PSC 8124: Multilevel Modeling
Department of Political Science ● George Washington University
Fall 2020 ● Mondays, 6:10 – 8:00pm

Professor Brandon Bartels
Classes held live via Blackboard Collaborate
Office: Monroe 478
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Office hours: Tuesdays and Thursdays, 2:00-3:30 (or by appt.), Google Chat and Meet

COURSE DESCRIPTION
The primary goal of the course is to highlight the core theoretical and statistical issues that accompany multilevel and hierarchical (aka, “clustered”) data, where observations from one level of analysis are nested within observations from a higher level of analysis (e.g., students nested within schools). The class will (1) emphasize the unique substantive opportunities that accompany multilevel modeling frameworks and (2) introduce and secure an understanding of the range of different models that fall under the multilevel modeling umbrella. We will discuss “classic” types of hierarchical data and also a particular type of longitudinal data, i.e., panel and “time-series cross-sectional” (TSCS) data.

The class will cover topics such as unobserved heterogeneity; complete pooling, partial pooling and no pooling modeling approaches to multilevel data; the random intercept (aka, “random effects”) model; substantive and statistical issues surrounding fixed versus random effects models; cross-level interactions; multilevel modeling applications to time-series cross-sectional and panel data; and beyond.

TEXTBOOKS


RECOMMENDED


Both books are useful as textbooks and applied R and Stata manual of sorts. Note that the third edition of the Rabe-Hesketh and Skrondal book has now been expanded into two volumes. Volume 1 covers continuous dependent variables and Volume 2 covers categorical dependent variables. I am not requiring the third edition, though you are free to purchase that, either through Amazon or Stata Press. Both books are very valuable for future reference.

SOFTWARE
We primarily use Stata, but we will use some R as well. If you don’t have Stata on your computer, it will be available to use for free via the CCAS Cloud. As you all know, R is free.
LEARNING OUTCOMES:
As a result of completing this course, students will:
1. Possess a comprehensive understanding of the methodological issues surrounding multilevel and longitudinal data.
2. Be prudent methodological consumers and practitioners when it comes to interpreting and applying these types of models.
3. Be able to write a paper—using the methods discussed in class—capable of being published in a professional journal.
4. Be able to write a dissertation chapter using the methods discussed in class.

Average amount of direct instruction or guided interaction with the instructor and average minimum amount of independent (out-of-class) learning expected per week
*Remote and hybrid courses*—For remote, online, and hybrid courses, the distribution of direct and independent learning minutes may vary; however, it is expected that courses will include significant synchronous elements, whereby students are engaging with the faculty member either through course discussions or lectures. For each course credit, students are expected to spend a minimum total of 2.5 hours per week of combined direct instruction and independent learning for a total of 37.5 hours in a 15-week semester.

GRADING
1. **Class attendance and participation** (10%): Students are expected to complete all of the assigned readings and to have thought about those readings, to attend each class, and to participate in class sessions.

2. **Problem sets** (50%): There will be four problem sets due throughout the semester.

   Important notes on problem sets:
   - Submit your problem set via Blackboard.
   - Feel free to work with your classmates on the problem sets. Collaboration can be beneficial for mastering the material. However, you must do your own work. That is, while you can work together, the final product that you hand in must be your own work.
   - Preliminary due dates: Oct. 2, Oct. 23, Nov. 13, Dec. 4

3. **Final paper** (40%): There are two options for the final paper: First, you can write a research paper using the skills you have learned throughout the class to analyze and write up results from an empirical analysis using data that you have gathered, downloaded, etc. The paper should also include a brief introduction, a brief characterization of the literature, and a brief section devoted to theory and hypotheses, etc. Importantly, the paper project is intended to give you practice toward mastering the art of writing a research paper, in particular, discussing results and how they relate back to the substantive research question(s), the theory, and hypotheses. I strongly encourage you to think about your research question very early in the semester and to make progress on the paper gradually throughout the semester. If you can write something related to your dissertation or core area of interest, that is ideal, though not completely necessary. Students should touch base with me about their papers—
particularly regarding the data they are interested in analyzing—sometime before the middle of the semester.

