

# ***LAB NOTES***

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## **Director's Welcome**

by Professor Herb Weisberg

Each issue of Lab Notes provides me with the opportunity to discuss the Lab's accomplishments over the previous quarter, and to provide some insight into our short- and long-term plans. As many of you have undoubtedly discovered, we have a number of new faces in the PRL this year, and this group has been extremely effective at responding to problems, as well as taking the initiative in developing new projects for the Lab.

On the staff side, many of you have already had the opportunity to work with Bill Miller and have discovered how fortunate the department was to hire Bill at the beginning of the year. Among his most important contributions have been the development of the new department Intranet which contains a great deal of useful information, the creation of a help-desk ticketing system to ensure that requests for assistance are being met in a timely manner, and the installation of an experimental wireless network for those who want

to use their laptops in Derby Hall. Our other system administrator, James Norman, spent his time upgrading the network, fixing the K: drive problems that certain 2<sup>nd</sup> year students were having, and also getting out a number of new computers for the experimental lab and faculty.

One of our graduate students, Brent Strathman, is responsible for developing the new department website, and he continues to work on ways to improve the design and content of the site. In the works are plans for new pages for all graduate students and faculty members that will contain a modern formatting scheme and be easily updated. Zach Mears is the other graduate student associate, and he has focused on the experimental subject pool, for which more than 700 undergraduate students participated in four separate experiments. In addition to these primary responsibilities, Brent and Zach have also answered a number of requests for assistance from students, faculty, and staff.

Greg Miller is the senior grad student assigned to supervise the day-to-day operations of the lab. He is rapidly becoming a jack-of-all-trades, doing everything from giving a brown-bag on using PowerPoint in the classroom to coordinating employee schedules and helping install new windows updates when emergencies hit. He is responsible for putting together LabNotes and he is also working with me in preparing a proposal for updating our basement computer classroom.

Finally, Misha Kovalchuk and Yared Debebe, the two undergraduate work-study students employed by the lab, were of great help early in the quarter during the university audit, and continually with requests for technical help from the department.

Again, the department is extremely fortunate to have these quality individuals working in the PRL and I look forward to working with them for the remainder of the year.

One last point is to remind everyone that if you encounter computer problems, please contact the PRL. It is difficult for us to fix problems that we do not know about, so the more information you provide the more helpful we can be. Thank you.

## **PRL Projects, Plans, and Services**

As always, the PRL is involved in a number of interesting projects. The following is a sample of our Autumn achievements, Winter plans, and consistently-offered services.

### *The Department Website*

Brent Strathman has completed the design of the new department website (pictured below) and is currently working on updating the student and faculty pages. In addition, Bill Miller has rolled out the new Intranet, which provides printable versions of many documents and forms frequently used by the department. It also has faculty and student contact information, as well as a link to the PRL helpdesk, which you can use to quickly alert us to problems. Please contact the PRL at [prl@polisci.sbs.ohio-state.edu](mailto:prl@polisci.sbs.ohio-state.edu) if you have suggestions for the Webpage or the Intranet.

In addition, we are asking for picture submissions for the front page of the website. Currently, the page contains a collage of some significant political images. However, the hope is to have a series of collages that will randomly rotate. If you have a great picture of a political person, place, or concept, send it in and we will include it on the front page. Please send submissions to Brent Strathman at [strathman.5@osu.edu](mailto:strathman.5@osu.edu).

### *Wireless Network*

The PRL has installed an experimental wireless network for those of you wishing to use your

laptops in Derby Hall. We recommend that interested people purchase SMC (a little cheaper) or Linksys (a little more range) adapters. The 2.4 GHz/11 Mbps cards seem to work best with the department's network. If you have questions or need help setting up your laptop, please contact Bill Miller at [bmiller@polisci.sbs.ohio-state.edu](mailto:bmiller@polisci.sbs.ohio-state.edu) or 292-1814.

