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Perspectives on Political Methodology: Interview with Simon Jackman*

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Abstract

In this interview, Simon Jackman discusses his background training and the state of political methodology in the United States. Themes include advantages of Bayesian inference, the links between Bayesian statistics and causal relations, the importance of statistical literacy and the role of programming for social scientists.

Leviathan: In a piece of yours on *The Political Methodologist*[1] you recolected your undergraduate studies and your methodological education. How did you decide to go to the United States and how clear was it back then that you would become a methodologist?

Simon Jackman: Once I had a quantitative term, which happened for me half way through my undergraduate degree, it became somewhat clear. A whole new goal opened up to me, and it was at that point that I understood that the United States was where the best work like that was being done, and if I wanted to do it, I should probably go there. There is no way staying in Australia was a workout at that point.

The other thing is that I was very lucky to have some professors trained in America who had come back to Australia and were encouraging me to apply to American grad schools, saying that "if you go into a good place, you could even have a

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[1] Christopher Achen, Larry Bartels, Simon Jackman and Joshua Clinton.A Methodological Education (In Four Parts). The Political Metodologist, vol.12, n.2, Fall 2004.

career there", and that started to become a plan. At some point, it was just "I will go to America". Once I got accepted to a place like Rochester, I knew that if I did well then, I could probably get a good job and a career in the United States.

So, it came a bit slowly. Going to Rochester was very fortunate. I don't think I tested that well, nor did I have a strong vita. Having participated in graduate commissions now, I look back at how my files must have looked and I am surprised that I got into a place as good as Rochester. Maybe I was a little bit lucky that one of the professors there, Dick Niemi[2], a very senior scholar, was able to look at my file and see some promise there that wasn't reflected in the test scores.

I didn't know it at the time, but in the late 1980's, early 1990's, Rochester was one of the best Ph.D. places in the country and, probably, in the world. Very strong formal modeling training and also very strong statistical training – and they were both talking to one another. It was Niemi who got me to Rochester, but while I was there, I very quickly understood I was probably one of the best statistics students in the group. Formal modeling was not going to be my strong suit, quantitative stuff was. It just came easy to me. So I doubled down and played my strength. That got me to the attention of Larry Bartels[3] and one thing led to another. I was able to follow Larry to Princeton and started to publish, had some ideas about how to move things forward, and things started to open up, the Bayesian thing being [first] a curiosity, then a philosophical position and then something practical. That is the evolution per se from my undergraduate phase to right on the verge of getting a job. The role of specific people coming into my life is very hard to understand.

Leviathan: Who were your advisers?

Simon Jackman: Back in Australia, it was a guy named David Gow[4], who published in the *American Political Science Review*, back in the 1970s, a paper on scaling judges. At Rochester, Dick Niemi, and then Dave Weimer and Larry Bartels, a

[2] Richard G. Niemi, scholar in the fields of voting behavior and political institutions.

[3] Department of Political Science, Vanderbilt University.

[4] The University of Queensland Business School.

very good group. It was a very small group. There were only eight graduate students a year, and maybe only five of us finished. Guy[5], me, Tim Ferguson, Harvey Palmer[6], and so maybe it was only four of us that finished (I hope I am not forgetting anyone!).

The professors were also great: David Austen-Smith[7], Jeff Banks[8]... And they were doing their work back then as well, a very cohesive group. You really felt you had a lot of support, "we are in this together". Everyone would come to work every day, work really long, hard days, and have a lunch to go. And all so poor! No money at all! Just in an apartment because it is so cold outside, too. It was just horrible, but it was really great professionally and intellectually [laughs].

Leviathan: At which point did you make contact with Bayesian inference? How was your transition to this kind of approach?

