

**THE UNIVERSITY OF TEXAS AT AUSTIN
STEVE HICKS SCHOOL OF SOCIAL WORK**

Course Number:	SW 388	Instructor:	Yessenia Castro, PhD
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Semester:	Spring 2020	Office:	SSW 3.130E
Meeting Time/Place:	Wednesdays 2:30pm – 5:30pm SSW 2.130	Office Phone:	512-232-0778
		Office Hours:	By appointment

QUANTITATIVE DATA ANALYSIS II

I. STANDARDIZED COURSE DESCRIPTION

This course is designed to build upon the concepts and procedures introduced in Quantitative Data Analysis I, and enable students to do a more thorough job of data analysis by introducing multivariate statistical procedures into their repertoire of statistical techniques. It provides students with extended practice in the conceptual and mathematical bases of linear and logistic regression models, as well as extended practice in data preparation and organization. It also introduces students to advanced regression-based data analytic techniques, including moderation and mediation. The primary focus is on using the SPSS statistical package for estimating multivariate statistical models, and on the interpretation and write up of statistical analysis for research papers.

II. STANDARDIZED COURSE OBJECTIVES

By the end of this course, student should be able to:

1. Understand the conceptual and mathematical basis of statistical control and regression models.
2. Understand and be able to explain and apply the concept of statistical inference.
3. Conduct a variety of statistical analyses, including testing of statistical assumptions, linear and logistic regression, mediation, and moderation.
4. Design a data analytic strategy that answers a research question (including data preparation and organization), requirements of the statistic, and limitations to the interpretation.
5. Interpret and present (written and orally) the results of statistical analyses.

III. TEACHING METHODS

A variety of methods will be used to achieve course objectives in order be inclusive of diverse learning styles. These include will be readings, lectures, group discussion, computer demonstrations, group and individual in-class exercises, quizzes and analytic assignments. Each three hour class period will be divided into two sections: 1) 1.5-2 hour lecture wherein students will participant in an organized lesson on the given topic of the day and are expected to actively participate in class discussions, demonstrations and exercises; 2) a 1-1.5 hour lab section, wherein practical instruction in data analysis and use of data analysis software is provided.

Students will be required to have prepared an SPSS dataset containing only those variables they are considering for use in the analyses for their *Research Methods* paper ready

for exploration at start of the course. This dataset will be used for the lab section of each class and completion of analytic assignments.

As this is a foundational course in applied regression analysis, much of the learning will take place via *hands on* practice in the form of in-class exercises that will occur in both the lecture and lab sections, as well as through the analytic assignments. Students are expected to consult each other as well as the instructor when engaging in any hands-on practice. The instructor encourages students to complete in-class exercises as a group in order to benefit from diverse understandings of the material. Lab exercises should further be completed at each student's individual pace to ensure they have an adequate familiarity and understanding of their dataset. Analytic assignments and lab exercises will represent a diversity of research topics, as they will be based on the individual research paper initiated by each student in the previous semester's courses.

IV. REQUIRED TEXT AND MATERIALS

Required Textbooks

1. Darlington, R. B. & Hayes, A. F. (2017). *Regression Analysis and Linear Models: Concepts, Applications, and Implementation*. New York; The Guilford Press.
 - i. E-version available through UT Libraries: <https://ebookcentral-proquest-com.ezproxy.lib.utexas.edu:2444/lib/utxa/reader.action?docID=4652287>
2. Hayes, A. F. (2017). *Using SPSS: A little syntax guide*.
 - i. Available at: <http://afhayes.com/using-spss-a-little-syntax-guide.html>
3. Muthén, L.K. and Muthén, B.O. (1998-2017). *Mplus User's Guide*. Eight Edition. Los Angeles, CA: Muthén & Muthén.
 - i. Available at: https://www.statmodel.com/html_ug.shtml
4. *Wheelan, C. (2013). *Naked Statistics: Stripping the Dread from the Data*. New York: W.W. Norton & Company.