### *Computer Upgrades*

Over break, we upgraded the computers in the experimental lab (Derby 2049A). The computers previously in the lab will be used to replace machines in some of the graduate student offices. In addition, everyone should be aware that the experimental lab is open to graduate students when not in use for experiments (make sure you save files to your K: drive when using these machines because they are periodically ghosted).

Also, the department has applied for funding from the college to overhaul the basement lab (Derby 0150). Our hope is to not only upgrade the computers (which are also available for graduate student use when classes are not in session), but also to install modern audio-visual equipment, especially designed for distance-learning and video conferencing, as well as some much-needed aesthetic renovations. We hope to have the computers upgraded by the summer, with the other changes being made as funds become available.

### *Experiments and Subject Pool*

Fall quarter was very successful for the subject pool and the experimental lab, with 700 undergraduates signing up to participate in experiments. However, we can always use more human subjects, especially since we expect a large increase in demand for subjects during the Winter quarter. Therefore, if you are an instructor looking for ways to give students extra credit, contact Zach Mears at [mears.16@osu.edu](mailto:mears.16@osu.edu) or 292-0511 for more information or to sign up.

In addition, anyone interested in running an experiment should contact Zach early in the

quarter, so he can determine the best way to divide up the subject pool. And then please inform him as soon as possible if you will not be using your subjects, so that he can reassign them.

### *USB Sticks*

Many of you have discovered the value of these key-sized storage devices that simply plug into USB ports and can be used to easily transport files from one computer to another. One problem is that our computers use operating systems that require drivers for each device. Because there are a number of different manufacturers, and because department computers are regularly ghosted, we recommend saving the driver that is specific to your USB stick onto your K: drive, so that it is easily accessible when you need it. This will also allow you to easily access the driver from any computer with Internet access (see directions for accessing your K: drive below).

### *Surge Protectors*

In addition to managing the department's computers and networks, the PRL also has an interest in protecting people's home computers. As a result, we want to remind everyone to use surge protectors on your home computers. We recommend devices that include both surge protection and an uninterruptable power supply (UPS) – basically a small backup battery providing you with time to shut down the computer normally, even if the power goes out. Typically, devices priced under \$50 do not provide the recommended protection, so consider those in the \$50-100 price range with surge protection and UPS. It is a small investment compared to the price of your computer.

### **Accessing the K: drive**

**I**n case you were not aware, everyone with a network account can access his or her K: drive from anywhere with Internet access (using either a PC or a Mac). To view your K: drive using a web browser:

1. In the internet address area, type:  
ftp://.name.grads.polisci@pol1.sbs.ohio-state.edu for graduate students or  
ftp://.name.faculty.polisci@pol1.sbs.ohio-state.edu for faculty (where name is the name you use to login to the network);
2. You will then input the same password you use to log into the network (be sure that when you are asked for your password, the username is listed as “.name.grads.polisci” or “.name.faculty.polisci”); and
3. The files in your K: drive should then appear in the browser window.

If you are using an ftp client instead of a browser, you will be asked to input the host, user ID, and password. The host is pol1.sbs.ohio-state.edu, the user ID is .name.grads.polisci or .name.faculty.polisci, and then use your network password. Please contact Greg Miller at 292-1061 or [miller.2452@osu.edu](mailto:miller.2452@osu.edu) if you have any problems.

### **PRISM Events for Winter Quarter**

**P**RISM will host three luncheons this quarter as part of our ongoing *Luncheon Series*. This series offers an excellent opportunity for graduate students and faculty to attend presentations on applied and timely methodological topics. The series also facilitates interaction between methods-oriented faculty and graduate students. All faculty and grad students are invited to the presentations, regardless of the intensity of one's methods interests. More detailed information regarding the three luncheons is included below. Contact Brandon Bartels at [bartels.20@osu.edu](mailto:bartels.20@osu.edu) or 292-9661 if you have any questions about these events, or if you have ideas for future PRISM Luncheons.

