Research Questions, Hypotheses, & Theories

PSY 4433

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Agenda

- Psuedoscience vs Science
- Research Steps
- Literature Reviews

Psuedoscience vs Science

- **Peudoscience** is a system of ideas (similar to science) that is presented in a similar manner but lacks empirical evidence
  - has no testable hypotheses
  - relies on subjective data/evidence
  - ignores nonsupporting evidence
  - no past research to build off of

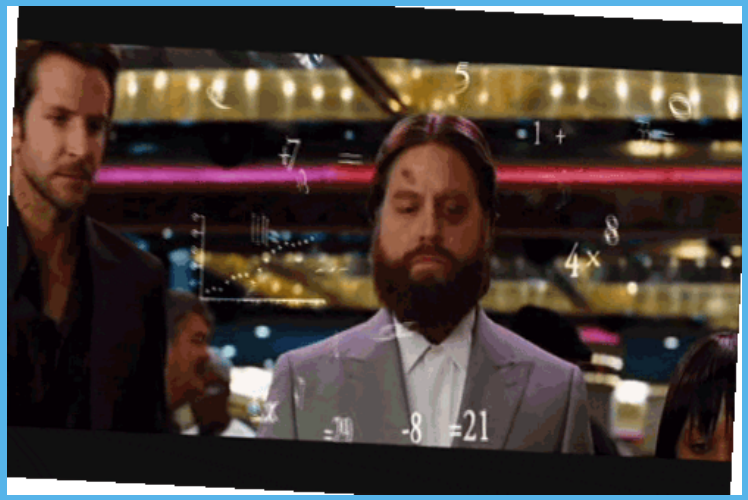
Peudoscience in Practice

Astrology is a joke. Also, so is numerology. While we're at it...Psychics are all jokes.

The Research Process

- There are both qualitative and quantitative research processes
- Both are useful for certain questions that need to be answered
- **JP Note:** Obviously I'm biased because I tend to focus on quantitative research

Quantitative Research



- Variables that vary in quantity
  - Focuses on numbers
- Interpreted using inferential statistics
  - SPSS

Qualitative Research

- Based on observations that are summarized into themes
  - Descriptive information (Content Analysis)
  - Interviews
  - Focus groups
- Interpreted "by hand"
  - also uses specific programs

Steps of a Research Process

1. Find a research idea topic
2. Form a hypothesis
3. Determine how you will define and measure your variables
4. Identify participants for the study; how you'll recruit
5. Select a research strategy
6. Select a research design
7. Conduct study
8. Evaluate data
9. Report the results
10. Refine/Reformulate research idea

Research Topic

- General Idea (Stress in college students)
  - think about the outcome of interest for your study, or your **dependent variable (DV)**
- Localized Idea (What about technology that causes stress in college students?)
  - incorporates **independent variable (IV)**, which is the variable that is manipulated
- Research Topic (Look into technological stressors of college students)
- Your Topic (Being on the internet causes stress)

Research Question & Hypothesis

- Does Internet use affect college students' stress?
- Internet use *will* affect stress in college students.

Operationalizing Definitions/Measurements

- Stress
  - What is stress in your defintion?
  - How could/should we measure it?
- Internet Use
  - What is stress in your defintion?
  - How could/should we measure it?
- What else should we consider when thinking about this relationship?
- What does the literature say?

Participants & Recruitment

- **participants** are individuals that take part in the research studies
- I want college students from every CSU
  - How realistic is this?
- Realistically, I'll get Psychology students from CPP
- How could I recruit participants?
  - SONA
  - What other options do I have for recruitment?

Research Strategy

- How will you get your data?
- Correlational or experimental design?
    - Descriptive?

