EDPSY 491A: Intermediate Educational Statistics
Winter 2016: Mondays, Miller 423A, 4:30-6:50p

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Electronic Devices: To form an optimal learning atmosphere for all, **laptops/tablets/cell phones, etc. must be turned off/silent and put away** during class lectures/activities, except for software learning or article reviews. *Please *do* bring your laptop with Word, Excel, SPSS, and G*Power to class if you have one (but we may not always use them).*

Overview: This is an intermediate course in statistical methods designed for two types of students: 1) **undergraduates** who wish to extend their statistical knowledge and learn how to use SPSS statistical software for potential jobs and/or graduate school applications; and 2) **graduate students** who are either unable to take the more intensive annual Edpsy 593/594 series due to schedule constraints, or who are strongly affiliated with qualitative methods yet wish to be able to conduct common statistical analyses using SPSS software. In either case, the pre-requisite for this course is that you have successfully completed Edpsy 490 (Basic Educational Statistics) or an introductory univariate statistics course that is equivalent in content (i.e., measurement scales, frequency distributions, sampling distributions, and 2-group *z*- and *t*-tests -- see me if there is any question about previous content coverage). While this course is not mathematically challenging, we assume you are proficient in basic algebra.

In this class we will cover the application and write-up of 1- and 2-group *t*-tests, as well as two major univariate statistical methods used in the social sciences: 1) analysis of variance (ANOVA), which is typically used in experimental (and some quasi-experimental) research, and 2) multiple regression, which is typically used in survey research. Both methods are unified under the **general linear model** and both are used heavily in social and behavioral science research. We will learn concepts via text readings, class lectures/examples, applied (journal article) readings, and hands-on practice in class, at the computer lab, and during homeworks. Although our topic coverage will *not* be in-depth given our time constraints, the concepts learned should enable you to conduct analyses, write-up findings in APA style, and be a better consumer of quantitative research. Although the focus for ANOVA homeworks will be on between-subjects/fixed effects models only, we will touch on within-subjects/random effects models during class discussion. Our estimated topic/reading schedule is provided below. **Please note: (a) there will be other readings during the quarter, and (b) class attendance and participation is required**.

Lomax Text	*Tentative* EDPSY 491 Winter 2016 Topic, Readings, Homework Schedule	
	Mondays	**Wednesdays**
(review)	<u>01/04</u> **–** Welcome & Intro to SPSS software, Review, extension of basic concepts (t-tests)	<u>01/06</u> – <mark>HW1 emailed</mark>
1.1 - 1.6, & 1.8	<u>01/11</u> – Extension of basic concepts (t-tests): effect size, power, writing, *article review*	
	<u>01/18</u> – **MLK DAY HOLIDAY, NO CLASS**	<u>01/20</u> – NO CLASS but <mark>HW1 due via 4:30p email OR my box, HW2 emailed</mark>
2.1 - 2.2	<u>01/25</u> – ANOVA: 1-way basics including effect sizes, power, validity, RA, MCPs, *article review*	
3.1 & 3.4	<u>02/01</u> – ANOVA: 2x2 factorial model, *article review* • <mark>HW2 due hard copy, HW3 emailed</mark>	
4.1 - 4.7	<u>02/08</u> – ANOVA: 2x2 factorial model, AN<u>C</u>OVA/ATI, extra assumption, *article review*	
7.1 - 7.5 & 8.1 – 8.3	<u>02/15</u> – **PRES DAY HOLIDAY, NO CLASS**	<u>02/17</u> – NO CLASS but <mark>HW3 due via 4:30p email OR my box, HW4 emailed</mark>
	<u>02/22</u> – Regression: linear regression, assumptions, power, *article review*	
	<u>02/29</u> – Regression: linear regression, *article review* <mark>HW4 due hard copy, HW5 emailed</mark>	
9.1 - 9.9	<u>03/07</u> – Regression: logistic regression, *article review*, wrap-up, last day Potluck	<u>03/16</u> – NO CLASS but <mark>HW5 due via 4:30p email OR my box</mark>

Text: The required course text is ***Statistical Concepts, 4th Ed*, by Lomax & Hahs-Vaughn (2012).** Like most courses, there are many excellent texts on our class topics. However, our text was chosen for its content coverage breadth and relatively low cost. The book is popular and new hard copies are on backorder from the publisher (used copies may be available at the UW bookstore or Amazon.com). An alternative is to rent or buy the text electronically in a kindle version from amazon.com (go to Amazon and search for the text, 2012 version): **http://www.amazon.com/Statistical-Concepts-Richard-G-Lomax-ebook/dp/B007M942CE/ref=mt_kindle?_encoding=UTF8&me=**
Finally, if you already have an older hard copy version this text it will be OK, but not optimal (check to be sure chapters correspond to our topics but note that older versions will not have SPSS or G*Power examples).

