

INTERNAL EVALUATION METHODOLOGY

Brooke Miller

PhD Psychology

The University of Texas at Austin

Three kinds of research studies

- Descriptive studies
 - Case Studies
 - Naturalistic Observations
 - Interviews
 - Surveys/Questionnaire
- Correlational studies
- Experimental studies
 - Pre-test, post-test

Three kinds of research studies

- Descriptive studies
 - Case Studies- examine one case in-depth
 - Following one family around a museum to see what questions they ask
 - Naturalistic Observations
 - Interviews
 - Surveys/Questionnaire

Three kinds of research studies

- Descriptive studies
 - Case Studies- examine one case in-depth
 - Following one family around a museum to see what questions they ask
 - Naturalistic Observations- Observing behavior that we see in our natural environment
 - Placing video cameras by a certain exhibit to determine how much time children interact with it
 - Interviews
 - Surveys/Questionnaire

Three kinds of research studies

- Descriptive studies

- Case Studies- examine one case in-depth
 - Following one family around a museum to see what questions they ask
- Naturalistic Observations- Observing behavior that we see in our natural environment
 - Placing video cameras by a certain exhibit to determine how much time children interact with it
- Interviews - In-depth questioning of a small number of participants
 - Interview parents of children in a STEM summer camp about their STEM backgrounds and experiences
- Surveys/Questionnaire

Three kinds of research studies

- **Descriptive studies**

- Case Studies- examine one case in-depth
 - Following one family around a museum to see what questions they ask
- Naturalistic Observations- Observing behavior that we see in our natural environment
 - Placing video cameras by a certain exhibit to determine how much time children interact with it
- Interviews - In-depth questioning of a small number of participants
 - Interview parents of children in a STEM summer camp about their STEM backgrounds and experiences
- Surveys/Questionnaire - Fast questioning of a large number of participants
 - Give surveys to conference participants to determine how to improve conference sessions

Three kinds of research studies

- Descriptive studies

- Case Studies- examine one case in-depth

- Pro: lots of in-depth information
- Con: How do you analyze it?

- Naturalistic Observations- Observing behavior that we see in our natural environment

- Pro: Ecological Validity
- Con: No explanatory power

- Interviews - In-depth questioning of a small number of participants

- Pro: lots of in-depth information
- Con: Need staff training, resources

- Surveys/Questionnaire - Fast questioning of a large number of participants

- Pro: Easy, fast
- Con: hard to write, participant honesty

Three kinds of research studies

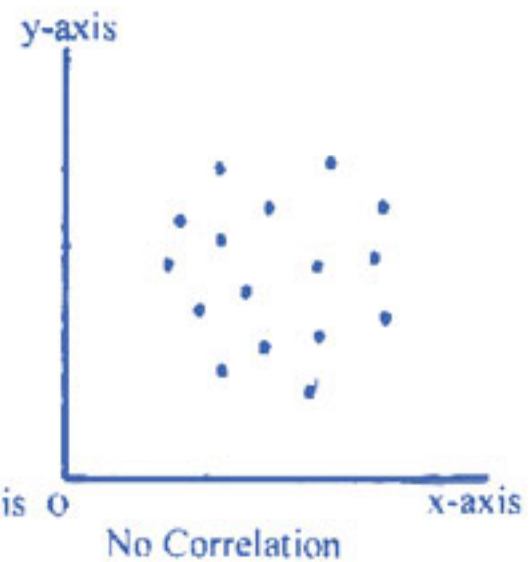
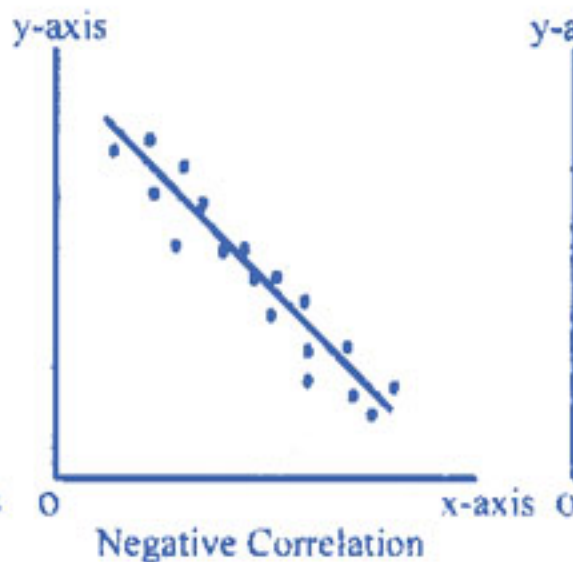
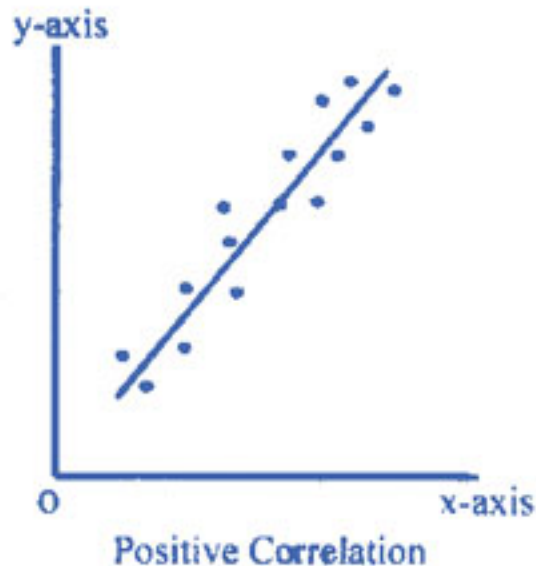
- Descriptive studies
 - Case Studies
 - Naturalistic Observations
 - Interviews
 - Surveys/Questionnaire
- Correlational studies
- Experimental studies
 - Pre-test, post-test

