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Spatial Models of Parliamentary Voting

This book presents a simple geometric model of voting as a tool to analyze parliamentary roll call data. Each legislator is represented by one point, and each roll call is represented by two points that correspond to the policy consequences of voting Yea or Nay. On every roll call each legislator votes for the closer outcome point, at least probabilistically. These points form a spatial map that summarizes the roll calls. In this sense a spatial map is much like a road map in that it visually depicts the political world of a legislature. The closeness of two legislators on the map shows how similar their voting records are, and the distribution of legislators shows what the dimensions of the space are. These maps can be used to study a wide variety of topics, including how political parties evolve over time, the existence of sophisticated voting, the representation of ethnic minorities in the legislature, constituency interests and legislative behavior, and how an executive influences legislative outcomes.

Keith T. Poole is a professor of political science at the University of California, San Diego. He is the author or coauthor of more than 40 articles as well as the coauthor of *Congress: A Political–Economic History of Roll Call Voting* and *Income Redistribution and the Realignment of American Politics*.

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Spatial Models of Parliamentary Voting

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University of California, San Diego

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Preface

This book is the end result of a thirty-year journey that began at the University of Rochester in 1974. In the spring semester of that year I took a course from Richard McKelvey on scaling methods. That course changed my life. Dick showed us how to take lists of numbers and transform them into simple pictures that conveyed meaning. Summarizing data with pictures! It was a revelation – I knew that this was what I wanted to do as a career.

Everything crystallized for me because the previous academic year I had taken a graduate course with Bill Riker on positive political theory where I learned about spatial voting models. After reading Riker and Ordeshook (1973) and Converse (1964), the scaling course with Dick convinced me that the correct way to measure ideology or Conversian belief systems was through the empirical estimation of spatial models of choice.

Dick left Rochester in the fall of 1974 to visit at Carnegie-Mellon for a year, and then he elected to stay at CMU. Partly due to my persistence but mostly due to his being such a nice guy, Dick agreed to chair my dissertation despite the fact that he had left Rochester. I went down to Pittsburgh two times to work with him before I finished up in late 1977. During my first trip, early in 1977, I had an after-dinner conversation with Dick and Peter Ordeshook during which Peter explained the two-space theory that he and Mel Hinich had developed. For me that was the last piece of the puzzle. The two-space theory reconciled classical spatial theory with the low-dimensional spatial maps from the early applications of multidimensional scaling to political choice data.

During my last trip to Pittsburgh in 1977, when I was nearly finished with my dissertation, I remember sitting in a Burger King with Dick – we were into gourmet food – and telling him an idea I had about interest group ratings. He liked the idea, gave me some advice on how to estimate the model I had in mind, and encouraged me to pursue it. That was the source of my first publication, and it got my academic career off the ground. A few years later, in 1981, Dick put in a good word on my behalf when I was being considered for a postdoc at Carnegie-Mellon.

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During the 1981–1982 academic year I was a postdoctoral Fellow at the Graduate School of Industrial Administration (GSIA) at Carnegie-Mellon University and had the very good fortune of linking up with Howard Rosenthal. Howard was also interested in ideology because of his in-depth studies of French politics, and he was also very knowledgeable about spatial theory. Very early in 1982 I gave a seminar at GSIA on my early interest group scaling work, and I was somewhat puzzled by the large number of tenured professors (many of whom I did not know well) who came to the talk. I had no idea that it was a stealth job talk. Thanks to Howard's efforts, I was hired at GSIA beginning in the fall of 1982, and our long collaboration began that year.

Howard is a skilled methodologist, and he convinced me that we ought to try modeling congressional roll call voting. Thus, NOMINATE was born in 1982–1983 (Howard invented the acronym – *NOMINA*i *T*hree-Step *E*stimation). In 1985 the NSF began its supercomputing initiative. We applied for and got time on the CYBER 205 supercomputer at Purdue University, and from January 1986 to late 1987 we developed D-NOMINATE.

Howard and I never viewed our NOMINATE work as an end in itself. We were always interested in how the spatial maps could be used to understand U.S. political-economic history. The bulk of our book – *Congress: A Political-Economic History of Roll Call Voting* – is devoted to showing that important episodes in U.S. political and economic history can be better understood by supplementing and/or reinterpreting more traditional analyses with the two-space theory of ideology as measured by the NOMINATE scores.