Additional required readings will be made available via Canvas.

**Readings from Wheelan (2013) are intended to provide a gentle, non-technical introduction to statistical concepts. It is strongly recommended that Wheelan (2013) chapters be read first when assigned.*

Required Materials and Software

1. Computer
2. Basic Calculator (such as the one available on most smartphones)
3. IBM SPSS Version 24 or higher
4. Mplus Version 8 (available via the UT Department of Statistics and Data Sciences Stat Apps Server: <https://stat.utexas.edu/consulting/stat-apps-server>)
5. Microsoft Excel
6. Microsoft Word

V. COURSE REQUIREMENTS

Students are required to attend all classes, complete all readings, participate meaningfully in class discussions, and complete all assignments. Grades will be based on student performance in three areas: 1) class participation; 2) weekly quizzes; 3) data analytic assignments. Grading in multiple areas is intended to allow students to demonstrate competency in different ways.

Class Participation (30 points)

Students will earn 2 points toward their overall grade at the end of each of 15 class days provided all attendance and participation expectations (as detailed in the section VI) are met. These points are earned on an all-or-nothing basis.

Weekly Quizzes (70 points)

Most weeks, there will be an online quiz due by Tuesday at midnight. Each quiz will contain a combination of multiple choice questions and short answer questions. The majority of each week's quiz will cover the reading assignments for the following class day. However, a minority of questions (2-3) on each quiz will cover ANY material appearing in the course up to that point in the semester. Students will have 30 minutes to complete quizzes on Canvas. Each quiz will be worth 10 points each. Students will complete 7 quizzes for a total of 70 points. Weekly quizzes cannot be made up under any circumstances.

Analytic Assignments (100 points)

Analytic assignments are based on the methods paper started in the student's Research Methods I class. Students are expected to complete and **turn in the following data analytic reports via Canvas before the start of class on the day that they are due**. No late Analytic Assignments will be accepted except in the circumstance of a *documented, unforeseen emergency* that occurs **on the day the assignment is due and has caused you to miss class**. In this case, be prepared to approach Dr. Castro with official documentation of the unforeseen emergency. If you are aware of any other situation that will cause you to be unable to turn in the assignment, plan to submit it early and notify Dr. Castro of your intent to do so.

- 1) **Analytic Assignment 1 (40 points):** Students will turn in 4 documents: 1) an SPSS file of the student's final dataset; 2) an Mplus file of the student's final dataset; 3) an SPSS code book summarizing all descriptive statistics for the student's final chosen variables; 3) all associated SPSS syntax/output summarizing any intermediary variable recoding, scoring, labeling, etc. as well as all data exploration syntax.
- 2) **Analytic Assignment 2 (30 points):** Students will turn in a manuscript quality draft of each of the following: 1) a complete draft of the Participants subsection of the *Methods* section, including a description of the intended priority population, inclusion criteria, and exclusion criteria; 2) a complete draft of the Participant Characteristics subsection of the *Results* section; 3) A table (or set of tables, as appropriate) summarizing descriptive statistics and participant characteristics for the final sample including all variables to be used in the student's paper. *In addition, all syntax/output* for these analyses must be turned in. Students should consult the APA Publication Manual for guidance on manuscript preparation.
- 3) **Analytic Assignment 3 (30):** Students will turn in a manuscript quality draft of each of the following: 1) a final draft of the Participants subsection of the *Methods* section, including a

description of the intended priority population, inclusion criteria, and exclusion criteria; 2) a final draft of the *Data Analysis (aka, Data Analytic Plan) subsection* of the *Methods* section; 3) a final draft of the *Results* section; 4) All tables and figures for the final manuscript. *In addition, all syntax/output* for these analyses must be turned in. Students should consult the APA Publication Manual for guidance on manuscript preparation.

