News and Events

Message From the Director  2
Undergraduate Courses  4
Graduate Courses  5
Statistical Consulting  6
Working Paper  6
Summer 2000 Workshop Spatial Methods in the Social Sciences  7
Interactive Seminar Series  8
New Faculty  10
Seed Grant Program  14
Seed Grant Awards  15

Spring 2000
Issue one
MESSAGE FROM THE DIRECTOR

It's been a wild ride! The new Center for Statistics and the Social Sciences started on July 1, 1999, based on UIF funding. It is the first Center in the nation devoted to this interface, with the triple mission of galvanizing collaborative research between social scientists and statisticians, developing a menu of new graduate courses for social science students, and putting together an innovative case-based undergraduate statistics sequence for the social sciences.

A dynamic new Seminar Series has been going since October, run by CSSS Seminar Director Rob Warren. This has featured a great deal of interaction and discussion, and has led to many interdisciplinary contacts. Several new working groups have started up: one on Causal Analysis organized by Babette Brumback (Biostatistics), Paul LePore (Sociology), Martin McIntosh (Biostatistics), and Rob Warren (Sociology), and one on Social Networks, organized by Tony Rossini (Biostatistics). There will also be a CSSS-sponsored Workshop on Bayesian Perspectives on Spatial Analysis in the Social Sciences on campus, June 19-23, organized by Mike Ward (Political Science).

Six seed Grants have been awarded to jump start six outstanding, mostly interdisciplinary projects featuring teams of investigators from Biostatistics, Demography, Economics, Political Science, Sociology, and Statistics. The new Statistical Consulting Service for the Social Sciences has been helping clients from across the social sciences on campus and beyond, including the State’s HEC Board, and United Way. It is run by CSSS Consulting Director Dean Billheimer, and Consultant Kent Koprowicz; please take advantage of this opportunity. A new CSSS Working Paper series has also been started, and submissions are invited.

Next year, CSSS will be offering a rich menu of new Graduate and Undergraduate Courses for social science students, in close collaboration with the Statistics Department. At the undergraduate level, there will be a new two-quarter statistics sequence for the social sciences. This will be taught in a case-based way, a radical departure from the traditional first statistics course. It will be preceded by a new course on Evaluation of Evidence. Seven graduate courses will be offered, of which four will be new courses offered for the first time by the new CSSS faculty members who are arriving in the Fall. Most of the courses are joint or cross-listed with Statistics, Sociology or Geography.

To make all this possible, four outstanding new Faculty have been hired and will be joining the university in the Fall. Mark Handcock will be Professor of Statistics and Sociology, Martina Morris will be the Blumstein-Jordan Professor of Sociology and Statistics, Peter Hoff will be Assistant Professor of Statistics, and Kevin Quinn will be Assistant Professor of Political Science. An active search for two more faculty, one to be joint with Social Work and the other with Nursing, will continue next year.

In addition to developing this area on campus, the Center aims to lead a renaissance of statistical methodology in the social sciences nationally and internationally. Several of the intellectual themes of this new generation
of methods are already becoming apparent in our first year. One is the analysis of data that are dependent, for example because their spatial position is important, or because they arise from a social network. Another is the development of ways to make causal inferences from observational data or social experiments. A further thrust is towards the valid use of complex simulation models. The interface between statistics and the social sciences is expanding rapidly, and several other universities have taken initiatives in the past few years; these include Columbia, Harvard, Michigan, UC Santa Barbara, North Carolina and Duke.

Details of many of our activities can be found on our Web page, www.csss.washington.edu, run with panache by our Webmaster, Jeremy Tantrum. It has been possible to come so far so fast because of the work of many people, an extraordinary campuswide wave of enthusiasm and support, and a buzz of excitement nationwide. It is widely felt that the foundation of CSSS signals the takeoff of this area that is so vital to the social sciences and so promising for statistical research. Much of the work has been done by CSSS Associate Director Ross Matsueda and by CSSS Administrator Gayle Gray, and many thanks are due to the College of Arts and Sciences and to the Provost’s Office for their strong support.

Adrian Raftery
CSSS Director
NEW CSSS UNDERGRADUATE COURSES

Three core undergraduate courses will be offered by the Center which feature innovative introductory statistical courses for the social sciences. “Evaluation of Evidence,” (CSSS 320) taught by Martina Morris, will provide a look at data and research design, and will complement CSSS’s two-semester undergraduate sequence, “A Case-based Approach to Learning Statistics,” taught by Mark Handcock.

This initiative is in response to the concern that a lack of statistical and quantitative reasoning skills among undergraduates is limiting their progress in their chosen fields. According to Mark Handcock, “The problem with many introductory statistics courses has been that the students find the course formulaic, dry and irrelevant. The excitement, usefulness and pervasiveness of probabilistic and statistical reasoning is never brought to the fore.”

