

Mathematical Sociologist

Message from the Chair: James A. Kitts



There has never been a more exciting time to be a mathematical sociologist. After I forwarded so many announcements for tenure track and postdoctoral positions this fall, the increased demand for candidates with advanced mathematical and computational training was unmistakable. It is clear that this erstwhile fringe community now faces an opening market for our expertise. Banished for so long like Rudolph in the Island of Misfit Toys, mathematical sociologists similarly offer a much-needed light to cut through the fog of our sociological imagination (continues on page 2).

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Inside this issue:

From the Chair	1
Section Officers	1
ASA 2020	3
Section Awards 2019	5
Call for Awards 2020	8
New Academic Work	9
News	10
Opportunities	11
Mission Statement	12

Opportunities to disseminate our work are also rapidly expanding. As Chair of the 2020 Program Committee -- also including Neha Gondal, Guillermina Jasso, and Diego Leal -- I am pleased to announce a wealth of sessions for mathematical sociologists to participate in the ASA annual meeting at San Francisco. I will organize the usual *Open Topics in Mathematical Sociology* as part of our regular session allocation and Neha Gondal will organize an invited half-session showcasing *New and Emerging Scholars in Mathematical Sociology*. Diego Leal will organize a Regular Session in *Mathematical Sociology* and Carter Butts will organize a joint session on *Computational Sociology* with the Methodology session. Submit your papers [at this web link](#) by January 29, 2020.

We can continue to augment our intellectual impact and recruitment reach by organizing related sessions outside our own section. First, any of us can create a regular session on a topic of interest to mathematical sociologists, such as social networks, formal theory, formal demography, text analysis, social exchange, or collective action. See [this web link](#) for information and deadlines for submitting regular session proposals. Second, any of us can organize a relevant session through another section. For example, I organized a session on *Networks and Organizations* with the Organizations, Occupations, and Work section and promoted mathematical sociology through that session. Anyone who chooses either of these options should coordinate with our Program Committee to ensure that all offerings are complementary. To volunteer to organize a session through another section, contact that section's chair and also check in with me. Third, we can begin conversations to organize a joint session with another section, such as Theory, Sociology of Population, Social Psychology, Communications, Information Technologies and Media Sociology, or Collective Behavior and Social Movements. For example, I organized a two-year joint session on *Computational Sociology* with the Methodology section. Sessions organized jointly with other sections attract exciting papers and enriching exchanges while also fostering cross-recruitment. This collaboration was just extended through 2021 so we can sponsor a new joint session starting in 2022. Please work on planning through me this year or through Guillermina Jasso next year.

Section membership continues to hold steady (from 211 in 2008 to 215 in 2019) even while the vast majority of ASA sections have shrunk, as the ASA membership diminished from 14,422 to 11,218 and the number of sections increased from 48 to 52. That said, let us revisit our perennial goal to broaden and deepen our recruitment in order to earn another session at the annual meeting, increase our operating funds, and expand our overall impact. On that note, our 2019 memberships will expire at New Years, so if you have failed to renew your section membership you can fix the oversight [at this web link](#) for 2020.

Our section has benefited greatly from the generosity of our members, as we see in our impressive Outstanding Dissertation in Progress Award, pioneered by Geoffrey Tootell. We hope you will continue to contribute to that award or to donate unrestricted gifts for our other initiatives and operations. The most direct and cost-effective contribution to the vitality of the section is to donate for graduate students' section memberships (at \$5 apiece). You are free to give particular students or colleagues section memberships [at this web link](#). Giving section memberships at the start of the year maximizes value for both the recipient and the section, and neatly satisfies any expectations for holiday gifts.

I am looking into setting up an independent fund that will support free grad student memberships in perpetuity. Under ASA rules, we are not permitted to use section operating funds to subsidize memberships, so any subsidies would need to be funded by unrestricted gifts. If you would like to contribute to the section's continued vitality with a monetary gift or bequest, please get in touch with me (jkitts@umass.edu) to be included in this conversation.

