Mathematical Sociologist

Message from the Chair: Carter T. Butts

With a great ASA meeting behind us in Philadelphia, a new year has already begun! Hopefully, many of you had the chance to attend Lynn Smith-Lovin's fascinating Coleman Award talk on recent progress in Affect Control Theory - one of our discipline's great success stories - as well as our paper sessions on mathematical and computational sociology. Our past chair, Ken Land, has now passed the proverbial wheel to me, and I am gradually learning to sail our ship around the shoals of ASA bureaucracy (cont. 2).

Inside this issue:

From the Chair	1
Section Officers	1
ASA 2019	4
Section Awards	4
Community Work	7
Oppotunities	8
Mission Statement	9

Section Officers

On the heels of helping Ken provide our Section Report to the ASA, I am again reminded of our Section's unique mission and of its importance to our discipline.

I am greatly aided in this effort by our section officers including Secretary/ Treasurer Zack Almquist, Newsletter Editors Pamela Emanuelson and Diego Leal, our Council members, and of course Ken himself. Recent world events - and, some would argue, statements made by officers of the American Sociological Association itself - have underscored the importance of defending rigorous science against those who would sacrifice it on the altar of political ideology. While it is tempting to take the easy road of arguing for preferred policies on the basis of intuition or emotional appeals, such shortcuts overlook the fact that an obdurate reality always has the last word. As physicist Richard Feynman famously noted, "for a successful technology, reality must take precedence over public relations, for Nature cannot be fooled." Whether our concerns lie with technology, social policy, effective organizational practices, public health, or any other domain, Feynman's admonition is a reminder that we must struggle to see things as they are, rather than as we - or others - might wish them to be.

The Section on Mathematical Sociology plays an important role within the American Sociological Association in supporting rigor within all areas of the discipline. Our members work to develop formal theories that provide insights into social mechanisms and allow increasingly precise predictions of a wide range of social phenomena. They develop new techniques for study design and data analysis that facilitate accurate measurement and enable the evaluation of complex hypotheses from an expanding range of data sources. They develop curricular innovations that improve education in mathematical and computational techniques within our graduate and undergraduate programs. And they apply these developments to a wide array of practical problems, in both the public sector and in industry. These activities help to strengthen sociological science, and serve as a counterweight to fuzzy reasoning about the social world.

And this highlights a great thing about this section: each member really does matter. As an advocate for science and reason, each one of you is making a difference within the discipline. It is an honor to be part of such a community, and to serve as your chair.

Looking to the year ahead, we have a number of exciting things on the horizon. Our annual award announcements are now out, and all members are encouraged to apply themselves and/or to nominate others. Following last year's Coleman Award, this year we will be accepting nominees for the Harrison

White Book Award - a great chance to honor larger publications that make a difference within the field. This year's annual meeting will feature the second installment of our joint session with the Section on Methodology on Computational Sociology, an area of interest for many of us. We will also have an open paper session, as well as Ron Breiger's Coleman Award lecture, which is sure to be fascinating. Work is also underway for a joint US/Japan pre-conference (an effort led by Jun Kobayashi), continuing a tradition of collaboration between the Mathematical Sociology section and the Japanese Association for Mathematical Sociology that has been ongoing for almost two decades. In the interim, the section Council is open to creative ideas for ways that the Section can support the efforts of its members to bring mathematical sociology to a broader audience. If you have the next killer app (or just a crazy idea), feel free to reach out to us.

Until our next newsletter, I wish you all a holiday season that is definitely positive and positive definite,

-Carter

A Message from the Past Chair

Ken C. Land, Duke University

Chairing this Section has been an honor and a pleasure. Members' willingness to contribute to section activities has been inspiring. Council members willingly took on selecting members and chairing our award committees. Alison Bianchi graciously agreed to organize an excellent session at ASA. Dave Melamed handled our budget and many other tasks efficiently and cheerfully. Pam Emanuelson and Diego Leal produced an informative newsletter. Matt Brashears managed the diplomatic and technical work of transferring and developing our web site. Murray Webster quickly provided documents and guidance on several crucial occasions. The section remains strong and I will enjoy watching it develop with our new officers.

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ASA Mathematical Sociology Section Sessions

2019 ASA – New York

Open Topics in Mathematical Sociology

Session Organizer: Anthony Paik, University of Massachusetts.

The Section on Mathematical Sociology welcomes paper submissions on all areas of mathematical sociology, including but not limited to mathematical and/or computational modeling, technical innovations in simulation or data analysis, and empirical studies leveraging or showcasing technical innovations.