The objective of the Center’s course is to improve the effectiveness of a student’s first exposure to statistics. According to Handcock, the most effective way to learn statistics is to actively engage in doing statistical analyses. The new course will be driven by a practical, hands-on approach. He will be teaching the course for the first time in the Winter and Spring of next year. The course will be built around a set of cases, each motivated by a question that needs to be answered. The statistical analysis flows naturally from the question. The discussion given in the cases will demonstrate the logic of the analysis and emphasize the interactive nature of the task. The aim of these cases is to show the student, by example, that statistical analysis clarifies complex situations. It enables one to draw useful conclusions, and much is learned about the problem during the analysis. Handcock adds, “The journey, as well as the arrival, matters.”

Cases will represent situations and contexts from a diverse set of social science fields, where quantitative reasoning is required to arrive at a meaningful conclusion. Topics covered include racial imbalance in public schools, health expenditures of states, random drug and disease testing, changes in wage inequality, the reporting of sexual partners by men and women, the possibility of voting fraud in an election, condom use and the prevention of AIDS, estimating a demand function, and the space shuttle Challenger tragedy. All of the datasets presented will be real.

Students will be required to complete their own computer-based analysis, guided by questions that show the path to an effective analysis. A “data analysis laboratory” will also be conducted in which an instructor coaches students through their own PC analysis of data sets from the cases. The labs will also promote interaction and small group learning experiences. “Such interaction reinforces the lessons learned in class and promotes the growth of confidence amongst the students about using the methods in the real world,” relates Handcock.

The material presented in the course will be analyzed using techniques that are typically taught in a traditional introductory course. The cases will be grouped by broad statistical topics, and arranged by topics in a sequence that is conventionally followed in a beginning course. There will be a certain progression in the material: concepts from data analysis will be used in subsequent cases dealing with applied probability, and statistical inference, and so forth.

Handcock has coauthored, with Jeff Simonoff and Samprit Chatterjee, a casebook that could be used for such a course (http://www.csss.washington/~handcock/Casebook). A working paper describing this more interactive and application-oriented approach to statistical training is also available on the CSSS website.

“It’s all very exciting,” says Handcock. “the CSSS has been the catalyst - it is the interdisciplinary nature of the CSSS that will make the case-based approach work.”

CSSS Undergraduate Courses 2000-1

**Autumn 2000**

CSSS/STAT/SOC 320
“Evaluation of Evidence”
Instructor: Martina Morris

Two-course sequence:

**Winter 2001**

CSSS/STAT/SOC 321
“Case-Based Introductory Statistics I”
Instructor: Mark Handcock

**Spring 2001**

CSSS/STAT/SOC 322
“Case-Based Introductory Statistics II”
Instructor: Mark Handcock
CSSS will offer seven graduate courses in statistics and quantitative methods for the social sciences in 2000-1. Four of these will be new courses taught by our new faculty who are arriving this Fall. These are CSSS 565, “Current Trends in Inequality,” to be taught by Martina Morris in Autumn 2000; CSSS 563, “Hierarchical Models for the Social Sciences,” by Kevin Quinn in Winter 2001; CSSS 562, “Statistical Analysis of Social Networks,” by Peter Hoff in Winter 2001, and “Bayesian Statistics for the Social Sciences,” also by Peter Hoff in Spring 2001.

Two courses on Social Networks will be offered in successive quarters. The first will be the previously mentioned CSSS 562 in Winter 2001, and this will be followed by CSSS 594, “Networks and Social Structure,” taught by Kate Stovel in Spring 2001. There is also a working group on Social Networks being run by Tony Rossini (Biostatistics). We anticipate that the general area of social networks will be a research focus for the Center.

Other courses being offered include CSSS 536, “Loglinear Models and Logistic Regression for the Social Sciences,” to be taught by Kevin Quinn in Autumn 2000; and CSSS 526, “Event History Analysis,” to be taught by Suzanne Davies Withers in Spring 2001. All the courses are jointly offered with either Statistics, Sociology or, in the case of CSSS 526, Geography.

CSSS will also be cross-listing two applied regression courses that are highly recommended for students wishing to benefit maximally from our graduate courses. SOC/CSSS 426 will be taught in Autumn 2000, and STAT/CSSS 423 will be taught in Winter 2001. These two courses will cover quite similar material, but with different emphases and assumptions about student preparation. SOC/CSSS 426 will emphasize social science examples and applications, and will assume less fluency with the underlying mathematics of matrix algebra. STAT 423 will draw on a wide range of examples from many fields, and will assume some familiarity with matrix algebra, as well as some calculus background.