A bit of good news: We saved money by collaborating with two other sections on our reception and we also benefited from support by members who self-paid significant expenses. (Thanks especially to Carter Butts for the mathematical sociology t-shirts and laser pointers / kitty teasers and a catered breakfast for the section Council.) Then some bad news: Despite these savings, the section spent far more last year than our annual allocation from section dues. This is because our annual dues revenue fell short of supporting our joint reception alone, not to mention the ~\$200 in award plaques and the \$500 graduate paper award specified in our bylaws. Our Council must discuss solutions. Most other sections have increased their section dues for regular (not student or low-income) members from \$10 to at least \$12. ([See this link](#) for all section dues.) Even such an increase would need to be combined with aggressive recruitment to pull our revenue into the range of our bare bones operating expenses (reception and awards). Again, feel free to contact me if you have clever or generous ideas.

There will be some upcoming bylaw changes for you to vote on, so please pay close attention to the forthcoming ASA ballot and associated materials. One bylaw change is to establish a new section award, for Progress in Mathematical Sociology, and the other to broaden eligibility for the Outstanding Graduate Student Paper in Mathematical Sociology award to include papers coauthored with faculty. Ratification requires a vote by the entire section membership, so please do not forget to weigh the issues and vote.

We are grateful to all members who have volunteered their time and effort to serve on committees and task groups to support the section. Carter Butts is chairing the Nominations committee. Dawn Robinson, Kimberly Rogers, Jeffrey Smith, and Ronald Breiger are chairing our awards committees, announced separately in this newsletter. Diego Leal and Pamela Emanuelson continue to produce outstanding newsletters and Matt Brashears continues to host the section webpage. Please contact me (jkitts@umass.edu) and Zack Almquist (zackwalmquist@gmail.com) to volunteer your services for any of these initiatives. We are maintaining a list of volunteers who want to get more involved.

We congratulate our Chair-Elect Guillermina Jasso, Student Representative Scott Duxbury, and incoming Council members Neha Gondal and Kimberly Rogers, and thank outgoing Student Representative Cassie McMillan and Council members James Moody and Arnout van de Rijt for their service. I want to personally thank Carter Butts for his many efforts as Chair last year and his assiduous attention to the leadership transition in his role as Past Chair. We look forward to receiving your work in the upcoming sessions, your nominations for the award competitions, and your news for the next newsletter. And Happy New Year to all!

Mathematical Sociology at ASA

2020 ASA – San Francisco

Open Topics in Mathematical Sociology

Session Organizer: James A. Kitts, University of Massachusetts (jkitts@soc.umass.edu)

This session features talks in all areas of mathematical sociology, aiming to understand the social world through mathematical or computational modeling, development or application of formal theory, and innovative social network analysis

Open-Theme Regular Session in Mathematical Sociology

Session Organizer: Diego F. Leal, University of South Carolina (leald@mailbox.sc.edu)

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.

Invited Paper Session on New and Emergent Scholars in Mathematical Sociology

Session Organizer: Neha Gondal, Boston University (gondal@bu.edu)

This session features work by new and emerging scholars in the area of mathematical sociology. We welcome work on all areas of the subfield including empirical applications, mathematical modeling, and formal theory.

Mathematical Sociology & Methodology Joint Session in Computational Sociology

Session Organizer: Carter T. Butts, University of California Irvine (buttsc@uci.edu)

This is a joint session of the Methodology Section and the Mathematical Sociology Section featuring papers related to computational sociology methods.

7th Joint US-Japan Pre-conference in Mathematical Sociology & Rational Choice

Organizer: Jun Kobayashi, Seikei University, Tokyo (jun.kobayashi@fh.seikei.ac.jp)

This pre-conference will be held on August 7th 2020. See more details in the Opportunities section below.

Section Awards

Harrison White Outstanding Book Award

Committee Chair: Pamela Emanuelson (North Dakota State University)

Committee Members: Alison J. Bianchi (University of Iowa); Diane H. Felmlee (Penn State); Eugene Johnsen (UC Santa Barbara); David Willer (University of South Carolina)

Winner: “How Behavior Spreads. The Science of Complex Contagions”

Damon Centola (University of Pennsylvania)

Abstract. New social movements, technologies, and public-health initiatives often struggle to take off, yet many diseases disperse rapidly without issue. Can the lessons learned from the viral diffusion of diseases be used to improve the spread of beneficial behaviors and innovations? In *How Behavior Spreads*, Damon Centola presents over a decade of original research examining how changes in societal behavior — in voting, health, technology, and finance — occur and the ways social networks can be used to influence how they propagate. Centola’s startling findings show that the same conditions accelerating the viral expansion of an epidemic unexpectedly inhibit the spread of behaviors.

