The Political Methodologist

Newsletter of the Political Methodology Section
American Political Science Association
Volume 11, Number 1, Fall, 2002

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Notes From the Editor

This issue of *TPM* includes the usual assortment of contributions on teaching, research, and section news and also melds perspectives from formal and qualitative methods with the typical focus on quantitative methods. In particular, Colin Elman, David Collier, and Henry E. Brady present a portion of the petition to form a new APSA organized section on Qualitivate Methodology. The section's plans complement and coordinate with the Political Methodology Section. With a more formal bent, the articles continue last spring's attention to EITM, with perspectives on the first summer program on the empirical implications of theoretical models from John Aldrich and from four student attendees from different graduate programs and at varying stages of their graduate career. Students offer their wisdom on combining formal and empirical work for those considering applying to attend future summer programs and discuss the strengths of the program for one's graduate career and beyond. On the more familiar empirical side of things, Jonathan Wand offers his suggestions for presenting simulation results. With increasing computing power, more sophisticated estimators, and advances in agent-based modeling comes increasing recourse to computer simulations. Often the simulations leave the analyst with pages and pages of

computer output, unclear how to present a wealth of information in a cogent and convincing way. Jonathan's contribution highlights the use of simulations to evaluate inferences when assumptions are violated, as applied to the effects of instrumental variable regressions involving incumbent spending. Future issues will continue to feature creative ways to present statistical results.

The teaching section includes both faculty and student reviews of John Fox's *Applied Regression Analysis* text, as well as the companion guide for R/S-Plus. Also on teaching, this issue includes an innovative alternative to the final paper and/or exam from Fred Boehmke. In the "LaTeX Corner", Jeff Gill provides tips to current LaTeX users make you a better LaTeX user. Section news includes announcements of recent section awards, information on the 2003 summer methods meetings, and a call for a new web master.

Thanks to all who contributed to this issue. Please contact me with your suggestions and ideas for future issues of *TPM*. I'd particularly like to hear from you if you have unique (and successful!) assignments for stats classes that you would like to share with readers.

Suzanna De Boef

Graduate Teaching Options

Teaching Advanced Graduate Methods: Using Poster Sessions

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In the Fall of 2001 I taught my first advanced graduate methods class. At the end of the semester I had the students present their research projects to our entire department in a poster session format. Since this is a relatively uncommon experience for most political science graduate students outside of conferences, I want to report the results of our experience with this format and to encourage others to experiment with it. This decision is based largely on our positive experiences and the enthusiastic comments I received from colleagues and students who attended. In this summary I relay our experience with a poster session, make some suggestions about logistical details that arose and discuss some of the strengths of using a poster session for summarizing research projects. First, though, I'll provide a quick overview of the class and the thought process that led me to the poster session format.

The plan of the class was straightforward: introduce our graduate students to many different quantitative methods being used today to advance our understanding of politics. We spent an average of two weeks on each topic, during which we would read a combination of methodological and empirical papers on each. Class time was split into lectures that were devoted to developing a theoretical understanding of each method and computer lab sessions that were devoted to learning how to implement the method on real data. The students were assigned bi-weekly homework that asked them to perform a variety of computer simulations for each topic, through which they learned how to generate data, estimate the correct model and what happens when an incorrect model is estimated. Some of the topics we covered included discrete choice analysis, duration analysis, dealing with missing data, selection bias and monte carlo simulation. Structuring the course in this way gave the students a chance to encounter many methods and then focus on the one(s) that were required for their research.

The students were expected to write a paper over the course of the semester, in which they were to apply an appropriate methodology to their research interests. As the semester progressed, I had each student talk about the substantive focus of their paper and what methodological issues they anticipated confronting. At the beginning of the class I envisioned each student doing a conference-style presentation to the class for 15-25 minutes, followed by a Q&A period. Realizing that with 10 students, this would take up almost two weeks of class time, I began to consider other options.

I decided to have the students present their work to the entire department in a poster session format. I think this was a very useful experience for the students and for their colleagues. It also offers many potential advantages over the traditional paper format that I originally intended to follow. I therefore plan to continue this method of allowing students to present their work next time I teach the class and recommend it to others as well. Based on our experience, there are a few important issues to consider in advance.

First, find an appropriate time to schedule your poster session. The end of the semester is beneficial for the students since they have more time to prepare, but remember that this also is when they and their colleagues take and give exams. The more people that are able to attend, the greater the benefit to the participants. I settled on the last week of classes to allow time for preparation and to give colleagues a chance to attend. I scheduled the poster presentation as a special session of our departmental workshop series and invited everyone in the department to attend. To encourage broad attendance, I recommend the session over a longer period of time (at least one hour, but preferably two) so people can come and go as their schedules permits. Also, it doesn't hurt to offer some refreshments or snacks (a.k.a. bribes).

Second, it is important to find a location with enough room to set up the posters and allow ample space for circulation. While it is relatively easy to envision how much room the posters themselves require, keep in mind that there may be three or four times as many people in the room once the audience arrives. Provide enough space around each poster so that a few people can comfortably view and discuss it. For our session, I reserved a large common area in our building that was convenient enough for anyone to just stop by.

Third, you will need some boards for the posters to be displayed on. Conferences typically provide 8' by 4' cork boards that students can mount their posters on, but these may be harder to come by or may be too large in this case. Instead of these boards we used smaller easels that the students could place a pre-mounted poster on. Since there are no concerns about travelling with large, pre-assembled presentations, the students could arrange their posters on 3' by 5' poster board in advance and then just place them on the stands. It's best to be flexible and creative on this front — my suggestion is to contact your school's Facility Services department and see what they have (a big thanks goes to the departmental staff for helping me solve this problem).

Even after you solve the logistical problems, you will most likely be faced with a bunch of graduate students who have no idea what you want them to do! Many students are not familiar with the poster session format, so some guidance may be required. I offered the following requirements: 1) use only eight to ten slides; 2) include a statement of the basic research question 3) explain the methodological approach being used and and why it is appropriate; 4) summarize the findings; 5) prepare a graphical interpretation of the results. A few online resources also make suggestions about fonts, layout, color, etc. The best one that I found is "Do's and Don'ts of Poster Presentation" by Steven M. Block (1996), which is available on the web at `http://www.biophysics.org/btol/img/Block.pdf`. Another useful resource is available from Jeff Radel at `http://www.kumc.edu/SAH/OTEd/jradel/Poster\_Presentations/PstrStart.html`.

The poster session format has many advantages for everyone involved. First, it forces the students to distill their research question and findings into their essential components. Second, it compresses all the research presentations into a two-hour time period (the value of which may depend on the size of the class). Third, the short time period and open format means that one can invite the entire department to stop by at their leisure to view and comment on the posters. Many of the participants reported that this was one of the more advantageous aspects of the format. Fourth, it provides good practice for future conference participation, especially since many students' first experience with conference presentation is via the poster format. One could even require the students to submit their poster to an upcoming conference.

Overall, the quality of the posters was quite excellent. They were all at least as good as the average poster at political science conferences in both presentation and content. Turnout from other members of the department was high and everyone who attended was highly supportive of the endeavor. As a final incentive to attend and explore all the posters, I decided to offer a prize (a copy of Greene's *Econometric Analysis*) for the best one and asked faculty attendees to cast their vote. The winning poster was "A Tool of the Rules? Committee Gatekeeping in the U.S. House" by Megan Shannon.

Based on my experience last year, I plan to continue the poster format as a part of my advanced methods class. Of course, there is no reason to limit this format to methods classes, but given their reliance on tabular and graphical presentation, methods classes may be particularly conducive to poster presentations.

References

Block, Steven M. 1996. "Do's and Don'ts of Poster Presentation." Biophysical Journal 71(6): 3257-3259.

Review of John Fox's *Applied Regression Analysis, Linear Models, and Related Methods*

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Applied Regression Analysis, Linear Models, and Related Methods. by John Fox (Sage: Thousands Oaks: Ca, 1997; 597pp; $79.95. ISBN: 080394540x.)

The textbook typically chosen for a political science graduate course tends to be an introductory econometrics text, with an emphasis on applications to economics. This book is written by a sociologist who also holds a position in a statistics department. The examples used in this book illustrate the relevance of statistics to social sciences beyond economics and are quite different from those one would normally find in an introduction to econometrics text. The structure of the book is more in line with statistical textbooks than books on introductory econometrics. It emphasizes learning statistical theory in combination with data analysis, and makes extensive use of modern visualization techniques. The book has many strong sides and features that make it an attractive choice to social scientists and political scientists.

Rather than starting with the usual one chapter review of statistical concepts before delving into regression analysis, Part I starts with non-parametric data analysis. Fox first shows how a conditional distribution of Y given X can be fitted to observed data. This is followed by an overview of data analysis by graphical methods, and a review of methods for data transformation and their rationale.

Linear regression is then introduced in Part II. With the background from Part I, the actual meaning of what a linear model, $E(Y|x) = \mu$, entails is better put into context. Many texts simply introduce regression by assuming a linear relationship with no introduction. Here, the material in Part I makes the linear regression model come across as less arbitrary, and the ability to approximate linearity through transformations and non-parametric varieties of linear regression is clear to the reader before taking on the effort to work with the theory of linear models.

Part III of the book is devoted to regression diagnostics and a discussion of various problems that may occur in applied regression. This part of the book is particularly strong and raises many issues that are not often covered in much detail in econometrics texts.

Part IV of the book introduces extensions of the linear regression model to limited dependent variables, time series, GLS, and non-parametric regression. It also contains a very useful chapter on bootstrapping and model cross validation.

The book can be read at many different levels. Fox's writing is very clear, and the emphasis on social science examples in the discussion makes it possible to read much of the book without any background in statistics and probability theory. Appendices on statistics and probability theory make the book largely self-contained. At the same time, the book is also theoretically thorough, and takes the reader through the most important proofs. Fox places particular emphasis on understanding the linear regression model geometrically. The geometrical diagrams and interpretations of the linear model are very good, and there are large payoffs for someone who takes time to work through this material. Finally, Fox does a good job of stressing the essential similarities between different models as classes of the general linear model. Looking at estimation equations in matrix notation makes it is easy to see why the estimation equation for limited dependent variables models are essentially the same as for linear regression, but have to be estimated via different procedures since the model is non-linear in the predicted probabilities.

The book is also strong on practical issues in data analysis and model diagnostics. I personally see the issues covered in Part III of this text as more useful for a first regression course in political science than topics in time series which often are covered in extensive detail in many introductory econometrics texts.

Many of the good things in this book rely on matrix algebra, however, and this might ultimately might make it difficult to use the book for many courses. Although it is possible to read a great deal of this book without matrix algebra, this would force the reader to skip parts of the book that contain its strongest sides. Many of the alternatives to this text for a course text, such as Gujarati, do not require any knowledge of matrix algebra.

I like this book a great deal, but whether I would choose it as a text depends on the course. The Fox book would be particularly suitable for a second course where students already have had some prior course in statistics and it is appropriate to go over the linear model in more detail. However, I would find it difficult to use this book in a first course on regression without matrix algebra, and would probably opt for a book that does not presume any knowledge of matrix algebra. At UCSD, for example, we currently have a 10 week first introductory regression course. Since we do not have an introductory course in

probability and statistical inference, we cannot presume any background and have to start from scratch. I have ultimately decided not to use Fox's book in this course, at least for the time being.