These courses are intended for social science graduate students who have already completed a first statistics sequence at the level of, for example, SOC 424-425. One book that covers this material is *Statistical Methods for the Social Sciences* by Alan Agresti and Barbara Finlay (Prentice-Hall). We also recommend that students taking these courses have, or acquire, familiarity with some basic mathematical concepts: basic calculus (differentiation and integration), matrix algebra (matrix addition, multiplication and inverse), and probability (including conditional probability). It is also recommended that students take an applied regression course, such as 426 or 423, before (or at the same time as) the CSSS graduate courses. The full list of CSSS courses appropriate for graduate students planned for 2000-1 is as follows. Note that these plans may change.

### CSSS Graduate Courses 2000-1

#### Autumn 2000

- **SOC/CSSS 426**
  - "Quantitative Methods in Sociology"
  - Instructor: Becky Pettit (Sociology)
  - Focus will be on applied regression

- **STAT/SOC/CSSS 536**
  - "Loglinear Models and Logistic Regression for the Social Sciences"
  - Instructor: Kevin Quinn (Political Science & CSSS)

- **SOC/CSSS 565**
  - "Current Trends in Inequality"
  - Instructor: Martina Morris (Sociology & Statistics)

#### Winter 2001

- **STAT/CSSS 423**
  - "Applied Regression"
  - Instructor: Alejandro Murua (Statistics)

- **CSSS/STAT 562**
  - "Statistical Analysis of Social Networks"
  - Instructor: Peter Hoff (Statistics & CSSS)

- **CSSS/STAT 563**
  - "Hierarchical Models for the Social Sciences"
  - Instructor: Kevin Quinn (Political Science & CSSS)

#### Spring 2001

- **GEOG/CSSS 526**
  - "Event History Analysis"
  - Instructor: Suzanne Davies Withers (Geology)

- **CSSS/STAT 564**
  - "Bayesian Statistics for the Social Sciences"
  - Instructor: Peter Hoff (Statistics & CSSS)

- **SOC/CSSS 594**
  - "Networks and Social Structure"
  - Instructor: Kate Stovel (Sociology)
CSSS consulting statisticians are available to assist social scientists in all quantitative aspects of their research including study design, data analysis, and report preparation. In addition, CSSS consultants collaborate with scientists to develop new methods to address scientific questions of interest. The consulting service is directed by Dean Billheimer, Ph.D., Acting Assistant Professor of Statistics, and operated by Kent Koprowicz, a senior graduate student in Biostatistics.

Since operations began in October 1999, more than 20 university faculty and graduate students made use of the consulting service. For example, Mr. David Sieminski of the United Way of King County, and a graduate student in the Evans School of Public Affairs, contacted the service for help in designing a survey of King County employers. The survey was performed under the auspices of the King County Social and Health Indicators Initiative, and seeks to identify and collect data on key social and for use by policy makers. CSSS statisticians assisted in forming the survey questionnaire, evaluating sample sizes for large and small companies, and outlining methods of analysis for the survey data. As data collection was completed, CSSS was involved in advising Mr. Sieminski on analysis and presentation of results.

“The University of Washington Center for Statistics and the Social Sciences contributed greatly to the development and implementation of King County Employer Benefit Survey 2000.” (Sieminski, D., the United Way of King County Your Community Safety Net Report)

A second project by Dr. Paul Burstein, Professor of Sociology, is interested in identifying the factors affecting a bill’s progress, such as the influence of political parties, interest groups or organizational changes. CSSS statisticians worked with Dr. Burstein to develop methods for sample design and to outline potentially useful methods of analysis. This collaboration resulted in Dr. Burstein’s submission of a grant proposal to further investigate this process.


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Dean Billheimer
CSSS Director of Consulting

Kent Koprowicz
CSSS Consultant

To schedule an appointment email kentk@biost.washington.edu
206•543•5366

The new CSSS working paper series was launched in December, and already seven working papers have been issued, and are available on the Web. They cover a wide range of disciplines, topics and approaches. The first working paper was a survey of the role of Statistics in Sociology over the past 50 years, by Adrian Raftery. In the second working paper, “Employment During High School: Consequences for Students’ Grades in Academic Courses,” Rob Warren, Paul LePore and their UCLA coauthors Rob Mare argued that prior research has wrongly extrapolated from an observed correlation between hours worked by high schoolers and poor grades, to conclude that working adversely affects grades. In “Combining Registration-System and Survey Data to Estimate Birth Probabilities,” Mark Handcock and his Penn State coauthors pointed out that demographers have recently been relying largely on survey data, and ignoring birth registration and other data, thus potentially throwing away valuable information. In “Location, Location, Location: An MCMC Approach to Modeling Spatial Context with Categorical Variables in the Study and Prediction of War,” Michael Ward and

(continued on page 7)
A one-week CSSS-sponsored workshop will be held on campus, June 19-23, on Bayesian Perspectives on Spatial Analysis in the Social Sciences. Professor Julian Besag (UW Statistics) will give two days of lectures on Bayesian analysis, with special emphasis on Markov chain Monte Carlo (MCMC) methods, and spatial statistics. These methods are now sweeping statistics and becoming important in the social sciences, so this is a great opportunity for UW graduate students and faculty.