Second, students can write a replication paper. This will also be a research paper that reanalyzes an already-published article in a peer-reviewed academic journal. More and more journals are requiring authors to post their data on a public website before their article is published. The American Journal of Political Science has been doing this since 2012. For journals that do not require authors to post their data, many authors make their data available via their websites. In the replication paper, you should think about how you want to reanalyze the paper, what additional analyses you think should be conducted, and how such analyses might make a substantive contribution. While you should seek to replicate what the authors actually did, I want you to go beyond what the authors did and produce additional analyses that you believe are substantively important and interesting and capable of being published on a peer-reviewed journal.

Due date: Designated final exam day.

COURSE OUTLINE

1. Sept. 14: Review of Regression and Limited DVs
   - Gelman and Hill, p. 79-85, 104, 118-119

2. Sept. 21: Multilevel Fundamentals: Partial Pooling and Cluster Confounding
   - Gelman and Hill, p. 237-241, 244-262, 477-478.

3. Sept. 28: Group Level Variation, including Multilevel Regression with Poststratification (MRP)
   - Gelman and Hill, pp. 265-76.

4. Oct. 5: Multilevel Modeling Unleashed: Varying Intercepts and Slopes
   - Gelman and Hill, pp. 279-97.
- Additional readings TBA.

5. **Oct. 12: Issues and Diagnostics**
- Gelman and Hill, Ch. 24

6. **Oct. 19: Difference in Differences**
- Angrist and Pischke, Section 5.2.

- Julia A Payson. Cities in the statehouse: How local governments use lobbyists to secure state funding. The Journal of Politics, 2018

8. **Nov. 2: Fixed v. Random Effects II (Panel/TSCS)**
- Kosuke Imai and In Song Kim. On the use of two-way fixed effects regression models for causal inference with panel data. 2018 **Skim p. 1-8; This mostly reviews their AJPS article**
• Applications TBA

9. **Nov. 9: Dynamics I (Panel/TSCS)**
   - Angrist and Pischke. Section 5.3, 5.4

10. **Nov. 16: Dynamics II (Panel/TSCS)**
   - Additional applications TBA

11. **Nov. 23: Dynamics III (Duration/Event History Modeling)**
    - Readings TBA

12. **Nov. 30: Generalized Synthetic Control and Matching Applications to TSCS**

13. **Dec. 7: Catch-up Day, Discussion of Papers, etc.**
UNIVERSITY POLICIES

Use of Electronic Course Materials and Class Recordings
This course/lecture may be audio/video recorded. The recording will be made available to students in this class. As part of your participation in this course, you may be recorded. If you do not wish to be recorded, please contact the GW Privacy Office (privacy@gwu.edu) the first week of class (or as soon as you enroll in the course, whichever is latest) with your privacy concern.

Students are encouraged to use electronic course materials, including recorded class sessions, for private personal use in connection with their academic program of study. Electronic course materials and recorded class sessions should not be shared or used for non-course related purposes unless express permission has been granted by the instructor. Students who impermissibly share any electronic course materials are subject to discipline under the Student Code of Conduct. Please contact the instructor if you have questions regarding what constitutes permissible or impermissible use of electronic course materials and/or recorded class sessions. Please contact Disability Support Services at disabilitysupport.gwu.edu if you have questions or need assistance in accessing electronic course materials.