Three kinds of research studies

- **Descriptive studies**
 - Case Studies
 - Naturalistic Observations
 - Interviews
 - Surveys/Questionnaire
- **Correlational studies-** allows us to look at the relationship between variables
 - Number of museum visits and number of questions answered correctly
- **Experimental studies**
 - Pre-test, post-test

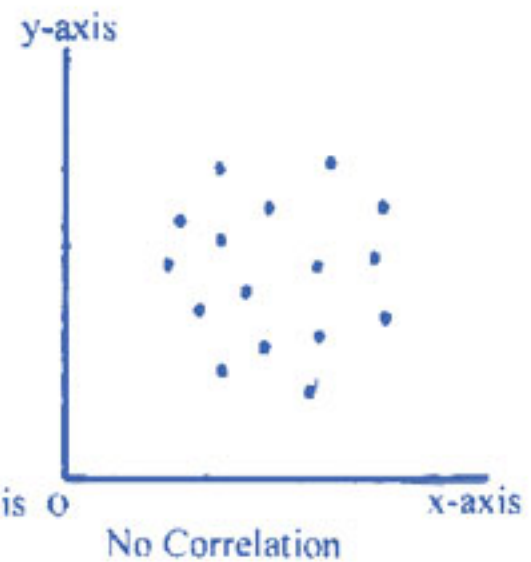
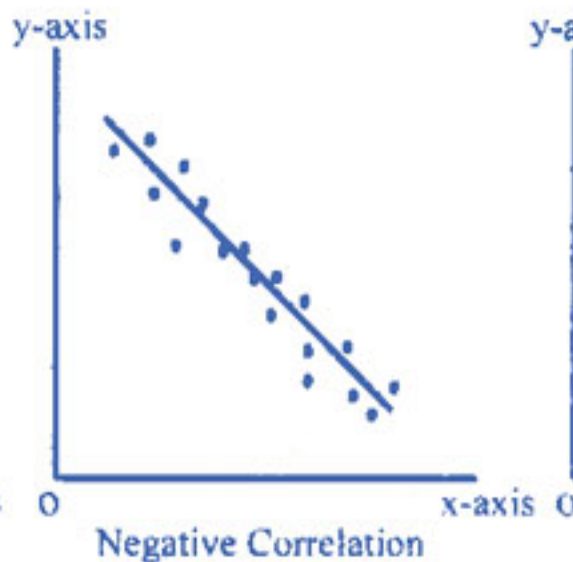
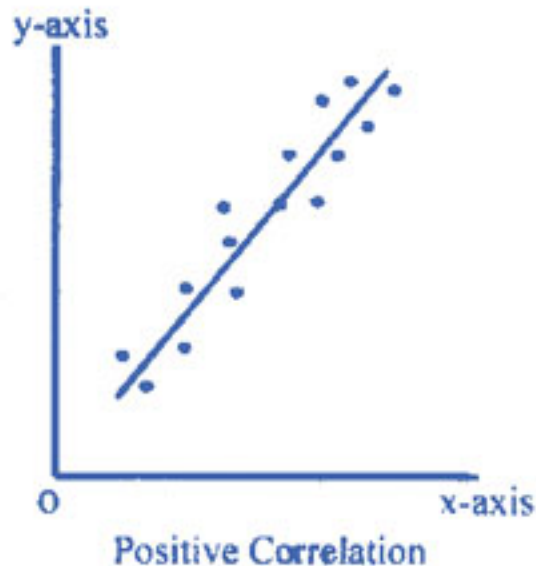
Three kinds of research studies

