Week 13: MOSTLY PRACTICE and some advanced analyses

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Housekeeping

Project Timeline

- Only 4 weeks left! 4 groups have been approved by IRB…
- But EVERYONE is ready to launch for SONA or has launched
- If you get 100 people, start analyzing (but keep collecting)
- Group should be working on *front end* (literature review, hypotheses, methods)

What's Next?

Week 15
4/17

Writing the Research Report

Woohoo! You've analyzed your data and interpreted the results. Now it is time to turn it into a complete research report. We will discuss what to include in the back end of a quantitative research article, including providing implications of your work, limitations, and future directions. We want you to write your work in a way that demonstrates that you implemented your method well and make a sound contribution to communication scholarship and theory.

Workshop Topic: Your Favorite Article

Readings

*Gliner, J. A., Morgan, G. A., & Leech, N. L. (2017). *Research methods in applied settings: An integrated approach to design and analysis* (3rd ed.). Routledge. *Read Ch 26**

Appelbaum, M., Cooper, H., Kline, R. B., Mayo-Wilson, E., Nezu, A. M., & Rao, S. M. (2018). Journal article reporting standards for quantitative research in psychology: The APA Publications and Communications Board task force report. *American Psychologist*, *73*, 3-25. https://doi.org/10.1037/amp0000191

Gernsbacher, M. A. (2018). Writing empirical articles: Transparency, reproducibility, clarity, and memorability. *Advances in Methods and Practices in Psychological Science, 1*(3), 403-414. https://doi.org/10.1177/2515245918754485

Lewis, N. A., Jr. (2020). Open communication science: A primer on why and some recommendations for how. *Communication Methods and Measures, 14*, 71-82. https://doi.org/10.1080/19312458.2019.1685660

Reaction Paper #11

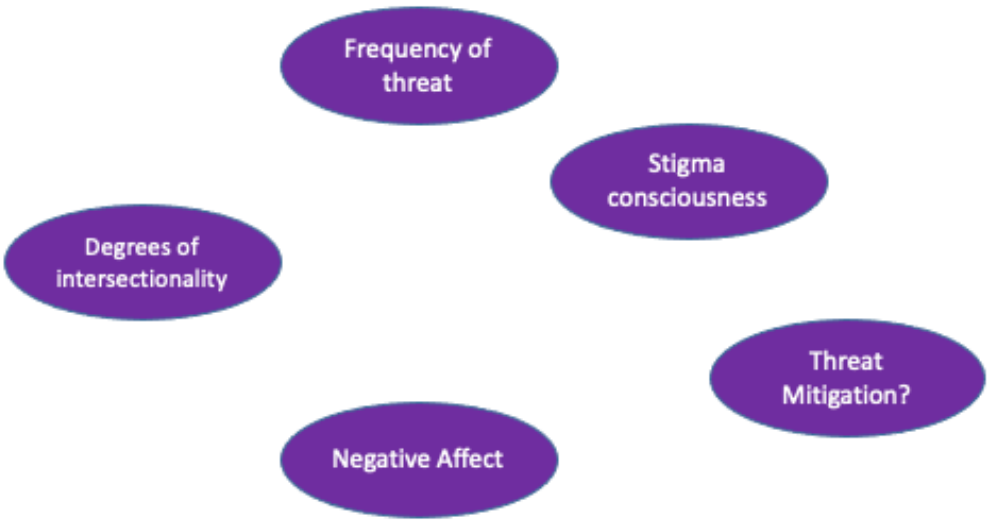
Overview of Today

- Review [5:00 until 5:20]
- Data Cleaning Practice [5:20 until 6:00]
- Data Analysis Practice [6:10 until 7:00]
- Advanced Analyses [7:10 until 7:45]

