

# Issues in International Relations Research

*What?* POLI791, University of South Carolina, Fall 2015

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*When and where?* Thursdays, 6.00-8.45p, GAMB130.

## Outline

If you open an article in a top journal nowadays, you'll encounter discussions about inferential issues that are quite different from their counterparts a decade ago. The menu of options of how to tackle such issues has expanded a lot. The implied answer of the question raised by an alumnus of the estimable London School of Economics,

What can a poor boy do except to sing for a rock 'n' roll band?,

is not (entirely) satisfying if the goal is to contribute to scientific knowledge. This course aims to provide some remedial actions. The goal is to think through problems that scholars of political science in general and of International Relations (IR) in particular routinely face, and what some of the remedies are. For example, scholars consider what the effects of unobserved heterogeneity and correlations within the data are; how one should think properly about what the statistical estimates mean; whether use of limited estimators biases or obscures, important other aspects of substantive interest; and what the implications for the data analyses are as we increasingly take theory more seriously. We'll deal with all these and more.

The class *will not* and *not* offer comprehensive treatments of each; rather, you will be introduced to many and via in-class labs will learn how to use several. If you participate actively and take this course *very* seriously, you will

- become (more) mindful of inferential issues that are front and center in cutting edge research;
- acquire the skills to perform basic variants of very advanced statistical methods that address inferential issues;
- become a better consumer of technical aspects of research;
- increase your fluency in *R*.

## Required material

We will focus on original material published in journals; no books necessary per se. However, access to standard econometrics, *R*, and statistics books is self-recommending.

The entire course will revolve around *R* and LaTeX as the pieces of software to carry out analyses and write up output, respectively. RStudio is the recommended GUI for *R*.

## Expectations

Lest this is not perfectly clear: Unless you participate actively and take every aspect *very* seriously, you will fail to learn the material, and thus by the end will not have acquired the skills to conduct the inferential part of modern social science research. It is the expectation that, if you take this course, that you will immerse yourself in it.

“Immerse yourself”? It means that you carefully read the assigned article. Not skim, but carefully, and probably twice. Immediately raise points that are not clear, devote numerous hours to the work and consult with instructor. It ought to go without saying that you should be in class on time and every time.

The instructor is here to help you learn the material—make use of him. That said, for many, many, many problems you will encounter (in particular with R and LaTeX), you will trivially find the answer through a simple search on the internet. Do this, please, before you consult me. After all, learning efficient self-help on these matters will save many headaches in the future.

## Grading, Rules, etc.

There are three graded contributions to your grade. Each will be graded on a 0–100 scale, and the final grade is simply the weighted average.

First, attendance and participation are crucial. We will spend a third to 40% of our class time in lab mode working through code and trying to get analyses to work. Collaboration will be important on this; therefore, the grade receives the non-trivial weight of 2.

Second, by the last day of class, a full-length paper is due. That is, one that has all the proper ingredients, such as introduction, pitch, literature review, theory, analysis, and conclusion. It ought to have all of these. It is absolutely okay to use an existing frontend as the bulk of the grade will stem from the analysis. Whatever your hypothesis is, you have to apply *three* different advanced analysis techniques, approaches, or methods that we learned in class to test it. If you hypothesize that as X goes up, Y goes up, then introduce and justify the use of three approach to test this. This receives a weight of 5.

Third, you alongside one or two classmates will write a primer on one of the approaches we cover. This has to cover the history of the approach (from biostats? from geography? how did it get into poli sci?), give an overview of the basics, and assemble and review ten studies that use the approach (what are the authors’ justifications? what are variants?). As this is complicated for sure, this primer will come about in stages. Three weeks before the class covering the approach: hand in a first draft of the primer in class and meet with me. Two weeks before: hand in the edited draft of the primer. One week before: hand in the final, edited version of the primer that then gets circulated among the entire class. This gets a weight of 5.

I will use the following grading scale to map between percentages and letter grades. A 92-100, B+ 87-91, B 80-86, C+ 77-79, C 70-76, D+ 67-69, D 60-66, and F 0-59. The standard rules of rounding are applied. The University of South Carolina Honor Code applies.

Reasonable accommodations are available for students with a documented disability. If you have a disability and may need accommodations to fully participate in this class, contact the Office of Student Disability Services: 777-6142, TDD 777-6744, email [sasds@mailbox.sc.edu](mailto:sasds@mailbox.sc.edu),

or stop by LeConte College Room 112A. All accommodations must be approved through the Office of Student Disability Services.

## Course schedule

This is a rough schedule of the sequence of what will be covered in class. The instructor will most probably amend things quite a bit. So, always check what will be next.