Professor Martina Morris (Sociology and Statistics) will give two days of lectures on the analysis of social networks, including data collection, survey design, statistical methods, including recent developments in random graph modeling. She will involve some of the nation’s leading experts in this area in the workshop. The analysis of social networks is emerging as one of our Center’s key intellectual foci, so this is a great way for graduate students and faculty to get in on the ground floor of a rapidly developing field. The workshop will feature software demos throughout. It is organized by Professor Michael Ward (Political Science).

The first two days of the workshop will be devoted to MCMC analysis, led by Julian Besag who has played a big role in introducing this breakthrough into statistics. MCMC methods were initially developed in physics in order to solve a spatial problem that is similar to one faced by many social scientists today: the dependence of observations on one another. Thus, there is a close relationship between MCMC methods and spatial statistics.

Martina Morris and other scholars at UW have been using spatial methods to analyze network data, such as those used by demographers and others to model the transmission of HIV. Progress is being made in using random graph models for networks building on work of Besag and Ove Frank, and first reported in a 1986 JASA article on the spatial network among a small subset of monks! In this context “space” is given a less Cartesian definition and a more socially defined spatial process is employed (some details can be found at the Web site: Kentucky.psych.uiuc.edu/pstar/). Martina Morris has been giving training workshops on these techniques recently, and some information on her recent demography workshop in Thailand is available online at www.pop.psu.edu/events/iussp/chiangmai.html.

There will be a morning seminar on day five that will bring local scholars together to present their own scholarship in a spatial context. This session will highlight ongoing, unfinished research projects currently underway at CSSS. Finally, there will be a panel session entitled “How Do I?,” at which local statistical and social science scholars will serve as a panel to answer questions from workshop participants.

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Application procedures and detailed information on this workshop, content and format, can be found at http://www.negia.uchicago.edu/CSISS/workshops or www.csss.washington.edu

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Working Papers Series continued from page 6

Kristian Gleditsch build on work by UW Statistics Professor Julian Besag to develop an explicit statistical model of regional and spatial context in linkages between regime characteristics and wars. Finally, in “Family Dynamics Through Childhood: A Sibling Model of Behavior Problems,” Lingxin Hao and Ross Matsueda showed how early childhood exposure to poverty, lack of extended kin networks, and physical punishment by parents all increased future child behavior problems.
INTERACTIVE CSSS SEMINAR SERIES IN ITS THIRD QUARTER

The CSSS is stimulating intellectual interaction among faculty and students by running a dynamic seminar series. The seminars, which take place at 12:30 on Wednesdays in 209 Savery Hall, typically feature presentations of ongoing research that involves cutting edge statistical methods in the social sciences. Other seminars focus on interesting statistical or methodological issues that come to light through the CSSS consulting service. Presenters come from many social science disciplines, as well as statistics, biostatistics, the health sciences, engineering, and other fields.

A highlight of the seminar series in the Fall of 1999 was Stephen Fienberg’s Inaugural Lecture on November 17. More than 200 people were in attendance. Fienberg, who is Maurice Falk University Professor of Statistics and Social Science at Carnegie Mellon University, gave a talk entitled “Estimating the Size of Populations” in which he presented an overview of the emerging toolkit of methods, both Bayesian and frequentist, that have found application in efforts to estimate the size of populations.

The Winter 2000 Seminar Series featured talks from statisticians, sociologists, demographers, economists, computer scientists, and others. Of note was Daniel Nagin’s talk on February 16 (Nagin is also from Carnegie Mellon University) in which he used a group-based, semi-parametric method for testing whether and to what extent there is late onset violent delinquency.

The Spring 2000 Seminar Series promises to be equally exciting (even though there are no speakers scheduled from Carnegie Mellon). A highlight will be a talk by Gary King, Professor of Political Science at Harvard, on May 10.

SPRING 2000 CSSS SEMINAR SCHEDULE

April 5 Martin McIntosh (Biostatistics)
“Socio-economics of Screening for Ovarian Cancer.”

April 12 Paul Burstain (Sociology)
“Problems in Sampling and Defining the Unit of Analysis in the Study of Policy Change.”

April 19 Dick Startz (Economics)
“Improved Inference for the Instrumental Variable Estimator or You Can’t Get Something for Nothing.”

April 26 Jerry Herting (Sociology and Psychosocial & Community Health)
“Looking for Effects of Group Characteristics on Outcomes in Group-Based Prevention Programs.”

May 3 Julian Besag (Statistics)
“Geographical Analysis and Ethical Dilemmas in the Study of Childhood Leukemias in Great Britain.”