VI. GRADES

Grades for the course will be based on participation in 15 classes (30 points), completion of 7 quizzes (70 points), and 3 Analytic Assignments (100 points), for a total of 200 points. Student grades will be based on the percentage of points earned out of 200. The grading scale for this course is as follows:

94.0 and Above	A
90.0 to 93.999	A-
87.0 to 89.999	B+
84.0 to 86.999	B
80.0 to 83.999	B-
77.0 to 79.999	C+
74.0 to 76.999	C
70.0 to 73.999	C-
67.0 to 69.999	D+
64.0 to 66.999	D
60.0 to 63.999	D-
Below 60.0	F

VII. CLASS POLICIES

Attendance and Participation

Class will start promptly at 2:30 pm. Students are expected to attend class and arrive on time. Student arrivals after 2:40 pm will be considered late. Students are expected to be prepared for each class (i.e., completed the week's readings, completed the week's quiz, downloaded necessary data and syntax from canvas for the day's lecture/lab), complete all in-class exercises, and contribute *meaningfully* each week's discussions. **Failure to meet any one of these expectations on a given class day will result in loss of the day's participation points.**

Meaningful Contribution: a meaningful contribution is a substantive comment that helps move the class discussion forward by expanding on discussion points, providing alternative solutions to problems, providing alternative explanations of concepts ("in your own words"), answering questions posed by others in the class, or otherwise helping the class through stuck points.

If a student cannot attend a class, they should notify Dr. Castro ahead of time. Students should notify Dr. Castro as soon as possible after a *documented, unforeseen emergency* that has caused them to miss class with no prior notice. If a student has a documented, unforeseen emergency that affects their attendance in this course, they should be prepared to approach Dr. Castro about it with official documentation of the unforeseen emergency. In the case of an

absence due to a documented and unforeseen emergency, Dr. Castro will assist the student in getting caught up with the missed class.

Electronic Devices in the Classroom

Students' use of computers and smartphones is permitted in class only when explicitly allowed by Dr. Castro for the purposes of instruction. They may not remain open and idle or be used for note-taking. The use of laptops or smartphones for other purposes (e.g., instant messaging, video chat, playing games, internet browsing, etc.), except as explicitly authorized by Dr. Castro constitutes unprofessional behavior. The use of other electronic devices during class is prohibited. *Students misusing laptops or smartphones, or using other electronic devices during class will be dismissed from class and this dismissal will constitute an unexcused absence.* Students must turn mobile phones to silent and disable notifications when they enter the classroom. (*Phones must be completely silent.* Placing phones on vibrate is not acceptable).

Use of the Canvas Web Site

Web-based, password-protected class sites using Canvas software are available for all accredited courses taught at The University of Texas. Syllabi, handouts, assignments and other resources are types of information that may be available within these sites. Site activities could include exchanging email, engaging in class discussions and chats, and exchanging files. In addition, class e-mail rosters will be a component of the sites. Students who do not want their names included in these electronic class rosters must restrict their directory information in the Office of the Registrar, Main Building, Room 1. For information on restricting directory information see: <http://www.utexas.edu/student/registrar/catalogs/gi00-01/app/appc09.html>.

This class will utilize Canvas for distribution of class readings and any other written materials, and recording of student grades. Canvas will also be used by Dr. Castro to communicate with students via email. Students should make a concerted effort to check their email at least once per day for any announcements from Dr. Castro regarding this course.

VIII. UNIVERSITY POLICIES

THE UNIVERSITY OF TEXAS HONOR CODE. The core values of The University of Texas at Austin are learning, discovery, freedom, leadership, individual opportunity, and responsibility. Each member of the university is expected to uphold these values through integrity, honesty, trust, fairness, and respect toward peers and community.

