Florida State University
College of Criminology and Criminal Justice

CCJ 6741 Advanced Data Analysis in Criminology & Criminal Justice (Data Management)

Credit Hours: 3
Meeting Time: Wednesdays, 10:45am-1:15pm
Meeting Location: CRM 0214

Professor: Joseph A. Schwartz, Ph.D.
Email: jaschwartz@fsu.edu
Phone: (850) 644-7949
Office: CRM 304A
Office hours: Mondays & Wednesdays 9:00am-10am (and by appointment)

What you Will Learn

Data preparation is one of the most important—and, sometimes, frustrating—aspects of research. Regardless of the care with which data are collected, the sophistication of the models estimated, and the clarity of the presented results, the validity and reliability of any given study rests on the accuracy of the processes that occur between data collection and the production of results. This collective set of tasks can be daunting, particularly when data are complex, longitudinal, or just plain messy (what I like to call "feral data"). While there are countless courses devoted to collecting and analyzing data, there are far fewer opportunities to hone the skills required for the intermediate phases of preparing data for analysis. Most researchers simply pick these skills up "on the fly" with many missteps—and the development of bad habits—along the way. The primary purpose of this class is to assist you with managing and preparing data for analysis. While there are a countless number of procedures and processes that could be characterized in this way, we will focus on areas that are more general and common in the hope that the skills you develop in this course will directly address issues you encounter in your own research. In an effort to explore the procedures discussed in class, we will use a "live" dataset (The Pathways to Desistance Study) available for download from ICPSR.

Course Objectives

The main objectives of this course are:

1. Use and navigate Stata effectively
2. Understand basic and intermediate aspects of Stata language
3. Organize a syntax file that allows for data and analysis replication
4. Develop a research workflow aimed at maximizing replicability
5. Construct long and wide datasets and be able to switch between the two
6. Combine multiple datasets
7. Evaluate missing data patterns and develop an appropriate analytic plan
8. Construct publication ready tables directly from Stata

9. Design appropriate and intuitive graphical representation of analytic results
10. Apply the skills acquired throughout the semester to a complex, longitudinal dataset

Required Course Materials

1. Articles and other materials that will be made available in the course library on Canvas (reading list provided at the end of the syllabus).

2. While there is no textbook required for this course, I understand that some students may want some reference materials or books to help inform future projects. For this reason, I have provided the following list of books which are **RECOMMENDED and are not required for this course**:
    a) Acock, A. C. (2023). *A gentle introduction to Stata (6th Ed.).* College Station, TX: Stata Press. ISBN: 978-1-59718-367-3 ($68.00).
    b) Long, J. S. (2009). *The workflow of data analysis using Stata*. College Station, TX: Stata Press. ISBN: 978-1-59718-047-4 ($54.00).
    c) Mitchell, M. N. (2020). *Data management using Stata: A practical handbook (2nd Ed.)*. College Station, TX: Stata Press. ISBN: 978-1-59718-318-5 ($64.00).

Software

This class requires the statistical software program Stata (preferably release 17 or 18, versions BE, SE, or MP), as this will be the primary vehicle for the procedures you learn in this class. However, we will address and discuss the theory and logic underlying these procedures in an effort to prepare you to perform them in other software packages if you choose. While we will be working in Stata, students are only expected to have basic familiarity with a statistical software package of their choice (e.g., SPSS, SAS, R, or Stata) and no direct experience with Stata is necessary.

So, why Stata? Well, Stata is in no way perfect, but I have found it to be well-rounded, relatively easy to use, and readily available. In addition, resources are widely available and easily accessible. The point of this class is not to force you to use Stata, but rather to use Stata as a vehicle to implement the skills and tools we will discuss in the course. Since software packages fall in and out of favor so quickly, the larger goal of this course is to assist you in your familiarity of the underlying logic of basic programming and syntax in an effort to develop and hone your data management skills regardless of the software package you decide to use. With that said, Stata is pretty awesome.