One potential selling point of the book is that the examples are generally not drawn from economics, and they can be understood without any background in economic theory. However, the examples that Fox use – such as Duncan's social mobility data – may not be much more familiar to the average political scientist. Much of this is compensated by the availability of the data online, and the author's companion book on R/S-Plus. Using these two books in combination would allow students to get a better understanding of the issues through the use of simulation and graphs, which R and S-Plus are particularly well suited for.

My reservations aside – and they are not really reservations against the text but rather its suitability for teaching – this is a great book which deserves to be widely read. All political scientists should give it serious consideration as a possible text for political science methods courses.

Review of John Fox's *Applied Regression Analysis, Linear Models, and Related Methods and R and S-Plus Companion to Applied Regression*

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Applied Regression Analysis, Linear Models, and Related Methods. by John Fox (Sage: Thousands Oaks: Ca, 1997; 597pp; $79.95. ISBN: 080394540x.)

An R and S-Plus Companion to Applied Regression. by John Fox (Sage: Thousands Oaks: Ca, 2002; 328pp; $39.95. ISBN: 0761922806.)

As graduate students in political science, most of us do not have strong backgrounds in calculus, linear algebra, or math/stat theory. If we do well in our introductory data analysis courses and decide to pursue more advanced methods training, we are all too often discouraged by our first experience with an econometrics text. We find ourselves in a 'Goldilocks-esque' dilemma where "this stats book is too easy but that one is too hard". Unfortunately, texts that are 'just right' have been few and far between.

John Fox's *Applied Regression Analysis, Linear Models, and Related Methods* helps to bridge the divide between introductory and intermediate to advanced methods courses. The book is written in a clear, concise manner and organized in such a way as to help facilitate comprehension of the material. It is important to understand that this is not an introductory text. The author clearly states that a knowledge of applied statistics including basic probability and statistical inference theory is necessary to appreciate the material in this text.

Fox has provided an excellent text book for a second and/or third semester course in a political science methods sequence. *Applied Regression Analysis, Linear Models, and Related Methods* can be used as the primary text for a course dedicated to linear regression and some basic extensions or in combination with a basic econometrics text (Greene, Gujarati, Kennedy) for a more advanced course in regression and maximum likelihood. Over the past two years, I have had the opportunity to use this text in both settings as a student and a teaching assistant. *Applied Regression Analysis* was very well received by nearly every student, regardless of their previous methods training. The fact that this text can be used at several different levels is certainly one of its major strengths.

A student's primary concern with a statistics test generally involves the problem sets at the end of the chapters. Here again, John Fox has done a wonderful service for students and teachers alike. The exercises range from trivial to demanding and are directly linked to specific sections in the text. The organization of the exercises is sometimes clumsy in that the exercises are spread throughout the chapters, rather than grouped at the end, but this is a minor inconvenience. Overall, the exercises thoroughly incorporate the important principals in the chapters. The data analysis questions are particularly useful in this respect. Professor Fox has posted all of the data used in the examples and the exercises on his website, allowing students to replicate his findings and to use real world examples when learning the principles of regression analysis.

Although *Applied Regression Analysis, Linear Models, and Related Methods* is a wonderful teaching/learning tool on its own, its true strength comes from its use in combination with Fox's *R and S-Plus Companion to Applied Regression.* Not only does this combination teach regression in an intuitive, hands-on fashion, but it also provides an excellent introduction to the statistical computing environment R. Helping to move students away

from point-and-click stats packages may well be one of Fox's most important contribution to methods training in the social sciences.

The *R and S-Plus Companion to Applied Regression* is arguably the best introduction to the S language for social science graduate students. As is the case with the *Applied Regression Analysis* text, all data sets used in the *Companion* are available on-line. The *Companion* is loosely organized to follow the text and includes a fabulous index of both subject headings and S language functions. Fox has also included a package of S functions written explicitly to be used in combination with the book.

The *R and S-Plus Companion to Applied Regression* introduces the S language in an accessible, lucid manner. The book begins with the basics, such as data entry and simple manipulations and transformations. The chapters move on to discuss linear regression, regression with dummy variables and interactions, and linear model diagnostics. Later chapters introduce more advanced regression techniques, including GLM's and related diagnostics. The last two chapters include a very useful discussion of graphing and function writing, two of R's most impressive features. Throughout the book, Fox has included an extensive number of clear examples, which students can replicate and modify.

Together, John Fox's *Applied Regression Analysis, Linear Models and Related Methods* and the *R and S-Plus Companion to Applied Regression* have made a fantastic contribution to the world of quantitative social science methodology. I would strongly encourage instructors of introductory and intermediate methods courses to consider *Applied Regression Analysis* as a primary text. For students and professors that have yet to discover the wonders of the S language, the *Companion* is a must read.

Web Based Statistics Books

Recently, Philip Schrodt posted a link to a web-based statistics book. At that time he also asked if anyone else knew of good web sites offering similar resources on the PolMeth listserve. There were several responses we found useful as references that could be recommended to students or used as teaching tools. We also felt that it might be beneficial to compile them into one place so everyone does not have to hunt through archived e-mails to find them. In general, all the sites provide a nice overview of many basic statistical concepts. However, many of the sites go beyond what a general textbook can provide by including interactive graphs and demonstrations. Thank you to all that posted a response to Philip Schrodt's question.

Heather L. Ondercin

- **HyperStat Online Textbook**
  In suggesting this web site Rick Almeidia stated "there is everything an introductory statistics student might need." HyperStat provides information on a wide variety of different topics. But in addition to the basic information, it contains many links to other statistics web sites. Recommended by Rick Almeida, University of Missouri — Columbia.

  `www.davidmlane.com/hyperstat/index.html`

- **The Rice Virtual Lab in Statistics (RVLS)**
  This site provides fun, interactive examples of basic statistical concepts such as regression and goodness of fit. Recommended by Rick Almeida, University of Missouri—Columbia.

  `www.ruf.rice.edu/~lane/rvls.html`

- **Seeing Statistics**
  This web-based book covers material form univariate statistics through regression. The examples are from a range of different disciplines including political science!! The draw back to this web-book is that it requires the user to purchase a copy, compared to the other sites that allow free access. However, this may provide a more effective learning or teaching tool than traditional text books. Recommended by Caroline Tolbert, Kent State University.

  `www.seeingstatistics.com`

- **StatSoft**
  StatSoft starts with very simple statistical concepts but also contains information on more advanced statistical concepts. Recommended by Paul Manna, University of Wisconsin-Madison, who believes one of the nice features of StatSoft is that it can be completely downloaded.

  `http://www.statsoftinc.com/textbook/stathome.html`

- **BMJ Statitistics** at Square One
  This site is clearly written and provides good information on some basic statistical concepts such as confidence intervals and t-test. It also contains a few chapters on more advanced concepts such as duration analysis. The downside to this web site is

that it is designed for those in medicine, thus all the examples are medical in nature. Recommended by Philip Schrodt, Kansas University.

`http://bmj.com/collections/statsbk/`

Doing anything innovative in your methods classes? Share with your colleagues!

TPM is always looking for your ideas, contact Heather Ondercin at hlo114@psu.edu

Empirical Implications on Theoretical Methods (EITM)

EITM

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One of the most exciting developments in Political Science is the National Science Foundation's initiative, called ***Empirical Implications of Theoretical Models*** (EITM). This initiative is due to the ideas and hard work of the Political Science team there, Jim Granato and Frank Scioli. EITM's mandate is deceptively simple: improve our theoretical work so that it yields more testable hypotheses, and improve our methodological work so that testing is made more effective and informative about the theory. It is hard to object to this mandate. It also turns out to be hard to meet it fully. Indeed, within the Foundation, the initiative was met with considerable praise — a rare fate for political science projects there. One reason for this welcome (a welcome backed with financial support) is that the problem of separation between good theorizing and good empirical work is common across the disciplines. In some ways, it may turn out that this discipline may be in one of the strongest, perhaps even unique, positions to act effectively toward achieving high quality EITM. In what follows I briefly report on the current manifestations of the NSF initiative, explain why Political Science may be uniquely well positioned to achieve the mandate, and then indicate some steps that might follow on the heels of what NSF has started, so that the discipline might, in fact, take full advantage of its positioning. Web site locations that may prove useful can be found in the appendix.

In July, 2001, NSF Political Science sponsored a workshop consisting of political scientists and select other social scientists to consider whether there is a problem or series of problems in the relationship between theory and method in the discipline, and if so, how the discipline as a whole might seek to make advances in EITM. The transcript of the proceedings and the report emanating from it can be found at web sites specified in the Appendix. In part based on that workshop, the NSF has, at least so far, created three programs. One set provided support for working groups of scholars that were dealing with topics that fit in with the EITM theme. The newest initiative provided support for graduate students achieving ABD status to design a special program of study to enhance their capabilities in the EITM area. Probably the best known, due to the breadth of scholars involved and their on going application process, are two summer training institutes, both running for four summers. One is at a rotating location, with the first institute held last summer at Harvard, to be followed respectively by summer training institute sessions at the University of Michigan (2003), Duke University (2004), and the University of California, Berkeley (2005). The second is to be held each summer from 2003 to 2006 at the Weidenbaum Center, Washington University, St. Louis. Both last four weeks and attract up to 25 participants. More details on each program can be found at appropriate web sites, and full details can be obtained from NSF. The major point is that this is a wide ranging initiative that can and apparently will affect a large number of political scientists.

Applications for EITM Summer Institutes for 2003

This year, for the first time, both summer institutes will be running. Details on applications for each can be found at their web sites listed in the appendix. They are both welcoming applications from graduate students, especially those having achieved ABD status, and junior faculty, coming from any institution. It is also far more important that the applicant be interested in developing their knowledge in these areas (and willing to work hard for a month in the summer) than it is for the applicant to have any particular skill level. Applications are welcomed for the Institute at the University of Michigan until February 2, 2003, and at Washington University, St. Louis, until February 15. The two institutes also plan to coordinate their application review and acceptance process. The result is that there will be spaces for approximately 50 young scholars this summer. Based on my observations from last summer, the experience will be exciting, intense, and exhausting—it certainly was for the faculty, anyway!

Political Science and EITM

It is generally accepted that there is plenty of room for improvement in relating theoretical implications and empirical testing. The NSF's EITM Report is one vehicle for capturing the flavor of this position as reflected by a number of leading scholars in the field. There are likely as well to be a series of subsequent articles and reports on the topic of the need and, perhaps, the ways to improve EITM in Political Science. As a participant in the original workshop, one surprise to me was to learn that other disciplines I consider more "advanced" in the development of both theory and testing see the divide between the two large and problematic. I therefore turn not to a lament about the state of our discipline, or the state of science generally, or even about why Political Science is worse or better than other disciplines in this regard. That case is being made elsewhere (see for example, Granato and Scioli, forthcoming). I reflect instead a bit on why we may be well positioned to make serious progress, providing a rare instance where Political Science might be a leader in the development of science.

It is much too simple to say that scientific style theorizing in Political Science began at any specific time or place or by any specific individual. An important turning point, however, surely was in 1963, when the Ph.D. program at the University of Rochester was established. Bill Riker was given the opportunity to create a program of his design. The faculty he added to the small existing core, the graduate students they attracted, and the concept of the program he created changed the discipline as significantly as anyone and any program have (for more on the program see: `http://www.rochester.edu:8000/college/PSC/intro/history.php`). The program is remembered for adding rigorous, mathematical, deductive theorizing to the discipline, even though Riker firmly believed in finding non-obvious empirical implications and in testing[1]. It could thus reasonably be said that the dedicated focus on rigorous theorizing is only about 35 years old in this discipline. That is a relatively short period of time, and it is clearly some years less than that in which such formalized derivations have become commonplace throughout the discipline and added to most graduate training programs.