Simon Jackman: Larry Bartels gave a lecture, he knew about the Bayesian approach. Dave Weimer taught a very traditional intermediate econometrics-type class. It was a semester long course and I think Dave Weimer[9] had a good [Bayesian] training himself. He has a masters in Statistics from Berkeley and understands the tension between frequentist and Bayesian positions. More than that, he knew that Larry understood all that as well. I think that Dave just thought of a nice way to break up a fourteen-week long class to have Larry Bartels come in and give the Bayesian critique, or the Bayesian approach.

It was just like being hit in the head with a hammer. He was just so clear and very smart and had clearly thought about the issues deeply. He had really worked out his own position, and could argue it very convincingly. I was sitting down and could hear things in my head just click with a "oh, God". It was so hard for me to understand the frequentist approach that I had to tell it to myself over and over again to make it sink. "It is a sample in distribution, but I could only get one set of data and...". Everything seemed backwards and strange to me. And then along comes this Bayesian position, not just in its own right but the way Larry, in his manner, would make fun of

[5] Guy Whitten, Political Science Department, Texas A&M.

[6] Department of Political Science, The University at Buffalo.

[7] Kellogg School of Management, Northwestern University.

[8] Jeffrey S. Banks, deceased.

[9] David L. Weimer, Robert M. La Follette School of Public Affairs, University of Wisconsin-Madison.

the frequentist position. I remember walking away thinking "well, I can't do this. That is it"! What do we do now? I went to his office and said "Come on, how do I analyze data this way"? And he says: "You know, you can't really". [laughs]

I would always go back to running regressions and looking at t-statistics and p-values, saying "what"? That was the big philosophical breakthrough for me and it just made so much more sense. I just followed it because the technique was still about a year or two or three away from... things were changing very quickly then. The MCMC[10] revolution was just taking off in the late 1980's, early 1990's in statistics. Larry bought me a Gateway computer when we went to Princeton. He went to Princeton and I was able to come with him. He had all this money, and he said "buy yourself a nice computer and buy me one while you're at it".

At the same time, Andy Gelman[11] was working with Gary King[12] and I was reading their papers. I was going "oh, wow! Ok! I can do this"! I was always a good programmer, so I could figure it out. Monte Carlo made so much sense now. I was already doing it but I didn't know the name for it. The other thing is that Larry had no students at Princeton when he first went down. I think part of the reason he was happy for me to come is because otherwise he wouldn't have had any students. Princeton was still transitioning to become modern-type department and Larry was part of this wave of highs that were trying to do that. But there were no students for them, John Londregan[13], Larry. I would have lunch with these guys every day, the five professors and one student! "Try that, do that"... Larry was just very patient.

Leviathan: At this point did you already have your thesis topic?

Simon Jackman: No, I did not have knowledge of my thesis topic then.

Leviathan: What was it about?

[10] Markov Chain Monte Carlo is a class of techniques that allow discovering any property of an unknown probability distribution by repeated simulations.

[11] Andrew Gelman, Columbia University, Department of Statistics and Department of Political Science.

[12] Harvard University, Department of Government.

[13] Department of Political Science, Princeton University.

Simon Jackman: Wow! Ah, it has a rather pretentious title: "Perception and Reality in America Public Opinion". It was about – a little less pretentiously – the difference between the real macro economy and the perceived macro economy. It was a time that the economic void in literature was in one of its upswings in the late 1980's, early 1990's, and I was drawn to the idea that a lot of input into those models needed to be questioned. Where did people form their views of the economy? How grounded were those views in reality? It is a piece of American political economy, the linkage between how people think the economy is doing and their political responses and public opinion about it. Some of those were based on misperception about the economic reality or just poor forecast. There were a bunch of papers there. The dissertation is a series of papers. The public's forecast inability in the aggregate, micro-level stuff on who knows what about the economy. Some time-series modeling. Some regime switching.

It is unusual because then I did absolutely nothing with it. I wrote my dissertation and I signed off on it. It is a big three-hundred page dissertation sitting on my shelf at Stanford. Not one of those chapters ever got published. I was crazy and a little irresponsible, frankly. I was doing so many other things with my publishing and my writing and research that I felt that I could get away with it, that didn't matter. I was writing this, that and the other thing. I was interested in too many things, and if I never published my dissertation, well, "that is cool. I am a punk" [laughs]. I thought "I do not need it because I have got all this other stuff that says how good I am". And there is a little bit of that attitude that I think was... I certainly wouldn't advise anyone to do that.