Application Review

Team Winchester House





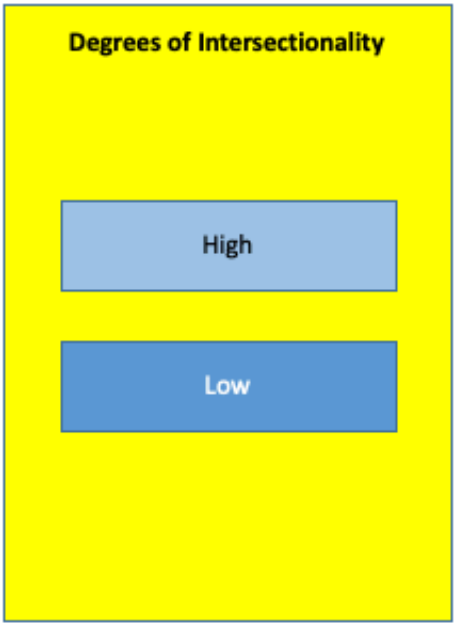
Option 1: Correlation



H: Individuals with higher degrees of intersectionality will report greater frequency of stereotype threat

Option 2: *t* test



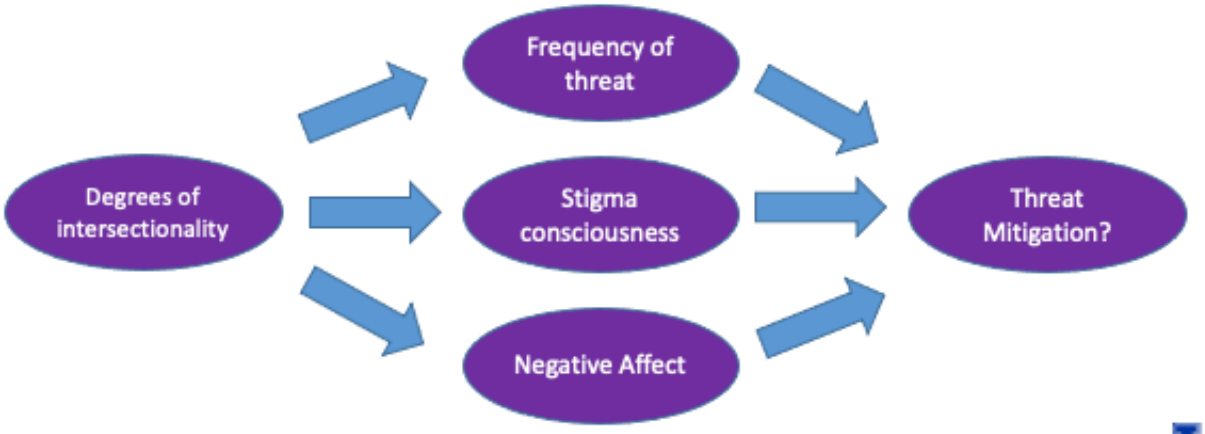


Frequency of threat

H: Individuals with higher degrees of intersectionality will report greater frequency of stereotype threat

Mediation?




Degrees of intersectionality
Frequency of threat
Stigma consciousness
Negative Affect
Threat Mitigation?