Software: You will need **Word**, **Excel**, **SPSS**, and **G*Power** for completing assignments; **PLEASE OBTAIN THEM IMMEDIATELY**. Student versions of the first three are available for purchase at the UW Bookstore's Computer Department or online through UW IT, and they are also installed on computers on the fourth floor of Miller Hall, in the Odegaard library, and CSSCR (Savery Hall) **http://julius.csscr.washington.edu.** Please be sure to carefully check the version of SPSS you need, ***and see my additional notes on the next page***. **G*Power** is free software from the following website: **http://www.gpower.hhu.de/en.html**. Note: new Excel/SPSS software versions are not always compatible with older versions of themselves or each other; be sure to save "down" if you are working between multiple computers.

Computer Lab: I have scheduled computing lab at CSSCR on a few of our Mondays for the last hour of class. On days that we have a lab, we will walk over to Savery, room 121, from our regular class together (we will typically leave at 5:45 for 5:50 lab). Labs will coincide with material taught in class **and attendance is required**.

Other Supplies: You will need a **memory stick/jump drive** to save files during labs, and **calculator** that can compute a number raised to a power ($\wedge$ or y^x), square roots ($\sqrt{}$), natural logarithms (**In**), and exponentiation (e^x or **exp**) of a number. The **TI-30Xa SE** and **HP 30S** are both examples of calculators that can perform these functions. A hefty **3-ring binder** to keep your notes and handouts in is also strongly recommended for staying organized. In addition to always bringing your calculator to class, I also recommend bringing a few colors of pens/highlighters for taking notes.

Class Email List: I will create a class email list and website to communicate course announcements and assignments; be sure that you can receive group emails in your email settings. Class emails do not allow anyone to select "reply all" (all queries go to me directly). Class website is located at **https://canvas.uw.edu/courses/1021992**.

Performance Evaluation:

Homeworks: There will be 5 applied homeworks, worth 80% of your grade. The number of points given for each will based on the amount of work required (usually 2 weeks given per homework). Each person is expected to submit his/her own original work (hard copy). We are happy to answer questions via email and appointment. Homeworks will be emailed to you via class email (including a Word document for responses along with one or more datasets). You should print your homeworks out to submit hard copy in class on the due date unless otherwise noted on the schedule. Your graded work should be returned approximately 2 weeks later with feedback.

Participation: Participation will be monitored for each class or lab, worth 20% of your grade. If you must miss a class, I will provide a make-up assignment for you to complete. The make-up should be submitted within one week. The assignment will involve exercise(s) that correspond to topics that were missed.

Late Policy: Late homework is accepted with a **5% penalty each calendar day it is late**. I always recommend you turn in what part(s) of the homework you have completed on the due date, and then continue working on the remainder as soon as possible.

Grades: There are no extra credit options for this course. Grades are based on percentage of accumulated points:

98% and above	4.0	79% to 81%	3.3
95% to 97%	3.9	76% to 78%	3.2
92% to 94%	3.8	73% to 75%	3.1
91% to 93%	3.7	70% to 72%	3.0
88% to 90%	3.6	67% to 69%	2.9
85% to 87%	3.5	64% to 66%	2.8
82% to 84%	3.4	61% to 63%	2.7

Students with Disabilities: If you require accommodations for a disability, you will need to contact Disability Resources for Students at 206-543-8924 or **uwdrs@uw.edu** (website: **http://depts.washington.edu/uwdrs**) to propose an educational plan and obtain a letter detailing the plan. Bring the letter to me in person or via email, and we will privately discuss arrangements for accommodations.

Supplementary Resources (<u>Not</u> Required)

APA Formatting

American Psychological Association. (2009). *Publication Manual of the American Psychological Association (Sixth Edition).*

Cooper, H. (2010). *Reporting Research in Psychology: How to Meet Journal Article Reporting Standards.* APA.

American Psychological Association's website (for purchasing APA books): **http://www.apa.org/pubs/books/**

Purdue University's Online Writing Lab (OWL) for APA Style: **https://owl.english.purdue.edu/owl/resource/560/01/**

Experimental Design

Kirk. R. E. (2012). *Experimental Design (Fourth Edition).* Sage Publications, Inc.

Maxwell, S. E., & Delaney, H. D. (2003). *Designing Experiments and Analyzing Data: A Model Comparison Perspective (Second Edition).* Psychology Press.

Meyer, J. L., Wells, A. D., & Lorch, Jr., R. F. (2010). *Research Design and Statistical Analysis (Third Edition).* Routledge.

Pagano, R. R. (2012). *Understanding Statistics in the Behavioral Sciences* (Tenth Edition). Cengage Learning.

Shadish, W. R., Cook, T. D., & Campbell, D. T. (2001). *Experimental and Quasi-Experimental Designs for Generalized Causal Inference.* Cengage Learning.

Multiple Regression

Aiken, L. S., & West, S. G. (1991). *Multiple Regression: Testing and Interpreting Interactions.* Sage Publications.

Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2002). *Applied Multiple Regression/Correlation Analysis for the Behavioral Sciences (Third Edition).* Routledge.