In retrospect, I think there is something to be said for, if not a book, then articles coming out of your dissertation. You can't do that much work, have that much taken out of your life and then just leave it on the shelf. Every now and then, I tell myself: "I am going to go back and update all those pieces". But I haven't and now we are a few years down the road. Maybe that moment has passed.

Leviathan: You mentioned your programming skills on graduate school. How did you learn to program?

Simon Jackman: When I started writing statistics code I was... Oh, wow, how old was I? I was 14 or 15... at my high school, in Basic[14]. I ran my first survey with my classmates and it was a terrible thing I asked them to do. I went to an all-boy's Catholic School and I asked all of my classmates to assign scores to all of the girls at our sister school. It didn't make me very popular with the girls [laughs], but that was my first real data set, and I wrote in Basic, on an Apple IIe, this code to compute means and standard deviations. And then, in a bizarre way, I got exposed to linear algebra. In the 9th grade[15] I was ridiculously lucky to have this great British teacher who used to be in the Navy in England and found himself teaching high school in Australia. That is the background. Then I get to the University of Queensland as an undergraduate and I don't do any of that for a couple of years. When I rediscovered the quanti side, I think part of what made it so easy is that I had all that skill. And I think the professors out there thought "this kid... you can do that"? By then I was using SAS[16] – which was a really awful thing to program, but it did have a matrix piece of it that was much more like real programming. You could actually program matrix operations in this one piece of SAS back then.

Then, the next big step was really when I got to the United States through Larry Bartels and was introduced to the Political Methodology group. It was Larry who took me to my first methodology conference. I was a second-year graduate student in 1990, in St Louis, and I got introduced to the greats. You know, "this is Chris Achen"[17], "this is John Jackson"[18], "this is Gary King", "that is Doug Rivers"[19], "Mel Hinich"[20], "Charles Franklin"[21], "Neal Beck"[22] – I am really good friends with all those guys, and it goes

[14] Programming language created in the 1960's and aimed towards beginners.
[15] Equivalent to Brazil's 1st year in high school.
[16] Statistical package developed by SAS Institute Inc.
[17] Christopher H. Achen, Department of Politics, Princeton University.
[18] Department of Political Science, University of Michigan.
[19] Douglas Rivers, Department of Political Science, Stanford University.
[20] Melvin J. Hinich, deceased.
[21] Department of Political Science, University of Wisconsin-Madison.
[22] Nathaniel Beck, Department of Politics, New York University.

back to... Because Larry brought a student to the meeting, and if Larry says he is good, I guess he is good, so I got to know all those guys as a second-year graduate student.

I was immediately plugged in to one of the best professional networks in the business. And they were all the best. You would talk about all the programming, "SAS is crap, you can't do anything methodological in that, you have got to use a thing called GAUSS[23] that econometricians use". GAUSS was much faster. You could write functions and that was it! Once I realized "oh, now I am writing subroutines" (as the Fortran people would call them, "subroutines"). Now I was doing something that looked like real programming.

That is all happening in my second/third year of grad school. Gary King was great... I could see him in the middle of the night and ask him "how do you do this"? Or Neal Beck. We got the Internet all of a sudden too. Suddenly you could e-mail someone and get a reply back instantaneously. That happened while I was in grad school. At the beginning, grad students couldn't do that. In 1989, you couldn't do that; by 1993, yeah, of course! FTP, sharing files, code and data. That happened pretty quickly, it seems now. Another Australian guy named Bruce Western[24], who had published a Bayesian article a long time ago, was in sociology at UCLA. One summer I flew out to have a vacation in Los Angeles, and Bruce says "are you using this thing called S-PLUS?[25] It's the bomb"! And it really was. The graphics were amazing, you could click on data and it would label it. We could spin a 3D cloud of data. The thing was slow as hell, but it was still so much better than anything else, and I went "whoa, that's it"! I threw GAUSS away and started using S-PLUS.