Obviously, conducting empirical investigations, even systematic ones, and even ones that are designed to investigate theoretical propositions, extends further back, at least to the work of Merriam and Gosnell and of Rice in the 1920s, or as far back as Woodrow Wilson (1881). Key, of course, had published a straightforward statistics book for the discipline to train students better (1954). Still, just as Rochester can be said to mark the beginnings of a serious attention to theorizing, the formation of the Society for Political Methodology marks a turning point in the development of rigorous methodology, especially statistical methodology, in the discipline[2]. As with the "Rochester school" Political Methodology has made possible tremendous strides in its selected area of focus since its founding, and it, too, has led to a dramatic increase in the sophistication of the discipline on methodological issues.

It is fair to say that one reason why Political Science may be uniquely well suited to make serious progress on EITM-style concerns is that there is a rough equality between theory and method. Both are reasonably young branches of the discipline, at least in terms of their dramatic turning points. Both have accomplished a great deal since their "founding." Neither, I think it fair to say, argues that its field has yet achieved the results (nor the resulting status) that its adherents hope will be realized. Each retains, in my observation, a great sense of optimism about what it hopes to achieve, and expects to do so in

[1] I can vividly recall Riker coming into the coffee lounge, which also served as graduate hangout, one day in the early 1970s. As was his wont, his discussion of the importance of doing empirical and not solely theoretical work ended up with him pounding vigorously on the table to make that point to us graduate students.

[2] It was my good luck to be invited by Chris Achen to attend the first "meeting" of the society. It was held by a group lounging on the steps in the lobby of the Palmer House Hotel, Chicago, and attending were many of the (then much younger versions of the) past and current leaders in methodology in the discipline.

relatively short order. Perhaps most important, the discipline has recognized each to a roughly equivalent degree. Unlike such disciplines as Economics or Physics, then, theory is not particularly privileged nor had its privilege firmly built into the status and rewards of their discipline. Nor is there a discounting of the value of the search for general statements and an asymmetric valuation of rigorous inductive data analysis in this discipline as there is in some others. In short there is rough equality in the history and, in my opinion, level of rigor and accomplishments, of the two areas, and the discipline recognizes each to a reasonably comparable degree. Neither area, it is important to add, is so deeply institutionalized or historically rooted as to be impermeable to development and change. This rough equality and relative youth therefore makes it at least imaginable that the two topics, even though currently seen as separate fields within the discipline, can be united around the common goal of making general statements that are empirically sustainable[3].

A further and very important reason we may be advantaged compared to others is that all parts of the discipline are reasonably conscious of the epistemology of science and social science, apparently more so than many other disciplines whose scholars seem more eager to get on with their specific work than to reason about its scientific status. Perhaps our sometimes rather self-conscious concern is simply a reflection of the diversity of our discipline. In any event reasonably self-conscious reflection on such questions, combined with the questions themselves being cast in a not very technical way (although particular answers often may be) further makes possible discipline-wide attention and, perhaps, progress.

To conclude, what then would be progress? The current plan so far focuses on the development of ideas, through the support for workshops, and on the development of a training of a small but noticeable portion of young scholars at the graduate student, post-graduate, and early professorial levels, The general notion is that these attack the problem at its most important points. The goal of the latter two types of programs is to develop a core of young, sophisticated EITM'ers who will, one day, become the leaders of the discipline, not unlike the early graduates of Rochester and the early members of the Society for Political Methodology have become current leaders in the discipline.

[3]In fact, the two need to be seen as separate fields from each other, because they rest not only on different goals but on different skills as well. That in no way implies that either is more nor less valuable, that the two fields cannot have common projects, notably EITM, nor that those without expertise in one or the other cannot be engaged deeply in EITM-style projects.

It is also hoped that the training institutions will develop not only a concern for EITM problems and a series of answers, over time, from those trained in those programs, but also the training itself will generate a curriculum, essentially novel to all, designed to be able to be transmitted to the discipline, presumably to be adopted into departmental graduate training. It is precisely the case that EITM will truly have been successful when standard graduate training teaches both a sensitivity to the problems then most pressing in the discipline concerning EITM, and a series of (as yet not developed) techniques designed to integrate empirical investigation with theoretical inquiry. While it may well turn out that the research frontier in EITM will look unusually technical, the discipline will, in fact, be a leader among scientific disciplines, when that collectivity that now broadly recognizes the nature of scientific inquiry recognizes, in turn, EITM as the appropriate ways to conduct that inquiry.

Appendix

The following web sites provide access to more information about EITM.

- NSF Political Science:

  `http://www.nsf.gov/sbe/ses/polisci/start.htm`

- A report from a planning conference held by NSF in July, 2001:

  The Empirical Implications of Theoretical Models Report:

  `http://www.nsf.gov/sbe/ses/polisci/eitmreport.htm`

- transcripts (7/9/01 and 7/10/01) of that EITM Workshop

  `http://www.nsf.gov/sbe/ses/polisci/eitmtrans.htm`

- Harvard's EITM site, useful to see how the initial training workshop, of the four university program was designed:

  `http://www.cbrss.harvard.edu/eitm.htm`

- The next in that series will be held at the University of Michigan, June 15 - July 12, 2003. Contact Prof. Robert Franzese, franzese@umich.edu.

  `http://www.isr.umich.edu/cps/eitm/eitm.html`

- The second NSF sponsored training workshop series are being sponsored by and held at Washington University, at the Weidenbaum Center, 2003-2006. The first will be held, June 2-27, see:

  `http://csab.wustl.edu/eitm/`

References

Granato, Jim and Frank Scioli. Forthcoming. *Puzzles, Proverbs, and Omega Matrices: The Scientific and Social Significance of the Empirical Implications of Theoretical Models (EITM).* unpublished manuscript, Political Science Program, Social, Behavioral and Economics Directorate (SBE), National Science Foundation.

Key, V.O., Jr. 1954. *A Primer of Statistics for Political Scientists.* New York: Thomas Y. Crowell Company

Wilson, Woodrow. 1881. *Congressional Government: A Study in American Society.* Baltimore: Johns Hopkins University Press

Reflections on EITM

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Empirical Implications of Theoretical Models (EITM), a 4-week intensive summer training institute, began in late June 2002 at the Center for Basic Research in Social Sciences at Harvard University. I was one of the two dozen advanced graduate students and junior faculty who were admitted to the program. We flocked to heat-wave-stricken Cambridge, MA from our alma maters throughout the United States, Mexico, and the UK. We all shared broad academic interests in both formal models and the investigation of their empirical implications; in addition, each of us had a project in hand that combined these two elements. Beyond that, we were a diverse group with substantive interests ranging from lobbying in American politics to the initiation of international conflicts to the economic effects of political institutions across democracies. During the breaks, you could hear us chatting not only in English, but also in Spanish, Russian, Chinese, or Slovak - we originally came from 11 countries on 4 continents. Unfortunately, women were heavily underrepresented, with only 4 of us in the predominantly male crowd.

In the beginning, we did not quite know what to expect from the coming four weeks. This was hardly surprising, since EITM was a brand-new program – an experiment for both the organizers and participants. In what follows, I will try to summarize the answers to two basic questions that we were all asking ourselves in the beginning of the program: what is EITM and how much background do we need to get the most out of it? However, those who plan to apply for the future EITMs at Michigan, Berkeley, or Duke are advised to take these answers as only a rough guide to what they should expect to get out of the later-generation programs: based on the ample participant feedback[1] and their own perception of what could be done better, the organizers have already planned several changes for the future programs.

What EITM is (and what it is not)

EITM is an intensive summer program. It involves up to 8 hours of classroom time a day, 6 days a week. The format will vary: some of it will be lectures, some seminar, and also hand-on tutorials. This said, do not expect to internalize everything you will be lectured about. The amount of information is huge and its depth considerable, so to learn everything you would need a year-long course. The following phrase, ascribed to one of the summer program lecturers, has become a part of the folklore of summer programs: "I have a week to tell them all I know — and they have the rest of their lives to figure it out." So, don't let the amount of new information overwhelm you — take it as a roadmap of what you may want to explore in more depth in the future. For example, I did not know much about factor analysis before EITM. Now, I can have an intelligent conversation about it and can spot research problems when it may be useful, but I cannot say that I have learned how to do it. However, if I need to do it in the future, I know where to look it up or who to contact about it.

The content of the lectures and seminars will vary depending on the topic and lecturer's style. You should expect that both formal modeling and empirical methods will be covered, although the depth will vary. Some instructors will want to go over the models in detail and solve them with you, while others will summarize the models relatively quickly and will want to discuss assumptions behind them. I personally preferred the former approach, but there is certainly a value added in the latter as well.

[1] We were asked to fill in online evaluations after each of the four weeks, and we also often talked to the organizers and lecturers informally about what we would change about the program

Now, the classroom time is not the end of the story. You will be assigned problem sets, to solve either individually or sometimes in smaller or larger groups. Some of these are optional, but you will most likely want to get your feet wet in the material that you have been passively absorbing so far. Plus, working in groups gives you a chance to interact with your fellow participants not only socially, but first and foremost as your future colleagues in the discipline. In addition, you will have an opportunity to schedule one-on-one meetings with all lead lecturers every week[2] and talk about your research in general or a specific research project that you are working on at this time.

As far as social interaction with both instructors and your peers is concerned, there will be plenty of opportunities for it as well. During our EITM, we had a garden social (barbecue, ice cream party, etc.) every week and several informal dinners with the instructors in small groups, which provided ample opportunities for us to get to know each other.

A word of caution: given the classroom time, homework assignments, and social engagements, do not expect to get much work done on your own project. Although there were exceptions who experienced an impressive burst of productivity during the EITM, most of us found that it was nearly impossible to find time or energy to concentrate on our own projects. The only time that was allocated to our own work was Week 4, which culminated in brainstorming sessions. These sessions included about a 20-minute discussion of each project. None of us presented our own work, but rather we were all assigned a discussant among our peers who would introduce the project and suggest improvements, which was followed by comments from everybody in the room.[3] In general, how useful such a session is for you depends on where you are in your project, but at the very minimum it gives you a good overall perspective of what everybody else in the program is doing.

[2]There were 2 lead lectures every week and several guest lectures, depending on the topic. Lead lecturers were Henry Brady and Steve Ansolabehere for Week 1 (spatial models); John Londregan and Rob Franzese for Week 2 (macropolitical economy); John Aldrich and Skip Lupia for Week 3 (institutional analysis). Note that Week 4, besides a few guest lectures, was devoted mostly to our own project preparation and presentation. Guest lecturers included Jim Snyder (factor analysis), Dan Diermeier (cabinet formation), Nolan McCarthy (separation of powers), and Ann Santori (international relations), and others.

[3]A very exciting part of these sessions was that they were simulcast on the web, so not only the instructors who were away from Cambridge by the end of the program, but also our advisors at our home institutions could log on and participate in the discussion by email.

How much background do you need?

