PUBL 611: Causal Inference for Program Evaluation
Tuesday 4:30 – 7 pm
ILSB 116a/Blackboard Collaborate

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OVERVIEW AND COURSE OBJECTIVES

A central goal of evaluation and policy research is estimating the causal effect of an intervention, program, or policy change on behaviors and outcomes. Often a randomized experiment can provide the best causal evidence, but in many policy contexts experiments are infeasible or unethical, and alternative research designs and analytic strategies can be employed to address causal questions.

This course provides instruction and practice in research designs and analytic strategies that are commonly employed to address causal questions in evaluation and policy research such as propensity score matching, instrumental variable, regression discontinuity, difference-in-differences, and others. We consider the underlying logic of each method, how and when to apply them to a policy research question, model assumptions and how they can be tested, and data requirements and limitations. Students will learn from illustrative examples and workshops using data and Stata statistical software.

LEARNING OBJECTIVES

Upon completion of this course, students will be able to:
- Understand the potential pathways framework for causal inference
- Assess the appropriateness of quasi-experimental research designs and analytic strategies
- Apply different research designs and analytic strategies to estimate specific causal relationships
- Test the validity of assumptions of quasi-experimental models
- Interpret results
- Communicate methods and results to a policy audience

PREREQUISITES
Students should have prior experience with regression analysis and statistical software (preferably Stata). PUBL 600 (Research Methods) and PUBL 604 (Statistical Analysis) are required.

TEXTBOOKS

Angrist, J.D. and Pischke, J.S. (2015). *Mastering Metrics: The Path from Cause to Effect*. Princeton University Press.

Murnane, R.J. and Willett, J.B. (2011). *Methods Matter: Improving Causal Inference in Educational and Social Science Research*. Oxford University Press.

SOFTWARE – *Stata 16 (earlier versions ok)*
Free download for UMBC students at https://wiki.umbc.edu/display/faq/Stata.

REQUIREMENTS

1. Complete training for human subjects Social/Behavioral Research Course (10 points)
Take the course at: http://research.umbc.edu/human-subjects-use-training-2/

2. Data projects (5 x 30 points each)
Each project will be workshopped in class. Projects are due via BB at the beginning of class. No late projects are accepted (ever).

Data for projects can be downloaded here:
https://stats.idre.ucla.edu/other/examples/methods-matter/

3. Take-home Exam (60 points)
Take-home exam will test mastery of theory and execution of research models, statistical terms, foundational statistical tools, and interpretation of results.

Pass/fail registration is not permitted in this course.

ACADEMIC INTEGRITY

Students are strongly encouraged to work together on all assignments. You must turn in original work that is your own. You will not receive credit for projects or exams that are identical to another student's work. If you use outside sources, you must cite them.

For more information on UMBC policies regarding academic integrity:
http://oue.umbc.edu/home/home/academic-integrity/

READINGS AND ASSIGNMENTS

Week 1 – September 1: Introduction to Causal Inference

Shadish, Cook, and Campbell – Chapter 1 (BB)
Murname & Willett – Chapter 2-3
Angrist & Pischke – Chapter 1

- ✓ Install STATA
- ✓ Complete human subjects training

Week 2 – September 8: Regression Analysis and Omitted Variable Bias

Angrist & Pischke – Chapter 2

Dale, Stacy Berg and Krueger, Alan (2002). Estimating the payoff to attending a more selective college: An application of selection on observables and unobservables." *Quarterly Journal of Economics*, 117(4), 1491-1527.

Week 3 – September 15: Regression with Experimental Data

Murnane & Willett – Read Chapter 4, Skim Chapters 5-6

Howell, W., Wolf, P., Campbell, D., & Peterson, P. (2002). School Vouchers and Academic Performance: Results from Three Randomized Field Trials. *Journal of Policy Analysis and Management, 21*(2), 191-217.

Week 4 - September 22: Regression with Clustered Randomized Data

Murnane & Willett – Chapter 7

Borman, G.D. et al (2005). Success for all: First-year results from the national randomized field trial. *Educational Evaluation and Policy Analysis*, 27(1), 1-22.

Week 5 – September 29: Workshop 1 – Fixed and Random Effects

- ✓ Workshop Project 1 – Murnane & Willett Chapter 7

Week 6: - October 6: Natural Experiments (Difference-in-Differences & Interrupted Time Series)

- ✓ Project 1 due

Murnane & Willett – Chapter 8
Angrist & Pischke – Chapter 5
Carpenter, C., & Dobkin, C. (2011). The Minimum Legal Drinking Age and Public Health. *The Journal of Economic Perspectives, 25*(2), 133-156.

Week 7 – October 13: Workshop 2 – Difference in Differences

  ✓ Workshop Project 2 – Murnane & Willett Chapter 8

Week 8 - October 20: Regression Discontinuity

  ✓ Project 2 due

Murnane & Willett – Chapter 9
Angrist & Pischke – Chapter 4
Carpenter, C., & Dobkin, C. (2009). The Effect of Alcohol Consumption on Mortality: Regression Discontinuity Evidence from the Minimum Drinking Age. *American Economic Journal: Applied Economics, 1*(1), 164-182.

Week 9 – October 27: Workshop 3 – Regression Discontinuity

  ✓ Workshop Project 3 – Murnane & Willett Chapter 9

Week 10 – November 3: Instrumental Variables

  ✓ Vote!
  ✓ Project 3 due

Murnane & Willett – Chapter 10-11
Angrist & Pischke – Chapter 3

Dee, T. (2004). Are there civic returns to education? *Journal of Public Economics*, 88(9-10), 1697-1720.

Angrist, J., Dynarski, S., Kane, T., Pathak, P., & Walters, C. (2012). Who Benefits from Kipp? *Journal of Policy Analysis and Management, 31*(4), 837-860.

Week 11 – November 10: Workshop 4 – Instrumental Variables

  ✓ Workshop Project 4 – Murnane & Willett Chapter 10

Week 12 – November 17: Propensity Score & Other Matching Techniques

  ✓ Project 4 due

Murnane & Willett: Chapter 12

Almond, D., Chay, K.Y., Lee, D.S., 2005. The costs of low birth weight, *Quarterly Journal of Economics,* 120, 1031-1083.

Week 13 – November 24: Workshop 5 – Propensity Scores

- ✓ Workshop Project 5 – Murnane & Willett Chapter 12

Week 14 – December 1

- ✓ Workshop 5 due
- ✓ Final Exam Distributed

Week 15 – December 8

- ✓ Final Exam Due