That is it, basically. That was almost the last evolution, up until right about my first job. It was in Chicago, I had been there talking to the Bayesian econometricians at the Business School about how they did their work. I was using some models that they had invented, frankly – this regime-switching thing on a Bayesian setting. I was talking to them about how I was using S-PLUS, they laughed and said "if you are going to do

[23] Programming language designed in the 1980's for mathematical and statistical computing.

[24] Harvard Kennedy School of Government.

[25] Proprietary implementation of the open-source S statistical programming language, developed by TIBCO Software Inc.

this, if you can code MCMC, you have to learn a real programming language like C". I guess GAUSS was a programming language, S-PLUS, R, but programming for real in a lower-level[26] environment like C didn't start until I had a job. This was about 1994, 1995, and that was great because things could go really fast, and you needed that. The computers just weren't fast enough. If you were doing something like MCMC back then, you needed to be able to code in C or Fortran, because BUGS and JAGS[27] weren't quite in the picture yet. They were, but BUGS was getting better at the time.

I was spending a lot of time writing code in grad school – and even now, but less intensively. I think the high order might have been as an assistant professor, but every now and then I have my moments on this, since all you do is write and code better. Now I have other responsibilities and it is increasingly tough to justify just writing code.

Leviathan: Getting back to the topic of Bayesian analysis, you and your book[28] have greatly contributed to develop the Bayesian approach in empirical social sciences. In which ways do you think the Bayesian approach offers a better answer for some puzzles in our field, when compared to the classical inference model?

Simon Jackman: There are two answers that come to mind: one a little more philosophical, the other more practical. I made this argument in the opening of the book. The philosophical argument is that the repeated sampling idea that underlies classical inference just does not make sense for a lot of what we do. Sometimes, we have the entire population. Think of cross-national research or historical datasets. The thought experiment of introductory statistics – drawing balls out of an urn, such stories – just makes no sense to me at all.

[26] In programming, low-level languages are distinguished from high-level ones by their ability to communicate directly (or with very little interference) with hardware. This often results in faster, more efficient software, at the expense of being less intuitive to code.

[27] BUGS (Bayesian Inference Using Gibbs Sampling) and JAGS (Just Another Gibbs Sampler) are statistical packages used in Bayesian modeling.

[28] Simon Jackman,Bayesian Analysis for the Social Sciences. Wiley, 2009.

So, at one level, I think you get to say what you mean. You can be actually honest in the Bayesian approach because you are categorizing subjective beliefs in light of data – and doing so in a rigorous way via Bayes Rule. I just think that is more intellectually honest. Now, does anybody care about it being intellectually honest? [laughs] Well, I tend to think we should, but a lot of people think "we are practical people, whatever". I take that side of it quite seriously, frankly. I don't have to use words that I know are not true [laughs]. When I am talking about the results of my work, when I am presenting my work to others, I can do so. I take that very seriously.

On the practical side, I have a couple of things to say. On the one hand, the toolkit merged with the philosophical approach (and by toolkit I mean things like JAGS and BUGS) gave us great flexibility with modeling – developing an hierarchical structure when that might make sense, or handling missing data problems on the fly rather than making it a separate piece of analysis. We have this amazing platform to write out models that are applicable to our data and to the issues we see in it, versus choosing from a menu of pre-canned modeling options. Estimation by MCMC, lots of parameters, inferences for big high-dimensional spaces. Whether you are a classical person or a Bayesian fan, just the power of that is breathtaking. The Bayesian revolution, MCMC powered, in the 1990's and the 2000's is driven by technology.