With all that said, one of the main drawbacks of using Stata is that it is proprietary and not open source, meaning that StataCorp is a for profit company and charges users for the software. To be honest, the accompanying fees are pretty exorbitant and have increased in recent years as StataCorp has shifted from perpetual licenses to a annual subscription model. With that said, getting access to Stata can present a bit of a challenge. You have three options for accessing Stata for this class:

1. The graduate computer lab (and other labs on campus) has Stata loaded on each computer.

2. You can access Stata using your personal or office computer using the FSU VLab, which offers a virtual computing space equipped with lots of useful (and expensive) software. If you want to go this route, please make sure to look through the FAQ articles found using this link. You will have to do some prep work to increase the efficiency of this option. You will also want to make sure that you map your OneDrive account to the VLab or it will be difficult to get files into and out of the virtual machine. You can find instructions on how to do map your OneDrive using this link.

3. As a last resort, you can purchase a 6- or 12-month Stata license directly from StataCorp using this link. You should be fine with the basic version (i.e., BE) for the purposes of this class. Personally, I would not pursue this option unless: 1) you absolutely cannot make the above methods work at all; 2) you already do or plan to use Stata extensively over the next 12 months; or 3) you are independently wealthy, and money is no object (ha!).

Course Structure and Format

This class will be organized in a workshop style format in which information on a given topic will be presented during class with additional time to work through examples reinforcing the topics covered. Therefore, all students are expected to: (1) attend every class meeting; (2) have completed the assigned readings BEFORE coming to class; and (3) actively participate in class discussions and exercises. Also, while not required, if you have a laptop that you can bring to class, I would highly recommend to do so. Working through the examples in real time will be beneficial. In my previous experiences, classes in which a high proportion of students complete these requirements tend to have much higher average grade distributions, and perhaps even more importantly, are far more engaging and enjoyable.

Evaluation and Grading

Your course grade will be based on your performance on two components:

1. ***Class Assignments***: (75% of your overall grade and 750 out of 1000 course points). Since the majority of the procedures introduced in this class will be new to students, and we will be working with a dataset few of you have worked with previously, you will reinforce the skills we discuss in class with a series of 6 course assignments worth 125 points each. Additional information, including specific requirements and directions, for each assignment will be provided in class and will be available for download on Canvas. All assignments should be submitted via Canvas ***before the beginning of class***. No late assignments, or assignments submitted via email, will be accepted.

2. ***Presentation***: (25% of your overall grade and 250 out of 1000 course points). You will be required to complete a short (10-12 minute) in-class presentation demonstrating a technique, procedure, or command we did not have time to cover in class that you have found to be useful. The procedure/command you choose can be part of canned (i.e.,

"built-in") Stata, or may be a user-written add-on. The primary point of this presentation is to share some of the skills you have acquired before and during this course with the rest of the class (and me). You may present the procedure/command in whatever way you feel is most effective (i.e., PowerPoint, live Stata demonstration, handouts, etc.), but, remember, the point of this task is to effectively demonstrate why your chosen procedure/command is worth discussing. Also keep in mind that most of your classmates will not be familiar with the material you will be presenting, so you will have to take extra care to be as clear as possible in your presentation. Presentations will take place on ***4/17 and 4/24***.

Course grades will be based on the following:

Assignments:	750 points (75%)
Presentation:	250 points (25%)
Total points possible:	**1000 points**

Grading Scale

A	94-100	C	74-76
A-	90-93	C-	70-73
B+	87-89	D+	67-69
B	84-86	D	64-66
B-	80-83	D-	60-63
C+	77-79	F	Below 60

Policies and Requirements

You are highly encouraged to attend each and every class. Information will be covered in class that is not available elsewhere. If you miss a class I highly recommend that you borrow notes from one of your fellow classmates and talk to me about any additional clarification you may need.

Students who miss an assignment must: 1) notify me within 24 hours of missing the assignment AND 2) provide me with an acceptable reason for missing the assignment and provide written documentation (e.g., doctor's note). Students who do not notify me within 24 hours of missing the assignment and/or do not provide an acceptable reason for missing the assignment will receive a zero (0). It is your responsibility to contact me, I will not notify you if you miss an assignment.