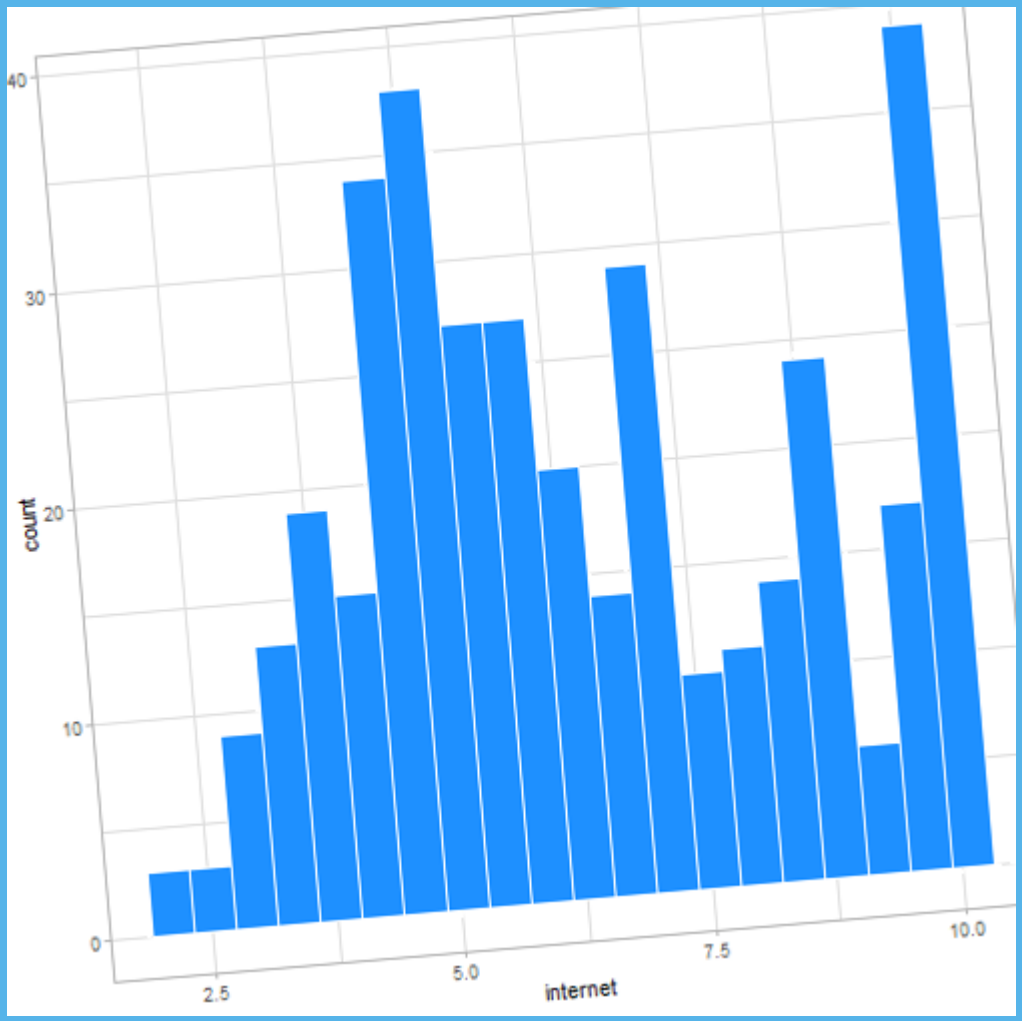
Research Design

- Correlational
  - survey
- Experimental
  - select and split groups randomly; lying to half of the groups to tell them that (between-subjects)
  - follow the same group (within-subjects)
- Quasi-experimental
  - split groups by specific parameter (heavy technology users & low technology users)
- Factorial design (experimental or quasi-experimental)
  - Combination of random groups & technology groups

