MEJO 890-003 Special Topics Seminar
Advanced Statistics for Social Sciences
M&W: 12:30 – 1:45 pm | Curtis Media Center--Rm 0303

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COURSE OVERVIEW
This advanced statistics course directly follows the lessons provided in MEJO 704 Statistics for Social Sciences, focusing on Ordinary Least Squares (OLS) linear regression analyses, the use of linear regressions to test mediation and moderation, and factor analysis. We will cover simple linear regression analyses, multiple linear regression analyses, mediation models, moderation in regressions, principal component analysis (PCA), exploratory factor analysis (EFA), and confirmatory factor analysis (CFA).

TEXTBOOK
Hayes, A. F. (2022 3rd edition or 2017 2nd edition). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. New York, NY: The Guilford Press.

Finch, W. H. (2019). *Exploratory factor analysis* (Vol. 182). SAGE Publications.

Note: Online versions of the textbooks are available through the Park Library.

Suggested Additional Texts:
Bolin, J. E. (2022). *Regression Analysis in R: A Comprehensive View for the Social Sciences*. CRC Press. (A comprehensive read with R examples)

Watkins, M. W. (2020). *A step-by-step guide to exploratory factor analysis with R and RStudio.* Routledge. (Hands-on guide for factor analysis through R)

Kranzler, J.H. (2007). *Statistics for the terrified* (4 th edition). Upper Saddle River, NJ: Pearson Education, Inc. (great introductory primer in paperback, with SPSS examples)

Pett, M. A., Lackey, N. R., & Sullivan, J. J. (2003). *Making sense of factor analysis: The use of factor analysis for instrument development in health care research.* sage. (application of factor analysis for instrument development, with SPSS examples)

Software
Your work will require use of R or SPSS on a computer for data entering, manipulation, and analysis.

If using R, you need to download and install R and RStudio. R is an open source and free tool for computing, statistics and analysis, and producing graphics. RStudio is an integrated development environment (IDE) that makes R a bit more user-friendly. Check out this quick tutorial for an overview.

If using SPSS, you may either use your own SPSS software that you have purchased through UNC or on your own, or you may use your own laptop to gain SPSS access through UNC's Virtual Lab—use your UNC wireless Internet connection and ONYEN to sign on and access SPSS at https://virtuallab.unc.edu/

COURSE POLICES
Attendance
Attendance is not recorded nor is it factored into the final grade. Please use good judgment in your own attendance. There are no make-ups or acceptance of missed in-class exercises or tests.

Late Work
Deductions: 10% is deducted the moment an assignment is past the due date and time. Late assignments will receive an additional 10% deduction each additional day after. After 10 days, an assignment can no longer be turned in and receive points. It is the student's responsibility to check that all assignments have successfully uploaded and that they've uploaded the correct file.

Grading
Grades in this graduate-level seminar are intended to offer feedback on your performance. Grades are based on the qualitative descriptions below and are informed by the percentage correct on individual assignments and tests. Percentages are used as a general guide to help define an H (high pass), P (pass), L (low pass) and F (fail):

- H (high pass) = Inspiring as well as clear excellence, similar to a 96-100% (an "A+" grade)
- P (pass) = Entirely satisfactory graduate work, similar to a 70-95% (an "A," "B" or "C")
- L (low pass) = Inadequate graduate work, similar to a 60-69% (a "D" grade)
- F (fail) = Fail, similar to a 59% or below (an "F")

Course Goals
The Hussman School of Journalism and Media's accrediting body outlines a number of values you should be aware of and competencies you should be able to demonstrate by the time you graduate from our program. Click here to learn more.

No single course could possibly give you all of these values and competencies, but collectively, our classes are designed to build your abilities in each area. In this class, the following values and competencies are specifically addressed:

● Conduct research and evaluate information by methods appropriate to the communications professions in which they work.
● Apply basic numerical and statistical concepts.

Honor Code
It is expected that each student in this class will conduct him/herself within the guidelines of the Honor System (http://honor.unc.edu). All academic work should be done with the high level of honesty and integrity that this University demands. If you have any questions about your responsibility or your instructor's responsibility as a faculty member under the Honor Code, please feel able to see the course instructor, speak with the senior associate dean of undergraduate studies in this school, and/or speak with a representative of the Student Attorney Office or the Office of the Dean of Students.

Seeking Help

If you need individual assistance, it is your responsibility to meet with the instructor. If you are serious about wanting to improve your performance in the course, the time to seek help is as soon as you are aware of the problem, whether the problem is difficulty with course material, a disability, or an illness. Please feel able to contact the course instructor as soon as you perceive any warning signs of things that might adversely affect your class performance or final grade.