PROFESSIONAL CONDUCT AND CIVILITY IN THE CLASSROOM. The professor expects students to act as professionals in class. This means students should arrive on time for class, be prepared to participate in the class discussion, and show respect for one another's opinions. A course brings together a group of diverse individuals with various backgrounds. Students are influenced and shaped by such factors as race, ethnicity, gender, sex, physical abilities, religious and political beliefs, national origins, and sexual orientations, among others. We expect to learn from each other in an atmosphere of positive engagement and mutual respect. This atmosphere includes working intentionally to recognize and dismantle racism, sexism, heterosexism, and ableism in the classroom. Social Work also deals with complex and controversial issues. These issues may be challenging and uncomfortable, and it would be impossible to offer a substantive classroom experience that did not include potentially difficult

conversations relating to challenging issues. In this environment, we will be exposed to diverse ideas and opinions, and sometimes we will not agree with the ideas expressed by others. Nevertheless, the professor requires that students engage one another with civility, respect, and professionalism.

UNANTICIPATED DISTRESS. Students may experience unexpected and/or distressing reactions to course readings, videos, conversations, and assignments. If so, students are encouraged to inform the professor. The professor can be responsive and supportive regarding students' participation in course assignments and activities, but students are responsible for communicating clearly what kind of support is desired. If counseling is needed, students may contact a service provider of their choosing, including the UT Counseling Center at 512-471-3515 or online at <https://cmhc.utexas.edu/>.

POLICY ON SOCIAL MEDIA AND PROFESSIONAL COMMUNICATION. Public social networks are not private. Even when open only to approved or invited members, users cannot be certain that privacy will exist among the general membership of sites. If social work students choose to participate in such forums, please assume that anything posted can be seen, read, and critiqued. What is said, posted, linked to, commented on, uploaded, subscribed to, etc., can be accessed and archived, posing potential harm to professional reputations and prospective careers.

Social work students who use social media (e.g. Facebook, Twitter, Instagram) and other forms of electronic communication (e.g. blogs) must be mindful of how their communication may be perceived by clients, colleagues, faculty, and others. Social work students are expected to make every effort to minimize material which could be considered inappropriate for a professional social worker in training. Because of this, social work students are advised to manage security settings at their most private levels and avoid posting information/photos or using any language that could jeopardize their professional image.

Students are asked to consider the amount of personal information posted on these sites and are obliged to block any client access to involvement in the students' social networks. Client material should not be referred to in any form of electronic media, including *any* information that might lead to the identification of a client or compromise client confidentiality in *any* way. Additionally, students must critically evaluate any material that is posted regarding community agencies and professional relationships, as certain material could violate the standards set by the School of Social Work, the Texas Code of Conduct for Social Workers, and/or the NASW Code of Ethics.

Social work students should consider that they will be representing professional social work practice as well as The University of Texas at Austin School of Social Work program while in the classroom, the university community, and the broader area communities.

POLICY ON SCHOLASTIC DISHONESTY. Students who violate University rules on scholastic dishonesty are subject to disciplinary penalties, including the possibility of failure in the course and/or dismissal from the University. Since such dishonesty harms the individual, all students, and the integrity of the University, policies on scholastic dishonesty will be strictly enforced. For further information, the student may refer to the Web Site of the Student Judicial Services, Office of the Dean of Students: <http://deanofstudents.utexas.edu/sjs/>.

USE OF COURSE MATERIALS. The materials used in this course, including, but not limited to exams, quizzes, and homework assignments, are copyright protected works. Any unauthorized duplication of the course materials is a violation of federal law and may result in disciplinary action being taken against the student. Additionally, the sharing of course materials without the specific, express approval of the professor may be a violation of the University's Student Honor Code and an act of academic dishonesty, which could result in further disciplinary action. This sharing includes, among other things, uploading class materials to websites for the purposes of distributing those materials to other current or future students.

DOCUMENTED DISABILITY STATEMENT. Any student who requires special accommodations must obtain a letter that documents the disability from the Services for Students with Disabilities area of the Division of Diversity and Community Engagement (471- 6259 voice or 471-4641 TTY for users who are deaf or hard of hearing). A student should present the letter to the professor at the beginning of the semester so that needed accommodations can be discussed and followed. The student should remind the professor of any testing accommodations no later than five business days before an exam. For more information visit: <http://diversity.utexas.edu/disability/>.