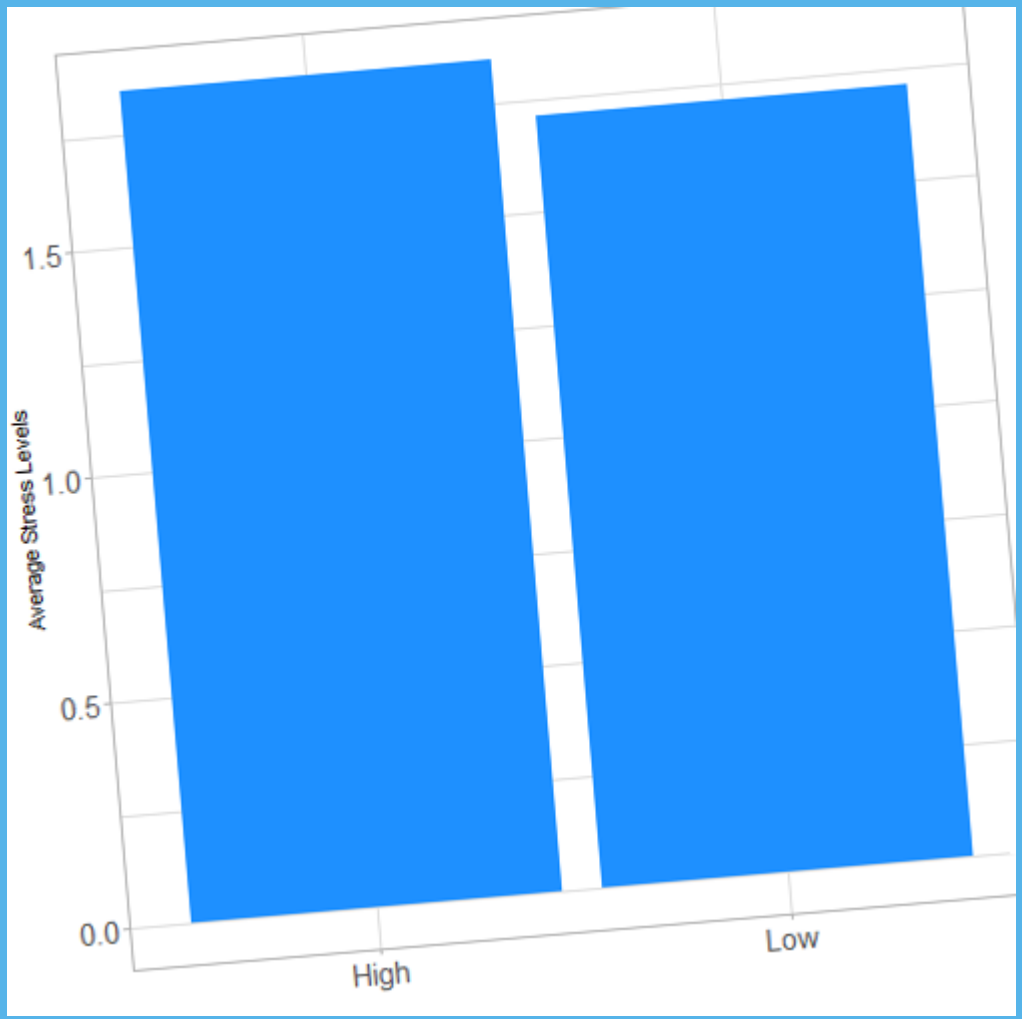
Conduct Study

- conduct your study based on whatever design chosen

Evaluate Data



Evaluate Data



Evaluate Data

```
##
##     Welch Two Sample t-test
##
## data:  stress by internet_groups
## t = 1.6128, df = 193.87, p-value = 0.1084
## alternative hypothesis: true difference in means is not equal to 0
## 95 percent confidence interval:
##  -0.02994377  0.29863424
## sample estimates:
## mean in group High  mean in group Low
##           1.847143           1.712798
```

Report Results

- Write a paper stating there were no difference between high and low technology users in level of stress

Refine Idea

- Additional considerations about conclusions
  - maybe not enough variation in CPP psychology students
  - What other altnerative explanations can there be for why an effect was not seen in our sample

Identifying Topic Areas

- Think of personal interests and curiosities
    - Why did you choose Psychology as a major?
- Think of behaviors, populations, and psychological topics (depression, anxiety, stress, areas of cognition, perceptions, etc.)

Identifying Topic Areas

- Causal Observation
  - you see a behavior/phenomenon happening in front of you
- Examples
  - watching movies make you sad
  - watching students get stressed when they open an exam or an email

Identifying Topic Areas

- Reports from other observations
  - news reports
  - current events
- Examples
  - effect of rent increases across the state on mental health
  - pandemic's effect on social skills

Practical Problems

- problems that may affect you in your daily life
- Examples
  - having a tv on while studying affects your grades
  - using apps to stop certain programs on your phone/computer to get work done