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Section Awards

James S. Coleman Distinguished Career Achievement Award

Committee Chair: Carter T. Butts (UC Irvine)

Ronald Breiger, University of Arizona

Outstanding Dissertation in Progress

Committee Chair: James Moody (Duke University)

"The Social and Biological Effects of Patient-Patient Co-Presence on Health in Hospitals using Electronic Medical Records"
Jeffrey Lienert, University of Pennsylvania

Outstanding Article Publication Award

Committee Chair: Joseph M. Whitmeyer (University of North Carolina – Charlotte)

Co-Winner: "Generalizing the network scale-up method: A new estimator for the size of hidden populations"

Dennis M. Feehan (UC Berkeley) and Matthew J. Salganik (Princeton)

Abstract. The network scale-up method enables researchers to estimate the sizes of hidden populations, such as drug injectors and sex workers, using sampled social network data. The basic scale-up estimator offers advantages over other size estimation techniques, but it depends on problematic modeling assumptions. The authors propose a new generalized scale-up estimator that can be used in settings with nonrandom social mixing and imperfect awareness about membership in the hidden population. In addition, the new estimator can be used when data are collected via complex sample designs and from incomplete sampling frames. However, the generalized scale-up estimator also requires data from two samples: one from the frame population and one from the hidden population. In some situations, these data from the hidden population can be collected by adding a small number of questions to already planned studies. For other situations, the authors develop interpretable adjustment factors that can be applied to the basic scale-up estimator. The authors conclude with practical recommendations for the design and analysis of future studies.

Co-Winner: "Generalizing the network scale-up method: A new estimator for the size of hidden populations"

Joscha Legewie (Harvard) and Merlin Schaeffer (U. of Copenhagen)

Abstract. Concerns about neighborhood erosion and conflict in ethnically diverse settings occupy scholars, policy makers, and pundits alike; but the empirical evidence is inconclusive. This article proposes the contested boundaries hypothesis as a refined contextual explanation focused on poorly defined boundaries between ethnic and racial groups. The authors argue that neighborhood conflict is more likely to occur at fuzzy boundaries defined as interstitial or transitional areas sandwiched between two homogeneous communities. Edge detection algorithms from computer vision and image processing allow them to identify these boundaries. Data from 4.7 million time- and geo-coded 311 service requests from New York City support their argument: complaints about neighbors making noise, drinking in public, or blocking the driveway are more frequent at fuzzy boundaries rather than crisp, polarized borders. By focusing on the broader sociospatial structure, the contested boundaries hypothesis overcomes the "aspatial" treatment of neighborhoods as isolated areas in research on ethnic diversity.

Honorable Mention: "Network dynamics of social influence in the wisdom of crowds"

Jashua Becker, Devon Brackbill, Damon Centola (U. of Pennsylvania)

Since the discovery of the wisdom of crowds over 100 years ago theories of collective intelligence have held that group accuracy requires either statistical independence or informational diversity among individual beliefs. Empirical evidence suggests that allowing people to observe the beliefs of others leads to increased similarity of individual estimates, reducing independence and diversity without a corresponding increase in group accuracy. As a result, social influence is expected to undermine the wisdom of crowds. We present theoretical predictions and experimental findings demonstrating that, in decentralized networks, social influence generates learning dynamics that reliably improve the wisdom of crowds. We identify general conditions under which influence, not independence, produces the most accurate group judgments.

Outstanding Student Paper of the Year

Committee Chair: David Melamed (The Ohio State University)

"Diagnosing multicollinearity in exponential random graph models"

Scott W. Duxbury, The Ohio State University

Abstract. Exponential random graph models (ERGM) have been widely applied in the social sciences in the past 10 years. However, diagnostics for ERGM have lagged behind their use. Collinearity-type problems can emerge without detection when fitting ERGM, yielding inconsistent model estimates and problematizing inference from parameters. This article provides a method to detect multicollinearity in ERGM. It outlines the problem and provides a method to calculate the variance inflation factor (VIF) from ERGM parameters. It then evaluates the method with a Monte Carlo simulation, fitting 216,000 ERGMs and calculating the VIFs for each model. The distribution of VIFs is analyzed using multilevel regression to determine what network characteristics lend themselves to collinearity-type problems. The relationship between VIFs and unstable standard errors (a standard sign of collinearity) is also examined. The method is shown to effectively detect multicollinearity, and guidelines for interpretation are discussed.