Hosmer Jr., D., Lemeshow, S., & Sturdivant, R. (2013). *Applied Logistic Regression.* Wiley. **I have not reviewed this yet**

Pedhazur, E. J. (1997). *Multiple Regression in Behavioral Research: Explanation and Prediction (Third Edition).* Wadsworth.

Tabachnick & Fidell. (2012). *Using Multivariate Statistics* (Sixth Edition). Pearson.

SPSS software (for newbies)

Field, A. (2013). *Discovering Statistics using IBM SPSS Statistics.* Sage Publications.

Notes on SPSS Software Versions for UW Students, <u>Especially Mac Users</u>

SPSS has been around for a long time. For a short period it was known as "PASW" but it is now back to its original name. I am sharing information from the UW's IT department regarding issues related to SPSS installation/use, especially for **Mac** users. SPSS was never created with Mac operating systems in mind, and it has had a hard time keeping up with all the different Mac platforms. If possible, I recommend you get the *disk/media* version of SPSS in case you have to re-install it for some reason. It costs a few dollars more, but it may save you some tears of frustration. If none of these work for you, use the versions that are physically available on campus (like CSSCR, fourth floor of Miller, or the libraries).

VERSIONS AVAILABLE FROM UW BOOKSTORE & UW IT (NOT ALL VERSIONS AVAILABLE!!!)

- **SPSS 19** <u>perpetual</u> license is no longer available as of July 2015
- **SPSS 22 or 23** <u>annual</u> license (must be renewed every year on July 1) = $100 downloadable: http://www.washington.edu/itconnect/wares/uware/spss-21-annual-subscription, or $115 with-media at UW bookstore: http://www.bookstore.washington.edu/_Common/Images/pdf/tech_center_current/acad_software_2015_11_03.pdf

PC USERS: Versions available through IBM

- **SPSS 18** is supported on Windows 7 or lower (unknown if it supported on Windows 8) (*no longer available* through UW)
- **SPSS 19 through 22** is supported on Windows 7 and Windows 8
- **IBM's GRADPACK23** Statistics <u>Standard</u> 6-month rental version: $60 (12-month $100) downloadable only: http://estore.onthehub.com/WebStore/ProductsByMajorVersionList.aspx?vsro=8&pc=ddc848d8-b4fe-e111-bd05-f04da23e67f6

MAC USERS: Versions available through IBM (IMPORTANT TO READ BEFORE ANY PURCHASE)

- **SPSS 18 & 19** (*no longer available from UW*) releases supported on Apple Mac OS 10.5 (Leopard) and 10.6 (Snow Leopard) with Intel processor. NOT supported on Mac OS 10.7 (Lion) and later.
- **SPSS 20** (*not available from the UW*) supported on Apple Mac OS X 10.6 (Snow Leopard) & 10.7 (Lion) with Intel processor. SPSS 20 was developed and released prior to Apple's release of 10.8 (Mountain Lion) operating system. It is not supported on 10.8, meaning any issues found can only be addressed in future releases. However, no serious issues are anticipated, and SPSS 20 can run on Mountain Lion with Intel processor but: (1) for new installations of 20 it is strongly recommended to read Technote 1606447 first and follow the instructions about Apple's new Gatekeeper security feature, and (2) if you are upgrading the operating system around an existing installation of 20.0, you may experience issue with your license code. See Technote 1607184 for info.
- **SPSS 21** supported on Apple Mac OS X 10.6 (Snow Leopard), 10.7 (Lion), & 10.8 (Mountain Lion) with Intel processor.
- **SPSS 22** supported on Apple Mac OS X 10.7 (Lion) & 10.8 (Mountain Lion) with Intel processor. **SPSS 22 NOT supported for Apple Mac OS X 10.6** (Snow Leopard). SPSS 22 was developed and released prior to Apple's release of OS X 10.9 (Mavericks). Per SPSS Product Management, version 22 can be installed on Mac OSX 10.9 **if you install Apple Java SE 6 (1.6.0_65) on OS X 10.9 first** installing 22. See http://support.apple.com/kb/dl1572 for download.
- **SPSS 23** supported on Apple Macintosh OS X 10.9 (Mavericks) and 10.10 (Yosemite) with Intel processor.
- **IBM's GRADPACK23** Statistics <u>Standard</u> 6-month rental version supported on Apple Mac OS X 10.8, 10.9, 10.10: $60 (12-month $100) downloadable only: https://estore.onthehub.com/WebStore/OfferingsOfMajorVersionList.aspx?pmv=89cf975c-47c3-e411-940a-b8ca3a5db7a1&cmi_mnuMain=ed6ad73c-7bc7-e011-ae14-f04da23e67f6
- **For more information**, see the IBM's website: https://www-304.ibm.com/support/docview.wss?uid=swg21507587

SOFTWARE RESOURCES WHEN THINGS AREN'T WORKING

- IBM product support/documentation if you got a disk version (see the product packaging for IBM's online support documentation)
- UW IT department if you did a download version of the software (help@uw.edu)
- CSSCR staff (computer lab) (consulting hours posted on: http://julius.csscr.washington.edu/)