Team Boys

Perceived importance of exercise

Amount of TV viewed

Sport Team identity

Motivation to exercise

Self-perceived fitness level

ANOVA

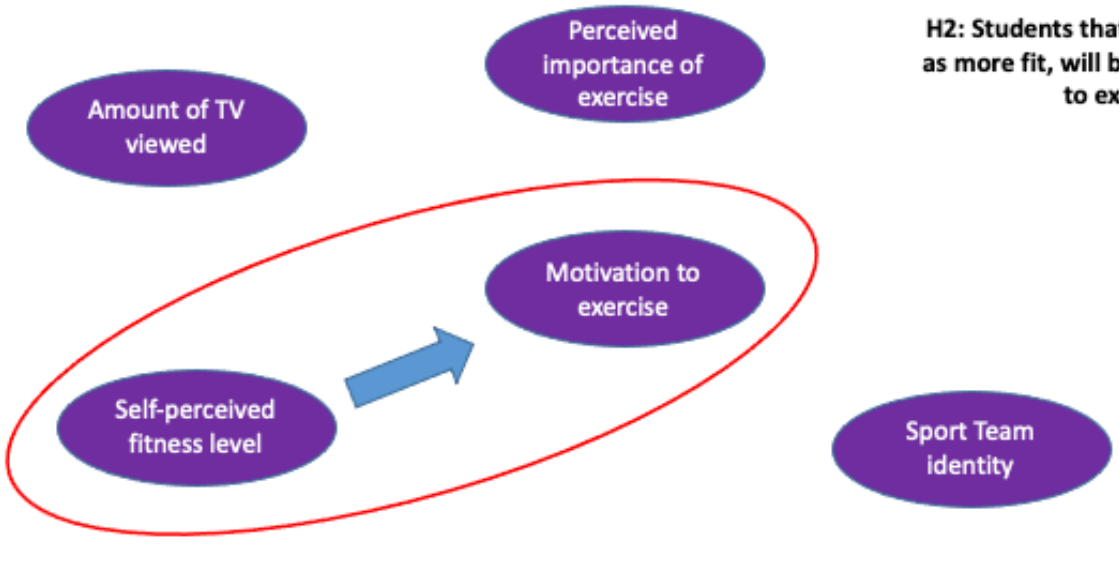
Level of Viewing

- Heavy
- Moderate
- Low

Motivation to exercise

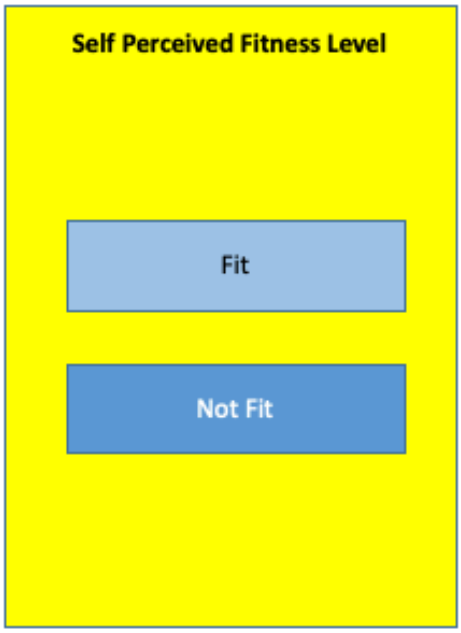
H1: Compared to lower and moderate television viewing, heavy television viewing of sport media will lead college student viewers to feel motivated to exercise

Correlation



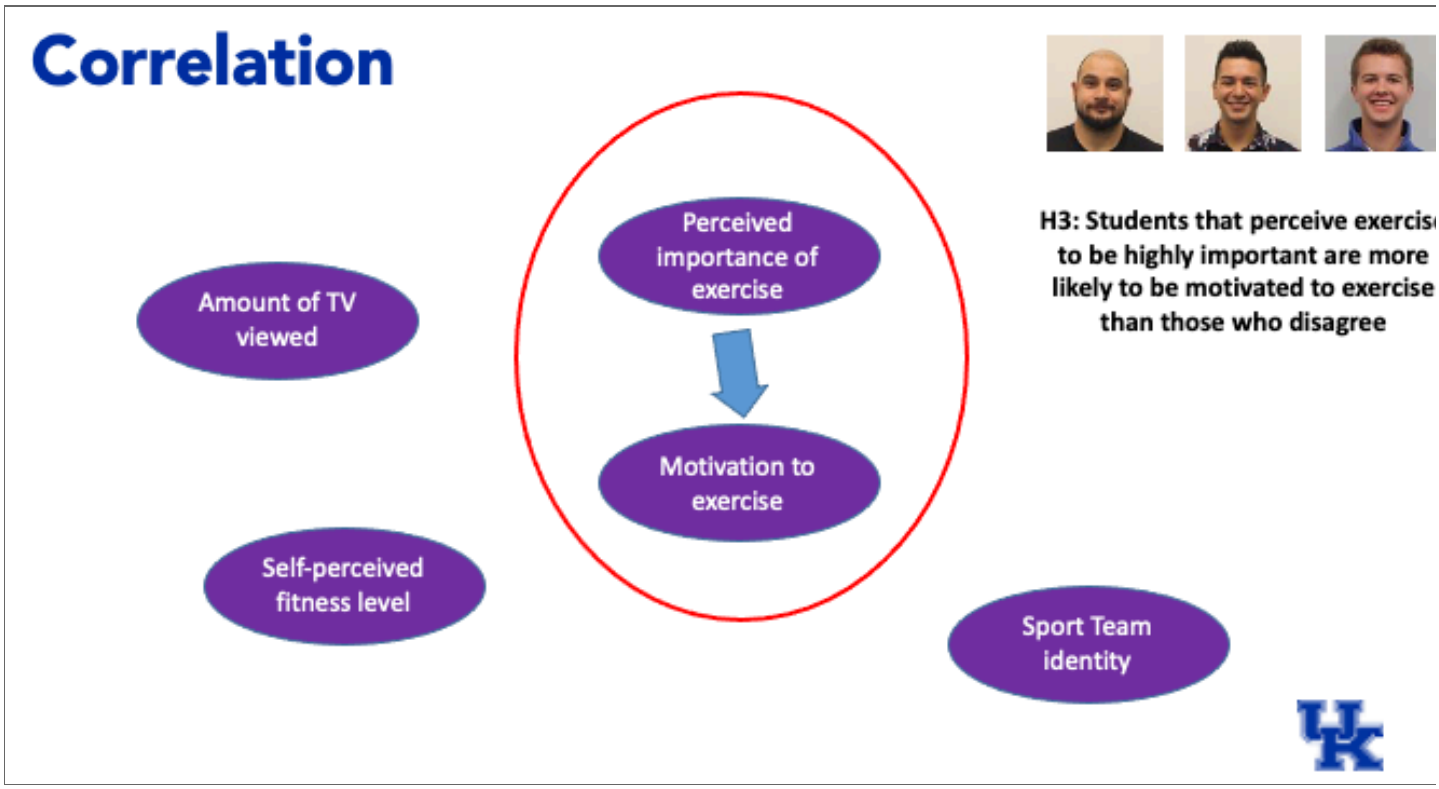
H2: Students that view themselves as more fit, will be more motivated to exercise