A WORD OF WARNING: Working with raw data can be challenging and, at times, extremely frustrating. But, the best way to learn some of the skills and procedures we will be covering in class will be to trudge on and be persistent. Most of the time, your first attempt will fail miserably. Debugging code is often times one of the most important—and time consuming—tasks we engage in as researchers. So, learning how to recognize errors and issues with your own code is one of the primary skills I hope you learn in this course and there is no substitute for hands-on experience. As Jedi Master Yoda noted in *The Last Jedi*, "The greatest teacher, failure is." With this in mind, I encourage you to be persistent in debugging and troubleshooting your code—don't give up. Sometimes it helps to take a break and work on something else for a while

and then come back to the problem with a fresh set of eyes. Based on the importance of this set of skills—and I'm going to be firm on this—I am happy to help you with the technical aspects of your assignments only AFTER you have tried to resolve any issues on your own AT LEAST THREE TIMES. If and when you reach that point, feel free to come to me with your questions, syntax, datasets, and anything else.

Students are expected to behave in a respectful and professional manner. Disrespectful behavior (directed either at me or other students) will not be tolerated in any capacity. Students who display any type of disrespectful behavior will be asked to leave the classroom immediately. Students are also expected to come to class fully prepared. The following rules will be enforced:

1. Do not talk while I am talking (no exceptions)
2. Do not talk while one of your classmates is talking
3. Do not sleep in class
4. Do not read outside/unrelated materials
5. Do not text or use your phone for anything else during class
6. Do not arrive to class late
7. Do not wear headphones
8. Do not browse websites during class (no exceptions)

All correspondence will be conducted using Canvas and/or email. Any pertinent information regarding the course (e.g., class cancelation, exam reschedule, etc.) will be communicated using Canvas and/or email. In addition, required readings and other relevant materials will be posted on Canvas. Students are responsible for checking their email and Canvas accounts regularly.

I prefer students to reach me via email. I constantly check my email account and will be most likely to provide a quick response to any inquiries you may have. Any email correspondence should include an appropriate subject line that identifies you as a student and the class you are enrolled in. Please keep professional etiquette in mind when sending me emails. For example, emails should include a proper salutation (e.g., Dear Dr. Schwartz; Hi Dr. Schwartz; etc.), should include proper punctuation, and should spell out words like "you" and "are."

In addition, the following expectations will be enforced:

1. All readings are expected to be completed by the assigned date.
2. You are expected to complete all assignments on time.
3. Plagiarism and cheating will not be tolerated. Note the Academic Honor Policy below.
4. Extend courtesy and respect to your fellow classmates at all times. Disrespect or hateful speech of any kind directed toward other students, myself, or anyone else will not be tolerated.
5. If you have any problem or experience any unforeseen circumstances, do not hesitate to contact me. The sooner you inform me of an issue, the more options we have to get it resolved.
6. Except for changes that substantially affect implementation of the evaluation (grading) statement, this syllabus is a guide for the course and is subject to change with advance notice.

7. All work must be original and created for this semester's course.
8. All work presented in assignments should be original and you ***should NOT copy and paste, or provide highly similar, language directly from the provided course materials*** in such instances. If this happens, a hefty penalty—via a point deduction—will be imposed.

Requesting Points, Re-Grading Assignments, Extra Credit, Late/Make Up Work and Rounding
I know it is tempting to **request more points** or a change to your grade as we move through the semester. Besides, "it never hurts to ask," right? I've deliberately designed this course to provide you with as many opportunities as possible to achieve the grade you have in mind. There are many, many opportunities for points outside of exams, which gives you far more control over your final grade in the class. With that in mind, I cannot accommodate grade change requests, appeals for more points, or any similar requests. For these reasons, any requests will be ignored, and I will not respond to emails making these requests.

Assignments will be graded as quickly as possible once turned in. It is possible that I made a mistake when grading your assignment and I want to ensure that any mistakes are corrected in due course. However, instances of **re-grading** assignments should be reserved for rare situations in which a mistake was made during the grading process. With this in mind, re-grading requests must be made within ***5 days of the grades being posted to Canvas***. In addition, for any re-grading request, I will grade your assignment as if it were a fresh submission, meaning ***you are just as likely to lose points as you are to gain them***.