May 10 Gary King (Department of Government and Center for Basic Research in the Social Sciences, Harvard University)
“Inference in Case-Control Studies with Limited Auxiliary Information”

Physics/Astronomy Building, room AA 110, 3:30-5:00pm, Reception following

May 17 Babette Brumback (Biostatistics)
“Perspectives on Casual Inference and Longitudinal Interventions”

May 24 Bryan Jones (Political Science)
“Representation, Information, and Public Policy.”

May 31 Peter Guttorp (Statistics, and Director of the National Research Center for Statistic and the Environmental)
“Environmental Standards from a Statistical Point of View.”

Rob Warren
Seminar Director
CSSS SEMINARS PRESENTED DURING 1999 - 2000
CSSS SEMINARS PRESENTED DURING 1999 - 2000

Peter Hoff (Department of Statistics, University of Wisconsin-Madison)

Adrian Raftery (Statistics and Sociology)
“Bayesian Model Selection and Model Averaging for Social Research: Recent Results”

Fadona Balabdou (Centre de Geostatistique, Ecole des Mines, Paris)
“The Evolution of Fertility in India in Time and Space”

Martin McIntosh (Biostatistics)
“Socio-economics of Screening for Ovarian Cancer”

Chang-Jin Kim (Economics)
“The Nature of Structural Breaks in the U.S. Stock Market” (with James Morley and Charles Nelson)

Daniel Nagin (Heinz School of Public Policy and Management, Carnegie Mellon University)
“Linking Trajectories of Childhood and Adolescent Physical Aggression: The Search for Late Onset Violence”

Greg Ridgeway (Statistics)
“Modern Prediction Methods: Bagging and Boosting”

Pedro Domingos (Computer Science and Engineering)
“Why Do Model Ensembles Work? (Joint Seminar with the Statistics Department)

Katherine Stovel (Sociology)
“Mergers and Mobility: Occupational Implications of Organizational Growth at Lloyds Bank, 1885-1940”

Tony Rossini, (Biostatistics)
“Statistical Issues with Network Analysis: Applications and Problems in AIDS.”

Elaine Thompson (School of Nursing)
“Methodological Problems in Defining Comparable Data Across National Data Sets and Field Research.”

Jon Wakefield (Biostatistics)
“The Use of Socioeconomic Measures in Spatial Epidemiology.”

Charles Nelson (Economics)
“Why Alternative Trend-Cycle Decompositions of GDP Disagree.”

Mary Gillmore (School of Social Work)
“Does ‘High’ Equal ‘High Risk’? The Relationship Between Drinking and Sexual Risk Taking.”

Mike Ward (Political Science)
Kristian Gleditsch (University of Glasgow)
“Space and Time in War and Peace During the Last 200 years: Ongoing Investigations of Spatial Connections in a Changing Topology.”

Inaugural Lecture
Stephen Fienberg, (Statistics, Carnegie Melon University)
“Estimating the Size of Populations.”

Darryl Holman (Anthropology)
“Age-Specific Total Fecundability and Fetal Loss in Bangladeshi Women.”

Rob Warren (Sociology)
“Socioeconomic Status and Pregnancy Outcomes: Evidence from Washington State”

Seminars are held in
209 Savery Hall
Wednesdays
12:30 - 2:00
During academic year
NEW CENTER FACULTY: Mark S. Handcock

Handcock saw moving to the University of Washington CSSS as an opportunity to bring together two interests - social science methodology and spatial statistics.

Handcock is a statistician who grew up on the South-West coast of Australia and studied mathematics at the University of Western Australia. "I was initially drawn to mathematics," he said, "because of its abstract beauty and the certainty with which it represents the world". During summers spent in scientific internships in industry, that began to change. "I found that to use mathematics in science, something had to give. You could either keep the certainty at the cost of realism, or solve the real problems by using approximations." And this is what led him to statistics, as an alternative way of representing reality.

Teaching is important to Handcock. "Statistics is fun." He says it uses the language of mathematics, but is really a set of ideas about how to think about the world. After three years of teaching introductory statistics he became frustrated with the pedantic quality of most introductory statistics textbooks. He spent the next year with Jeff Simonoff and Samprit Chatterjee (both at New York University) coauthoring a casebook for teaching. They sought to develop a more interactive and application-oriented approach to statistical training. The book is therefore structured around a set of 61 cases representing situations and contexts from a diverse set of fields. In each case the importance of the underlying statistical concepts is learned by actively doing the statistical analysis. He is in the process of developing a two-semester case-based sequence for undergraduates that uses this approach.