Type of test?



Motivation to exercise

H2: Students that view themselves as more fit, will be more motivated to exercise


Correlation
Amount of TV viewed
Perceived importance of exercise
Motivation to exercise
Self-perceived fitness level
Sport Team identity
H3: Students that perceive exercis
to be highly important are more
likely to be motivated to exercise
than those who disagree

Correlation

Perceived importance of exercise

Amount of TV viewed

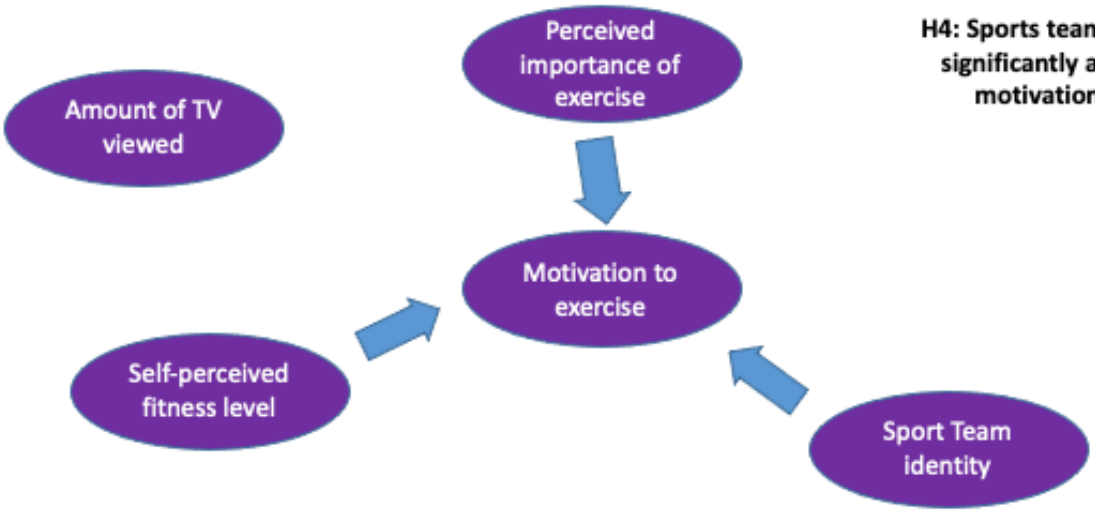
H4: Sports team identity will be significantly associated with motivation to exercise