Please observe the following rules of “netiquette” for communicating online:

- Remain professional, respectful, and courteous at all times.
- Remember that a real human being wrote each post and will read what you write in response. It is easy to misinterpret discussion posts. Let’s give the benefit of the doubt.
- If you have a strong opinion on a topic, it is acceptable to express it as long as it is not phrased as an attack. Please be gracious with differing opinions.
- When upset, wait a day or two prior to posting. Messages posted or emailed in anger are often regretted later.
- Proofread and use the spell check tool when you type a post. It makes the post easier to read and helps your readers understand what you are saying.
- I reserve the right to delete any post that is deemed inappropriate for the discussion forum, blog, or wiki without prior notification to the student. This includes any post containing language that is offensive, rude, profane, racist, or hateful. Posts that are seriously off-topic or serve no purpose other than to vent frustration will also be removed. For information on how to interact effectively and constructively with course colleagues, please consult Engaging in an Online Course.

Academic Integrity Code
Academic Integrity is an integral part of the educational process, and GW takes these matters very seriously. Violations of academic integrity occur when students fail to cite research sources properly, engage in unauthorized collaboration, falsify data, and in other ways outlined in the Code of Academic Integrity. Students accused of academic integrity violations should contact the Office of Academic Integrity to learn more about their rights and options in the process. Outcomes can range from failure of assignment to expulsion from the University, including a transcript notation. The Office of Academic Integrity maintains a permanent record of the violation.
More information is available from the Office of Academic Integrity at studentconduct.gwu.edu/academic-integrity. The University’s “Guide of Academic Integrity in Online Learning Environments” is available at studentconduct.gwu.edu/guide-academic-integrity-online-learning-environments. Contact information: rights@gwu.edu or 202-994-6757.

University policy on observance of religious holidays
In accordance with University policy, students should notify faculty during the first week of the semester of their intention to be absent from class on their day(s) of religious observance. For details and policy, see “Religious Holidays” at provost.gwu.edu/policies-procedures-and-guidelines

Support for students outside the classroom

Virtual academic support
A full range of academic support is offered virtually in fall 2020. See coronavirus.gwu.edu/top-faqs for updates.

Tutoring and course review sessions are offered through Academic Commons in an online format. See academiccommons.gwu.edu/tutoring

Writing and research consultations are available online. See academiccommons.gwu.edu/writing-research-help

Coaching, offered through the Office of Student Success, is available in a virtual format. See studentsuccess.gwu.edu/academic-program-support

Academic Commons offers several short videos addressing different virtual learning strategies for the unique circumstances of the fall 2020 semester. See academiccommons.gwu.edu/study-skills. They also offer a variety of live virtual workshops to equip students with the tools they need to succeed in a virtual environment. See tinyurl.com/gw-virtual-learning

Writing Center
GW’s Writing Center cultivates confident writers in the University community by facilitating collaborative, critical, and inclusive conversations at all stages of the writing process. Working alongside peer mentors, writers develop strategies to write independently in academic and public settings. Appointments can be booked online. See gwu.mywconline.

Academic Commons
Academic Commons provides tutoring and other academic support resources to students in many courses. Students can schedule virtual one-on-one appointments or attend virtual drop-in sessions. Students may schedule an appointment, review the tutoring schedule, access other academic support resources, or obtain assistance at academiccommons.gwu.edu.
Disability Support Services (DSS) 202-994-8250
Any student who may need an accommodation based on the potential impact of a disability should contact Disability Support Services to establish eligibility and to coordinate reasonable accommodations. disabilitysupport.gwu.edu

Counseling and Psychological Services 202-994-5300
GW’s Colonial Health Center offers counseling and psychological services, supporting mental health and personal development by collaborating directly with students to overcome challenges and difficulties that may interfere with academic, emotional, and personal success. healthcenter.gwu.edu/counseling-and-psychological-services

Safety and Security
- In an emergency: call GWPD 202-994-6111 or 911
- For situation-specific actions: review the Emergency Response Handbook at safety.gwu.edu/emergency-response-handbook
- In an active violence situation: Get Out, Hide Out, or Take Out. See go.gwu.edu/shooterpre
- Stay informed: safety.gwu.edu/stay-informed