Indeed, there is a whole lot of people that say "ah, philosophy... whatever! I don't really care. It is just words, right? We have this amazing technology to fit really interesting models with tons of parameters, and you can put hierarchical structures on them. I am not attracted to it necessarily because I am a Bayesian, but just because that is a cool thing to do". I think that is a very practical set of concerns. Look at how political science has been evolving. It used to be that if you knew the linear regression model pretty well, you're a methodologist. We have come so far from that. New types of data, the size of data, the models that we want to fit into these huge datasets, the last five, ten years or so of thinking about text data, social network analysis, spatial statistics... I just go down that checklist of things. Or look at some of the things we are doing in survey research to deal with non-response, or how to correct for bias in survey sampling. I look around at research programs and see Bayesian models

powering. It is a Bayesian model they'reusing here, and it is a Bayesian model they're using there...

The one place where it isn't is the work on causal inference, in matching, which is not one specially Bayesian at all. That is interesting. That has gotten really hot in the last five years. Ten years, say, in North America, at least, and probably around the world, it would be fair to say. Trying to think of one area where there is a lot of exciting debate going on where Bayesian ideas are not playing a key role, this is one. But in many, many other areas, it is either Bayesian with a capital B or with a little b. The MCMC idea, even if not particularly Bayesian at all, is powering it. That is quite gratifying. It is great to see that, and I had to stop my book at 600 pages but there is so many more areas that are opening up. If I ever did a second edition, I'd have to talk about spatial analysis, networks, text data... I think that is precisely because it is such an enabling technology and it lets you do so many things.

Leviathan: In Nate Silver's recent book[29], he makes a claim that some problems we see in science and in some famous statements, like the one by Fisher that smoking didn't cause cancer, were possible by their lack of appreciation for Bayesian statistics. But, as you said, we do not see much relation between Bayesian statistics and causal inference. What are your thoughts on the connection between causal inference and the Bayesian approach? There doesn't seem to be much difference between Bayesian and frequentist approaches when we're thinking of causal inference.

Simon Jackman: I agree there isn't much connection at the moment. I think the whole idea in that literature is driven by the purpose of getting unbiased estimations. If you match and match and match and match, better matching means less bias and this is a very classical idea: put the bias estimation front and center. Whereas in the Bayesian [approach], you have the computed posterior density and maybe centered over the right place – if there is indeed such a thing as the right place. The thing is, after you matched, the analysis is just the differences of means. That is a pretty simple problem and that is the point. If we get the matching done right, the causal inference

[29] Nate Silver,The Signal and the Noise. Penguin Press HC, 2012.

problem reduces to a difference of means, and you don't need sophisticated technology to do that. You could always do the difference of means that come on the back of a matching procedure in a Bayesian way. You could do meta-analysis, which is similar to hierarchical modeling, cross multiple studies after you have matched estimates, and things like that. So there is Bayesian stuff around to take advantage of, if you want. You match unobservables, there is an ignorability assumption made to do that, we hope it is valid. And now we do inference.

Bayesian ideas may come into play in the effort to get better and better matches, I may be throwing away data and, hence, getting a noisier, less precise estimate. Maybe there are some ideas from hierarchical modeling that could be deployed. But I do not see a lot of that out there. I have a few ideas that are not particularly well-formed on where Bayesian thinking might come in and may be able to help out. I am very interested to see what Guido Imbens[30] thinks, because I think he is a Rubin[31] student and has this interest in the tension between classical and Bayesian.

I wonder if simulation might find deployment in the causal inference world. I think what is happening is that there is so much data that variance is arbitrarily small anyway. What is making these things even is that even in little slices of the data set after we've matched down there is still so much data that the bias-variance trade is not so much, it's all about bias. If I could get away from all my projects at the moment and try to think about something from scratch, it would be that problem. I would love to see it and maybe I am not the person to do it. But it would be great to have a conference and get together, in just a day or something — Imbens and Gelman, and maybe bringing Don Rubin and Gary... just sit around and see whether these two approaches link up with Do. That would be a fun thing to do, yeah. I should do that [laughs].