While it is commonly believed that “weak ties” —long-distance connections linking acquaintances—lead to the quicker spread of behaviors, in fact the exact opposite holds true. Centola demonstrates how the most well-known, intuitive ideas about social networks have caused past diffusion efforts to fail, and how such efforts might succeed in the future. Pioneering the use of Web-based methods to understand how changes in people’s social networks alter their behaviors, Centola illustrates the ways in which these insights can be applied to solve countless problems of organizational change, cultural evolution, and social innovation. His findings offer important lessons for public health workers, entrepreneurs, and activists looking to harness networks for social change.

Practical and informative, *How Behavior Spreads* is a must-read for anyone interested in how the theory of social networks can transform our world.

Outstanding Dissertation-in-Progress Award

Committee Chair: Marcel van Assen (Tilburg School of Social and Behavioral Sciences)

Committee Members: Jacob Dijkstra (University of Groningen); Joseph Dippong (UNC - Charlotte)

Winner: “Worth the Weight: Framing Social Processes as Weighted Social Networks”

Cassie McMillan (Pennsylvania State University)

Abstract. Cassie’s dissertation focuses on weighted networks, or networks where individual relationships are assigned quantitative measures of tie strength. Most social network research treats

social ties as binary variables in which relationships are either present or absent. However, weighted network data is collected frequently, especially when considering how our social connections relate to processes of inequality. Cassie's work demonstrates that it can be misleading to overlook the variability that defines tie weights by first exploring the theoretical puzzles that arise when studying homophily in weighted social networks. Through developing innovative methodological techniques to address these questions, she finds that when processes of homophily operate differently for strong and weak social ties, traditional methods fail to characterize this complexity. In the remaining chapters, Cassie applies these same methods to model social processes at both the macro- and micro-levels. For instance, by conceptualizing the flows of international migration as a social network, she finds that persistent patterns of global inequality, such as previous colonial ties and economic disparities, play a vital role in informing the movement of people on a global scale. Finally, she considers how patterns of homophily shape the formation of adolescent friendships. While stronger ties tend to connect individuals from the same racial, ethnic, and nativity backgrounds, weaker connections link more heterogeneous pairs. This finding is noteworthy because weak ties play a crucial role in circulating new information and encouraging social change

Outstanding Article Publication Award

Committee Chair: Arnout van de Rijt (Utrecht University)

Committee Members: Joshua Becker (Northwestern University); Dennis Feehan (UC Berkeley); Joscha Legewie (Harvard University); Yoshimichi (Mitch) Sato (Tohoku University).

Winner: “*Status Organizes Cooperation: An Evolutionary Theory of Status and Social Order*”

Noah P. Mark (University of North Carolina at Charlotte)

Abstract. Status behaviors are verbal and nonverbal behaviors that elevate or lower the status of the individuals who perform them and that can combine to create status hierarchies in task groups. This article identifies how status behavior could promote contributions to public goods in social dilemma situations through its ability to organize a group — that is, through its ability to generate a status hierarchy and mobilize contributions from all members of a group — and offers an explanation for the evolution of cooperative status behavior. The evolutionary viability of cooperative status behavior derives from its orientation toward hierarchy: status behavior tends to produce hierarchy in groups, and status behavior discriminates between the presence and absence of hierarchy. Cooperative status actors achieve mutual cooperation when they encounter each other but are protected from exploitation when a collectively recognized hierarchy is not present. This article shows that a strategy of cooperative status behavior can proliferate under conditions that otherwise make cooperation impossible.

Honorable Mention: “Experimental Evidence for Tipping Points in Social Convention”**Damon Centola, Joshua Becke (University of Pennsylvania)****Andrea Baronchelli (City University of London)**

Abstract. Once a population has converged on a consensus, how can a group with a minority viewpoint overturn it? Theoretical models have emphasized tipping points, whereby a sufficiently large minority can change the societal norm. Centola et al. devised a system to study this in controlled experiments. Groups of people who had achieved a consensus about the name of a person shown in a picture were individually exposed to a confederate who promoted a different name. The only incentive was to coordinate. When the number of confederates was roughly 25% of the group, the opinion of the majority could be tipped to that of the minority.

Graduate Student Paper Award

Committee Chair: Christopher Marcum (National Institutes of Health)

Committee Members: jimmi adams (University of Colorado – Denver); Katie Corcoran (West Virginia University); Amy Kroska (University of Oklahoma); Jeffrey Smith (University of Nebraska – Lincoln).