Handcock obtained his bachelor of science degree in mathematics with honors from the University of Western Australia in 1983, and his doctoral degree in Statistics from the University of Chicago in 1989. After graduating, he took a postdoctoral research position in the Department of Mathematical Sciences at the IBM T. J. Watson Research Center outside of New York City. In 1990 he joined New York University as an assistant professor in Statistics, becoming an associate professor in 1994 and receiving tenure in 1996. In 1996 he moved to the Department of Statistics at the Pennsylvania State University, and also became a research associate of the Population Research Institute. He has published in a wide range of areas, including the modeling of spatial phenomena, the identifiability of climate change within the historical variation in climate, and the measurement of economic inequality and job mobility. Papers have appeared in such journals as Technometrics, the Journal of the American Statistical Association, Sociological Methodology, The American Journal of Sociology, the American Sociological Review, and the Journal of Labor Economics. He will take up residence at UW in the fall of 2000.

"Statistics is fun. It uses the language of mathematics, but is really a set of ideas about how to think about the world."
NEW CENTER FACULTY: Martina Morris

Martina Morris is a sociologist who got her start in the Pacific Northwest, at Reed College in Portland. “My mentor there” she says, “taught me that sociology is the study of morphology and stratification in human populations.” Her current work reflects those two basic interests—structure and inequality.

On the “morphology” side, Morris studies networks, using a variety of data and statistical tools. Her primary area of application has been to the study of network effects on the spread of HIV/AIDS in different populations around the world. Small differences in patterns of sexual behavior cumulate up into potentially very different population networks. These networks serve as the transportation system for the virus, affecting the speed and direction of epidemic spread. Systematic biases in partnership formation, such as assortative mixing by age or race, and variations in the timing and sequence of partnerships, can make the difference between an isolated outbreak of infection and a full scale epidemic.

Morris has developed extensions to generalized linear models that enable one to link data on population networks to dynamic simulation models for the spread of infection. The methods are designed to use local (or ego-centered) network data, which can be collected using standard survey sampling techniques. “Network sampling is expensive,” Morris notes, “and since these methods can use relatively inexpensive standard survey data instead, we get a big bang for the buck.” This pragmatic approach has made it possible to conduct surveys in several countries, including the United States, Thailand, and Uganda.

Fifteen years into this AIDS epidemic, Morris says, “behavior change remains the primary method of HIV prevention. Though our models are pretty abstract they have led us to a surprising number of simple behavioral intervention strategies.” Her findings suggest that concurrent sexual partnerships (partnerships that overlap in time) are likely to have amplified the epidemic in Uganda, and other places. This suggests that for HIV, prevention messages promoting one partner at a time may be more effective than messages promoting fewer partners. She has also shown that the behavior changes among gay men in New York City have done what medical advances have not; bringing the epidemic to just under the reproductive threshold by the early 1990s. She notes that this doesn’t mean we can declare victory and go home, however. Less risky behavior remains the key to the long term dynamics of infection for this community. “What we do today will determine whether this disease dies out, or climbs back up over the epidemic threshold and persists for generations.” Still, Morris notes, behavior change is free and universally accessible. It should not be overlooked in the race for medical cures and vaccines.

On the “stratification” side, Morris works on a variety of labor economics issues, including the recent growth in wage inequality and changes in the gender wage gap. Using relative distribution methods (developed with fellow CSSS colleague, Mark Handcock) she has shown that much of the decline in the gender wage gap is attributable to the deterioration of men’s earnings rather than to improvements in women’s. “The statistical methods we used here made it possible to see things that others had missed,” Morris says, “It really brought home to me the benefits of fostering statistical developments in the social sciences.” Morris and Handcock have recently published a book on these methods, Relative Distribution Methods in the Social Sciences (Springer Verlag, 1999).

Morris obtained her bachelor of arts degree in sociology from Reed College in 1980, her master of arts degree in statistics from the University of Chicago in 1986, and her doctoral degree in sociology from the University of Chicago in 1989. After graduating, she took a position as an assistant professor at Columbia University in Sociology, with an eventual joint appointment at the School of Public Health. In 1996 she moved to Pennsylvania State University, becoming a professor with a joint appointment in Statistics and Sociology. Her publications have appeared in a wide range of journals, including Nature, the American Journal of Epidemiology, the American Sociological Review, Sociological Methodology and the Journal of Labor Economics. She will take up residence at UW in the fall of 2000.
For five months Kevin Quinn stumbled through Russia’s economic system, collecting data for his research on intergovernmental budgetary transfers in the Russian Federation. The research from his fieldwork would eventually become the basis for his dissertation.

On one occasion, after working through his connections, he was put into contact with a woman who had collected data vital to his research. She wouldn’t allow him to meet her in her government office, but rather arranged for him to meet her in an out-of-the-way basement cafe. “It was indicative of a lot of things going on there,” said Quinn of the incident. In Russia, security was tight. As Quinn was in a region of tension between ethnic Russians and ethnic Tatars, the Tatars were often suspicious of the fact that many of his contacts were ethnic Russians. His research in Russia was made more difficult because politicians were reluctant to reveal data, due to rampant corruption. “My research wasn’t exactly exposing government corruption in Russia, as it was already known,” Quinn said, “but I definitely ran into some questionable stuff.”