Diversity
The University's policy on Prohibiting Harassment and Discrimination is outlined in the 2011- 2012 Undergraduate Bulletin at http://www.unc.edu/ugradbulletin/. UNC is committed to providing an inclusive and welcoming environment for all members of our community and does not discriminate in offering access to its educational programs and activities on the basis of age, gender, race, color, national origin, religion, creed, disability, veteran's status, sexual orientation, gender identity, or gender expression. In this course, you are encouraged to represent diverse populations, diverse viewpoints, and diversity of perspective in your own work. You are also asked to be sensitive to the various backgrounds, perspectives, origins, and situations represented by the students in the course, the students, faculty, and staff at this university, and the residents of this state.

Special Needs
The University of North Carolina – Chapel Hill facilitates the implementation of reasonable accommodations, including resources and services, for students with disabilities, chronic medical conditions, a temporary disability or pregnancy complications resulting in difficulties with accessing learning opportunities.
All accommodations are coordinated through the Accessibility Resources and Service (ARS) Office. In the first instance please visit their website at http://accessibility.unc.edu, call the SPRING 2022 office at 919-962-8300, or email accessibility@unc.edu. A student is welcome to initiate the registration process at any time. However, the process can take time. ARS is particularly busy in the run-up to Finals and during Finals. Students submitting Self-ID forms at that time are unlikely to have accommodations set until the following semester.

Please contact ARS as early in the semester as possible.

ASSESSMENT & GRADE COMPONENTS
Research Spotlight Presentation & Handout (10%)

Once during the semester, each student will give a 5-10 minute report on an exemplary peer-reviewed journal article. The article should be empirical in nature and report the use of advanced statistical methods, such as multiple regression, logistic regression, mediation, moderation, factor analysis (common for scale development and validation), or structural equation model. This article can come from any peer-reviewed journal and can be related to any area of communication, such as political communication, health communication, public relations and so on. **Before the session the report is given, students must post their handout and a pdf of the article** in the "Research Spotlight Handouts/Articles" forum on Sakai (due by 12:30 pm one day before the presentation).

The presentation should briefly summarize the theoretical aim and method of the research and then focus on evaluating the quality of the data, the statistical analysis, and your assessment of how well

their findings address their research questions/hypotheses. Is their report of results accurate, clear, and thorough? Is anything missing? Is their discussion sound given their data analysis? Remember to address both strength and weakness. The handout should be an approximately one-page summary of the presentation (bullet points encouraged).

Assignments (65%)
Assignments are graded for accuracy and thoroughness. Percentage correct is the basis for these grades, with additional adjustments reflecting completion and thoroughness. As many of these assignments require use of statistical analysis software on a computer, you are encouraged to either (1) use R; (2) gain SPSS access. More detailed Rubrics will be posted for each assignment a few weeks before they're due.

Final Exam/Project (25%)
There is one comprehensive final exam/project with no make-up opportunity. This exam/project will be made available through the course Sakai site before the semester is over and will be due during the final exam period scheduled by the University. This is open-book, open-notes. Lecture material, homework, and print and online sources may be used as reference. However, this is closed-person—you may not seek the assistance of other members of the course, tutors, teachers, or other live assistance from anyone but the instructor of record for this course. This said, you are strongly encouraged to ask the instructor for help or clarification for any questions you might have.

Tentative Course Schedule (subject to change)

Day	Lesson	Topic	Readings
9 Jan	Introduction	Overview	For this class, you need to install R and RStudio OR SPSS & PROCESS module. You can play with Swirl to get familiar with R. Choose the first course (R Programming) and select the topic of interest to you. Complete the course 100%.
11 Jan	Simple Linear Regression	Review	Review the slides on basic math concepts. Hayes Chapter 2.1-2.3
16 Jan	NO CLASS	MLK DAY	
18 Jan	Multiple Linear Regression	Introduction	Hayes Chapter 2.4-2.6
23 Jan	Multiple Linear Regression	Conducting in R	(none)
25 Jan	Multiple Linear Regression	Categorical predictor, multicollinearity	Hayes chapter 2.7-2.9
30 Jan	Multiple Linear Regression	Conducting in R	Next class, we will be talking about reporting regression. Here are some examples of reporting regression analysis:

			Lee, S., Rojas, H., & Yamamoto, M. (2022). Social media, messaging apps, and affective polarization in the United States and Japan. Mass Communication and Society, 25(5), 673-697. Roozenbeek, J., Schneider, C. R., Dryhurst, S., Kerr, J., Freeman, A. L., Recchia, G., ... & Van Der Linden, S. (2020). Susceptibility to misinformation about COVID-19 around the world. Royal Society open science, 7(10), 201199.
1 Feb	Reporting Regression	Applications & Considerations	Spotlight presentation(s)
6 Feb	Guest lecture -TBD		For next class, start reading Hayes' chapter on The Simple Mediation Model – the first three sections up through the example with Dichotomous X.
8 Feb	Simple Mediation Analysis	Introduction	Finish Hayes' chapter on The Simple Mediation Model – up through the Chapter Summary
13 Feb	No CLASS	WELLNESS DAY	
15 Feb	Simple Mediation Analysis	In R	We will use R's Lavaan package. Install the package following the guide
20 Feb	Simple Mediation Analysis	Inference, practice	Read Hayes' chapter on More than One Mediator (Multiple Mediator Models) – the first three sections from The Parallel Multiple Mediator Model through Statistical Inference.
22 Feb	Multiple Mediators	Parallel Mediation	Finish Hayes' chapter on More than One Mediator (Multiple Mediator Models) – up through the Chapter Summary.
27 Feb	Multiple Mediators	Serial Mediation	Read Hayes' chapter in the 2nd edition book called Causal Steps, Confounding, and Causal Order – read the whole thing. Next class, we will be talking about reporting mediation. Here are some examples of mediation analyses: Oh, S. H., Lee, S. Y., & Han, C. (2021). The effects of social media use on preventive behaviors during infectious disease outbreaks: The mediating role of self-relevant emotions and public risk

			perception. Health communication, 36(8), 972-981. Mourão, R. R., & Brown, D. K. (2022). Black Lives Matter coverage: How protest news frames and attitudinal change affect social media engagement. Digital Journalism, 10(4), 626-646.
1 Mar	Reporting Mediation	Considerations and Reporting	Spotlight presentation(s) Read Hayes' chapter on the Fundamentals of Moderation Analysis – the first three sections up through Visualizing Moderation.
6 Mar	Moderation	Introduction	Finish Hayes' chapter on the Fundamentals of Moderation Analysis – up through Chapter Summary.
8 Mar	Moderation	Simple Slope Analysis	Read Hayes' chapter on Extending (the Fundamental) Moderation Analysis Principles – the first three sections from Moderation with a Dichotomous Moderator up through Hierarchical versus Simultaneous Entry.
13 Mar 17 Mar	No CLASS	SPRING BREAK	
20 Mar	Moderation	Practice	(none)
22 Mar	Dichotomous Moderators	Introduction	Finish Hayes' chapter on Extending (the Fundamental) Moderation Analysis Principles – up through Chapter Summary.
27 Mar	Dichotomous Moderators	Practice	Read Hayes' chapter in the 2nd edition called Some Myths and Additional Extensions of Moderation Analysis – read the whole thing.
29 Mar	Reporting Moderation	Applications & Considerations	Spotlight presentation(s) Here are some examples of reporting moderation: Turner, M. M., Rimal, R. N., Morrison, D., & Kim, H. (2006). The role of anxiety in seeking and retaining risk information: Testing the risk perception attitude framework in two studies. Human Communication Research, 32(2), 130-156.

			Borah, P. (2014). Does it matter where you read the news story? Interaction of incivility and news frames in the political blogosphere. Communication Research, 41(6), 809-827.
3 Apr	Intro to Factor Analysis	Latent and observed variables	Ch1 of Finch's EFA (optional) Carpenter, S. (2018). Ten steps in scale development and reporting: A guide for researchers. Communication methods and measures, 12(1), 25-44.
5 Apr	Mathematical underpinnings	Common factor model, eigenvalue/eigenvector, communities	Ch2 of Finch's EFA Review of linear algebra I like this piece to show how to compute eigenvalues.
10 Apr	Exploratory Factor Analysis (EFA)	Methods of factor extraction, practice	Ch3 of Finch's EFA Watkins' R Guide Steps 4-6
12 Apr	Exploratory Factor Analysis (EFA)	Factor rotation, determine the number of factors, practice	Ch4 & 5 of Finch's EFA Watkins' R Guide Steps 7-9
17 Apr	Confirmatory factor analysis (CFA)	Introduction	Intro to CFA (Reinecke & Pöge, 2020) – on Sakai
19 Apr	Confirmatory factor analysis (CFA)	Conduct in R	A CFA example in R Lavaan
24 Apr	Reporting Factor Analysis	Applications & Considerations	Spotlight presentation(s) Here are some examples of factor analysis: Dogruel, L., Masur, P., & Joeckel, S. (2021). Development and validation of an algorithm literacy scale for internet users. Communication Methods and Measures, 1-19. Dillard, J. P., & Shen, L. (2005). On the nature of reactance and its role in persuasive health communication. Communication Monographs, 72(2), 144-168.
26 Apr	Review	Discuss Final Exam/Project	Final exam/project will be made available before today.
Final	Final Exam/Project	DUE THURSDAY MAY 5 BY 12:30 pm	TURN IN FINAL EXAM/PROJECT ELECTRONICALLY to Sakai assignment