Leviathan: What are then, in your opinion, the greatest achievements of political methodology as a field?

Simon Jackman: You've got... the empirical people won. There is much more data to work now than there was when I was getting started. And I think the reason is

[30] Department of Economics, Harvard University.

[31] Donald Rubin, Department of Statistics, Harvard University.

we train people how to look at data. I think the other thing that is happening is, once you have data, does it mean you just run a regression? People are thinking about where the data comes from, what its properties are. I look at Gary [King] with Clarify[32]. That had a huge impact, people understood that just estimating a model is not enough. You have to be able to elaborate. What is the model telling us about the underlying process? So I think there is some iteration. We are moving on to not just getting people using statistics, but using it intelligently. There is a couple of us who can claim some credit for that. You would have to put Gary up there. Bartels too, Andy [Gelman] and, to some extent, myself. Good looking, beautiful data analysis. It is not just to slap the [regression] table up anymore. You must be able to say for yourself what is the picture, in the first instance, understand what the hell is going on. Then tell your audience.

The other thing I would have to say comes back to experiments and causal inference. I think that these things are huge. Political science has just embraced that with the fervor of the moment in North America, at least. Don Green[33], a long-time member of the methodology group, has really stopped being active as he got on this. He and Alan Gerber[34] started to develop that whole program at Yale. The way that this swept the profession at the moment is a great thing.

I would also point out the work of my colleague Doug Rivers who started not one, but two survey firms on the Internet. Two of the best known names in American social sciences for survey research are companies that he built, putting low-cost survey research out there for the profession. A project that I run, the American National Election Studies, is no longer the monopoly supplier of survey data. That is a great thing. You can get a survey this weekend at low cost. For a couple of thousand bucks, you can get data sent back next week: with an experiment on it, or just a survey. Then again, that is more a business idea than a method.

[32] Statistical package for presenting and interpreting statistical models.

[33] Donald Green, Department of Political Science, Columbia University.

[34] Department of Political Science, Yale University.

Those things are transformative, you have graduate students doing original research. They used to be really hard to do. As a graduate student, original research meant field work and comparative analysis. Now everybody is running an experiment. You can run a survey and the pace of research, the pace of discovery is turned out by an order of magnitude compared to graduate school 20 years ago.

Leviathan: Speaking of research being made by graduate students, given your experience in Stanford, what are the general expectations for a doctoral thesis in the United States today? Is it true that students are expected, for example, to have at least a formal model, an observational analysis and maybe an experimental design? Is it possible to do it all well?

Simon Jackman: [laughs] I heard that before. I do not think that is true for a start. I think there is a certain stereotype about comparative politics, in particular, that there is a certain type of student Stanford is producing at the moment who will have the formal model, will have field work and, then, will have either an experimental or observational study. And I think there may be a little bit of truth to that in some part of that department that is extremely prominent. But not even in that group this is... I have seen people for whom that is true. I can easily understand how that might come to be seen as a requirement. It isn't. We want our students to know what those things are and how to do them. And we certainly had a bit of intelligent critics of this, so I don't think we're insisting that everybody do that. There is a bit more of heterogeneity around.

Leviathan: This leads us to a more general question about the path for students who are interested in pursuing a research agenda related to political methodology. Could you elaborate on your prior comments about the role of methodological training in American graduate school? Also, what would you say to programs which are willing to invest more heavily in this area?

Simon Jackman: In general, I think both the undergraduate and especially the graduate crew need to have a certain knowledge of the tools. This has been true for a long time. It is very hard to read the journals and understand what is going on in the field if you are not tooled up to a little level. You just need to have a certain literacy to be able to read what is going on. Part of it is generational and part of it is an opposition

between American political science versus the rest. There is a bit of that and I know about it. I am not from America myself. I grew up in Australia and I know how all that works.