EITM is certainly not a refresher course. In other words, it is targeted at advanced graduate students with a solid background in both formal modeling and empirical methods. Now, it is hard to say how many courses you need to get the most out of it — this will vary depending upon your home institution and also how much you have succeeded in teaching yourself. Having taken five formal theory and two statistics/econometrics graduate courses, as well as a field exam in mathematical and econometric methods, I felt quite comfortable with the material, although there was a number of new topics and techniques that I learned about during the program. However, there were people with both more and less background than mine and we all got different things out of EITM, so the amount of prior training needed seems to be quite flexible.

Another question is at which point of your graduate student experience would a program like EITM be most beneficial? In general, I would say that the optimal point is after you have done all your coursework and have an idea where you want to go with your dissertations. Still, if you have progressed further in your dissertation, you may find it useful to do this the summer prior to entering the job market (which was my case): the upside is that you will get comments on your dissertation from the top scholars in the discipline and also meet your peers who are likely to be on the job market with you; the downside is that you will not be able to do much work on your project for about a month.

Overall, the initial EITM at Harvard was an excellent experience: as a first attempt in the series of summer training institutes of this sort, it has achieved putting together a remarkable group of instructors and participants who benefited greatly from working and interacting together for four intense and rewarding weeks. I am confident that the following EITMs will be even better!

The EITM Experience

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Among many divides within political science, the one between formal modeling and empirical analysis is probably the most disconcerting. Both game theorists and statisticians pursue the same fundamental goal: to conduct scientific research. Further isolation of the two groups would by no means promote scientific progress in the discipline. It is especially harming for incoming graduate students who often have to choose what to study: rational choice theory or econometrics. Then there is a danger that a combination of formal and empirical analyses would lead only to a confusion and rejection of "the other" approach. Finally, absense of communication between approaches may lead to a research agenda, which in the case of game theory is more appropriate for mathematics than political science.

These were the reasons why I decided to become a participant of EITM[1] summer institute, this year held at CBRSS[2] , Harvard University. The annual program was created by a group of leading scholars in the field[3] and supported by NSF[4]. Creators of the program along with several invited scholars formed EITM faculty who became our lecturers and mentors for the four weeks of the program. The two dozen EITM participants were a diverse group, mostly advanced graduate students from U.S. universities. About half of them were international students. Although many participants represented top schools, students from smaller programs, including myself, also had a chance to be a part of EITM. Interestingly, our research interests were also very diverse, ranging from game theory and macropolitical economy to intellectual property rights, agent-based modeling, and evolutionary psychology. Participants had certain technical skills in formal or empirical analyses and the goal of positive political science in common.

The program held at Harvard was structured around three subjects: spatial modeling, macropolitical economy, and institutional models. Besides, there were guest lectures on some other approaches, most notably agent-based modeling (Lars-Erik Cederman) and experimental methods (Arthur Lupia). During the first three weeks a typical day consisted of two to three hours of morning lectures, lunch break, and three to four hours of afternoon lectures. Evenings were devoted to homework and our own research projects. Lectures provided a comprehensive coverage of the three fields mentioned above. This state of the art overview was quite intense, especially given the homework and research project assignments. It is likely, however, that next year in Michigan the emphasis will be switched from comprehensive coverage of the fields to hands-on study of particular methods in formal modeling and empirical analysis. The change is not going to be dramatic but it should, nevertheless, allow EITM participants to spend more time working on their individual research projects.

With the exception of a couple of guest lectures, the whole week four was devoted to final preparation and presentation of these projects. My collaborator, James Fowler from Harvard, and I managed to write a new paper during just four weeks of EITM, a direct result of the favorable academic environment, a variety of new ideas generated during the lectures, and personal faculty advice. The latter was one of the program highlights for me: each of the participants had an opportunity to discuss his/her project with a dozen leading figures in the field, one-on-one.

Individual projects were presented in the very end of the program. The presentations were broadcasted live on the Internet such that virtually anyone with computer and Internet access had an opportunity to watch (and participate!) in the sessions. Most of the "brainstorming" session time was devoted to all EITM participants for their questions and suggestions whereas the author of the project typically was taking notes and had a final word in the end if time allowed. Later everyone received a compact-disk with a video record of presentations.

One of the obvious goals of the EITM summer institute was to teach us certain methods of formal modeling and empirical analysis. It is hard to tell whether or not this goal was achieved; three weeks is not sufficient time to study what was in effect a full year course. On the other hand, the EITM program set the stage for a new generation of young faculty who realize that both theoretical and empirical models are deficient without each other. This is a community of people committed to open-mindedness without the sacrifice of scientific rigor.

Finally, it is necessary to mention the summer institute's organization, excellent academic, financial, and administrative support. Throughout the EITM program

[1] Empirical implications of theoretical models.
[2] Center for Basic Research in Social Science.
[3] James Alt, Henry Brady, John Aldrich, and Robert Franzeses.
[4] Details can be found here: `https:\\www.fastlane.nsf.gov/servlet/showaward?award=0215621`

I would associate my experience with the academic environment at Heidelberg in 19th century as described in Heinrich Mann's literary work.

EITM and Dissertation Work

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Providing an overall student perspective on the EITM summer program is an intricate task. The twenty-five of us comprised quite a diverse group in terms of areas of substantive interests, skills in formal modeling and econometrics, as well as graduate programs. Probably the only thing that united us was our determination to use the opportunity provided by the NSF to advance the quality of our future scholarship. Hence, I focus here on this aspect of the EITM. That is, on what it can offer a graduate student with a dissertation project in hands.

In this respect, I will not argue here for the necessity of bridging the divide between formal and empirical modeling. This point has been made by many and is probably well-communicated to us by our advisers' insistence on strengthening the theoretical *and* empirical components of our dissertations. What I would like to stress here is the benefit of the EITM program that comes as a by-product of its emphasis on integrating theory and data.

By its very nature, graduate training in political science is highly specialized. Early on, we are required to select a field of specialization and focus our future training to the chosen area. In addition, many programs are limited in their course offerings both in terms of methods and substantive areas. As a result, we often define ourselves (as aspiring scholars) in terms of either a particular method or a particular substantive area and, consequently, accumulate highly specific knowledge. Regardless one's view of the virtues and vices of narrow training and specialization, it has become a fact.

The EITM's greatest and immediate payoff was that it provided us with a rare opportunity to get exposed to the most advanced applications of formal and empirical modeling across several fields of political science. Certainly, this exposure did not turn us into political scientists with a general expertise. However, it clearly demonstrated the necessity to stay attentive to the scholarship outside one's own area of specialization. In addition, the program provided us with an opportunity to discuss our projects with specialists in other areas and to benefit from their diverse perspectives.

This was particularly valuable to people like myself who are coming from smaller graduate programs. Presenting my research project on more than a dozen of occasions to faculty members, guest lectures, and colleague participants allowed me to crystallize my own vision of its future progress. I got new ideas on how to enhance its theoretical component and formulated a much clearer perspective of its empirical testing. I believe that these improvements were significant and became possible because of the stimulating and creative environment of the program.

Having said that, given the demanding nature of the program, you will have to postpone any serious writing until you return back from the program. In addition, the exposure to areas different from your own field of specialization during the program might sometimes lead you to feel that you have more questions than answers. Nevertheless, the last week of the program is totally devoted to your own work and allows you to put your ideas in a better perspective. In short, attending the EITM summer program is not a panacea for dissertation pains, but I truly believe that it is worth your time and effort and will eventually improve the quality of your scholarship.

In closing, I would like to mention an important issue that became clear to me through my experience at the EITM. While the necessity of bridging the gap between formal models and their empirical implications has been well articulated by many, it remains unclear whether this process will result in the enhancement of scientific knowledge. Formal modeling in its present form is unable to address some important aspects — for example, it cannot address the dynamic nature of politics. Even though empirical tests (time series) are readily available, no advances in this area can be made without an improvement in the theory itself. Hence, a stress on "bridging" should not divert our attention from the necessity to improve theory. Similarly, current statistical analysis cannot properly estimate non-linear preferences employed by formal models. This suggests that we need to either improve the current statistical tools or look beyond statistics in order to test formal models. On this point, a stronger emphasis on and articulation of the limitations of merging formal and empirical analysis in their current forms could be a worthwhile addition to future programs.

EITM: It's Not Just For Techies Anymore

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During a recent presentation of statistical results at Columbia University, a non-quantitative scholar asked the question: "Since we expect the agents to be interacting strategically, can we trust these results at all?" This is why EITM is not just for techies anymore. The mainstream of political science has begun to recognize that standard techniques for drawing inferences from data can produce misleading results in the context of strategic interaction.

For four weeks over the past summer, the EITM workshop brought together a group of leading scholars and eager graduate students to discuss the best methods of testing theoretical models. James Alt and the staff of Harvard's Center for Basic Research in the Social Sciences made us feel very welcome. By the end, every participant said they would recommend next year's workshop to colleagues. Some also expressed a few reservations about their experience. Their primary complaints will be solved next summer in Michigan: air-conditioning will be provided, and Caltech students will never again be asked to survive without internet access in their rooms.

I shall first give an overview of a few of the highlights from the four weeks. As an example, I describe a portion of Nolan McCarty's presentation. I then mention two substantive reservations about the program shared by some of the participants.

A Few of the Highlights

Nolan McCarty's nicely titled presentation "Separating Power: Joining Theory and Data" was one of the favorites among students because it explicitly addressed the link between model and testing. He first described a simple model of legislative policy-making with three players: the House, the Senate and an Agency. The equilibrium shows the policy outcome as a function of the players' ideal points. Next, he presented 3 problematic approaches to testing. This was interesting because all of these were the sorts of tests one might think about running, or that have been run in the literature.

Among the problems with the statistical models discussed were: (1) improper specification of the null and alternative hypotheses that do not capture all of the implications of the theoretical model, (2) failure to nest alternative hypotheses in the statistical model, (3) potential bias due to misspecification, (4) bias resulting from the tendency of measurement error to lead to incorrect classification of the ordering of players' ideal points. Happily, data could also be generated from the true model to make the difficulties easily apparent.

There were also many other interesting sessions. With lectures and discussions from 9:30 to 4:30 on weekdays and a half day on Saturdays for four weeks, there were far too many for me to name here. Daniel Diermeier presented a structural equations approach to estimating a theoretical model. John Londregan discussed his own work integrating formal models with case studies. Henry Brady discussed nesting two theoretical models in a single statistical model. Anne Sartori argued that because our models always simplify reality, we should derive statistical tests with sensitivity to the qualitative results of formal work, but without expecting the empirical model to be derived directly from a formal model.[1] Robert Franzese showed how even very simple theoretical models can imply large numbers of interaction effects one might have to estimate, and Arthur Lupia discussed the role of experimental tests. I could mention many others.

Faculty members also made themselves available outside the classroom. There were barbecues, dinners, drinks and ice-cream socials. Many faculty also posted sign-up sheets for students wishing to come by to discuss their own work. This was very useful and greatly appreciated by students.

Some Room for Improvement

As with all things, many participants (myself included) thought there was room for improvement. While many of the presentations, such as those mentioned above, dealt with the link between theoretical and empirical work, many presentations just addressed theoretical and empirical work. That is, they addressed theoretical models in a substantive area of political science, and then later empirical models, without actually discussing ways of linking the two. Participants arrived with an awareness that strategic interaction might cause special problems for testing theories. And we had a sense that most of the literature in the field does not adequately address the difficulties. There was therefore some frustration at seeing papers presented that we had already reviewed at our home institutions, and that themselves maintained

[1] She drew a contrast between her approach and Curtis Signorino's in "Strategic Interaction and the Statistical Analysis of International Conflict," *APSR*, vol. 93, June 1999, pp. 279-297.

rather than bridged the "great trench" between theory and data.