A political science major from the Johns Hopkins University who later got a Ph.D. at Washington University in St. Louis, Quinn found statistics inextricably bound to political science. Now a postdoctoral researcher in the Center for Basic Research in the Social Sciences at Harvard University, Quinn is working on a project with other postdocs alongside Gary King from the Harvard Government Department. Funded by a grant from the World Health Organization, the project focuses on forecasting world mortality rates. Of this project, Quinn said, “It’s nice to take part in a project that has a positive effect on people’s lives.”

Much of Quinn’s more current research deals with issues involved in validating formal theoretic models of politics. One project makes use of a Bayesian hierarchical model to produce improved measures of legislators’ policy preferences. Another project develops an applied equilibrium model of party electoral competition in multiparty, proportional rule democracies. In addition, Quinn is also working on more flexible methods to impute missing data, and improved forecasting methods for rare events data with strong temporal and spatial dependence.

By joining CSSS this September, Quinn will continue his research combining the social sciences and statistics. “I think it’s going to be a really exciting place to be,” he said, for the work of course, but for the people, the hiking, and Seattle’s thriving jazz scene.
CSSS may not be the only one recruiting Peter Hoff. So may be punk rock bands, ultimate frisbee teams, and the Tour de France.

For the past six and a half years, Peter Hoff has worked with statistics at the University of Wisconsin-Madison. During this time, not only has he been playing with his punk rock band, K-Limited, at local bars and the Student Union Building, but he biked across France in 1992, and since then he has spent his summers trying to perfect his vertical leap in Ultimate Frisbee.

Hoff's statistical work with two-sided modeling, called "marriage models," which try to distinguish what it is that attracts two individuals to one another, may not be fit for Seventeen Magazine. His research, which was done in collaboration with sociologist John Logan and his advisor, Michael Newton, details such things as the education and socioeconomic level of the two lovebirds involved. This model works for both the marriage market and the labor market, because what brings two marriage partners together has formal analogies to what brings together a worker and his or her job.

Hoff is not just analytical, but has a literary side too, as shown by his love of Tolstoy and by his unusual, though flattering description of statistics. "There is an art to statistics," he said. "Data analysis is an art. Each data analyst brings his own set of tools and his own view of how to do it." He extended this metaphor by likening statistics to beauty "It's an aesthetic way of making the dirty world cleaner," he said.

In addition to his social science work, Hoff is collaborating with researchers at the McCord Laboratory for Cancer Research on problems in genetics. He works purely with the statistical analysis of the data, as he feels lab work is too messy.

The project on which he is working is trying to isolate cancer-causing genes in mice in order to find an analogous gene in humans.

It is the relationship between statistics and the social sciences that brings Hoff to CSSS. For Hoff, this will be his first time living away from the Midwest. He was a math major at Indiana University, got his Ph.D from the statistics department at the University of Wisconsin-Madison, and wrote his dissertation on nonparametric density estimation subject to constraints. The move to Seattle won't drastically alter Hoff's lifestyle, but instead will complement his hobbies. He joked that Seattle's "fit" reputation will bring down his relative fitness.
The CSSS Seed Grants Program is a small grants program designed to promote interdisciplinary research among UW social scientists and statisticians. The goal is to stimulate scholarly initiatives by encouraging faculty to explore new directions in research and scholarship that contributes to the development of statistical methods for social scientific problems. The Seed Grants are used to pursue pilot studies, feasibility studies, or preliminary research that initiates a larger project that has high promise of extramural funding, which would be administered through the Center. Awards are in the range $10,000-20,000 and typically include one month of summer salary for the principal investigator and one quarter's salary for a research assistant. The length of the project period is usually about one calendar year.

Proposals are reviewed by ad hoc reviewers with expertise in the proposed project area. A review panel, consisting of CSSS Executive Committee members and chaired by Ross Matsueda, evaluates proposals and makes funding recommendations to the CSSS Director.

This year, we funded six outstanding proposals, which include investigators from Biostatistics, Demography, Economics, Political Science, Sociology, and Statistics. The next submission deadline will be in September 2000. We seek interdisciplinary collaborations—particularly between social scientists and statisticians—but such collaboration is not a formal requirement. For more information, see the CSSS web site, www.csss.washington.edu, and go to the Seed Grants page.

The following are descriptions of each of the funded projects.