Motivation to exercise

Self-perceived fitness level

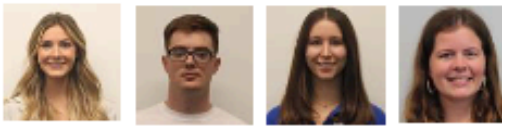
Sport Team identity

Multiple Regression



H4: Sports team identity will be significantly associated with motivation to exercise

Team Shake and Bake



Sex

- Male college students
- Female college students

- Health literacy
- Health attitudes
- Health agency Intention

3 *t* tests

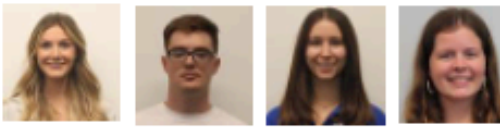
Sex

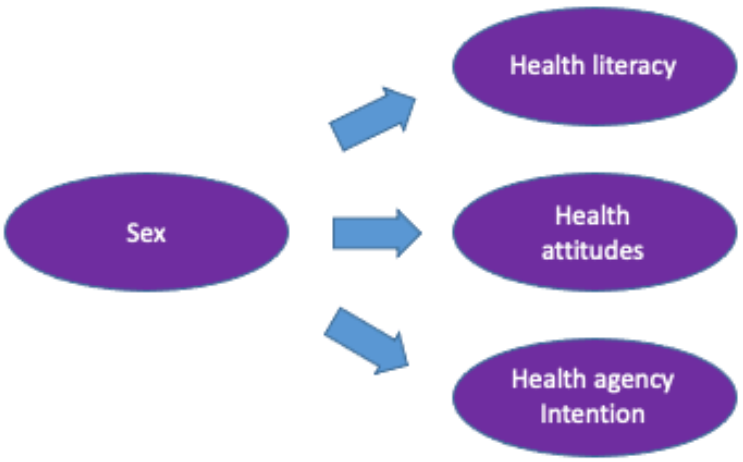
- Male college students
- Female college students

- Health literacy
- Health attitudes
- Health agency Intention

H1a-c: Female college students will have higher degrees of health literacy, attitudes, and agency regarding the HPV virus and vaccine compared to Male college students

Regression





H1a-c: Female college students wil have higher degrees of health literacy, attitudes, and agency regarding the HPV virus and vaccin compared to Male college students

Advanced Analyses

Structural Equation Modeling

SEM is the root of many, many advanced techniques applying the general linear model.

Model Building

SEM involves building a MODEL or MODELS of how variables connect

The SEM Process

- Specify a model on the basis of theory
- Each variable in a model is conceptualized as a *latent* construct measured by multiple indicators
- Three or more indicators per latent variable

Key SEM Terms

Indicators | **Latent** | **Exogenous** | **Endogenous**

- Observed, manifest, reference variables
- Must be theoretically sound and reliably measured
- Unobserved variables/constructs/factors
- Measured by their respective indicators (include independent, mediating and dependent variables)
- Independent variables with no prior causal variable; all are assumed correlated

  Dependent or mediating variables (variables which are both effects of other exogenous or mediating variables and are causes of other mediating and dependent variables.

SEM Steps

SEM typically proceeds in two steps:

- Validation of the *measurement* model
- Testing the *structural* model

The Measurement Model

Confirmatory Factor Analysis

- Not exploring data but confirming the structure.
- Purpose is to validate (or confirm) the way the researcher has measured the latent variables (factors) in the model
- Establishes convergent and divergent validity of the model
- Consists of the latent variables and their indicator variables;

The Structural Model

Measurement Model + Latent Variables **+ Paths and Covariances connecting them**

Purpose is to establish that the structural model has a GOOD FIT to the DATA

That one model FITS the data BETTER than another model

Determining FIT

Kline (2016) and Hu and Bentler (1999) are most common.

- chi-square goodness-of-fit
- root mean square error of approximation (RMSEA) < .08
- standardized root mean square residual (SRMR) < .08
- Tucker-Lewis index (TLI) > .90,
- Comparative fit index (CFI) > .90.