Part of the difficulty lay in the diverse backgrounds of the participants. Some were more comfortable with theory, some with empirical testing. The faculty therefore tried to present topics related to both individually as well as the link between the two. Still, students from both sides of the divide felt that presentations should have more consistently addressed the link, rather than either individually.

There also seemed to be a certain gravitational pull of the voting models literature. No other formal literature in political science can match it in terms of volume of articles. We were drawn in by their strong pull perhaps a little longer than we should have been, in light of the diverse interests of the group.

Just Do EITM

Those reservations notwithstanding, my experience was extremely valuable. I would strongly recommend participation in future workshops. The organizers also sought immense amounts of feedback from all of the participants, and I have no doubt that they will respond to our criticisms as best as is possible. As another participant said, creating the perfect workshop linking theory and data may be a challenge for our generation.

Articles

The LaTeX Corner: Wielding LaTeX To Greater Effect

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LaTeX is a wonderful and addicting tool. I have not used a word-processor in ten years and I even write letters to my mom in the TeX environment. Over time a number of tricks and shortcuts become second nature to users, and it's always fun to swap hints with people at meetings. Usually these conversations are quickly forgotten and we all return from Chicago (or elsewhere) to reinvent the wheel. I have *never* overheard, incidently, conversations about the latest MS-Word trick. Why is that? Despite the obvious selection bias of the conversations that I might be around, the real reason is that with proprietary software it really doesn't make sense to invest oneself in the nuances since it is the vendors' prerogative is to make substantial changes on each new version. Of course it could also be that using word processors is just unpleasant in general.

In the spirit of such conference exchanges this column presents a loosely organized potpourri of various helpful hints that I've accumulated that are not widely known or appreciated (i.e. not prominent in the standard references). None of these are going to change anyone's life, but I think that in sum, they might save some anguish and perhaps lead to nicer typesetting. In any case, I now have a document to assign to graduate students.

Clean Code

There are a few simple programming practices that will make your source-code more readable and in some cases improve the quality of the resulting document. LaTeX doesn't care about spacing in files with the exception of line-feeds, so if it is possible to write your source document to reveal structure then this often leads to better writing and easier debugging. For instance, hunting through long sections to find footnote structure can be annoying, so a good strategy is to indent footnote contents within paragraphs:

```
Perhaps the best known prison rodeo is in Angola,
Louisiana.\footnote{Angola runs
        every Sunday in October and
        one weekend in April each year.}
However, Texas has a long tradition of running prison
rodeos as well.
```

Also, anything after `\end{document}` is ignored, so you can use this area of the file for things like notes, extra tables, and unused references. Few people bother, but you can insert comments anywhere in the document to yourself or coauthors that will not be typeset if they follow the "`%`" character on a given line. For longer sections of text to be unprocessed it might be more convenient to use the `\begin{comment}` and `\end{comment}` statements, although these can sometimes hide amongst other statements in the file and cause one to lose track of what is "in" and what is "out."

Some small things... Inserting two spacings before a new sentence is not necessary since TEX controls intersentence spacings, but it makes the source file easier to read. Be sure to use the tilde character to keep figure and table reference numbers next to the word (rather than possibly being split over lines): `Figure~\ref{cowboy.figure}` and `Table~\ref{angola.history.table}`. Of course, it is well-known that such table and figure references shouldn't be hard-coded: `Table 1`, `Figure 3`. Computer code and URLs look much nicer when typeset with the `\texttt{}` command or the `verbatim` environment (which requires the `verbatim` package). Don't use the keyboard's double quote: `"`. In LATEX the way to get correct quotations is to use two left-facing single quotes at the beginning, ``, and two right-facing single quotes at the end, ''.

The standard way to input references is with `\bibitem{}` or `\item[]` for each entry and then a section at the end of the document delimited by `\begin{thebibliography}{99}` and `\end{thebibliography}` ({99} prepares LATEX for up to 99 citation reference numbers). This gives a nicely formatted reference section (including automatic sectioning with title), but unfortunately the default is more suited to referencing in a number of natural sciences rather than political science:

> [1] Bergner, Daniel. 1998. *God of the Rodeo: the Search for Hope, Faith, and a Six-second Ride in Louisiana's Angola Prison.* New York: Crown Publishers.

Years ago Jason Wittenberg gave me the following code which makes the reference section look appropriate for political science work: no citation numbers in the text or the references, and a standard indentation scheme. First, place for convenience the following in the preamble.

```
\renewcommand{\bibitem}{\vskip
    2pt\par\hangindent\parindent\hskip-\parindent}
```

Then begin the reference section with:

```
\section*{References}
\mbox{} \baselineskip=6pt \parskip=1.1\baselineskip
    plus 4pt minus 4pt \vspace{-\parskip}
```

and simply start each bibliography entry with `\bibitem`. There is no longer a need to put braces or brackets after `\bibitem` or to include an end statement to indicate the end of the reference section. The result looks like:

Bergner, Daniel. 1998. *God of the Rodeo: the Search for Hope, Faith, and a Six-second Ride in Louisiana's Angola Prison.* New York: Crown Publishers.

This code is easy is drop into a file and it avoids some of the extensive and confusing trickery that I have seen with other solutions. Eventually, though, one might want to migrate to the elaborate and flexible BIBTEX package which provides a personalized central inventory of references and can save a lot of work once setup.

Miscellaneous Math

It makes sense to always load the $A\mathcal{M}S$; packages (`\usepackage{amsfonts, amssymb, amsmath}`): better fonts, a lot more features, and you don't have to remember whether something is in the packages or not. The extra compile time is minimal anyway. The key to creating readable math when you look at the file two years later is hierarchical organization. Specifically, use spaces, tabs, and line feeds to show the structure of the formula so you can read and edit it much easier later. For example contrast the organized math (from actual work):

```
\begin{align}\label{QH.likelihood.separation}
\ell(\T|\X_{obs})
  &= \underbrace{ \int\ell(\T|\X_{obs},\X_{mis})
       f(\X_{mis}|\X_{obs},\T^{(0)}) d\X_{mis} }
           _{ Q(\T|\T^{(0)}) }
       \nonumber \\
  &- \underbrace{ \int\log f(\X_{mis}|\X_{obs},\T)
       f(\X_{mis}|\X_{obs},\T^{(0)}) d\X_{mis}. }
           _{ H(\T|\T^{(0)}) }
\end{align}
```

with an unorganized version of the same code, which provides the exact same typeset output:

```
\begin{align}\label{QH.likelihood.separation}
  \ell(\T|\X_{obs})&=\underbrace{\int\ell
  (\T|\X_{obs},\X_{mis}) f(\X_{mis}|\X_{obs},
  \T^{(0)})d\X_{mis}}_{Q(\T|\T^{(0)})}\nonumber\\
  &-\underbrace{\int\log f(\X_{mis}|\X_{obs}
  ,\T) f(\X_{mis}|\X_{obs},\T^{(0)})d\X_{mis}.}
  _{H(\T|\T^{(0)})}
\end{align}
```

This advice applies equally to formatting tables since it is very easy to leave out an `&` character when the columns are not lined up (even though they obviously do not have to be). Above, `\X` and `\T` are user-defined shortcuts for $\mathbf{X}$ and $\boldsymbol{\theta}$ that make the source file easier to write and read. These shortcuts are defined in the preamble with:

```
\newcommand{\T}{{\boldsymbol{\theta}}}
\newcommand{\X}{{\mathbf{X}}}
```

These are immensely time-saving and more complex forms can be created without a lot of energy:

```
\newcommand{\SIinv} {{\|\boldsymbol{\varSigma}\|^{-1}}}.
```

Note also that shortcuts are not confined to the math environment. The font shortcut for displaying computer code in this document was created with:

```
\newcommand{\code}[1]{\texttt{\small#1}}
```

where the different treatment of `\texttt` and `\small` reflects differences in how these font characteristics are programmed in TEX, and the `[1]` plus `#1` indicates that one argument only is processed in this new function. Sometimes the `newcommand` strategy is not flexible enough, particularly when there are optional arguments involved, and it is possible to define a new command from the original definition in the `latex.ltx` source file. Never modify this file directly, instead create a local style file such as `mycustom.sty` and modify the structure in there (you will have to add `\usepackage{mycustom}` to your preamble). For instance the same effect as above could be created in the style file by writing:

```
\DeclareTextFontCommand{\code}{\codefamily}
\DeclareRobustCommand\codefamily
        {\not@math@alphabet\ttfamily\mathtt\small
        \fontfamily\ttdefault\selectfont}
```

which is exactly the pertinent code in `latex.ltx` except `\texttt` based on the `\ttfamily` has been redefined to be `\code` based on the new `\codefamily`, which has `\small` added to the specification list.

Writing simply `exp` and `log` in math mode looks ugly since they will be automatically italicized. Most people therefore use `\text{exp}` and `\text{log}` to give a consistent font with the rest of the document. A minor trick, which is cleaner and gives the exact same result, is `\exp` and `\log`. This also works with limit functions and common trigonometric functions, `\lim`, `\sup`, `\inf`, `\sin`, `\tan`, etc. A related shortcut that has great flexibility is the modulo function. Typesetting `a = b \pmod{c}` in math mode gives $a = b \pmod{c}$, which handles the spacing perfectly (an annoying task with `\;` and other spacers). Also `a = b \mod{c}` provides $a = b \mod c$, `a = b \bmod{c}` provides $a = b \mod c$ (slightly less space), and `a = b \pod{c}` provides $a = b \pod{c}$, all with perfect math spacing.

A strangely frequent mistake is to use `\Pi` when it is appropriate to use `\prod`. Contrast the mistaken version: $L(\mathbf{x}, y, \theta) = \Pi_{i=1}^{n}\Pi_{j=1}^{k}[\Phi(\theta_j - \mathbf{x}'\boldsymbol{\gamma}) - \Phi(\theta_{j-1} - \mathbf{x}'\boldsymbol{\gamma}]^{z_{ij}}$, with the corrected version: $L(\mathbf{x}, y, \theta) = \prod_{i=1}^{n}\prod_{j=1}^{k}[\Phi(\theta_j - \mathbf{x}'\boldsymbol{\gamma}) - \Phi(\theta_{j-1} - \mathbf{x}'\boldsymbol{\gamma}]^{z_{ij}}$. Similarly, it seems surprisingly common to see x or $*$ instead of `\times` to get $\times$. A related type of error is incorrect parenthesis sizing; usually too small. To get parenthesis sizes that match the height of the math within, use `\left(` and `\right)` (this also works with other delimiters such as brackets, [, bars |, and double bars ‖. The only caveat is that LaTeX uses these *contextually* in formulas so you cannot break up a left-right pair across lines in the align environment. In this case you will have to manually size the parentheses with: `\bigl(`, `\Bigl(`, `\biggl(`, and `\Biggl(`.

LaTeX has some "nested" characters that improve the typesetting of certain repeated forms. For instance, $a << b$ looks dumb, but $a \ll b$ (created with `a \ll b`) looks perfect (there is also the $\lll$ symbol if one wants to be more emphatic). In the same vein, it does not look good to iterate integrals: $\int\int\int f(\zeta, \xi, \nu) d\zeta d\xi d\nu$. Instead use the provided construct, `\iiint`, to get $\iiint f(\zeta, \xi, \nu) d\zeta d\xi d\nu$. There are two to four iterations provided by the number of `i`'s in front of `nt`, and for more than four one can use: `\idotsint` to get $\int \cdots \int$. It is also much nicer to use `\ldots` rather than "..." since LaTeX will give distinct spacing. Note as well that there is `\cdots` for centered dots, `\vdots` for vertical dots, and `\ddots` for diagonal dots (useful in matrix expressions).