RELIGIOUS HOLIDAYS. By UT Austin policy, students must notify the professor of a pending absence at least fourteen days prior to the date of observance of a religious holy day. If the student must miss a class, examination, work assignment, or project in order to observe a religious holy day, the professor will give the student an opportunity to complete the missed work within a reasonable time after the absence.

TITLE IX REPORTING. In accordance with Title IX of the Education Amendments of 1972, the University of Texas at Austin is committed to maintaining a learning environment that is free from discriminatory conduct on the basis of sex <https://titleix.utexas.edu/>. Faculty, field instructors, staff, and/or teaching assistants in their supervisory roles are mandated reporters of incidents of sex discrimination, sexual harassment, sexual violence, stalking, dating violence, or any other forms of sexual misconduct. Students who report such incidents will be informed of University resources. Incidents will be reported to the University's Title IX Coordinator. Further information, including student resources related to Title IX, may also be found at <https://titleix.utexas.edu/>.

CAMPUS CARRY POLICY. The University's policy on concealed firearms may be found here: <https://campuscarry.utexas.edu>. You also may find this information by accessing the Quick Links menu on the School's website.

CLASSROOM CONFIDENTIALITY. Information shared in class about agencies, clients, and personal matters is considered confidential per the NASW Code of Ethics on educational supervision and is protected by regulations of the Family Educational Rights and Privacy Act (FERPA) as well. As such, sharing this information with individuals outside of the educational context is not permitted. Violations of confidentiality could result in actions taken according to the policies and procedure for review of academic performance located in sections 3.0, 3.1, and 3.2 of the Standards for Social Work Education.

USE OF E-MAIL FOR OFFICIAL CORRESPONDENCE TO STUDENTS. Email is recognized as an official mode of university correspondence; therefore, students are responsible for reading their email for university and course-related information and announcements.

Students are responsible for keeping the university informed about a change of e-mail address. Students should check their e-mail regularly and frequently—daily, but at minimum twice a week—to stay current with university-related communications, some of which may be time-sensitive. Students can find UT Austin’s policies and instructions for updating their e-mail address at <http://www.utexas.edu/its/policies/emailnotify.php>.

SAFETY. As part of professional social work education, students may have assignments that involve working in agency settings and/or the community. As such, these assignments may present some risks. Sound choices and caution may lower risks inherent to the profession. It is the student's responsibility to be aware of and adhere to policies and practices related to agency and/or community safety. Students should notify the professor regarding any safety concerns.

BEHAVIOR CONCERNS ADVICE LINE (BCAL). If students have concerns about their behavioral health, or if they are concerned about the behavioral health of someone else, students may use the Behavior Concerns Advice Line to discuss by phone their concerns. This service is provided through a partnership between the Office of the Dean of Students, the Counseling and Mental Health Center (CMHC), the Employee Assistance Program (EAP), and The University of Texas Police Department (UTPD). Call 512-232-5050 or visit <http://www.utexas.edu/safety/bcal>.

EMERGENCY EVACUATION POLICY. Occupants of buildings on the UT Austin campus are required to evacuate and assemble outside when a fire alarm is activated or an announcement is made. Please be aware of the following policies regarding evacuation:

- Familiarize yourself with all exit doors in the classroom and the building. Remember that the nearest exit door may not be the one you used when entering the building.
- If you require assistance to evacuate, inform the professor in writing during the first week of class.
- In the event of an evacuation, follow the professor’s instructions.
- Do not re-enter a building unless you are given instructions by the Austin Fire Department, the UT Austin Police Department, or the Fire Prevention Services office.

IX. COURSE SCHEDULE

Although the course calendar indicates specific lecture topic each week, the instructor stresses that students should consider the calendar of topics a *living document*. It is designed to allow for much flexibility in the amount of time allotted to a given topic so that Dr. Castro can tailor the pace of the course to students' needs. However, assignment due dates are hard due dates. When in-class exercises require data analysis, students will utilize data collected from populations of color historically under-represented in social science research and test research questions particularly relevant to these populations.