#### *Introduction to Stata*

Monday, January 12, 2004 (3:30 – 5:00 p.m.)  
Derby Hall 0150 (Basement Computer Lab)  
Presenter: Kevin Sweeney

A broad overview of Stata, including information on getting started, as well as details on how to do basic data management, generate descriptive statistics commands, and run various estimation commands. The session is targeted to those who

have never used Stata, but those who have a vague applied understanding of Stata may also find the session useful. Students in Professor Wright's 685 course and Professor Lacy's 786 course will find this presentation especially useful, since much of the session is designed for these courses.

### *Post-Estimation Techniques in Statistical Analysis: Introduction to Clarify & S-Post*

Tuesday, February 10, 2004 (12:00 – 1:30 p.m.)  
Derby Hall, Spencer Room  
Presenters: Brandon Bartels and Kevin Sweeney

Upon estimating a statistical model, post-estimation techniques allow quantitative researchers to compute various quantities of interest to comprehend and present more powerfully the substantive effects produced by a statistical model. In many maximum likelihood models, some people find it difficult to make substantive sense out of coefficients. *Clarify* (by Michael Tomz, Jason Wittenberg, and Gary King) and *S-Post* (by J. Scott Long), both free and easy-to-download software packages, offer researchers the means of easily interpreting and presenting the effects of independent variables from maximum likelihood models. Common post-estimation techniques include: 1) calculating the predicted probability of an event occurring given a covariate profile; 2) calculating the change in the probability of an event occurring given a particular change in an independent variable of interest (while holding other variables constant); and 3) producing various types of graphs, including the option of graphing the probability of an event occurring as a function of a particular independent variable of interest (while holding other variables constant). These techniques, among others, greatly aid an analyst in the most efficient and powerful presentation of results from a statistical analysis.<sup>1</sup>

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<sup>1</sup> Directions for installing *Clarify* are available at: <http://gking.harvard.edu/clarify/docs/clarify.html>. See also: King, Gary, Michael Tomz, and Jason Wittenberg. 2000. "Making the Most of Statistical Analyses: Improving Interpretation and Presentation." *American Journal of Political Science* 44:341-55.

### *Endogeneity in Political Science Research*

Friday, March 5, 2004 (3:00 – 4:30 p.m.)  
Derby Hall, Spencer Room  
Panelists: Professor Janet Box-Steffensmeier, Professor Dean Lacy, Professor Irfan Nooruddin, Professor Brian Pollins, Brandon Bartels

This session will be a panel on the issue of endogeneity in political science research. Endogeneity exists in a model when an explanatory variable is not truly exogenous, but instead, is caused (or affected) by other variables within the system. When an endogenous right-hand-side (RHS) variable is a function of the dependent variable, reciprocal causation – the most common form of endogeneity – exists between these two variables, such that the endogenous RHS variable affects the dependent variable, but is also a function of the dependent variable. Indeed, the presence of an endogenous RHS variable can damage empirical research. For instance, the presence of an endogenous RHS variable in a statistical model can produce biased coefficients unless properly accounted for.

More generally, endogeneity can be thought of from three angles, and this threefold framework maps onto the structure of the panel discussion. First and foremost, endogeneity is a *theoretical* issue, and a researcher needs to think long and hard about the causal mechanisms at work in the process under study. Second, endogeneity can be confronted via a good *research design*. As experimental designs are capable of rendering strong causal inferences, researchers can use power of random assignment to treatment conditions in order to ascertain the causal impact of a factor on a dependent variable. Finally, the third way of confronting endogeneity is *statistically*. Two-stage least squares (2SLS) and its siblings (2SPR, 2SCML) are statistical means

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Directions for installing *S-Post* are available at: [http://www.indiana.edu/~jslsoc/spost\\_install.htm](http://www.indiana.edu/~jslsoc/spost_install.htm). See also: Long, J. Scott and Jeremy Freese. 2001. *Regression Models for Categorical Dependent Variables Using Stata*. College Station, TX: Stata Press.

of purging endogenous RHS variables of their endogeneity and generating unbiased coefficients, although there are problems associated with these techniques that will be addressed in the panel. In aggregate studies, vector autoregression (VAR) can be used to estimate the direction of causality between two time series. Along with discussing both theoretical and technical issues, Professor Brian Pollins will present an applied discussion about how IR scholars handle the reciprocal relationship between trade and conflict.