Work by Members of Our Community

Book Manuscript: Gathering Social Network Data by jimi adams

Section member jimi adams has posted his book manuscript on Gathering Social Network Data online for Open Review at - https://getsndata.com The Open Review site provides the opportunity for broad-based feedback on any elements of the manuscript to generate a better book (please feel free to add your own feedback!), and takes place alongside the peer review process (this book is under review in the SAGE "little green book" QASS series). If you're interested in more about the Open Review process, here's a short story on that as well - https://www.socialsciencespace.com/2018/09/crowd-sourcing-as-a-complement-to-peer-review/

Goldberg, Amir and Sarah K. Stein. 2018. "Associative Diffusion and the Emergence of Cultural Variation." *American Sociological Review* 83(5): 897-932. **[link]**

Jasso, Guillermina. 2017. "Inequality in the Distribution of a Good Is a Bad, and Inequality in the Distribution of a Bad Is a Good." *European Sociological Review* 33(4):604-614. **[link]**

Jasso, Guillermina. 2018. "The Theory of Comparison Processes." Pp. 249-280 in Peter J. Burke (ed.), *Contemporary Social Psychological Theories.* Second Edition. Stanford, CA: Stanford University Press. **[link]**

Jasso, Guillermina. 2018. "What Can You and I Do To Reduce Inequality?" *Journal of Mathematical Sociology* 42(4):186-204. **[link]**

Jasso, Guillermina. 2018. "Quantitative Methods." Pp. 235-241 in J. Michael Ryan (ed.), *Core Concepts in Sociology*. New York, NY: Wiley-Blackwell. **[link]**

Jasso, Guillermina. 2018. "Anything Lorenz Curves Can Do, Top Shares Can Do: Assessing the TopBot Family of Inequality Measures." *Sociological Methods and Research* online first **[link]**

Opportunities

Postdoctoral Researcher Needed for Fall 2019 -

The FAST study (led by James Kitts with Mark Pachucki and collaborators in Kinesiology, Nutrition, and Statistics) is looking to hire a postdoctoral researcher beginning in Fall of 2019. This project models social networks and social influence on health behavior among students in four diverse middle schools. In its second year, the project includes 4 faculty, 2 postdocs, 3-4 graduate RAs, and a team of undergrad assistants and staff. The postdoc will benefit from affiliation with the Computational Social Science Institute, currently 81 faculty from 27 departments in 9 colleges at UMass.

The postdoc's participation involves two primary thrusts: First, the postdoc will work with a team in statistical modeling of network dynamics and social influence on health behavior, using data on at least 7 different kinds of relationships over 12 time points, derived from surveys and administrative records. Second, the postdoc will work with a team to develop software to conduct computational experiments, allowing researchers to explore virtual health interventions based on the models and data analysis above.

Required qualifications include advanced skills and experience in statistical analysis of network data in R (e.g., temporal exponential family random graph modeling in Statnet, stochastic actor-oriented modeling in RSiena). Desirable qualifications include general programming skills (e.g. C, Python); deep knowledge of social network and social influence theory; experience in agent-based modeling; availability to work on the project long term (at least 2 years). Applicants from any disciplinary background will be considered, but interdisciplinary research experience is strongly desired.

The University of Massachusetts Amherst is an Affirmative Action/Equal Opportunity Employer of women, minorities, protected veterans, and individuals with disabilities and encourages applications from these and other protected group members.

Interested candidates should send the PI (jkitts@soc.umass.edu) a CV and cover letter summarizing relevant training and research experiences, scope of availability, and the names of 3 references.

Thank you for your timely contributions to the Summer/Fall 2018 Issue of the Mathematical Sociologist. Please continue to send us your announcements, articles, book reviews, conference announcements, etc. The more you are involved with the newsletter, the better it will be. Please feel free to send us your comments, concerns, corrections, or any ideas you have for the newsletter.

We also wanted to let our members know that the Section website (http://www.mathematicalsociology.org) is now housed in a server at the University of South Carolina. Thanks to the webmaster, Matt Brashears, for keeping the site up and running!

Have a great end of the summer and winter break and watch your email for future newsletter editor requests!

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Mission Statement of the Mathematical Sociology Section

The purpose of the Mathematical Sociology Section of the American Sociological Association is to encourage, enhance and foster research, teaching and other professional activities in mathematical sociology, for the development of sociology and the benefit of society, through organized meetings, conferences, newsletters, publications, awards and other means deemed appropriate by the Section Council. The Section seeks to promote communication, collaboration and consultation among scholars in sociology in general, mathematical sociology and allied scientific disciplines.