Unlike my book with Howard, this book is focused on the technical aspects of designing and estimating spatial models of parliamentary voting. However, I adhere to the philosophy that Howard and I stated on many occasions. Estimating spatial maps is easy using existing computer programs. But the maps are worthless unless the user understands both the spatial theory that the computer program embodies and the politics of the legislature that produced the roll calls.

Acknowledgments

There are so many people who have helped me out along the way that it is difficult to know where to begin. I would not have had an academic career if it had not been for the efforts of John Orbell and Bill Mitchell to get me hired at the University of Oregon in the spring of 1978. It was a tough job market back then and I might have ended up as a rich computer programmer in Bellevue, Washington, had I not gotten my foot in the door at the U of O.

At Carnegie-Mellon, Tom Romer, Dennis Epple, Allan Meltzer, Tom Palfrey, John Londregan, Tim Groseclose, Fallaw Sowell, and Steve Spear gave me valuable feedback during the years that NOMINATE and Optimal Classification (OC) were being developed. Just before his untimely death in 1996,

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my friend Jerry Salancik gave me a set of invaluable comments on my first OC paper. He is sorely missed.

I thank my colleagues at the University of Houston Department of Political Science for hiring me in 2000 to fill the Kenneth L. Lay endowed chair. I have enjoyed being in the Department immensely, and it has been a great place to work. They can be justly proud of the strong traditions of the department that emphasize quality research and teaching. It is no accident that so many great scholars have been faculty members here.

Noah Kaplan, Tim Nokken, and Ernesto Calvo have given me valuable feedback, and they have been great colleagues. Ray Duch has been a great friend (and a great cook), and he helped me out with parts of this book on countless occasions.

Kevin Quinn, Andrew Martin, and Jeff Lewis pushed me to learn R and Bayesian simulation. It turns out that an old dog can learn new tricks, and I have them to thank for that. They also read several of the chapters and gave me detailed comments that improved the presentation of Bayesian simulation and the parametric bootstrap (they can't be blamed for any errors that remain, however).

I spent the 2003–2004 academic year at the Center for Advanced Study in the Behavioral Sciences where most of this book was written. During that stay I had the benefit of numerous very helpful conversations with Simon Jackman. He was unfailingly courteous even when I asked the dumbest questions. Kathleen Much of CASBS read the first six chapters and did an outstanding job of editing the manuscript. Whatever bad English grammar remains is my doing, not hers.

I thank Neal Beck not only for pushing me to write the paper on QN that appeared in *Political Analysis* in 2001, but also for prodding me in a very nice way to keep working on this book and finish it. Although the book is about four years late, he was always patient and I appreciate his support.

During the past five years while I was working on this book Gary Cox has read many versions of the chapters and has given me invaluable feedback. He, Mat McCubbins, and Rod Kiewiet were very early consumers of NOMINATE scores, and all three have been very supportive of my research over the past 15 years. I am very grateful to them for that.

Over the past 13 years I have benefited greatly from innumerable discussions with Nolan McCarty on the topics covered in this book. He helped design and program the personal computer version of W-NOMINATE. It's a closely guarded secret, but he can write FORTRAN with the best.

Larry Rothenberg read all of the chapters more than once (sometimes four times). He is a tough but fair critic, and his advice has been invaluable. This book is much better as a result of his careful reading and advice.

My long-time collaborator Howard Rosenthal read many of the chapters and made many suggestions on how to tighten up the presentation. I expect that our collaboration will continue another 10 years until we both finally retire.

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Finally, I dedicate this book to my sweet wife Jan. Her love and support for more than 32 years has been and will always be my center of gravity. I am amazed that she has put up with me for all these years. To me she will always be the beautiful young woman in the flowing flowered tie-dyed dress with the long brown hair. I age but she never does and she never will.

Data and Software

The Web site for this book is http://k7moa.com/Spatial_Models_of_Parliamentary_Voting.htm. There is a separate Web page for each chapter. All the programs and data that are used in each chapter can be downloaded from the corresponding chapter Web page. All the spatial maps shown in this book were done in R, and the R code and data used to make the maps are also posted on the corresponding chapter Web pages. Feel free to contact me via the e-mail address posted on http://k7moa.com if you need help with any of the data or programs.

I will also post problem sets for each chapter to assist those scholars who wish to use this book as part of a college course on scaling. I will be happy to make the answers available to instructors.

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