In regard to **extra credit**, I will not provide extra credit to individual students. Any extra credit opportunities will be made available to the entire class, at my discretion, and will be announced via Canvas in full detail. Please do not ask for extra credit. If an extra credit opportunity becomes available, I will announce it to the entire class.

Late work will only be considered or accepted in exceptional circumstances. Specifically, students must 1) notify me within 24 hours of missing the assignment, AND 2) provide me with a university approved excuse for missing the assignment (see the "University Attendance Policy" below for what constitutes a university approved excuse). I may request written documentation for the excuse if necessary. If this procedure is not followed, you will receive a score of zero for the assignment.

Grades are **rounded** to the nearest whole number when calculating your final grade. For example, an 89.5 (or greater) will round to a 90, but an 89.4 will round to an 89. This is the only rounding that will take place for this course. I do not round quiz or problem set grades. Any requests for additional rounding or another form of rounding will not receive a response.

University Attendance Policy
Excused absences include documented illness, deaths in the family and other documented crises, call to active military duty or jury duty, religious holy days, and official University activities. These absences will be accommodated in a way that does not arbitrarily penalize students who have a valid excuse. Consideration will also be given to students whose dependent children experience serious illness.

Academic Honor Policy
The Florida State University Academic Honor Policy outlines the University's expectations for the integrity of students' academic work, the procedures for resolving alleged violations of those expectations, and the rights and responsibilities of students and faculty members throughout the process. Students are responsible for reading the Academic Honor Policy and for living up to their pledge to "...be honest and truthful and...[to] strive for personal and institutional integrity at Florida State University." (Florida State University Academic Honor Policy, found at http://fda.fsu.edu/Academics/Academic-Honor-Policy).

While you are encouraged to support one another and work collaboratively when appropriate, plagiarism or other academic dishonesty of any kind will not be tolerated in this class. Incidents of cheating or plagiarism of any type will be rigorously pursued. Any form of academic dishonesty will result in a grade of "zero" for that particular assignment. I reserve the right to screen for plagiarism, including electronic citation checkers (e.g., SafeAssign). For this course, you may be required to submit assignments to SafeAssign. All written materials will become source documents in the SafeAssign database and will be used solely for the purpose of detecting plagiarism.

Academic Success
Your academic success is a top priority for Florida State University. University resources to help you succeed include tutoring centers, computer labs, counseling and health services, and services for designated groups, such as veterans and students with disabilities. The following information is not exhaustive, so please check with your advisor or the Dean of Students office to learn more.

Americans with Disabilities Act
Florida State University (FSU) values diversity and inclusion; we are committed to a climate of mutual respect and full participation. Our goal is to create learning environments that are usable, equitable, inclusive, and welcoming. FSU is committed to providing reasonable accommodations for all persons with disabilities in a manner that is consistent with academic standards of the course while empowering the student to meet integral requirements of the course.

To receive academic accommodations, a student:
1. Must register with and provide documentation to the Office of Accessibility Services (OAS)
2. Must provide a letter from OAS to the instructor indicating the need for accommodation and what type
3. Should communicate with the instructor, as needed, to discuss recommended accommodations. A request for a meeting may be initiated by the student or the instructor.

Please note that instructors are not allowed to provide classroom accommodations to a student until appropriate verification from the Office of Accessibility Services has been provided.
This syllabus and other class materials are available in alternative format upon request.
For more information about services available to FSU students with disabilities, contact the

Office of Accessibility Services
874 Traditions Way
108 Student Services Building
Florida State University
Tallahassee, FL 32306-4167
(850) 644-9566 (voice)
(850) 644-8504 (TDD)
oas@fsu.edu
https://dsst.fsu.edu/oas

Confidential Campus Resources
Various centers and programs are available to assist students with navigating stressors that might impact academic success. These include the following:

Victim Advocate Program
University Center A, Rm. 4100
(850) 644-7161
Available 24/7/365
Office Hours: M-F 8-5
https://dsst.fsu.edu/vap

Counseling and Psychological Services
Askew Student Life Center, 2nd floor
942 Learning Way
(850) 644-8255
https://counseling.fsu.edu/

University Health Services
Health and Wellness Center
(850) 644-6230
https://uhs.fsu.edu/

TENTATIVE SCHEDULE AND ASSIGNED READINGS

Week	Date	Topic
1	1/10	Course Introduction
2	1/17	Stata Crash Course (Strap in, we're about to make the Kessel Run in less than 12 parsecs) *****SIGN UP FOR PATHWAYS CONSTRUCT(S)*****
3	1/24	Basic Coding (AKA the pumpkin spice latte of coding…)
4	1/31	Basic Coding (AKA the pumpkin spice latte of coding…) *****ASSIGNMENT #1 DUE*****
5	2/7	Intermediate Coding (Merges, macros, & loops…oh my!) *****ASSIGNMENT #2 DUE*****
6	2/14	Intermediate Coding (Merges, macros, & loops…oh my!)
7	2/21	Reshaping Data (From wide to long [and back again]) *****ASSIGNMENT #3 DUE*****
8	2/28	Reshaping Data (From wide to long [and back again])
9	3/6	Handling Missing Data (The data 'lost and found') *****ASSIGNMENT #4 DUE*****
10	3/13	*****SPRING BREAK – NO CLASS*****
11	3/20	Handling Missing Data (The data 'lost and found')
12	3/27	Table Automation (Let Stata "set the table" for you!) *****ASSIGNMENT #5 DUE*****
13	4/3	Graphing Basics (Tables are sooooo 2023…) *****CLASS PRESENTATION TOPIC SELECTION*****
14	4/10	Graphing Basics (Tables are sooooo 2023…)
15	4/17	*****CLASS PRESENTATIONS***** *****ASSIGNMENT #6 DUE*****
16	4/24	*****CLASS PRESENTATIONS*****
Finals	5/1	**No Class**

This syllabus is only tentative and highly subject to change. I reserve the right to modify this syllabus at any time throughout the semester and it is your responsibility to stay up-to-date on any changes that are made.

READING LIST

Course Introduction (1/11)

No assigned readings.

For next time: Sign up for your chosen construct(s) by replying to the prompt on the appropriate Canvas discussion board before our next class meeting (1/17).

Stata Crash Course (1/17)

Ellison, C. G., Burdette, A. M., & Hill, T. D. (2009). Blessed assurance: Religion, anxiety, and tranquility among US adults. *Social Science Research*, *38*, 656-667.

This paper is only related to Assignment #1. See the handout for complete details. Be sure to submit your final documents to Canvas before the beginning of class on 2/1.

Stata Manual (2023). Chapters 1-4 (pp. 1-29). College Station, TX: StataCorp.

These chapters should give you a general overview of the Stata interface and also presents some commonly used commands. In addition, these introduction chapters also provide a basic overview of the structure of the syntax in Stata.

Watch the following videos from the Stata YouTube channel:

1. Interface overview:
   https://www.youtube.com/watch?v=nV5WfR92LIM&index=27&list=PLN5IskQdgXWk7ft_JxyirnTfsd5BY4iba
2. Labeling variables:
   https://www.youtube.com/watch?v=l5QM2RzU3VM&list=PLN5IskQdgXWmih67kPngkd0P022h1j82j
3. Value labels:
   https://www.youtube.com/watch?v=CiSIeQVWxW0&list=PLN5IskQdgXWmih67kPngkd0P022h1j82j&index=2
4. Missing data values:
   https://www.youtube.com/watch?v=6HV2773-dVM&index=8&list=PLN5IskQdgXWmih67kPngkd0P022h1j82j
5. Using the 'generate' command:
   https://www.youtube.com/watch?v=E_wCh0rf4p8
6. Basic descriptive statistics:
   https://www.youtube.com/watch?v=3WpMRtTNZsw

   The Stata YouTube channel is very helpful in providing basic overviews of Stata features and procedures. Just a word of warning, the demonstrations make use of the Stata dropdown menus and the graphical user interface (GUI) included in Stata. We will not be relying on the GUI in this course! However, Stata will issue the necessary syntax to complete the processes carried out via point and click procedures. Pay attention to the syntax (including commands) that are issued after the point and click procedures are completed. Also, feel free to take a look at other Stata YouTube videos if you choose.