Date	Topic	Assignment Due	Readings Due
DAY 1 1/22	Introductions, syllabus, introductory topics, review of descriptives and dispersion	<i>Preliminary data subset for your methods papers in SPSS.</i>	<u>Required</u> <ul style="list-style-type: none"> • Hayes, A. F. (2017). Using SPSS: A little syntax guide. Pages 1-4. <i>-maintain regular access to this document for reference.</i> • Vardeman & Morris, 2003 • Wheelan, Ch 1-3, 7 <u>-Optional/helpful:</u> Kim (2013) Brandon Foltz Playlist 2 (1, 2) <i>Descriptive Statistics:</i> https://www.youtube.com/playlist?list=PLIeGtxpvyG-K82r1fgL-DO1xKg133PXXh
DAY 2 1/29	Review of covariance and correlation		<u>Required</u> <ul style="list-style-type: none"> • Lomax, Ch 10 • Wheelan, Ch 4
DAY 3 2/5	Review of statistical inference, introduction to Mplus		<u>Required</u> <ul style="list-style-type: none"> • Cohen (1994) • Cortina & Dunlap (1997) • Wheelan, Ch 8-9

			<p><u>Optional/helpful:</u> Brandon Foltz Playlist 8 (2) <i>Confidence Interval Estimation:</i> https://www.youtube.com/playlist?list=PLLeGtxpvyG-KkhLBDGW3Jp3ThPAEQvMfk Brandon Foltz Playlist 9 (1, 2) <i>Hypothesis Testing:</i> https://www.youtube.com/playlist?list=PLLeGtxpvyG-IZRHcZcOy12jp7ywuRbE7l</p>
DAY 4 2/12	Simple linear regression		<p><u>Required</u></p> <ul style="list-style-type: none"> • Darlington & Hayes Ch 1-2 • Wheelan, Ch 11 <p><u>-Optional/helpful</u> Brandon Foltz Playlist 14 (1-4, 6, 11) <i>Simple Linear Regression:</i> https://www.youtube.com/playlist?list=PLLeGtxpvyG-LoKUpV0fSY8BGKIMIdmfCi</p>
DAY 5 2/19	Multiple linear regression		<p><u>Required</u></p> <ul style="list-style-type: none"> • Darlington & Hayes, Ch 3-4 <p><u>Optional/helpful</u> Brandon Foltz Playlist 15 (1, 3A, 3B, 4) <i>Multiple Linear Regression:</i> https://www.youtube.com/playlist?list=PLLeGtxpvyG-IqjoU8IiF0Yu1WtxNq_4z-</p>
DAY 6 2/26	Multiple linear regression		<ul style="list-style-type: none"> • Darlington & Hayes, Ch 5, 9,10

DAY 7 3/4	Multiple linear regression		<ul style="list-style-type: none"> • Darlington & Hayes, Ch 16 <p><u>Recommended:</u> Brandon Foltz Playlist 15 (2) <i>Multiple Linear Regression</i>: https://www.youtube.com/playlist?list=PLIeGtxpvyG-IqjoU8IiF0Yu1WtxNq_4z-</p>
DAY 8 3/11	Logistic regression	<i>Analytic Assignment 1</i>	<p><u>Required</u></p> <ul style="list-style-type: none"> • Peng, Lee, & Ingersoll (2002) • Wheelan, Ch 5 & 6 <p><u>Optional/helpful:</u> Darlington & Hayes, Ch 18 (to page 569)</p> <p>Brandon Foltz Playlist 16 (1-6) <i>Logistic Regression</i>: https://www.youtube.com/playlist?list=PLIeGtxpvyG-JmBQ9XoFD4rs-b3hkcX7Uu</p>
3/18 Spring Break	<i>Spring Break! Spring Break! Spring Break! Spring Break! Spring Break! Spring Break!</i>		
DAY 9 3/25	Logistic regression		
DAY 10 4/1	Statistical moderation		Ch 13
DAY 11 4/8	Statistical moderation	<i>Analytic Assignment 2</i>	Ch 14