- Correlational studies- allows us to look at the relationship between variables
 - Do children who eat breakfast before school do better on math tests?
 - Pro: Simple, easy, clear results



Three kinds of research studies

- Correlational studies- allows us to look at the relationship between variables
 - Do children who eat breakfast before school do better on math tests?
 - Con: Correlation Does Not Imply Causation!



Three kinds of research studies

- Descriptive studies
 - Case Studies
 - Naturalistic Observations
 - Interviews
 - Surveys/Questionnaire
- Correlational studies
- Experimental studies
 - Pre-test, post-test

Three kinds of research studies

- Descriptive studies
 - Case Studies
 - Naturalistic Observations
 - Interviews
 - Surveys/Questionnaire
- Correlational studies
- Experimental studies- manipulating variables to determine cause and effect
 - Pre-test, post-test

Three kinds of research studies

- Experimental studies- manipulating variables to determine cause and effect
 - Pre-test, post-test
 - Same question as before: Do children who eat breakfast before school do better on math tests?
 - Design: Children come to school early and are sorted into two groups- one group eats a breakfast with 100 calories, the other eats a breakfast of 300 calories. Wait 30 minutes after they finish, then each child takes a math test
 - Experimenter control allows us to draw conclusions from our data

Three kinds of research studies

- Why would we ever do a correlation study? Why not just do an experimental study?

Three kinds of research studies

- Why would we ever do a correlation study? Why not just do an experimental study?

..... It isn't always possible

Three kinds of research studies

- Why would we ever do a correlation study? Why not just do an experimental study?

..... It isn't always possible

Sometime this is the best we can get. We can't control how many times a child visits the museum.

Don't discount correlation studies

Three kinds of research studies

- **Descriptive studies**
 - Pros: Accurate reflection of what is really going on, Leads us to additional research questions
 - Cons: Limited in the conclusions that we can draw from it, Can't tell us about cause and effect
- **Correlational studies**
 - Pros: Let's us examine the relationships between variables
 - Cons: Can't tell us about cause and effect
- **Experimental studies**
 - Pro: Can determine cause and effect
 - Con: takes time, money, control, and resources.

Three kinds of research studies

- Internal Evaluation:
 - Descriptive studies
 - Correlational studies
- External Evaluation:
 - Experimental studies

External Evaluators will help you to design studies and run statistics to determine statistical significance.

When do you need StatSig? To get grants, to get published

When do you not need StatSig? All other situations

Have a data analysis plan!

No matter what kind of study/evaluation program you choose, always keep this in mind:

You MUST have an analysis plan for every question you asks!

Have a data analysis plan!

No matter what kind of study/evaluation program you choose, always keep this in mind:

You MUST have an analysis plan for every question you asks!

What kind of data (qualitative/quantitative) will the question give you? How do you plan to analyze that data? How do you plan to graph it?



Writing survey questions

There are many ways to ask questions...

..... And if you don't ask the right ones, you won't get the information you need

Writing survey questions

1. Why do you want to ask these questions? (Set a goal)
2. Who do you want to ask?
3. What do you want to ask?
4. How should you ask it?
5. When should you ask it?

Writing survey questions

1. Set a goal – Why did you create the survey? What information/data are you hoping to collect? What do you want to know and why do you want to know it?
2. Who to ask – Gender? Age group? Education level? STEM summer campers?
3. What to ask- What do you actually want to know? Only ask questions that relate to your goal (KISS)
4. How to ask- This will depend on the “who.” A survey for children will be written differently than one for adults
5. When to ask- when is the best time to approach participants?

Writing Survey Questions – How?

Wording effects:

1. Do you believe in aliens?
2. Do you believe that there might be intelligent life somewhere in the universe?

Writing Survey Questions – How?