The align math environment is tremendously useful and flexible for multi-line math where you want to line up the equations vertically according to some character, usually an equal sign. If it is desired to put extended text somewhere in-between one can stop the align environment and then start a new one after the text. However, this may make it hard to continue the alignment process, so LaTeX has the `\intertext{}` command for inserting text without losing the alignment process. Simply insert the command with the desired text (no need to supply the `\text` command) and the right thing will happen (the new line command is not needed at the end of this line: `\\`).

Terrific Tables

Tables can consume an immense amount of time in order to look really clean and sharp. However, this time can be quite well-spent since casual readers often look only at the table to see model results. The general structure of tables is to embed `tabular` in the `table` environment, for instance:

```
\begin{table}[t] \begin{center}
\caption{\textsc{Angola Prison Rodeo History}}%
        \label{angola.history.table}
\vspace{0.07in}
\renewcommand{\arraystretch}{1.2}
\begin{tabular}{cr|l}
  \hline
  \multirow{4}{3mm}{
```

```
      \parbox[h]{3mm}{
         \begin{turn}{90}Milestones\end{turn} } }
  & 1965 & First rodeo (for prisoners \&
           staff only) \\
  & 1967 & Opened to the public \\
  & 1972 & Professional Rodeo Cowboys Association
           rules adopted \\
  & 1997 & Stadium expanded \\
  \hline
\end{tabular}\end{center}\end{table}
```

Here we get "Milestones" vertically in the first column using `multirow` from the package of the same name (see also the `rotate`, and `sideways` environments provided by the same `rotating` package). Note that this rotating effect will not show up with a `DVI` viewer because it is implemented at the `postscript` step. The use of `multirow` is slightly more involved than `multicolumn` because it is necessary to stipulate the spacing (`3mm` here).

The `tabular` command dictates the number of columns, the alignment in these columns, and whether or not there should be a vertical bar of separation (as done above). What can be frustrating is processing format exceptions within the table. That is, situations where one table cell deviates from the rest of the column's specification. TPM readers probably already know that the `multicolumn` statement allows text to cross numbers of columns, but it seems less-well known that the multicolumn statement with "1" as column width can be used to customize a single cell distinct from the rest of the column, for instance `\multicolumn{1}{|c}{1997}` would make the "1997" contents in the bottom left cell center-aligned instead of right-aligned, and move the wall to the left side from the right.

Some useful table options include: `\cline2-3` for underlining a subset of columns (columns 2 and 3 of the next line here, as opposed to `\hline` which underlines the entire table row), use of `p{10mm}` in the `tabular` line to give specific column spacing, the `dcolumn` package for more flexibility in controlling column formats, and using subenvironments like paragraph boxes (`parbox`) within cells.

Regretfully, it is often necessary to use the `\vspace` command to get nice looking separation between the caption and the table. Of course this is trial and error work. There are many ways to impose different vertical spacing in the table than in the text, but I rather like to use `\renewcommand` because it gives direct control.

A really nifty way to put confidence intervals (as opposed to moronic stars) into tables is to code the structure of the confidence interval into the `tabular` command. This makes the formatting of the table easier for you and usually produces very nicely lined-up columns. Unfortunately when the numeric values differ considerably in magnitude it is necessary to use spacing characters in order to line up the decimal points:

```
\begin{tabular}{lr@{:}l}
  \hline
  $\alpha_{\tau}$ & [~~~0.0026 & ~~~0.0511] \\
  $\beta_{\tau}$  & [109.3254  &  875.0422] \\
  $\tau_c$        & [~~~6.9151 & ~~~9.5301] \\
  \hline
\end{tabular}
```

Bad Behavior

The package `verbatim` sometimes does not "play well" with other packages and commands. It is very difficult to create a new environment (`\newenvironment` in the preamble) that includes the `verbatim` environment. Furthermore, commands like `\begin{small}` and `\end{small}` cannot be placed on the same line in the source file. However they can be on adjacent lines. Oddly enough, other formatting commands *can* be placed on the same line as the `verbatim` commands, like `\renewcommand{\baselinestretch}{1.00}`. It is also impossible to put the `verbatim` environment inside a `parbox`, but possible inside a `minipage`.

Managing "floats" can be a bear. Figures and tables that LaTeX moves around itself during typesetting are called floats. This arrangement is necessary since authors cannot see where the page breaks will be when editing the source file. The agony is that sometimes LaTeX will move these too far from the relevant discussion or clump several of them awkwardly on the same page. The primary weapon at one's disposal is the float placement specifier that is part of the `table` and `figure` statements: `\begin{table}[tbhH]`, where `t` means top of the page, `b` means bottom of the page (and sometimes unintentionally bottom of the document), `h` means try hard to put it *here* in the text, and `H` means put it *right here* even with ugly consequences. Some of these can be combined, and one can also add `!` in order to ask LaTeX to try really hard to comply with the specification. Sometimes it is helpful in this cause to resize figures (easy with `epsfig` and `includegraphics` since they have a sizing option), or tables (by changing font sizes or column widths). Other times this can be difficult such as with large tables like those often requiring the use of `sidewaystable`. Although it is rarely used, a nice effect that is easy to obtain with smaller tables and figures is to have the text wrap around the float using `floatingfigure` or `wrapfigure`, as done above. In reality there is often considerable trial and error so the standard, but often ignored, advice is to wait

Judge	Rider A	Rider B
1	3	0
2	3	0
3	3	2
4	0	5
5	0	5
Total	9	12

until all other editing is done before worrying about moving floats around. Chapter 6 of the indispensable LaTeX *Companion* (Goosens, Mittelbach, and Samarin [1994], Addison Wesley), has a wealth of useful advice on managing floats.

To quote one of my students, "LaTeX likes to complain." In particular it likes to complain during the typesetting process when it has a problem fitting the text into the paragraph width specified so that the right margin is justified. So it is extremely common to see "underfull" and "overfull' statements scroll by such as:

```
Overfull \hbox (4.4555pt too wide) in paragraph
    at lines 1020--1020
Underfull \hbox (badness 10000) in paragraph
    at lines 727--745
```

Underfull indicates that LaTeX could not nicely typeset the indicated lines(s) within the specifications and lets you know that it under-fit the line (too much end space) with warning levels given according to the parameter `\hbadness`. Here *badness* ranges from 0 badness for a perfect match, and 10,000 badness for something hopeless. The default badness is 1,000, and setting: `\hbadness=10000` will remove all such warnings from the screen. With regard to overfulls, Knuth (TeX's creator) decided that it was better to let text occasionally foray into the right margin (the overfull) rather than have really ugly spacings or weird hyphenations on that line. The amount of overfull complaining is determined by the `\hfuzz` (horizontal fuzz) parameter (defaulted to 0.1), and the algorithm is controlled (partially) by `\tolerance` (defaulted to 200). Setting something like `\hfuzz30pt` will generally prevent reporting of overfulls, and the tolerance can be made bigger if more space is to be allowed between words (exceeding 9999 apparently gives ugly results though). The algorithm here is reasonably sophisticated and it is not terribly common to have to intervene. Furthermore, since there are 72.27 points to an inch, many of the reported "problems" are not really worth fretting about.

LaTeX does not always know where to hyphenate words. This is especially true for highly technical or unusual words that are fairly long. So sometimes the word will be hyphenated in an inappropriate place. This can be solved by "telling" LaTeX where to hyphenate a specific word. Simply place the instructions in the preamble according to: `\hyphenation{non-con-verg-ence}`.

Hasty Conclusion

I hope that this little exercise is found to be helpful. Presumably we will see some really interesting additions to *The* LaTeX *Corner* on subjects like: advanced graphics, dissertation/book strategies, multi-line math tricks, METAFONTand METAPOST, as well as integration with `html` and `xml`.

Have You Mastered Tables and Graphics in LaTeX? Share Your Secrets with TPM's Readers.

Contact Heather Ondercin at hlo114@psu.edu

Working on Your Dissertation in LaTeX? Share Your Experience With Your Peers.

Contact Heather Ondercin at hlo114@psu.edu

A New APSA Organized Section for Qualitative Methods

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A diverse group of APSA members has launched an initiative to form a new Organized Section for Qualitative Methods within the American Political Science Association.[1]

If approved by the APSA, the proposed section will sponsor training and research focused on the several branches of methodology associated with the qualitative tradition. The section will also seek to promote an integrated understanding of these methods and their relationship to other branches of methodology, including quantitative methods. The goal is both to complement the activities of the Political Methodology Section by emphasizing the qualitative side of methodology, and to develop productive avenues of cooperation with the existing section.

Qualitative methods are understood as a diverse set of approaches that partially overlap with one another, and some of which are congruent with the concerns of the Political Methodology Section. These approaches include the case study method, small-N analysis, the comparative method and the comparative-historical method, the ethnographic tradition of field research, constructivist and interpretive methods, concept analysis, and related areas of social and political theory.

[1]This report is adapted from the petition that has been circulated in the process of forming the new section. The full petition is available at `http://www.asu.edu/clas/polisci/cqrm/qualsect.htm`. The transitional officers of the section are David Collier, President; Elizabeth Kier, University of Washington, Vice-President; and Colin Elman, Secretary-Treasurer. The Transitional Executive Committee Members are Andrew Bennett, Georgetown University; Theda Skocpol, Harvard University; Kathleen Thelen, Northwestern University; Alexander Wendt, University of Chicago; and Deborah Yashar, Princeton University.

Specific Goals

Training in Qualitative Methods. Although qualitative research methods are widely employed in political science, inadequate attention has been devoted to teaching these methods. A central objective of the section will be to address this deficit. Training institutes and workshops on qualitative methods will be designed to serve users of qualitative methods, as well as scholars who have a more specialized interest in teaching and research on methodology.

Bridging Methodologies. The section will be centrally concerned with integrating the insights and research tools offered by the different methodological approaches and traditions enumerated above. At present, these different qualitative approaches are somewhat balkanized. For example, the comparative method is closely identified with the fields of comparative politics and international relations; comparative-historical method has strong links to the discipline of sociology; important new debates on constructivism are centered in the field of international relations; and some branches of concept analysis are linked to the field of political theory.

Yet these different approaches sometimes address similar analytic problems, and they constitute a shared intellectual and methodological enterprise to a greater degree than is often recognized. In training workshops, APSA panels, and other fora, the new section will explore the commonalities among these different branches of the qualitative tradition, their distinctive contributions, and—crucially—complementarities vis-à-vis the quantitative tradition. Thus, while a compact name, "Qualitative Methods," has been adopted for the section to identify a central aspect of its focus, the section will also be strongly concerned with exploring ways to bridge qualitative and quantitative methods.

Logical Foundations. In conjunction with the first and second goals, and in the framework of the pluralistic approach to methodology reflected in these goals, another objective will be to strengthen the interrelated branches of qualitative methods by drawing on statistical theory and mathematical reasoning (especially probability theory) as a source of logical foundations. New research on these foundations is increasingly providing valuable insights into some types of qualitative analysis, and the new section will actively encourage this new line of inquiry.