Winner: “The Contribution of National Income Inequality to Regional Economic Divergence”**Robert A. Manduca, Harvard University**

Abstract. After more than a century of convergence, the economic fortunes of rich and poor regions of the United States have diverged dramatically over the last 40 years. Roughly a third of the US population now lives in metropolitan areas that are substantially richer or poorer than the nation as a whole, almost three times the proportion that did in 1980. In this paper I use counterfactual simulations based on Census microdata to understand the dynamics of regional divergence. I first show that regional divergence has primarily resulted from the richest people and places pulling away from the rest of the country. I then estimate the relative contributions to regional divergence of two major socioeconomic trends of recent decades: the sorting of people across metro areas by income level and the national rise in income inequality. I show that the national rise in income inequality is sufficient on its own to account for more than half of the observed divergence across regions, while income sorting on its own accounts for less than a quarter. The major driver of regional economic divergence is national-level income dispersion that has exacerbated preexisting spatial inequalities.

Call for Section Award Nominations

James S. Coleman Distinguished Career Achievement Award

Committee Chair: Ronald (Ron) Breiger (University of Arizona)

The Distinguished Career Award recognizes a lifetime of contributions to the field of Mathematical Sociology. A letter of nomination should outline the candidate's activities of lasting significance in mathematical sociology, conducted over the course of their career. The nomination also should include a copy of the candidate's curriculum vitae, and an assurance that the candidate has given permission to be nominated for the award. Nominations must come from American Sociological Association members. Please send materials to Ron Breiger (breiger@email.arizona.edu), award committee chair, by April 15, 2020.

Outstanding Dissertation-in-Progress Award

Committee Chair: Jeffrey A. Smith (University of Nebraska - Lincoln)

The Outstanding Dissertation-in-Progress award provides a grant of \$5,000 to meet some of the scholarly expenses of a student whose dissertation employs mathematics in an interesting, imaginative or ingenious way to advance sociological knowledge. The applicant should submit a copy of their approved dissertation proposal, with a list of any requirements added by the graduate committee. The packet should also include a letter of support from the student's sponsor, which describes the student's qualifications for the completed task and the potential importance of the project. Applicants must be members of the Mathematical Sociology section in good standing, and must agree to remain members through the period to be covered by the grant. Please send a copy of the dissertation proposal and a nomination letter to Jeffrey Smith (jsmith77@unl.edu), award committee chair, by April 15, 2020. (Letters of support may be sent to the chair under separate cover; please indicate the name of the letter writer in the application packet.)

Outstanding Article Publication Award

Committee Chair: Kimberly (Kim) B. Rogers (Dartmouth College)

The Mathematical Sociology section is accepting submissions for the Outstanding Article Publication Award. The award is presented for a published article making significant contributions to the field of mathematical sociology. Eligible papers must have been published during the past three years prior to the

award year, and self-nominations are welcome. Please submit papers and a nomination letter to Kim Rogers (kimberly.b.rogers@dartmouth.edu), award committee chair, by April 15, 2020.

Outstanding Graduate Student Paper Award

Committee Chair: Dawn T. Robinson (University of Georgia)

The Mathematical Sociology section is accepting submissions for the Outstanding Graduate Student Paper Award. This award is presented for a paper that makes a significant contribution to mathematical sociology. Papers can be published or unpublished. The submission can consist of a dissertation chapter, but not the entire dissertation. Eligible papers must have been written while the corresponding or first author was still a graduate student and during the three years prior to the award year. The nominee must be a member of the Section at the time of award. Multiple-author papers are admissible, provided that the corresponding or first author meets the eligibility requirements and no non-student is co-first author; in the case of multi-authored papers with non-student authors, a letter from the most senior non-student author is required which describes the student(s) contributions. On multiple-author papers including non-student authors who are Section members, the award is shared by the eligible student authors. Self-nominations are welcome. Please email a copy of the paper and a nomination letter to Dawn T. Robinson (sodawn@uga.edu), award committee chair, by April 15, 2020.