The other thing I would point to is: forget political science. Look at what is happening in the culture. Look at the way data is now "big data", machine learning and... this is touching corporate life and what governments are doing, companies are harvesting vast amounts of data. That is the revolution that, if you ignore, you are at peril. We ought to equip our undergraduates to understand what is going on out there. Political science has a role to play. This is a form of power. Data is power, right? The analysis of data has this empowering influence in contemporary society. How could we turn our backs from that? How could we look the other way as scholars, as teachers? This is not just about our research, I am talking about what is happening in the culture. We must give our students a little bit of statistical literacy as part of their education because a) it's what an educated person should know, b) it's what an employable person should know, and c) it's our obligation to equip them as they go out the door with an undergraduate degree.

At Stanford, in particular, everybody — everybody? — I think everybody has to do a year of statistics. A year? No, probably it is just half a year. Everybody is required, but most people do a full three quarters, nine months. A lot of people do some more on top of that, and that was true of Rochester back then. It is tough to find a good Ph.D. program in the United States where that is not the case. You do not have to be a methodologist – and it is not even clear what that is, frankly. But there is so much going on out there, and again it is not just "oh, I can read the regression table". That does not cut it anymore. You must be able to think in a randomization, what that does and what ignorability is, what is an identification strategy. Even someone for whom regression was the high-order math, that is not getting it done anymore.

My last word about that is: the direct effects of a good methodological training when you go into the academic job market, on that first burst of scholarly productivity around a Ph.D., is great. There is also the ability to refresh yourself throughout the

career cycle. So, from now on, you're a senior person and can read all text data analysis that were deployed. Or the causal inference literature comes along and I am not completely blind, because I have a certain amount of quantitative literacy, I can pick up stuff and read it. Not only in political science, I can pick up work in economics, I can pick up work in epidemiology. I think your ability to be a scientist, consume knowledge and be stimulated by what is going on in other scholarly fields is also enhanced by some statistical literacy. Isn't that an obligation of a scholar? Do you want to only know about, for example, the US Supreme Court, and not be able to say much of anything else? I can't imagine such a life [laughs].

Leviathan: In that sense, can you give us a quick overview of what are the minimum requirements in Stanford's basic methodological training?

Simon Jackman: The first class is introduction to some probability, some fundamentals of mathematical statistics. Law of Large Numbers, Central Limit Theorem and some elementary data analysis: mean, proportion, what a crosstab is, inference on a crosstab, differences of means, correlation. And then, the second class is interesting. It used to be a regression class but now it has got to do with a lot more than that, so some casual inference comes in as well. It is somewhat like an applied modeling class. You are not just fitting means, it might be a ratio, a logit or probit, and things that go wrong with that, like measurement error. It is still is an intermediate econometrics course with the injection of causal of inference. That is what we require of most people. In fact, that is what we require of everybody. Electives come after that, but that is a rough quick sense of the topics we cover in the two required classes.

Leviathan: Are students introduced to Bayesian inference in these classes?

Simon Jackman: Not really, and that is interesting. If I am teaching the regression class, I will try and do what Larry Bartels did for me. I will try and get a day to Bayes. I say "now, I am going to mess with your heads"! But I do the classical theme for the most part. It is difficult for me, and I find myself muttering little asides to students. I teach the Bayesian basics in a separate class because I try to power it with the applications on ideal point estimation, polling, a couple of specific applications. That is really a little more advanced. You really can't show them that until they have the fundamentals, but a certain Bayesian comes in.

Leviathan: You talked a lot about the statistical side of methodological training, but what about the implementation side? Are students trained to code?

Simon Jackman: Oh, they hate it! [laughs] They do not all hate it, but some of them do, because all the teachers on these classes are using R now. We get a bit of griping about that. There is a start-up cost, and Stata seems so much easier. Sometimes we are getting students who come from another place where they thought "if I learn Stata, I will be set for life". There is a sense in which that is true, but there is also a sense in which there is another level up and they feel cheated that they spent all this time learning Stata and now they have start from scratch with a new language.