### Week 1: 'Howdy' and more.

*Read:* Arena & Joyce (2015) (PDFs on Blackboard), Clarke (2001), Leamer (1983), Leamer (1985), and Signorino & Yilmaz (2003).

### Weeks 2 through 4: Nuisances or substance?

*Read:* Erikson, Pinto & Rader (2010), Erikson, Pinto & Rader (2014), Cranmer & Desmarais (2011), Cranmer, Desmarais & Menninga (2012), Clark & Linzer (2015),<sup>1</sup> Cranmer, Desmarais & Kirkland (2012), Harden (2011), Carter & Signorino (2010), and Traunmüller, Murr & Gill (2015). And read in this order: Green, Kim & Yoon (2001), King (2001), and Beck & Katz (2001).

### Weeks 5 and 6: Proper counterfactuals

*Read:* Reed & Chiba (2010), Holland (1986), Sekhon (2009), King & Zeng (2006), Eggers & Hainmueller (2009), Ho, Imai, King & Stuart (2007), and Iacus, King & Porro (2011).

### Weeks 7 and 8: With help from variation from elsewhere

*Read:* Dunning (2008), Miguel, Satyanath & Sergenti (2004), Sovey & Green (2011), Feyrer & Sacerdote (2009), Angrist, Imbens & Rubin (1996), and Conley, Hansen & Rossi (2012).

### Weeks 9 and 10: Taking theory seriously

*Read:* Signorino (1999), Clinton, Jackman & Rivers (2004), Signorino & Yilmaz (2003), Signorino & Tarar (2006), Randazzo (2008), Whang (2010), and Bas, Signorino & Walker (2008).

### Weeks 11 through 13: Rise of the machines

*Read:* Varian (2014), Beck & Jackman (1998), Imai & Tingley (2012), Hill (2011), Chipman, George & McCulloch (2010), Hainmueller & Hazlett (2014), Green & Kern (2012), chapter on penalized regression, and Kenkel & Signorino (2013).

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<sup>1</sup> Available on Clark's website, <http://bit.ly/1gtfadX>.

Week 14 (maybe): It's ABC, not DEFGHI ...

Read: TBA.

## References

- Angrist, Joshua D, Guido W Imbens & Donald B Rubin. 1996. "Identification of causal effects using instrumental variables." *Journal of the American statistical Association* 91(434):444–455.
- Arena, Philip & Kyle A Joyce. 2015. "Challenges to Inference in the Study of Crisis Bargaining." *Political Science Research and Methods* pp. 1–19.
- Bas, Muhammet Ali, Curtis S Signorino & Robert W Walker. 2008. "Statistical backwards induction: A simple method for estimating recursive strategic models." *Political Analysis* 16(1):21–40.
- Beck, Nathaniel & Jonathan N Katz. 2001. "Throwing out the baby with the bath water: A comment on Green, Kim, and Yoon." *International Organization* 55(2):487–495.
- Beck, Nathaniel & Simon Jackman. 1998. "Beyond linearity by default: Generalized additive models." *American Journal of Political Science* 42(2):596–627.
- Carter, David B & Curtis S Signorino. 2010. "Back to the future: Modeling time dependence in binary data." *Political Analysis* 18(3):mpq013.
- Chipman, Hugh A, Edward I George & Robert E McCulloch. 2010. "BART: Bayesian additive regression trees." *The Annals of Applied Statistics* 4(1):266–298.
- Clark, Tom S & Drew A Linzer. 2015. "Should I use fixed or random effects?" *Political Science Research and Methods* 3(2):399–408.
- Clarke, Kevin A. 2001. "Testing nonnested models of international relations: Reevaluating realism." *American Journal of Political Science* 45(3):724–744.
- Clinton, Joshua, Simon Jackman & Douglas Rivers. 2004. "The statistical analysis of roll call data." *American Political Science Review* 98(2):355–370.
- Conley, Timothy G, Christian B Hansen & Peter E Rossi. 2012. "Plausibly exogenous." *Review of Economics and Statistics* 94(1):260–272.
- Cranmer, Skyler J & Bruce A Desmarais. 2011. "Inferential network analysis with exponential random graph models." *Political Analysis* 19(1):66–86.
- Cranmer, Skyler J, Bruce A Desmarais & Elizabeth J Menninga. 2012. "Complex dependencies in the alliance network." *Conflict Management and Peace Science* 29(3):279–313.
- Cranmer, Skyler J, Bruce A Desmarais & Justin H Kirkland. 2012. "Toward a network theory of alliance formation." *International Interactions* 38(3):295–324.