For next time: Visit the Pathways to Desistance website (http://www.pathwaysstudy.pitt.edu) as well as the Pathways Project ICPSR website: http://www.icpsr.umich.edu/icpsrweb/NAHDAP/studies/29961.

Be sure to pay particular attention to the sections of these websites that deal directly with the constructs that you may select from (listed in the corresponding Discussion Board on Canvas). Also, the codebooks contain a limited amount of information regarding the actual items that comprise each construct, so be sure to check out the Pathways website for more information.

Assignment #1 is due on 1/31. Reproduce Table 1 from Ellison et al. (2009) and upload it to Canvas before the beginning of class.

Basic Coding (1/24-1/31)

Long, J. S. (2009). Chapter 1 (pp. 1-9) in *The workflow of data analysis using Stata*. College Station, TX: Stata Press.

> *These chapters will give you a great start to thinking through your workflow when dealing with raw data. While the author focuses on organization and issues particularly salient within the framework of Stata, many of these suggestions and strategies can be employed across any software program you choose.*

Mulvey, E. P. (2000-2010). *Research on Pathways to Desistance [Maricopa County, AZ and Philadelphia County, PA]: Subject Measures, 2000-2010. Baseline Interview Codebook.*

> *You don't need to read the entire codebook, but spend some time skimming through to get an idea of what constructs are available. The "Variable Group Crosswalk Across Waves" is particularly useful, as it summarizes the key constructs and also indicates when each construct was collected.*

Schubert, C. A., Mulvey, E. P., Steinberg, L., Cauffman, E., Losoya, S. H., Hecker, T., ... & Knight, G. P. (2004). Operational lessons from the pathways to desistance project. *Youth Violence and Juvenile Justice*, *2*, 237-255.

> *Provides a technical overview of the data collection procedures pertaining to the Pathways to Desistance Study.*

Pathways to Desistance Research Team. (2007). *Pathways to Desistance (Baseline) Reference List*. Also available from the Pathways website: http://www.pathwaysstudy.pitt.edu/baselineinterview.html.

> *Provides a brief overview of the constructs measured at the first point of data collection (Baseline Interview). This is intended to give you an idea of the breath of the Pathways data and what types of measures are available.*

For next time: **Assignment #2:** Download and recode the items related to your construct(s) from the Baseline Interview only! Do not download items from subsequent interviews, this will be taken care of in future assignments.

Intermediate Coding (2/7-2/14)

StataCorp (2017) Data management made easy. The Stata Blog.
https://blog.stata.com/2017/11/15/data-management-made-easy/

More of an FYI for future procedures you may be interested in. Feel free to take a closer look at some of topics and bookmark this page for future reference.

Cox, N. J. (2001). Speaking Stata: How to repeat yourself without going mad. *The Stata Journal, 1,* 86-97.

Cox, N. J. (2020). Speaking Stata: Loops, again and again. *The Stata Journal: Promoting Communications on Statistics and Stata*, *20*(4), 999–1015.

These articles provide the basic logic of macros and loops and similar automation procedures, as well as an overview of the commands and syntax used in Stata for performing these procedures.

Social Science Computing Cooperative. (2015). Stata for researchers: Combining data sets.

This tutorial provides an excellent overview of the logic as well as the syntax required to combine variables from two datasets that have unique identifiers in common (i.e., merging).

For next time: **Assignment #3**: Recode the items related to your construct from the remaining follow-up interview periods (6-month follow-up through 84-month follow-up) and merge all necessary items into a single dataset that contains the final, completed measures for your constructs across all examined time periods (baseline though 84-month follow-up).