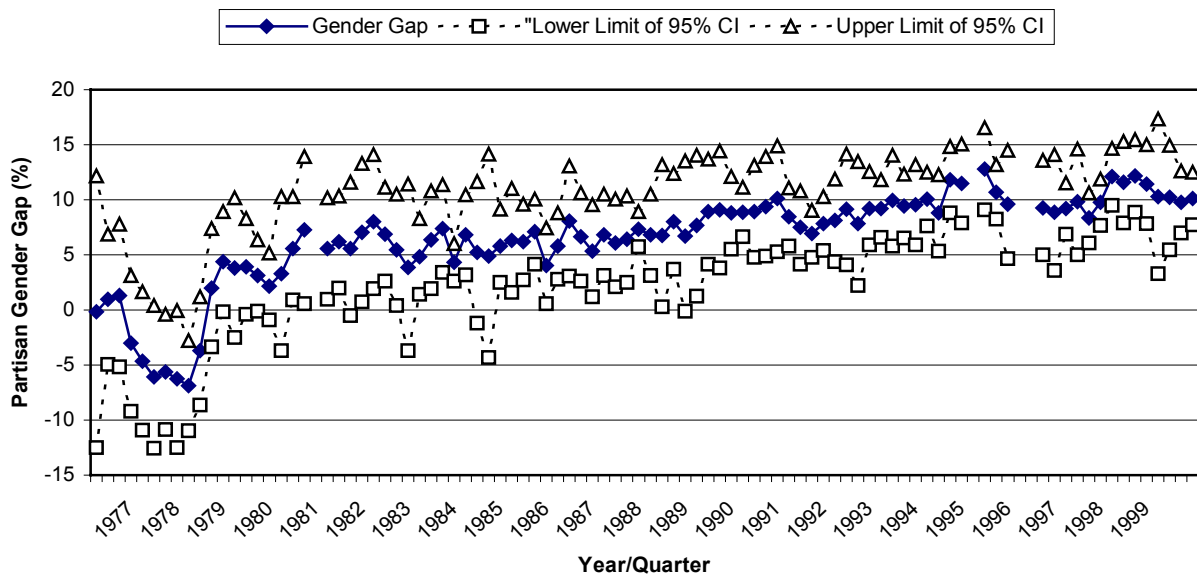
After the panel, please join us for happy hour and drinks (meeting place to be determined).

## Statistics Corner

### *Time Series Analysis and Fractional Integration*

By Professor Jan Box-Steffensmeier

**T**ime series statistical techniques are used to evaluate social processes occurring through time. A basic definition of a time series is that it is a set of  $N$  time-ordered observations of a process where each observation is an interval-level measurement with equal measurements of time separating the observations. We are considering the case where  $T$  (time) clearly dominates  $N$  (number of observations). Below is an example of the type of data that would be analyzed. This is the time series for the partisan gender gap in the U.S. using quarterly data from 1977 to 2000. That is, the difference between the partisanship of men and women – aggregated by quarter with 95% confidence intervals.



The gender gap has ranged from nearly zero to just over 10% between 1977 and 2000. Women were about 5% more Republican than men in the late 1970s and were about 5-10% more Democratic than were men by the late 1980s and through 2000. The gap does not appear to grow steadily, but increases substantially in 1979 and keeps increasing at a slower rate. Since all surveys have margin of error, we include 95% confidence intervals (i.e.,  $1.96 \times \text{margin of error}$ ).