Structure

1. Unstructured: How satisfied are you with the current pick-up schedule?

2. Structured: Circle the time you would like pick-up to happen

As it was

one hour earlier

one hour later

Writing Survey Questions – How?

TENSE

Perfect

I did in the very recent past.

EXAMPLE

Which brands have you bought?

Lacks clarity, some may not be sure what brands they should select
e.g. *“Um?...I bought this brand once but...”*

DON'T 

Present

I am doing this now.

Which brands do you buy?

More concise and clear
I buy this brand = clear statement of fact

DO 

Writing Survey Questions – How?

- Questions should be:
 - Brief
 - Relevant to the goals of the study
 - Simple
 - Specific and Direct

Keep the writing style simple. Your survey shouldn't be a reading test!

Writing Survey Questions – How?

- What kind of question should you ask?
 - Multiple choice?
 - Likert Scale?
 - Forced Choice?
 - Open ended?

Writing Survey Questions – How?

Avoid:

- Leading questions
- Loaded or suggestive questions
- Double-barrel questions
- Fatiguing question types – large tables, lots of open-text questions
- Sensitive questions
- Highly technical language

Writing Survey Questions – How?

Data Types:

1. Qualitative Data
2. Quantitative Data

Writing Survey Questions – How?

Data Types:

1. Qualitative Data - descriptive data (observations, surveys, etc.)
 - Generally open-ended
 - Helps you define a problem
 - Can lead you to further research questions

But:

- Requires training to interpret results
- Interpretation Bias

2. Quantitative Data – numerical data (correlation, experiments)

- Generally structured questions with closed answer options
- Easy to analyze

But:

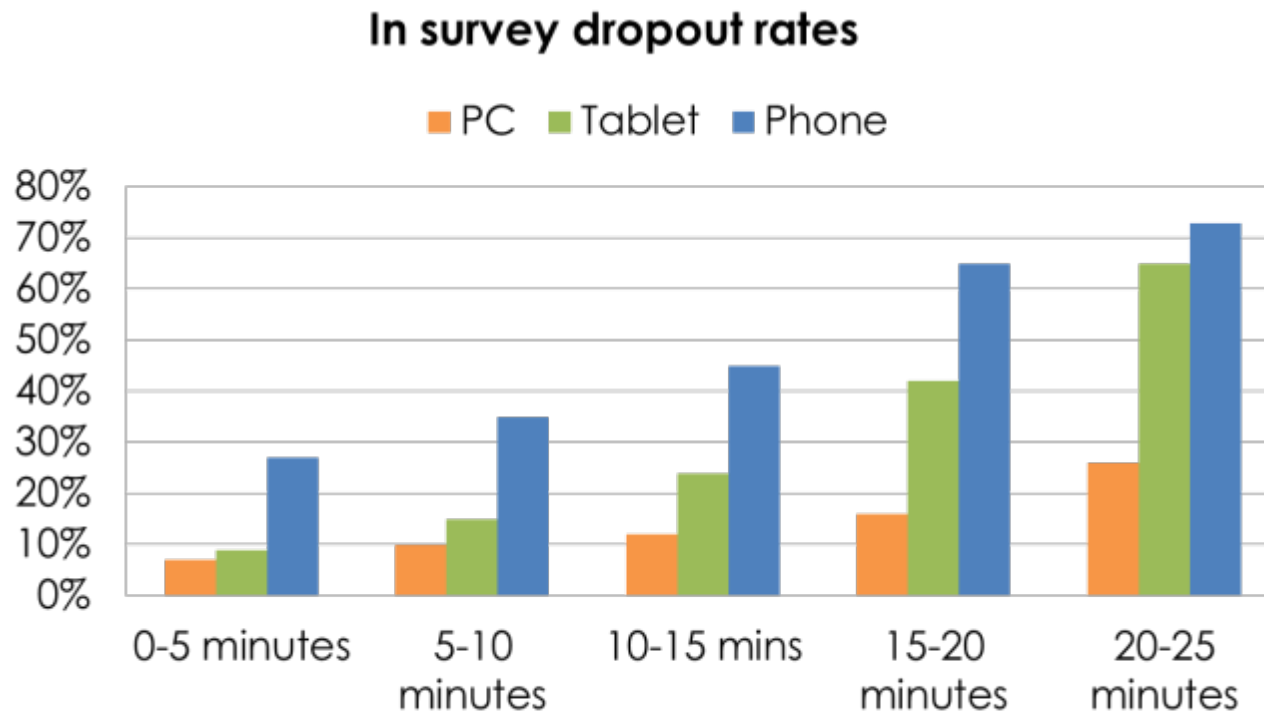
- No nuance

Writing Survey Questions – How?