Practical Problems

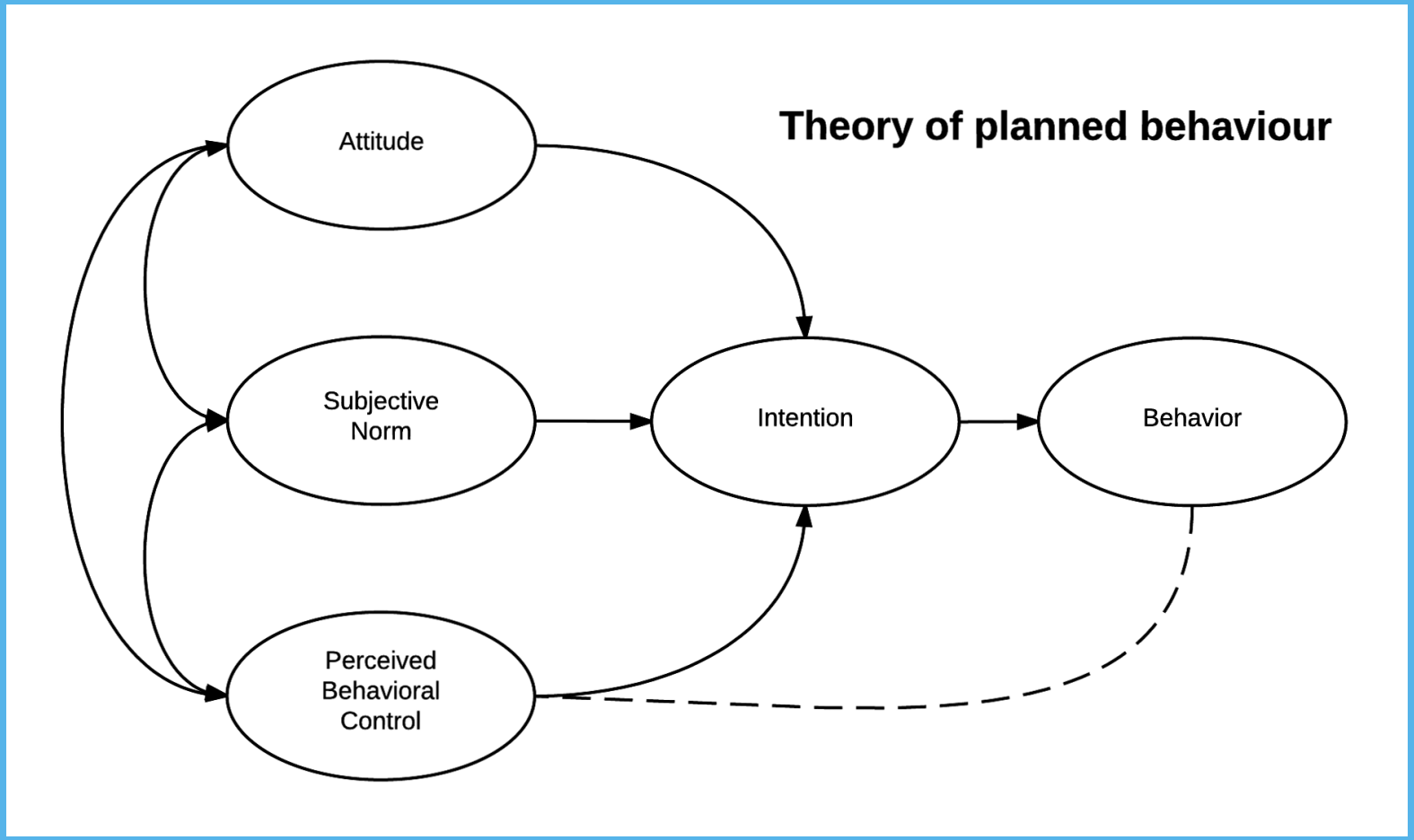
- **Applied research** is when research is created to solve practical problems
- **Basic research** is when research solve theoretical issues
- **Efficacy**
  - What we will focus in this course
  - how well the IV affects the DV in a controlled setting
  - following a strict protocol to see how instructors teach students research design
- **Effectiveness**
  - how well IV affects the DV in a real-world setting
  - give training for instructors to teach research design; evaluate training

Practical Problems

- Examining the association between coping and grief
- Testing the theory that differing coping styles handle grief differently using a survey
- A quasi-experiment comparing levels of grief in participants with different coping styles
- An intervention promoting specific coping styles designed to help with grief in a real-life setting

Behavioral Theories/Frameworks

- Research into potential theories in past literature that offer explanations for your topic
  - you'll need to do this for all of your assignments
  - in Psychology, having a theory is critical unless you are creating a theory (which is rare)


Theory of planned behaviour
Attitude
Subjective Norm
Perceived Behavioral Control
Intention
Behavior

Searching for Literature on your Topic

- most time-consuming part of your project
- most crucial step to go research

Literature Review Notice

Sources

- **Primary sources**
  - sources that were written by those that conducted the study
  - Ex: peer-reviewed articles, theses, dissertations, non-published articles
- **Secondary sources**
  - online sources that usually screw everything up about a study
  - descriptions or summaries from online outlets about primary sources (original researchers' work)
  - did not participate in the study at all
  - Ex: Buzzfeed, The Atlantic, textbooks, etc.