While stark changes in the nature of the gender gap have stimulated individual level research explaining why men and women behave differently or have different preferences, the dynamics of the gender gap have gone largely unexplored. Time series techniques are uniquely suited and specifically designed to get at precisely these dynamics. It is clear that the gender gap is dynamic and importantly, that these dynamics exist outside of elections. The partisan gender gap has grown in a period of Republican strength, but appears to be maintained equally by similar movements toward the Democratic Party. Parallel and counter movements in men's and women's partisanship, different rates of decline and rebound, produce a gender gap that tells a more interesting story than that women identify more with Democrats than do men; *men and women react differently to the political environment*. But it is not clear what motivates these dynamics. What moves the partisan gender gap? What about the macropolitical environment has affected men and women differently? These are important questions both for improving our understanding of gender differences and for understanding the interplay of politics and gender as macropolitical events. Again, time series analysis is precisely the method to answer these types of substantive questions.

Examining the dynamics of the partisan gender gap gives us a unique perspective on the causes of gender differences and offers several advantages over cross sectional analysis. Time series analysis allows us to assess the role of the changing environment in determining gender differences in attitudes and behavior and to offer an explanation for this change. Specifically, by using time series data, we can test the hypotheses that changes are

due to the effects of changes in the political environment; changes in the conditions or experiences of men and women; and changes in the economy. In so doing, we can better understand gender differences more generally. In contrast, cross sectional analysis is prone to several pitfalls. First, the persistence of the gender gap cannot be assessed cross sectionally. Second, explanations for the gender gap in cross sectional analysis focus on features that discriminate among individuals, which are inherently less political than macro level factors (Erikson, MacKuen, and Stimson 2002); political conditions are constant within a cross section and cannot help us understand variations in gender differences at any one point in time. Third, the factors that help us explain variation in individual behavior do not work well over time, in fact, they are usually constant. We, however, want to understand the impact of slow moving macro (social) processes, e.g., economic, social, and political processes. For example, the percent of women with a college education moves very slowly over time and is constant for all individuals if using a cross sectional approach. Finally, one cannot consider the evolution of the gender gap and associated counterfactuals over time. We want to be able to talk about the effect of a shock on the trajectory and sustainability of the gender gap. There is a role for both cross sectional and time series analysis, but they ask and answer different questions.

We assess the *persistence* of the gender gap because of its importance for thinking about shifts in aggregate partisanship. If gender differences are persistent, an increase in the gender gap due to shocks in the political, economic, and structural environment may last for years even if the shocks are just transient phenomena. In addition, theory predicts that gender differences will be persistent because they are a function of features of the political system that change very slowly. For example, it is difficult to move people off of welfare or change education levels, so gender differences will be persistent.

The level of persistence is determined by estimating the parameter,  $d$ , when characterizing a time series. When we relax the assumptions about



$d$  so that it can be any real number, we are using fractional integration. Fractional integration is an important innovation because of the increased precision of our estimates and characterizations of our series. If our series are not characterized appropriately, then subsequent analyses will not be accurate. Fractional integration also eliminated a major criticism of Box-Jenkins times series methods, specifically, the “art” of interpreting autocorrelation functions and partial autocorrelations functions to determine the characterization of the series was seen as too casual and was a controversial approach. Beran (1994) goes so far as to consider fractional integration a key unifying concept in time series analysis. Lanier et al. (1998) and Lebo (1998) argue that modeling data with fractional integration reduces spuriousness and improves parsimony. Importantly, fractional integration links macro and micro-level processes, which is theoretically important (e.g., Granger 1980; Box-Steffensmeier and Smith 1996). Finally, Lebo et al. (1998) show that most of the series of interest to political scientists are characterized by fractional dynamics, including presidential approval, consumer sentiment, macropartisanship, and ideology of the Supreme Court.