- Keep question sequence in mind!
- Start broad, then move to specifics
- Think about the impact early questions might have on proceeding questions!
- Watch for leading questions

Writing Survey Questions – How?

- Minimize the length of your survey
 - 15 minutes max- really want it to be less



Source: GMI analysis of 31,000 surveys 2014

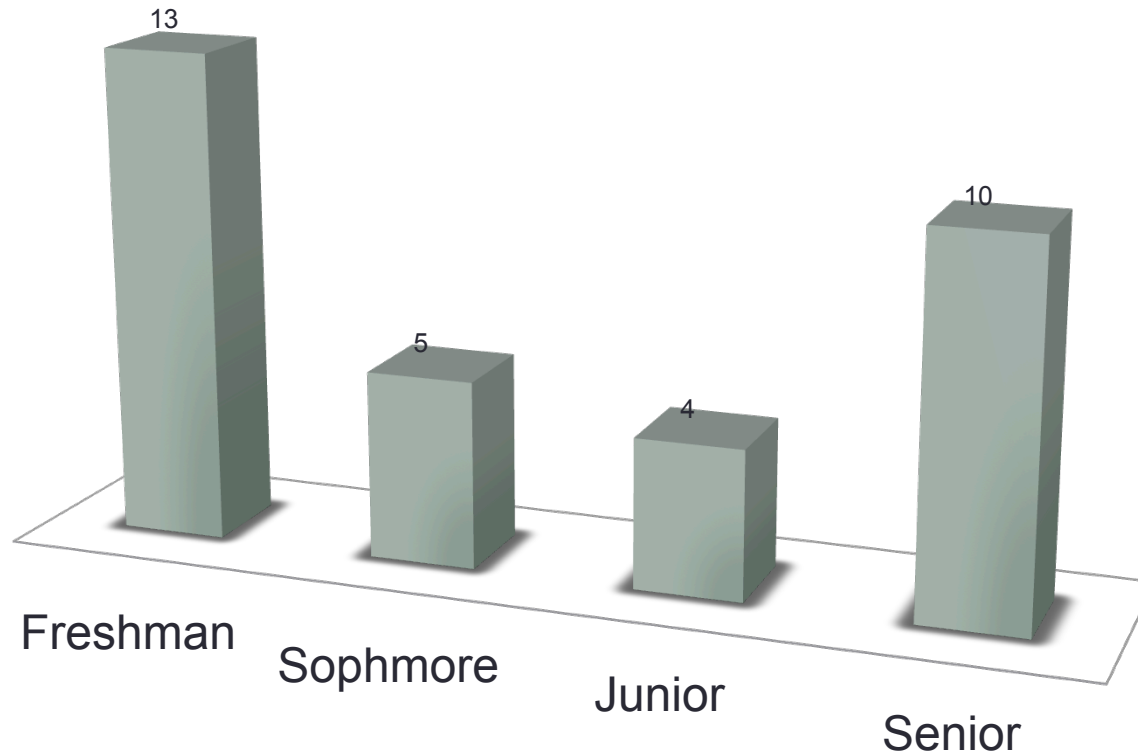
Writing Survey Questions – How?

- What to AVOID! All of these questions will produce biased data
 - **Avoid leading questions!** When the wording of a question points to a certain answer.
 - **Avoid loaded questions!** When the wording of the question contains emotionally charged assumptions.
 - **Avoid built-in assumptions!** When the question assumes certain beliefs on the part of the participant
 - **Avoid jargon!** Use simple language. Your survey should not be a reading test!
 - **Avoid double negatives!** If your survey is difficult to understand, people will become frustrated, which will impact the answers they give
 - **Avoid double-barreled questions!** This is when a single question asks two questions at once. Often participants will only answer one.