Eggs Are Bad For Your Health

- Egg Yolk Consumption & Carotid Plaque
  - primary source
- Study: Eggs are Nearly as Bad for Your Arteries as Cigarettes
  - secondary source
- Let's talk problems

Purpose of Literature Review

1. gain general understanding of your area of interest
    - interest in a potential IV and DV
2. find research studies that serve as the basis for your study
    - you can't build a study on no empirical evidence

Literature Review

- Look for reliable sources of research
    - Google Scholar
    - CPP Library (PsycINFO, PsycARTICLES, PsycTests?)
    - PubMed
    - Google
- You don't need to know everything, but you should cover all your bases
- use a funnel method
    - start general and get more specific

Literature Review - Keep an Open Mind

- look for general information
  - when you find relationships that are of interest, take note of these
  - there may be something that you did not consider that sounds interesting
- Book: states to be critical of single studies
  - **JP Note** look at meta-analyses or systematic reviews instead
- Once you have single studies, then look critically at those
  - what were the future steps
  - what can you do different in the methods
  - maybe their hypotheses/research questions/aims are not exactly what you are interested in

Literature Review - Focus, Focus, Focus

Literature Review - Take One Step at a Time

- this is a tedious part of your project
- set some guidelines for yourself
  - I'm going to find 5-10 articles that appear to be relevant based on their abstracts
- organization is key
  - once you start getting a better feel for the structure of your paper, then you can start organizing a folder into subfolders

Literature Review

- Use **subject words**, or words used to identify your variables and population of interest
    - once you started looking through articles, you'll see more accurate scientific terms
- Example word search
    - (systematic review OR meta-analysis OR review) AND stress AND ((college OR university) AND student)
- JP Note: as a POC you may have to use somewhat inappropriate terms to find articles
    - Example: Hispanic, Latino, Latin, Latina, Mexican

Literature Review

- Book: follow author names
  - While important, you may start to miss other authors that have different conclusions in their studies
  - can also miss details that differ in methods

Literature Review

- Book: talks about branches of research
- JP Note: I'll show you all a different way of thinking about research articles

Online Databases

- several different publications exist in **online databases**
  - locations to find articles that tend to be assocaited with your school
- **abstracts** are good starting points
  - brief summaries at the beginning of an article/publication
  - approximately 100-250 words

Screening Articles

- titles are going to be the most useful
- followed by the abstract
- save articles that you think may be useful from the title and abstracts
    - even if articles have slightly different operationalizations for variables (IV and DV) and different populations, keep those articles
    - JP Note: I like to keep these in a `Slightly Relevant` subfolder

JP's Tips for Looking for Research

1. Start with secondary sources
2. Then start your literature search based on a topic of interest 2b. Start with a systematic review and/or meta-analysis
3. Forward search (See who cited that article)
4. See what research has been conducted and adapt from those studies
5. Filter to the last 10-12 years to see what is more current in the field of research
6. Collect all articles that are somewhat close to your topic 6b. Read all the abstracts and rate how related they are to your topic of interest
7. Find the golden ticket (article)
8. Backward search (Use references section)
9. Keep reading
10. Start seeing articles that you've seen
11. Get rid of your year filter and see if anyone has done anything similar before the last 10-12 years
12. Stop. You've probably done enough research

JP's *Lazy* Way of Reading Articles

- Most graduate students SHOULD learn how to read articles (at least in the social sciences [maybe even just Psychology])

1. Read title
2. Read abstract

JP's *Lazy* Way of Reading Articles

- Following steps depend on what you want from an article
- Hypotheses, research questions, purposes, aims
  - last paragraph in introduction
- no need to read introduction on first read through
  - the authors are making argument showing they know the topic (other research)

JP's *Lazy* Way of Reading Articles

- methods
  - tells you design, measures, participants, analytic plan
- design
  - correlational or experimental
- measures
  - how did they define measures
- participants
  - do those participants look like your potential sample
- analytic plan
  - what stats did they use (not helpful for now)

JP's *Lazy* Way of Reading Articles

- Results
  - ignore
  - you'll just get into your own head
  - useful for discussion writing
  - shows descriptive statistics that may indicate why they found something and you didn't or vice versa

JP's *Lazy* Way of Reading Articles

- Discussion
    - starts with purpose/aims/hypotheses again
    - each paragraph will have a main point about each hypothesis
    - followed by research backing their claim
- limitations & strengths
- future directions/next steps
- implications
- conclusion