreases) so does the value of the other variable.
- A perfect positive correlation is +1.0.
- The closer the correlation is to +1.0, the stronger the relationship.

Negative Correlation

- As the value of one variable increases, the value of the other variable decreases.
- A perfect negative correlation is -1.0.
- The closer the correlation is to -1.0, the *stronger* the relationship.

How to Read a Correlation Coefficient



Correlation Practice!

- IQ/academic success
- Self esteem/depression
- Stress/health
- Shoe size/ grade on next exam
- Education/income
- Price of gas/sales of SUV's

Survey Method

- Most commonly used
- Cheap and fast
- Need a good random sample
- Low-response rate
- People Lie
- Example
- Wording Effects

--the problem with surveys

(examples of the wording effect)

- "ignorant" of what is being asked:
- (from the Louis Harris Poll taken at New York's American Museum of Natural History)

- **77% interested in plants/trees ; 39% botany**
- **48% fossils; 39% in paleontology**
- **42% rocks/minerals; 53% geology**
- **Lie: exit poll 52/48; opposite**
- **Interviewer: white: 62; black: 46**
- **Framing of question: H Clinton/Perdue**

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.

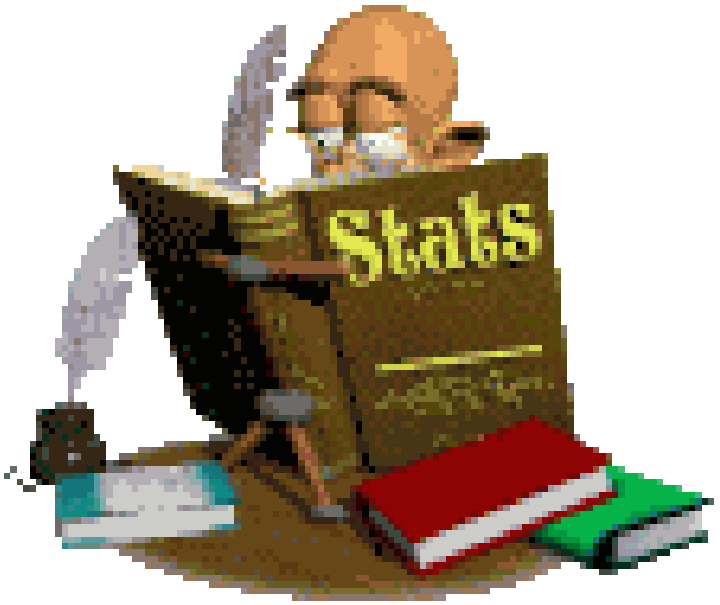
Case Studies

- 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.

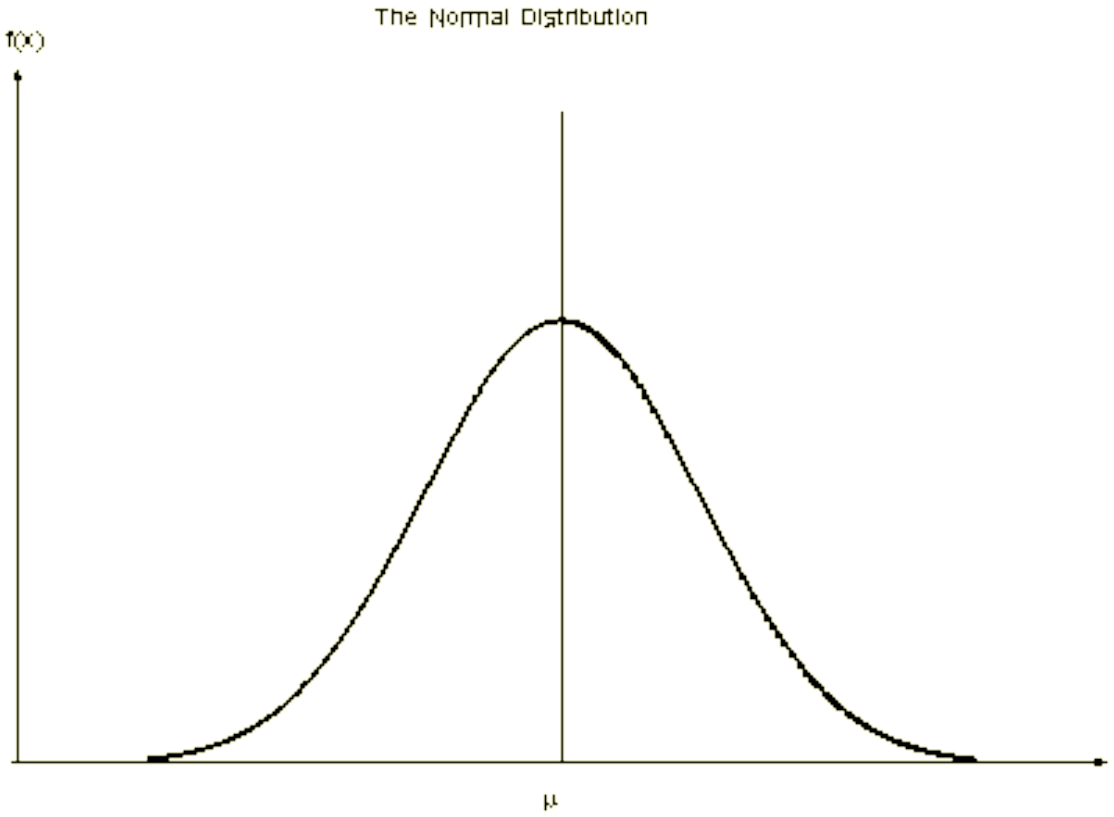
Let's look at the salaries of the employees at Dunder Mifflen Paper in Scranton:

$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.

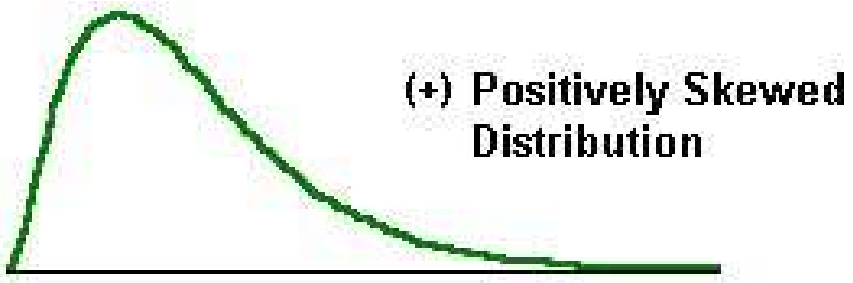
Normal Distribution

- 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.

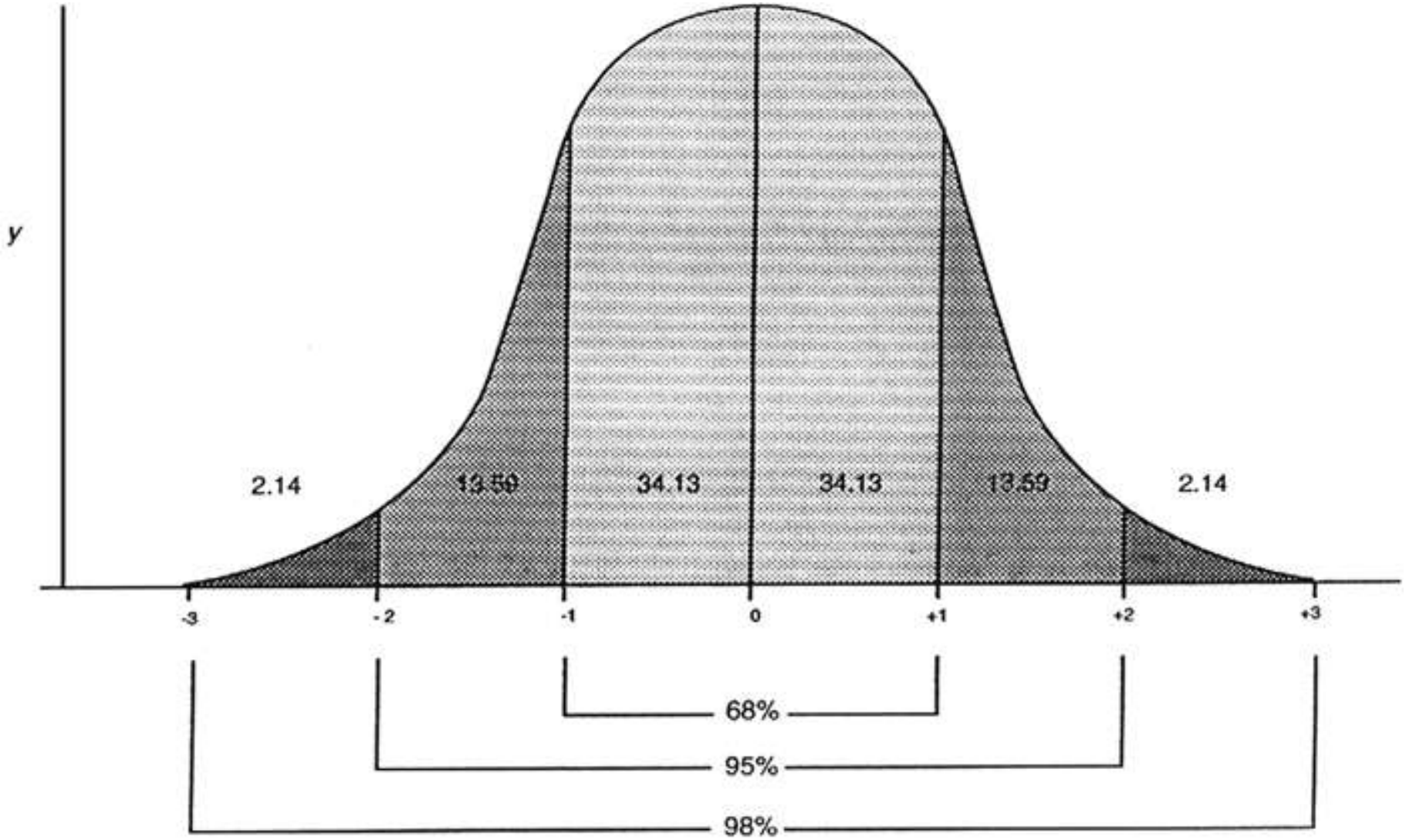
Do scientists want a big or small SD?