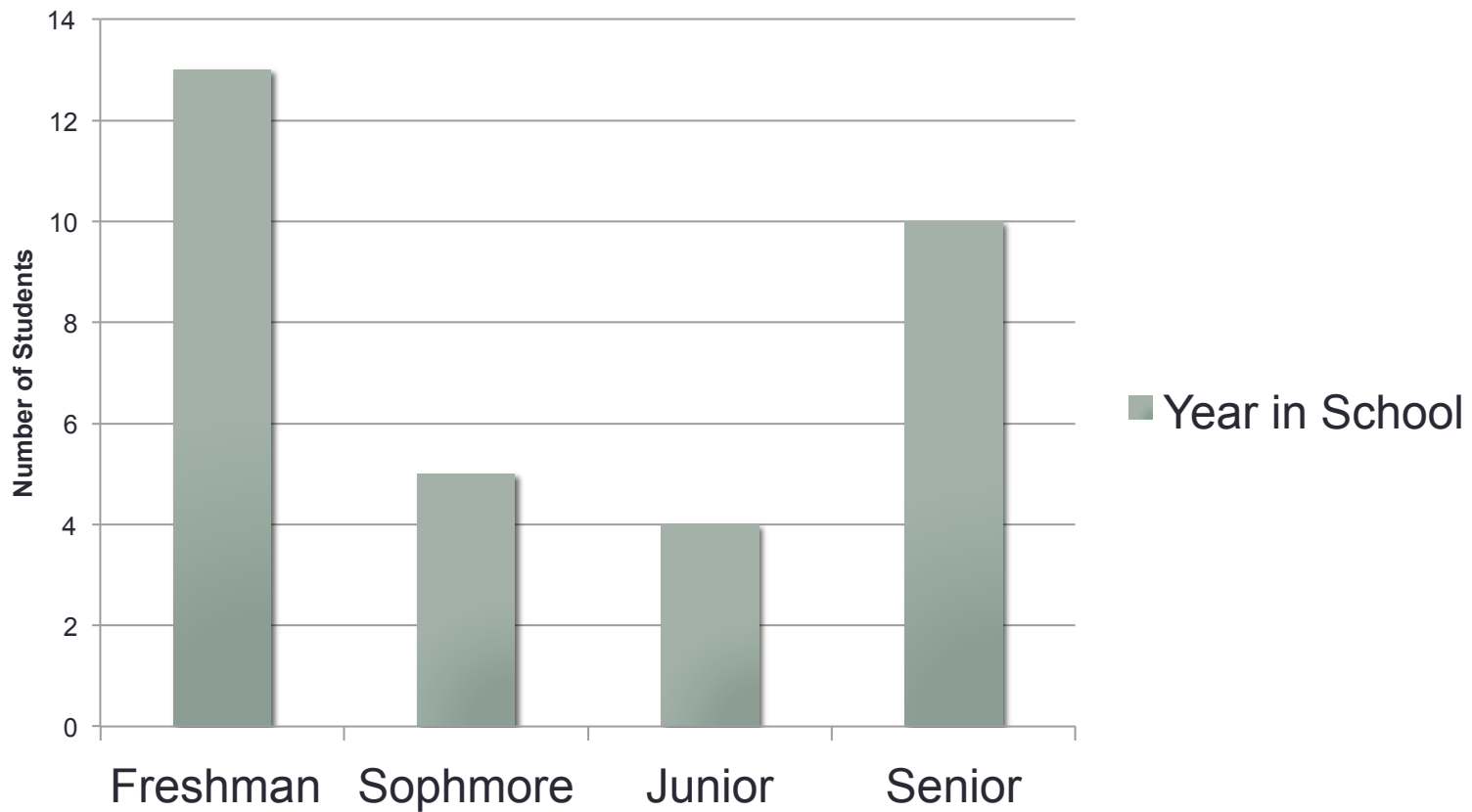
Bad graph

Number of students per grade



Good graph

Number of students per grade



Different Kinds of Data

- Nominal Data
 - Has categories
- Ordinal Data
 - Has categories that are ordered
- Interval Data
 - Has categories that are ordered by magnitude
- Ratio Data
 - Has categories that are ordered by magnitude that have a true zero

Different Kinds of Data

- Nominal Data
 - Has categories
 - **counts and percentages—no variability**
- Ordinal Data
 - Has categories that are ordered
 - **median and range**
- Interval Data
 - Has categories that are ordered by magnitude
 - **Mean and standard deviation**
- Ratio Data
 - Has categories that are ordered by magnitude that have a true zero
 - **Mean and standard deviation**