Fractional integration will be an integral topic in the upcoming time series course taught by John Freeman (University of Minnesota), Jon Pevehouse (University of Wisconsin and former OSU grad student) and myself. The course starts January 23<sup>rd</sup> and lasts for fourteen weeks. After a brief review of the calculus of finite differences and other estimation techniques, we study stationary ARMA models. In the next section of the course, we examine a number of important topics in time series analysis including “reduced form” methods (granger causality and vector autoregression), unit root tests, near-integration, fractional integration, cointegration, and error correction models. Time series regression is also discussed (including a brief discussion of pooling cross sectional and time series data). We learn not

only how to construct these models but also how to use them in policy analysis.

In contrast, Brian Gaines will teach an ITV course on the very large and rapidly growing statistical literature on analyzing data in which observations are a cross section of some units (e.g. individuals, countries, states, firms) over multiple time periods but where the cross sectional units clearly dominate. That is, the focus is on cases in which we have much larger  $N$ s than  $T$ s. Here “panel data” is used in a broad sense to mean any data spanning multiple dimensions, usually (but not necessarily) time and space. In general terms, the advantage to having time and space variance is that one can avoid inferring that inter-personal differences across units are equivalent to inter-temporal differences within units. For instance, in a cross section if we find that age is a significant predictor of voting, we often infer that this result implies a forecast that all members of the relevant population will vote with increasing probability as they age. From a time series on just one unit, we might make the companion inference: that an observed life-cycle change in one unit implies across-age variation in a population that is heterogeneous in age in any given time period. Panel models are particularly prevalent in comparative politics.

Whether  $N$  (observation units) or  $T$  (time) dominate the data has a huge impact on the methods used. However, both time series and panel data methods take advantage of the inter-unit and inter-temporal variance. By using both dimensions of the data, one can typically adjudicate better among rival theories. The increasing availability of large data sets and powerful computers has made time series and panel models more and more prominent in the literature. For further information on both the time series and panel data courses and to obtain the syllabi, please see the ITV webpage at: <http://psweb.sbs.ohio-state.edu/faculty/jbox/ITV/ITVHome.html>

## PRL Staff Information

Title	Name	Office	Phone	Email
Director	Herb Weisberg	2049D	292-6572	<a href="mailto:weisberg.1@osu.edu">weisberg.1@osu.edu</a>
Associate Director	Jan Box-Steffensmeier	2049S	292-9642	<a href="mailto:jboxstef+@osu.edu">jboxstef+@osu.edu</a>
Assistant Director	Gregory Miller	2049R	292-1061	<a href="mailto:miller.2452@osu.edu">miller.2452@osu.edu</a>
Systems Manager	James Norman	2049K	688-3732	<a href="mailto:norman.67@osu.edu">norman.67@osu.edu</a>
Systems Manager	Bill Miller	2049E	292-1814	<a href="mailto:bmiller@polisci.sbs.ohio-state.edu">bmiller@polisci.sbs.ohio-state.edu</a>
Graduate Assistant	Brent Strathman	2049F	292-0511	<a href="mailto:strathman.5@osu.edu">strathman.5@osu.edu</a>
Graduate Assistant	Zach Mears	2049F	292-0511	<a href="mailto:mears.16@osu.edu">mears.16@osu.edu</a>
Undergraduate Assistant	Michael Kovalchuk	2049H	292-0511	<a href="mailto:kovalchuk.2@osu.edu">kovalchuk.2@osu.edu</a>
Undergraduate Assistant	Yared Debebe	2049H	292-0511	<a href="mailto:debebe.1@osu.edu">debebe.1@osu.edu</a>
PRISM Senior Fellow	Kevin Sweeney	2049Q	292-9661	<a href="mailto:sweeney.101@osu.edu">sweeney.101@osu.edu</a>
PRISM Junior Fellow	Brandon Bartels	2049Q	292-9661	<a href="mailto:bartels.20@osu.edu">bartels.20@osu.edu</a>

To contact all Lab Staff simultaneously, email us at [prl@polisci.sbs.ohio-state.edu](mailto:prl@polisci.sbs.ohio-state.edu)

Previous issues of Lab Notes and other valuable information can be found at the Lab's website:  
<http://psweb.sbs.ohio-state.edu/prl/index.htm>