Reshaping Data (2/21-2/28)

Baum, C. F., & Cox, N. J. (2007). Stata Tip 45: Getting those data into shape. *The Stata Journal, 7,* 268-271.

Stata help file for `reshape` (i.e., `help reshape`)

These should provide a good overview for the logic and syntax required for reshaping data, while also defining important terms (i.e., long, wide, etc.).

Pyrooz, D. C., Gartner, N., & Smith, M. (2017). Consequences of incarceration for gang membership: A longitudinal study of serious offenders in Philadelphia and Phoenix. *Criminology*, *55*, 273-306.

Sweeten, G., Piquero, A. R., & Steinberg, L. (2013). Age and the explanation of crime, revisited. *Journal of Youth and Adolescence*, *42*, 921-938.

Think about how these data were organized prior to analysis. Try to sketch out the organization and think about what kind of syntax would be required to get the data into the format necessary.

For next time: **Assignment #4**: Reshape your data for all time-varying constructs from wide to long format for longitudinal analysis. Reshape the data back to wide format.

Handling Missing Data (3/6-3/20)

Acock, A. C. (2005). Working With Missing Values. *Journal of Marriage and Family*, *67*, 1012–1028.

Allison, P. D. (2012). *Handling Missing Data by Maximum Likelihood*. SAS Global Forum: Paper 312-2012. http://www.statisticalhorizons.com/wp-content/uploads/MissingDataByML.pdf

Allison, P. D. (2001). *Missing data*. Sage University Papers Series on Quantitative Applications in the Social Sciences. Thousand Oaks, CA: Sage.

Brame, R., Turner, M. G., & Paternoster, R. (2010). Missing data problems in criminological research (pp. 273-288)) in A. R. Piquero and D. Weisburd (Eds.), *Handbook of Quantitative Criminology*. New York, NY: Springer

Two approachable, but comprehensive, discussions of the processes that ultimately result in missing data and methods to address such issues.

Social Science Computing Cooperative. (2013). *Multiple imputation in Stata: Introduction*. https://www.ssc.wisc.edu/sscc/pubs/stata_mi_intro.htm

A comprehensive, step-by-step guide for multiple imputation procedures within Stata using the relatively new `mi` *suite of commands.*

For next time: **Assignment #5**: Compare results from the same model before and after employing multiple imputation procedures to handle missing data.

Table Automation (3/27)

Diamond, R. (2022). Tables in Stata. Social Science Computing Cooperative, UW Madison. https://sscc.wisc.edu/sscc/pubs/stata_tables/

This is a valuable and comprehensive overview of the suite of canned commands that can be used to create publication ready tables from Stata directly. Pay particular attention to `esttab` *as I have found it to be particularly useful.*

Princeton University Library (2023). Using `outreg2` to make publication-quality tables in Stata: A hands-on tutorial. https://libguides.princeton.edu/outreg2

This tutorial is focused on the user-written command `outreg2` *which is an extension of the canned* `outreg` *command but with some useful changes.*

Graphing Basics (4/3-4/10)

Bischof, D. (2017). New graphic schemes for Stata: plotplain & plottig. *The Stata Journal, 17,* 748-759.

> *This article describes a set of user-written graph schemes for Stata that instantly transform the u-g-l-y graphing defaults into beautiful, publication-ready figures.*

Jann, B. (2017). *Plotting regression coefficients and other estimates in Stata*. Unpublished manuscript.

> *This is a user's guide for the user-written command* `coefplot` *which allows for a more effective presentation of regression coefficients.*

Williams, R. (2012). Using the margins command to estimate and interpret adjusted predictions and marginal effects. *The Stata Journal, 12,* 308-331.

> *This article provides an overview of the extremely useful suite of* `margins` *commands, which allow for the estimation of a host of predicted values including conditional effects and predicted probabilities. In addition, the* `marginsplot` *command allows you to easily graph the results produced by* `margins`*.*

For next time: **Assignment #6**: Run a regression model and plot the results using the `coefplot` user-written command. Run another regression model with an interaction term and then plot the results using the `margins` and `marginsplot` commands.

For next time: **Class Presentations (4/17-4/24)**