DAY 12 4/15 no class	<i>No class!!! No class!!! No class!!! No class!!! No class!!! No class!!! No class!!! No class!!! No class!!!</i>		
DAY 13 4/22	Statistical moderation		<ul style="list-style-type: none"> • Darlington & Hayes, Ch 15 • Hayes (2009) • Preacher & Hayes (2008)
DAY 14 4/29	Statistical mediation		
DAY 15 5/6	Statistical mediation	<i>Analytic Assignment 3</i>	

X. BIBLIOGRAPHY

This bibliography lists resources in multiple modalities in consideration of diverse learning styles.

Scientific Publications

1. American Psychological Association (2009). *Publication Manual of the American Psychological Association, 6th edition*. Washington, DC; American Psychological Association.
2. Cohen, J. (1994). The earth is round ($p < .05$). *American Psychologist*, 49, 997-1003.
3. Cortina, J. M., & Dunlap, W. P. (1997). On the logic and purpose of significance testing. *Psychological Methods*, 2(2), 161-172.
4. Enders, C. K. (2010). *Applied Missing Data Analysis*. New York; Guilford Press.
5. Hayes, A. F. (2017). *Introduction to Mediation, Moderation, and Conditional Process Analysis: A Regression-Based Approach*, Second Edition. New York; Guilford Press.
6. Hayes, A. F. (2009). Beyond Baron and Kenny: Statistical mediation analysis in the new millennium. *Communication Monographs*, 76(4), 408-420.
7. Hayes, A. F., & Montoya, A. K. (2017). A tutorial on testing, visualizing, and probing an interaction involving a multicategorical variable in linear regression analysis. *Communication Methods and Measures*, 11(1), 1-30.
8. Hayes, A. F. (2015). An index and test of linear moderated mediation. *Multivariate Behavioral Research*, 50, 1-22.
9. Hosmer Jr, D. W., Lemeshow, S., & Sturdivant, R. X. (2013). *Applied Logistic Regression* 3rd Edition. John Wiley & Sons.
10. Lomax, R., & Hahs-Vaughn, D. (2012). *An introduction to statistical concepts*. Richard G. Lomax, Debbie L. Hahs-Vaughn. (3rd ed.). New York: Psychology Press.
11. MacKinnon, D. P., Krull, J. L., & Lockwood, C. M. (2000). Equivalence of the mediation, confounding and suppression effect. *Prevention Science*, 1(4), 173-181.
12. Muthén, B.O., Muthén, L.K., & Asparouhov, T (2016). *Regression and Mediation Analysis Using Mplus*. Los Angeles, CA: Muthén & Muthén.
13. Peng, Lee, & Ingersoll (2002). An Introduction to Logistic Regression Analysis and Reporting. *The Journal of Educational Research*, 96(1), 1-13.
14. Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods*, 40(3), 879-891.
15. Vardeman, S. B., & Max D Morris, M. D. (2003) Statistics and Ethics, *The American Statistician*, 57(1), 21-26.

Instructional Websites

1. UT Austin SDS software tutorials: <https://stat.utexas.edu/training/software-tutorials>
2. Mplus Website: <http://www.statmodel.com/index.shtml>
3. UCLA Institute for Digital Research and Education Website: <http://www.ats.ucla.edu/stat/>

Youtube Channels

1. Research by Design (SPSS tutorials)
2. Quantitative Specialists (SPSS tutorials)
3. Brandon Foltz (statistics tutorials)
4. Mplus (Mplus tutorials)
5. James Gaskin (statistics tutorials in SPSS and Mplus)

Free Resources

1. UT Austin SDS stat apps server: <https://stat.utexas.edu/consulting/stat-apps-server>
2. UT Austin SDS statistical consulting: <https://stat.utexas.edu/consulting/free-consulting>