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

Z Scores

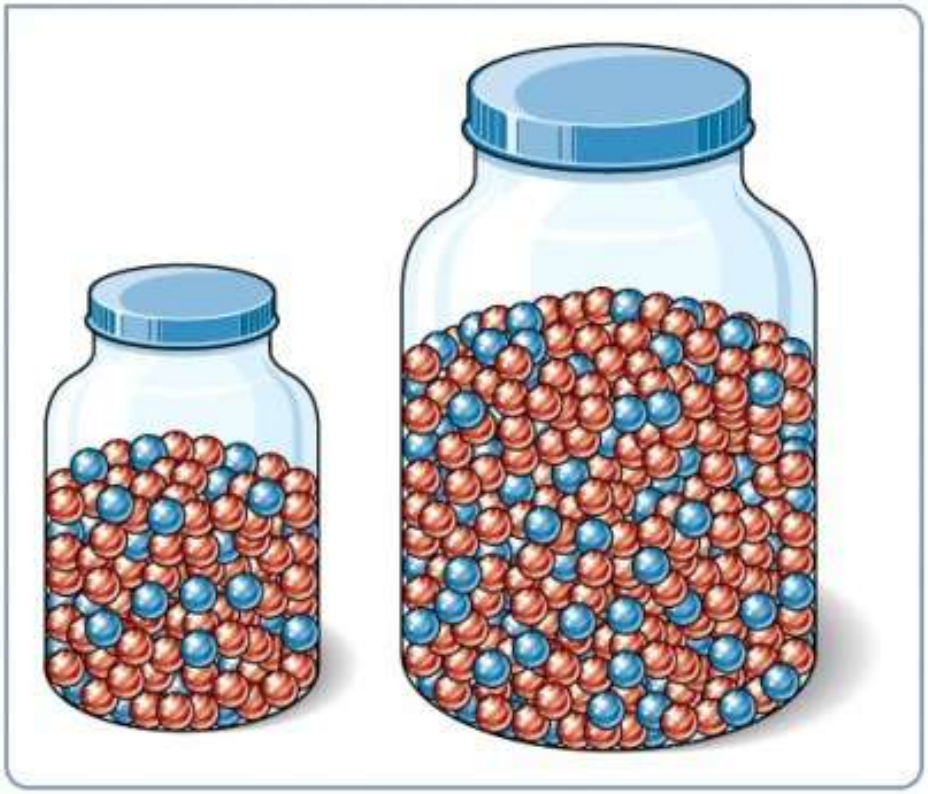
- A unit that measures the distance of one score from the mean.
- A positive z score means a number above the mean.
- A negative z score means a number below the mean.

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

Actual Example of Informed Consent

Background Information:

The purpose of this study is to determine if perceptions high school general education teachers and special education teachers on inclusion differ. It is hoped that this study will help us determine high school teacher perceptions on inclusion and factors that may contribute to their perceptions.

Procedures:

Participation in this study will take no more than 10 minutes of your time. If you agree to be in this study, you will only need to click on the attached email link to access and complete a survey.

Risks and Benefits of being in the Study:

The risks are no more than the participant would encounter in everyday life. Your participation in this study will add to existing research on teacher perceptions of inclusion at the high school level. This study will provide school leaders with information to address teacher needs regarding inclusion. Addressing teacher needs will enhance student learning.

continued

Compensation:
Participants will not receive any compensation for their participation.

Confidentiality:
The data collection for this this study will be completed anonymously. No one, including the researcher, will have any way of identifying who actually participated in the study. The researcher is the only person who will have access to collected data. In any sort of report we might publish, we will not include any information that will make it possible to identify a subject.

Voluntary Nature of the Study:
Participation in this study is voluntary. Your decision whether or not to participate will not affect your current or future relations with the Liberty University, the Douglas County School System, or the school that you work at. If you decide to participate, you are free to not answer any question or withdraw at any time with out affecting those relationships.

Contacts and Questions:
The researcher conducting this study is Carmen Wiggins. You may ask any questions you have now. If you have questions later, you are encouraged to contact her at cwiggins@liberty.edu, or her committee chair Dr. Mowen at cmowen@liberty.edu If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher(s), you are encouraged to contact the **Institutional Review Board,** Dr. Fernando Garzon, Chair, 1971 University Blvd, Suite 1582, Lynchburg, VA 24502 or email at fgarzon@liberty.edu.