Who To Read

Notable Scholars: Michael Stephenson, Lance Holbert, Rex Kline, Alan Goodboy

Meta-Analysis

Noar, 2006

In a Nutshell

For a meta-analysis, you are taking the effect sizes from all studies on a subject and combining them to understand effects ACROSS studies.
Not concerned with statistical significance (well, not really).

Who To Read

Notable scholars: Mike Allen, Seth Noar

Hierachical Linear Modeling

One of the assumptions of statistical inference is that observations are independent of one another.
If not, then all responses share a bit of error that biases results.

An Example

Consider a classroom. If I asked students to fill out a survey about their instructor, can I assume responses are totally independent?
No! They are reporting on the same instructor.

HLM

HLM runs a bunch of regressions at the same time, at multiple levels.
It *nests* individuals within larger groups (levels) to statistically control for a lack of independent observations.

What Can It Do?

- It can examine change or growth (observations nested within individuals)
- It can examine how outcomes vary across groups OR how group-level characteristics affect outcomes.

Example RQs

- To what extent do schools vary in their schooling outcomes?
- What school policies and practices improve the levels of schooling outcomes?
- Are there significant differences between schools in their average rates of growth?
- How do school-level variables affect the average rate of growth (e.g., the effects of school policies and practices)?

Applied to Comm

- Students nested within instructors, classrooms, university
- Individuals with multiple observations over time
- Individuals within couples or dyads
- Other nested structures?

Who To Ready

Notable scholars: Kody Frey (Maybe not notable, but I can do it!), Hee Sun Park, Andrew Hayes (Read him for ANY method, really), Betsy McCoach

Bayesian Statistics

Involves using your prior beliefs, also called as priors, to make assumptions on everyday problems and continuously updating these beliefs with the data that you gather through experience.

An Example Pt. 1

Let's assume you live in a big city and are shopping, and you momentarily see a very famous person. Let's call him X.
Now you come back home wondering if the person you saw was really X.

An Example Pt. 2

Let's say you want to assign a probability to this.
Since you live in a big city, you would think that coming across this person would have a very low probability and you assign it as 0.004.
Bayesian Statistics partly involves using your prior beliefs, also called as priors, to make assumptions on everyday problems.
Mathematically, we can write this as: P (seeing person X | personal experience) = 0.004

An Example Pt. 3

The next day, since you are following this person X on social media, you come across his post with him posing right in front of the same store. You are now almost convinced that you saw the same person.
You assign a probability of seeing this person as 0.85.
Mathematically, we can write this as: P (seeing person X | personal experience, social media post) = 0.85

An Example Pt. 4

You want to be convinced that you saw this person. So, you start looking for other outlets of the same shop.
You find 3 other outlets in the city. Now, you are less convinced that you saw this person. You update the probability as 0.36.
Mathematically, we can write this as: P (seeing person X | personal experience, social media post, outlet search) = 0.36

An Example Pt. 5

Let's say you want to predict the bias present in a 6 faced die that is not fair. One way to do this would be to toss the die *n* times and find the probability of each face. This is commonly called as the frequentist approach. Another way is to look at the surface of the die to understand how the probability could be distributed. Say, you find a curved surface on one edge and a flat surface on the other edge, then you could give more probability to the faces near the flat edges as the die is more likely to stop rolling at those edges. This is the Bayesian approach.

Shoutout this guy

https://medium.com/@shankyp1000/bayesian-statistics-explained-in-simple-terms-with-examples-5200a32d62f8

Who To Read

I have no idea. I'm sure the Bayesian Comm Scholars exist somewhere… Maybe Andy Pilny??

Growth Curve Modeling

Growth curve modeling is a technique to describe and explain an individual's change over time.
Hence the focus on GROWTH
Curran et al., 2010

In Sum

Everything stems from group differences and associations!
Complex does not equal accurate.
It's hard to keep up when statistical methods change and develop so frequently.
From Goodboy and Kline (2017):
"Box (1976) put it like this: Overelaboration and overparameterization—that is, unnecessary complexity—is often the hallmark of scientific mediocrity."

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