We have learned this, and to solve it, we staff these classes really well. I think here is the other key: the department makes a commitment. Everybody is going to go through this, but we are going to resource it at the right level. There are teaching assistants, there are labs, there are people there to hold their hands and get them through this. We understand that for some people it is going to be harder. They are seeing it for the first time. Some people are seeing it for the third time. But we are going to get everybody through because it is a requirement, and if we are going to make a requirement, we are going to make it easy for you to jump over that hurdle. It is the first year of grad school, it isn't going to be a picnic. For some it is going to be hard, so they grumble a bit, but what I am looking for are kids who have got a flair for it and can work with me. Not many do. Really good programming talent, sometimes, intersects with wanting to be a political scientist. But really? [laughs]

Leviathan: You coded an R package for ideal point estimation[35]. Could you tell us how was your experience, and what are some of the programming difficulties involved? Did you write it in C?

Simon Jackman: Yeah, I did. I had to know C. When I realized I wanted to get my stuff out there, and I wanted people to use it, I was unhappy with the speed of BUGS. Even in my own book, I was unhappy about this. I wrote [the package] because I needed it to be fast. It wasn't an R package for a couple of years, it was a stand-alone C

[35] Package "pscl".

program that would run out of the command line. I didn't know about making R packages, but then people started making packages which essentially wrapped my C code. That is the way it went. I had to know some C and that took me a long time getting it to work right. It took a while. I'd really love to go back and redesign some of that. I think there are things I could do now, make it go a little bit faster, or exploit multiple cores. The estimation does not scale well. You get more votes, you get more legislators, so I have thought about ways to maybe only do the MCMC at the end. I don't know. I have a few ideas on that, but it is hard. Life is short. [laughs]

Leviathan: You told us something about what you do and what you did in political science. Regarding the future, where do you think the field is going?

Simon Jackman: Text data I think is huge. That actually means everything is data. This is data everywhere. Text coupled with dimensional analysis. What is a law? How do laws relate to one another? What is a political speech? What is a politician's rhetoric? How would you ever do quantitative work on that? I think that is going to be huge. Social media as well. Think of the scope of things that will fall into the realm of quantitative analysis once you understand text. We have computers just scraping and parsing text, and the next 10, 15 years are going to be crazy. That may be coupled with experiments too. That could be really interesting... This is already happening, people are doing studies like that now.

Leviathan: And maybe to complement this idea, data analysis seems to be advancing very rapidly whereas theory advances at a different pace. How do you see the future for those studies that aim to build empirical evidence around theoretical micro-foundations?

Simon Jackman: I think that can't help but suffer. I have seen the pendulum swing a bit more towards a data first approach, but not radically. That happens because there is so much data, particularly coupled with the ability to generate your own data. I thinkthat is when people can be creative and get outside the box a little bit, and try things. But that is an interesting point, the pace of the new ideas not happening as fast. Yes, it is obviously true. It is not happening as quickly as the methodological innovation, or the big data revolution. That is interesting. I am not quite sure what we do with that, but think faster, ok? [laughs] I would if I could.

Often what drives theoretical innovation is what happens in the real world: wars, economic downturns, or, in the present case, technological breakthroughs. The things that we use, while driving a lot of change inside the profession of political science also are things that are driving a lot of change in society, like I said earlier. Maybe we need some theoretical constructs that help us understand those, or think about their implications, or give names to them and develop them. It could be that this is the big thing happening in society that we are waiting to see how it plays out. I am just thinking, say, in the realm of democratic politics, or political economy, or the relation between civil society, citizens, corporations and state. Technology is doing things to all those realms that maybe will drive really interesting youth theorizing, some new categorizations. It is usually the outside world that offers, for most scholars, the motivation for intellectual work. A whole generation of scholars in the theoretical tradition were impacted by what was happening to them when they were young. And what is happening to you, guys, as you are young, as you are writing in the middle of this technological revolution that is changing so much in society, could really inform not just the way you do your work, but what you work on.