Participating Groups

Two pre-existing organizations are playing a central role in forming the new section.

The APSA Committee on Concepts and Methods is an official Related Group of the American Political Science Association. This Committee is closely affiliated with Research Committee No. 1, the Committee on Concepts and Methods, of the International Political Science Association. Over the past few years, the APSA Committee has organized a number of panels and short courses at the annual APSA meeting, often in co-sponsorship with the Political Methodology Section. In the event that the proposed organized section is approved by the APSA, the Committee on Concepts and Methods will be merged into the new section.

The Consortium for Qualitative Research Methods (CQRM), located at Arizona State University, supports an annual Training Institute and other scholarly communication focused on methodology. CQRM collaborates closely with APSA organized sections and committees. Its inaugural Training Institute, held in January 2002, brought together a talented group of 45 graduate students and junior faculty from across the United States. Many of the participants were nominated by the universities that are sponsors of CQRM, and others were drawn from a national pool of 200 applicants. The second Training Institute in January 2003 will be expanded to accommodate approximately 60 participants. The new section will help administer the Training Institute and other CQRM activities. Information on CQRM may be found at `http://www.asu.edu/clas/polisci/cqrm/`.

Cooperation with the Political Methodology Section

The proposed section intends to continue the cooperative relations that the APSA Committee on Concepts and Methods previously established with the Political Methodology Section, including co-sponsorship of APSA panels and short courses. The goal is to join forces in broadening the discussion of methodology within the political science discipline. Future cooperation might include working together in providing electronic access to working papers, syllabi, and other scholarly material, as well as collaboration in initiatives connected with the journal *Political Analysis*.

We see a clear division of labor between the two sections. The Political Methodology Section has made an outstanding contribution in sponsoring research and scholarly communication focused on quantitative methods, and the new section will certainly not seek to duplicate this effort. At the same time, we believe that both the qualitative and the quantitative tradition can be strengthened by drawing insights from the other tradition, and close links between the two sections will therefore be essential if the new section is to achieve its intellectual goals.

The proposed section is currently seeking formal approval from the APSA. For more information, please contact Colin Elman `colin.elman@asu.edu` or David Collier `dcollier@socrates.berkeley.edu`.

Evaluating the Consequences of Assumptions Using Simulations

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While prominent in some aspects of statistical analysis, simulations are infrequently used to evaluate the quality of specific empirical statistical results. Since few researchers would argue that they have a perfectly specified model, how much we believe a particular set of results depends on the degree to which assumptions of the statistical model are believed to be violated and the robustness of the model to those violations. Although assumptions will in general be unverifiable, the value of a particular empirical analysis can be made clearer by characterizing how inference would change if the assumptions did not hold. Two useful criteria for evaluating the sensitivity of models can be provided using simulations. First, the degree of assumption violation necessary to change our beliefs about competing theories, such as causing the false rejection of a hypothesis. Second, at what point would it no longer be possible to recover the results originally found using the actual data.

Simulation methods in statistics have been widely used to solve analytically intractable problems including

- Estimating models with analytically intractable criterion functions: e.g., MCMC (Jackman, 2000).

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- Optimizing irregular or multi-modal functions, e.g., genetic algorithms (Sekhon and Mebane, 1998).
- Specifying critical values for test statistics with analytically unknown sampling distributions, e.g., pretest bias (White, 2000).
- Improving small sample inference, e.g., bootstrap (Efron and Tibshirani, 1993).
- Evaluating properties of estimators in small samples where only asymptotic results are analytically feasible.

Simulations are also used to characterize properties of estimation results by conditioning on parameter estimates and explanatory variables, and drawing simulated values of quantities of interest (King et al., 2000). I show that simulations can be fruitfully employed to investigate uncertainty about assumptions associated with a particular analysis, uncertainty which is not necessarily summarized or not summarized correctly in measures of sampling uncertainty, such as confidence intervals.

This essay follows from the 2002 APSA meeting's "Campaigns and Incumbency" methods panel, where we had a lively discussion on the challenges of synthesizing Monte Carlo studies and empirical analysis more closely. Charles Franklin offered stimulating comments as discussant of our papers.

The outline of the essay is as follows. The next section briefly discusses how Monte Carlo studies are often designed. I then discuss the need for Monte Carlo studies tailored to individual data analysis, with particular attention to Instrumental Variable (IV) estimators. Subsequently, I provide an application analyzing the effects of incumbent spending. Finally, I conclude.

What is usually known about estimators

Textbooks generally focus on the properties of estimators under the "true" data generating process, and spend little time discussing the implications of violations of assumptions. Exceptions do exist, such as the standard treatment of measurement error. When new estimation techniques are introduced in articles, they will often be accompanied by simulations which compare the bias, relative efficiency, and root mean squared error of different methods. Most simulations present results for different sample sizes and a small number of parameter values. However, presentations of simulations results evaluating estimators usually have the following limitations:

- Only using a single "true" data generating process.
- Only using simulated data for both dependent and independent variables.
- Only testing models with small numbers of parameters.

A reasonable explanation for these limitations is that the goal of these simulations is to present in a relatively parsimonious manner the central advantage of an estimator. Although a researcher may perform a much larger variety of tests, exploring even a small fraction of possible alternative experimental variations in the simulation design leads quickly to a large amount of information that is difficult to summarize and convey in an article.

However, within the context of each new empirical analysis, researchers may allay some of the concerns of skeptics in their audience by revisiting the performance of their estimators using simulations which reflect the particular characteristics of the data being analyzed. A very good, and unfortunately very rare, example of revisiting the performance of estimators within the context of a particular dataset is Bartels (1991, section 9).

Appraising the properties of estimators for each sample

Researchers should evaluate whether it is possible to recover the data generating process (DGP) that they estimate with their data in the presence of plausible violations of the statistical model's assumptions. The relevant part of recovering the DGP will depend on the research topic, and may include estimating whether the parameters of interest have the correct coverage of the "true" coefficients from the original analysis, or testing against a particular hypothesis—i.e., under what circumstance would our inference change. In my application below, I focus on the distribution of point estimates and ask under what conditions would it be more or less probable to observe those results.

As a specific example, consider the problem of endogenous regressors and the use of instrumental variables (IV). Bartels (1991) investigated analytically, empirically, and by simulation the implications of having instruments which are not truly exogenous, and the trade-off between the efficiency of an instrument and its exogeneity. His

formal findings and heuristic rules of thumb should be an important part of any discussion of results from IV estimation. Goodliffe (2002) presented a further set of Monte Carlo results in which he investigated, using simulated data, the performance of a variety of IV estimators when the instruments were not truly exogenous, followed by applications of the estimators to campaign finance data. Goodliffe demonstrates that the many variants of IV estimators also perform poorly in the presence of even modest endogeneity of instruments.

Bartels identifies a number of aspects of the data beyond the correlation structure of the errors with the endogenous variable and quasi-instrument that affect the performance of an IV estimator. For example, he makes clear that an apparently strong instrument can be relatively inefficient if it is correlated with the portion of the endogenous variable that is collinear with the other regressors. It is therefore important to perform data specific investigations of the estimator's performance. In his simulations investigating the small sample root mean squared error of his parameter of interest, the marginal impact of incumbent spending on electoral outcomes, Bartels conditioned on the data used in an earlier controversy (Jacobson, 1990; Green and Krasno, 1990) and varied the endogeneity of the quasi-instrumental variable in the simulations. This approach is used in the following application.

Application

Expositions of the properties of IV estimators are provided by Bartels and Goodliffe, and my presentation will be limited to those points necessary to answer two questions, which will be answered using simulation methods. I, too will focus on the issue of incumbent spending and its impact on the challenger vote share, and how an estimate of this relationship is affected by a correlation between the instrument (lagged incumbent spending) and the error in the equation explaining the challenger candidate vote share. The two questions are:

1. At what level of endogeneity of the instrument (correlation of the error with lagged incumbent spending) is the estimated DGP unlikely to be obtained?

2. At what level of endogeneity could the impact of incumbent spending be distorted such that a (hypothesized) "truth" of incumbent spending having no impact could be observed empirically as the estimated parameter value?

The first question is the criterion of being able to recover the current model even with some deviation from assumptions. The second question is the counterfactual criterion which asks what degree of assumption violation would be necessary for one hypothesis to be true (in this case no impact) and for us to falsely reject it based on estimates using the observed data.

To establish notation, y is a vector of the challengers' share of the major party vote in each district. X are the explanatory variables, which include the endogenous measure of logged incumbent spending (the vector x_2). Z is a matrix of instruments which is the same as X, except that it replaces current logged incumbent spending with the value from the previous election (z_2). For $y = X\beta + u$, the IV model addresses the situation where $E(u|x_2) = 0$ is not realistic, but there exists instruments z_2 where it can be assumed that $E(u|z_2) = 0$ and that z_2 does not cause y. Let ρ_{zu} denote the population correlation between the instrument and the error.

To investigate the consequence of correlation between the instrument and the errors, estimate the model using the original data, and then generate simulated errors and vote shares using functions of the fitted data. Using the original data, let

$$\begin{aligned} \hat{\beta} &= (Z^\top X)^{-1} Z^\top y \\ \hat{y} &= X^\top \hat{\beta} \\ \hat{u} &= y - \hat{y} \end{aligned}$$

See Green and Krasno (1990) for details of the model specification, and their Table 1 for parameter estimates. The model is then repeatedly refit using simulated data with induced correlation ρ_{zu} varied to explore the two questions of interest. For the first question, begin with the assumption that no violation of assumption occurs, with $\rho_{zu} = 0$, and then incrementally increase the magnitude of ρ_{zu} (positive or negative) until it is no longer possible to recover the original data generating process. For the second question, replace the estimated incumbent spending parameter with the value of zero (i.e., no impact on challenger vote share, but otherwise the DGP is assumed to be the same), and search for the value of ρ_{zu} which produces the estimated results observed in the initial estimation (i.e., incumbent spending does apparently affect challenger vote share). Although the current presentation conditions on the point estimates $\hat{\beta}$ for generating the simulated data, a fuller analysis would also take into account, among other things, uncertainty in β.

After the initial estimation, the simulation steps are as follows for each draw.

1. Simulating residuals and constructing $\check{y}$.

Conditioning on the observed quasi-instrumental and endogenous variables z_2 and x_2, and their sample covariance. Induce a correlation between these variables and a simulation sample of residuals, $\breve{u}$, assuming a multivariate normal distribution and using the Metropolis-Hastings (MH) algorithm (Hasting, 1970). In this way, errors with a desired level of correlation with the endogenous variable and instruments are constructed, while leaving the relationship between the instrument and the explanatory variables unchanged.