**The Comparative Measurement of Individual Values**
Michael Hechter, Sociology
Hyojoung Kim, Sociology
Adam Simon, Political Science

For nearly a century, social theorists have recognized that behavior is a function of two quite different factors: values—that is, individual’s relative evaluations of the attractiveness of their available courses of action, and the constraints that these individuals face in their environment. However, attempts to measure values have often come up short. This study will compare the predictive reliability of a new measurement strategy, based on factorial survey techniques, to the traditional strategy, based on surveys in which respondents are directly questioned. Unlike the traditional measurement strategy, the factorial approach entails substantial statistical modeling.

**Bridging Quantitative and Qualitative Approaches in the Study of Democracy**
Hyojoung Kim, Sociology
Chang-Jin Kim, Economics

An important question in the field of political economy is whether a country’s economic development fosters political democracy. For example, using statistical analyses of nations, scholars have concluded that development increases democracy by producing a middle class and tolerant attitudes, or by increasing the division of labor which creates a demand for more complex political institutions. In contrast, comparative historical research finds that the effect of economic development on political democracy is contingent, varying greatly across countries and historical periods. Thus, research in this area yields depending on method used (comparative-historical or statistical) divergent findings. Kim
and Kim will seek to reconcile this divergence using improved measures models for time series data.

**Demand, Diffusion or Ideation? Explaining Fertility Decline**

Arian E. Raftery, Statistics and Sociology
Fadoua Balabdaoui, CSDE

Explaining the decline of fertility in developing countries has been one of the main foci of demographic research in the past half-century. There are several leading explanations. One is traditional demographic transition, or “demand” theory, developed by Kingsley Davis in 1945, and presented in perhaps its most refined form by Richard Easterlin in the 1980s. This says that actual fertility is influenced in specific ways by the demand for children, the supply of children, and the costs of fertility regulation. These factors are in turn influenced by quantities such as the schooling of children and infant mortality. A second leading explanation is ideation theory, which identifies modern ideas and their diffusion as the key determinant. Of course, all these factors may be important, in which case identifying their relative contributions becomes the research task.

It is hard to adjudicate between these theories, because the relevant variables all tend to change together. In a previous study using data from Iran in 1950-1977, we were able to make this distinction, and found that the fertility decline in Iran was better explained by demand factors than by ideational ones.

The goal in this project is to extend these results to other countries, to see if they hold up on a wider scale. To that end, we have already collected a data set giving fertility rates and posited determinants for each of 35 countries that participated in the original World Fertility Survey for 1950 to 1995. A key part of ideation theory is the idea of diffusion of ideas, and this should reflect itself in spatial correlation in our data. We also intend to take account explicitly of missing data. We will build a Bayesian model for the data that incorporates geostatistical ideas from spatial statistics, and multiple imputation ideas for missing data, and estimate it using Markov chain Monte Carlo methods. We will compare the competing hypotheses by building statistical models corresponding to each of them, and comparing them using Bayes factors.

**Visualization and Analytic Goodness of Fit for Social Network Analysis**

Anthony Rossini, Biostatistics

Social network analysis has increasingly become a key approach to studying social structure, social interactions, and social diffusion. For example, HIV/AIDS research focuses on networks of partners who contact each other through a particular transmission mechanism, such as IV-needle sharing or sexual contact. This growing interest in network analysis has spawned developments in statistical models of social networks, including loglinear models for studying interactions through pairwise mixing measures, and models, which are constructed as auto-logistic models. These families of statistical models are both fairly complex and make strong assumptions about the data. Rossini will work on visual and analytical methods for assessing how well these models fit the data.

**Spatial Analysis of War and Democracy**

Michael D. Ward, Political Science
Patrick Heagerty, Biostatistics
Kristian S. Gleditsch, Faculty of Social Sciences, University of Glasgow

Why do nations go to war? The study of war in both national and temporal contexts occurs at the intersection of two important scholarly concerns. The first is the broader question of how geography is a component of world politics. The second is the question of how to model political processes that vary both across nations and across time. Little research has capitalized on recent advances in statistical modeling of spatial processes developed by statisticians. Ward, Heagerty, and Gleditsch will analyze data on all international conflicts since 1800 and on the type of governing institutions in each country during this period. They will use novel statistical methods to model temporal context.

The Effects of “What People Do for a Living” on Health Outcomes: Does it Matter How “Occupation” is Measured?

Rob Warren, Sociology
Daphne Kuo, Sociology

Do good jobs or occupations result in better physical and mental health? Having a particular occupation - such as dishwasher, legal secretary, X-ray technician, or high school teacher - determines a host of conditions that in turn could affect one’s health. Such conditions include stress, exposure to hazardous materials, physical exertion, wages, prestige, and intellectual engagement. Thus, a crucial question concerns how to develop measures of occupations that capture the complex conditions that are relevant to health. For example, does a simple classification of occupations into “white collar” and “blue collar” jobs capture the relevant dimensions of occupations that affect health outcomes? This project asks how conclusions about the impact of occupation on health are affected by the way in which occupation is measured and operationalized in empirical analyses.