- Dunning, Thad. 2008. "Model specification in instrumental-variables regression." *Political Analysis* 16(3):290–302.
- Eggers, Andrew C & Jens Hainmueller. 2009. "MPs for sale? Returns to office in postwar British politics." *American Political Science Review* 103(04):513–533.
- Erikson, Robert S, Pablo M Pinto & Kelly T Rader. 2010. "Randomization tests and multi-level data in US state politics." *State Politics & Policy Quarterly* 10(2):180–198.
- Erikson, Robert S, Pablo M Pinto & Kelly T Rader. 2014. "Dyadic Analysis in International Relations: A Cautionary Tale." *Political Analysis* 22(4):457–463.
- Feyrer, James & Bruce Sacerdote. 2009. "Colonialism and modern income: islands as natural experiments." *The Review of Economics and Statistics* 91(2):245–262.
- Green, Donald P & Holger L Kern. 2012. "Modeling heterogeneous treatment effects in survey experiments with Bayesian additive regression trees." *Public Opinion Quarterly* 76(3):491–511.
- Green, Donald P, Soo Yeon Kim & David H Yoon. 2001. "Dirty pool." *International Organization* 55(2):441–468.
- Hainmueller, Jens & Chad Hazlett. 2014. "Kernel regularized least squares: Reducing misspecification bias with a flexible and interpretable machine learning approach." *Political Analysis* 22(2):143–168.
- Harden, Jeffrey J. 2011. "A bootstrap method for conducting statistical inference with clustered data." *State Politics & Policy Quarterly* 11(2):223–246.
- Hill, Jennifer L. 2011. "Bayesian nonparametric modeling for causal inference." *Journal of Computational and Graphical Statistics* 20(1):217–240.
- Ho, Daniel E, Kosuke Imai, Gary King & Elizabeth A Stuart. 2007. "Matching as nonparametric preprocessing for reducing model dependence in parametric causal inference." *Political analysis* 15(3):199–236.
- Holland, Paul W. 1986. "Statistics and causal inference." *Journal of the American statistical Association* 81(396):945–960.
- Iacus, Stefano M, Gary King & Giuseppe Porro. 2011. "Causal inference without balance checking: Coarsened exact matching." *Political analysis* 30(1):1–24.
- Imai, Kosuke & Dustin Tingley. 2012. "A statistical method for empirical testing of competing theories." *American Journal of Political Science* 56(1):218–236.
- Kenkel, Brenton & Curtis S Signorino. 2013. available on Polmeth paper repository.
- King, Gary. 2001. "Proper nouns and methodological propriety: Pooling dyads in international relations data." *International Organization* 55(2):497–507.
- King, Gary & Langche Zeng. 2006. "The dangers of extreme counterfactuals." *Political Analysis* 14(2):131–159.

- Leamer, Edward E. 1983. "Let's take the con out of econometrics." *The American Economic Review* 73(1):31–43.
- Leamer, Edward E. 1985. "Sensitivity analyses would help." *The American Economic Review* 75(3):308–313.
- Miguel, Edward, Shanker Satyanath & Ernest Sergenti. 2004. "Economic shocks and civil conflict: An instrumental variables approach." *Journal of political Economy* 112(4):725–753.
- Randazzo, Kirk A. 2008. "Strategic anticipation and the hierarchy of justice in US district courts." *American Politics Research* 36(5):669–693.
- Reed, William & Daina Chiba. 2010. "Decomposing the relationship between contiguity and militarized conflict." *American Journal of Political Science* 54(1):61–73.
- Sekhon, Jasjeet S. 2009. "Opiates for the matches: Matching methods for causal inference." *Annual Review of Political Science* 12:487–508.
- Signorino, Curtis S. 1999. "Strategic interaction and the statistical analysis of international conflict." *American Political Science Review* 93(2):279–297.
- Signorino, Curtis S & Ahmer Tarar. 2006. "A unified theory and test of extended immediate deterrence." *American Journal of Political Science* 50(3):586–605.
- Signorino, Curtis S & Kuzey Yilmaz. 2003. "Strategic misspecification in regression models." *American Journal of Political Science* 47(3):551–566.
- Sovey, Allison J & Donald P Green. 2011. "Instrumental variables estimation in political science: A readers guide." *American Journal of Political Science* 55(1):188–200.
- Trautmüller, Richard, Andreas Murr & Jeff Gill. 2015. "Modeling Latent Information in Voting Data with Dirichlet Process Priors." *Political Analysis* 23(1):1–20.
- Varian, Hal R. 2014. "Big data: New tricks for econometrics." *The Journal of Economic Perspectives* 28(2):3–27.
- Whang, Taehee. 2010. "Empirical implications of signaling models: Estimation of belief updating in international crisis bargaining." *Political Analysis* 18(3):mpq014.