The MH algorithm is briefly reviewed here to make concepts concrete, and is more generally discussed by Tanner (1996). Start by initially drawing a vector of residuals, $\breve{u}$, from $N(0, \hat{\sigma}^2_{uu})$ where $\hat{\sigma}^2_{uu}$ is the estimated variance of the residuals from the initial estimation. Next, loop over the following steps:

(a) Draw a new sample of residuals v also from $N(0, \hat{\sigma}^2_{uu})$

(b) Replace element $\breve{u}_i$. with element v_i, with probability $\alpha(\breve{u}_i, v_i)$,

$$\alpha(\breve{u}_i, v_i) = \min\left\{\frac{\pi(v_i)}{\pi(\breve{u}_i)}, 1\right\}$$

where $\pi(\breve{u}_i)$ is the density of the multivariate normal distribution evaluated at the value of $\breve{u}_i$, with mean vector $\mu = (\bar{x}_2, \bar{z}_2, 0)$ and covariance matrix

$$\Sigma = \begin{bmatrix} \hat{\sigma}^2_{xx} & \hat{\sigma}^2_{xz} & \hat{\sigma}^2_{xu} \\ \hat{\sigma}^2_{xz} & \hat{\sigma}^2_{zz} & \sigma^2_{zu} \\ \hat{\sigma}^2_{xu} & \sigma^2_{zu} & \hat{\sigma}^2_{uu} \end{bmatrix}$$

where $\hat{\sigma}^2_{xx}$, $\hat{\sigma}^2_{xz}$, $\hat{\sigma}^2_{xz}$, $\hat{\sigma}^2_{zz}$, $\hat{\sigma}^2_{uu}$, $\hat{\sigma}^2_{xu}$ are the original sample variance-covariance estimates. $\sigma^2_{zu} = \rho_{zu}\hat{\sigma}_{xx}\hat{\sigma}_{uu}$ is varied by the design of the Monte Carlo study.

Repeat loop until the (updated) vector $\breve{u}$ has converged to the desired covariance with x_2 and z_2.

Another method of simulating errors would be to use a model based bootstrap and sample with replacement from the fitted errors, $\hat{e}$, again inducing the desired level of correlation between the endogenous and quasi-instrumental variable using the MH algorithm.

Construct simulated values of $\breve{y} = X^\top\hat{\beta} + \breve{u}$. Also simultaneously sampling from the estimated distribution of $\hat{\beta}$ parameters would generalize this example.

2. Estimation and hypothesis testing.

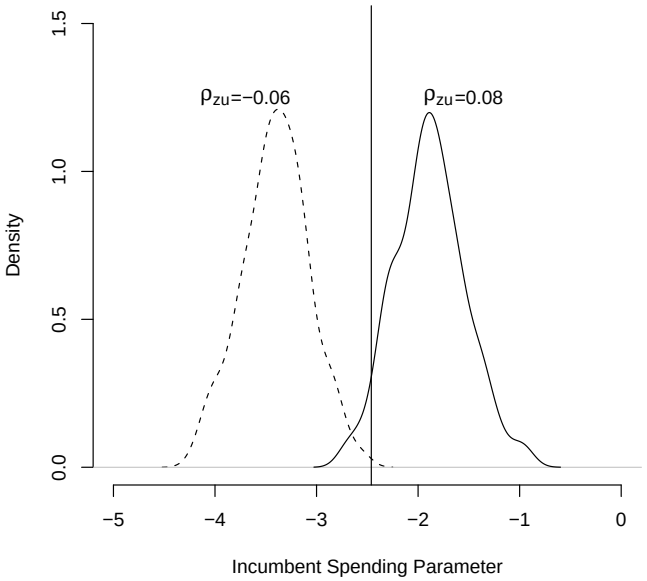

Figure 1: Distribution of point estimates of incumbent spending parameter from Monte Carlo. Vertical line is parameter value from original estimation. N=250 for each value of ρ_{zu}.

Refit the model using the simulated data to estimate $\breve{\beta}$. At this point one would like to keep track of some summary statistic of the (relative) fit. For example, the probability of the simulated draw having the same parameters as the original estimates ($\breve{\beta} = \hat{\beta}$). Alternatively, a general hypothesis test could be performed (e.g., $\breve{\beta} = 0$). For the purpose of answering my two questions, I keep track of the parameter estimate of the slope on incumbent spending from each simulation draw.

Values of ρ_{zu} (both positive and negative) should be explored until either the simulation results are significantly different from the original DGP, or inference changes from the initial model. The search over values of ρ_{zu} need not be linear; use of a binary search algorithm will shorten the search time for threshold values.

Figure 1 plots the density of parameter values for the incumbent spending variable at different induced values of ρ_{zu}. The vertical line is the point estimate for the slope in the initial estimation. For $\rho_{zu} < -0.06$ and $\rho_{zu} > 0.1$ there is less than a five percent chance of recovering the data generating process that is observed in the initial estimation. As Bartels already noted, it does not take much endogeneity to wreak havoc on the results of an IV estimator. The more interesting possibility is encompassed in the second question, how much endogeneity is necessary such that even if incumbent spending

actually has no impact ($\beta = 0$) that we will still observe our original estimate ($\hat{\beta} = -2.5$). The answer is about $\rho_{zu} = -0.2$. Making substantive comments on the interpretation of these values of ρ_{zu} is deferred to later studies.

Conclusion

This essay is not aimed particularly at addressing issues of IV estimators or campaign contributions. They are both important topics, but in this case they simply provide a useful and familiar set of examples for demonstrating the possibility and importance of using simulations to reevaluate the consequences of violating a model's assumptions. The main goal is to suggest ways that individual studies can reappraise the performance of their estimator in the context of their particular dataset and analysis. It is my hope that this approach will alter debates over whether certain assumptions hold or not by making it more concrete what is at stake and what level of violation of assumptions substantively matter. In the case of IV estimators, in some instances simulations will show that plausible levels of endogeneity are unlikely to change our inference, while in other instances simulations will make very clear the fragility of particular sets of results.

References

Bartels, Larry. 1991. "Instrumental and quasi-instrumental variables." *American Journal of Political Science* 35 (Aug): 777-800.

Bradley Efron and Robert J. Tibshirani. 1993. *An Introduction to the Bootstrap.* New York: Chapman Hill.

Goodliffe, Jay. 2002. "Instrumental Variable Estimation Using Quasi-instrumental Variables, with an Application to Campaign Spending."Paper presented at the 2002 APSA meetings, Boston MA.

Green, Donald Philip and Jonathan S. Krasno. 1990. "Rebuttal to Jacabson's 'New evidence for Old Arguments.' " *American Journal of Political Science* 34 (May): 363-372.

Hastings, W.K. 1970. "Monte Carlo Sampleing Methods Using Markov Chains and Their Application." *Biometricka* 57: 97-109.

Jackman, Simon. 2000. "Estimation and Inference Via Bayesian Simulations: An Introduction to Markov Chain Monte Carlo." *American Journal of Political Science* 44 (Apr): 375-404.

Jacobson, Gary C. 1990. "The Effects of Campaign Spending in House Elections: New Evidence for Old Arguements." *American Journal of Political Science* 34 (May): 334-62.

King, Gary, Michael Tomz, and Jason Wittenberg. 2000. "Making the Most of Statistical Analyses: Improving Interpretation and Presentation." *American Journal of Political Science* 44 (Apr): 347-361.

Sekhon, Jasjeet S. and Walter R. Mebane Jr. 1998. "Genetic Optimization Using Derivatives." *Political Analysis* 7: 187-210.

Tanner, Martin A. 1996. *Tools for Statistical Inference.* Springer.

White, Halbert. 2000. "A Reality Check for Data Snooping." *Econometrica* 69: 1097-1127.

TPM is Looking for Your Tips on Presenting Results from Statistical Models.

Contact Heather Ondercin at hlo114@psu.edu

Section Activities

Section Awards

Two awards were given at the section business meeting at APSA, August 30, 2002. The winner were

Patrick Heagerty, University of Washington; Michael D. Ward, University of Washington & Kristian Skrede Gleditsch, University of Californian San Diego

The *2002 Miller Prize* for "Windows of Opportunity: Window Subseries Empirical Variance Estimators in International Relations" (Vol 10: 304-317). The *2002 Miller Prize* was warded for the best article published in *Political Analysis*, Volume 10. The Miller Prize is named for the late Warren Miller, who early on understood the importance of good methodology for the study of politics, and who was instrumental in providing support for the formative meetings of what was to become the Society for Political Methodology. The Miller Prize carries with it a $500 award funded by Oxford University Press. The committee consisted of Gary King, Larry Bartels, and Henry Brady.

Sunshine Hillygus, Stanford University, Ph.d. candidate

The *Society for Political Methodology Poster Award* for "The Dynamics of Voter Decision-making in Election 2000" presented at the 2002 summer Methodology meeting. Ms. Hillygus' research used extensive survey data to demonstrate when voters reached crucial decisions during the campaign. The *Society for Political Methodology Poster Award* is given for the best poster in the area of political methodology at any political science conference.

The best poster committee consisted of John Freeman (chair), Walter Mebane, and Kevin Clarke.

Webmaster Needed

Jeff Gill has done an incredible job as webmaster, but we are looking for someone new. Jeff plans to finish out his term, continuing through August 2003, so that he can complete some scheduled up grades. The job of webmaster provides an excellent view of the methods subfield and opportunity interact to with those who are active in the subfield. The most challenging part of the job is getting people to submit! This job is particularly well suited for those that enjoy the challenges of computing. If you are interested, please e-mail, the president, Jonathan Nagler at `Jonathan.Nagler@NYU.edu`.

2003 Summer Methods Meetings

The 2003 Political Methodology Summer Conference will be at University of Minnesota July 16-20. A call for paper proposals will be forthcoming shortly and be posted to the political methodology listserve.

`http://web.polmeth.ufl.edu/conferences.html`

Update on the next recompetition of The American National Election Studies (ANES)

At its meeting on November 13, 1997, the National Science Board of the National Science Foundation approved a Resolution Concerning Competition, Recompetition and Renewal of NSF Awards (NSB 97-224). In the Resolution, the Board:

- "(a)ffirms its strong support for the principle that expiring awards are to be recompeted unless it is judged to be in the best interest of U.S. science and engineering not to do so. This position is based on the conviction that peer-reviewed competition and recompetition is the process most likely to assure the best use of NSF funds for supporting research and education.
- And (r)equests that the Director, NSF, take such steps necessary to ensure that NSF practices embody this principle."

The NSB Resolution, together with the support provided to the ANES by the Political Science Program since 1977, resulted in an ANES recompetition in 2000-2001. The current ANES award ends January 1, 2006.

In keeping with the recompetition precedent and the scientific and infrastructural progress and needs of Political Science, the next ANES recompetition Dear Colleague Letter is scheduled for release in the Summer of 2003. **The deadline for proposals will be on August 15, 2004.**

Note, the yearlong gap between the Dear Colleague Letter and the competition target date is being done to give all potential applicants sufficient planning time. Further details will be forthcoming in the Spring of 2003.

Any questions should be addressed to:

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The Political Methodologist

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The Political Methodologist is the newsletter of the Political Methodology Section of the American Political Science Association. I gratefully acknowledge the support of the Department of Political Science of the Pennsylvania State University in helping to defray the editorial and production costs of the newsletter.

Subscriptions to *TPM* are free to members of the APSA's Methodology Section. Please contact APSA (202 483-2512, `https://www.apsanet.org/about/membership-form-1.cfm`) to join the section. Dues are $25.00 per year and include a free subscription to *Political Analysis*, the quarterly journal of the section.

Submissions to *TPM* are always welcome. Articles should be sent to the editor by e-mail (sdeboef@la.psu.edu) if possible. Alternatively, submissions can be made on diskette as plain ascii files sent to Suzanna De Boef, Department of Political Science, 108 Burrowes Building, Pennsylvania State University, University Park, PA 16802. LaTeX format files are especially encouraged. See the *TPM* web-site [http://web.polmeth.ufl.edu/tpm.html] for the latest information and for downloadable versions of previous issues of TPM.

TPM was produced using LaTeX on a PC running MikTex and WinEdt.