New Work by Members of Our Community

New Articles

Leal, Diego F., Anthony Paik and Steven A. Boucher. 2019. "Status and Collaboration: The Case of Pro Bono Network Inequalities in Corporate Law." *Social Science Research* 84: 102325. [[link](#)]

Stoltz, Dustin S. and Marshall A. Taylor. 2019. "Concept Mover's Distance. Measuring Concept Engagement via Word Embeddings in Texts." *Journal of Computational Social Science* 2(2): 293-313. [[link](#)]

Stoltz, Dustin S. and Marshall A. Taylor. 2019. "Textual Spanning: Finding Discursive Holes in Text Networks." *Socius* 5: 1-2. [[link](#)]

van de Rijt, Arnout. 2019. "Self-Correcting Dynamics in Social Influence Processes." *American Journal of Sociology* 124(5): 1468-95. [[link](#)]

van de Rijt, Arnout. 2019. “How Behavior Spreads.” Review of Centola 2018, “How Behavior Spreads: The Science of Complex Contagions.” *Journal of Mathematical Sociology* 43 [[link](#)]

New Software

Stoltz, Dustin S. and Marshall A. Taylor. 2019. textSpan: R Package for Measuring Textual Spanning ([available via GitHub](#)).

Stoltz, Dustin S. and Marshall A. Taylor. 2019. CMDist: R Package for Measuring Concept Engagement via Word Embeddings ([available via GitHub](#)).

News Related to Members of Our Community

Dissertation Completed: *Religious Islands, Partners and Bridges: Studying Cross-denominational Shared Ideas Using Book Co-purchase Networks*

Section member [Nathaniel D. Porter](#) recently defended his dissertation in the Sociology department at the Pennsylvania State University. This dissertation studies shared exposure to ideas between U.S. Protestant Christian groups as cultural isolation, group dyadic preferences, and network bridges. To do so, I collect and analyze new data from Amazon “Customers who bought this also bought” product recommendations, which allow for studying with which other books and topics an individual book is commonly bought. Methods include mixed effects fractional logistic regression, MRQAP, and Partial Group Betweenness Centrality, a novel generalized measure of group betweenness described in the Appendix. Results suggest informal cultural ties form through a mix of micro-, meso- and macro-processes. Relationships occur both directly, through co-purchase of ecumenical titles, and mediated by co-exposure to titles designed to appeal to a wide range of Christians across denominations. The dissertation contributes both technically, through introduction of new data and methods, and theoretically, by applying network theories and informal cultural analytics to key questions in the sociology of religion.

Open-Access ETD: <https://catalog.libraries.psu.edu/catalog/27088003>

New Position: [Marshall A. Taylor](#) started a new position as Assistant Professor of Sociology at New Mexico State University in Las Cruces, New Mexico.

Award: Section member [Arnout van de Rijt](#) won the 2019 International Society for Scientometrics and Informetrics (ISSI) paper of the year award, for the article “The Matthew Effect in Science Funding.” (with Thijs Bol and Mathijs de Vaan)

Award: Section member [Arnout van de Rijt](#) won the 2019 James S. Coleman Outstanding Article Award, American Sociological Association, Rationality & Society section, for the article “The Matthew Effect in Science Funding.” (with Thijs Bol and Mathijs de Vaan)

Opportunities

6th International Conference on Computational Social Science (IC2S2)

IC2S2 brings together researchers in computational science, complexity, and social science, and provides a platform for new work in the field of computational social science. Regular abstract submission deadline: 02/16/2020. More details: <http://2020.ic2s2.org/>

Joint 7th US-Japan Pre-conference in Mathematical Sociology & Rational Choice

Announcement from the organizing committee: *The joint pre-conference welcomes any topics in the field, including preliminary results and work in progress. It provides the opportunity to share and exchange your ideas. Young scholars and students are especially encouraged to apply. Most papers have good chances to be accepted as long as they study the field in the broadest sense. Call for abstracts will be announced shortly. Why don't you join us celebrating its 20th anniversary in beautiful summer San Francisco?*

Date: August 7, 2020 (a day before the annual ASA meeting)

Venue: ASA meeting place in San Francisco (Hilton San Francisco Union Square or Parc 55)

Cosponsors: ASA Mathematical Sociology Section, ASA Rationality and Society Section, Japanese Association for Mathematical Sociology, and ISA Research Committee 45 on Rational Choice .

Organizers: Jun Kobayashi (Seikei University), Richard Edward Gardner (UC Irvine), Kikuko Nagayoshi (Tohoku University), Kazuhiro Kezuka (Tokyo Institute of Technology), and Gianluca Manzo (Centre National de la Recherche Scientifique)

Thank you for your timely contributions to the Fall/Winter 2019/2020 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.

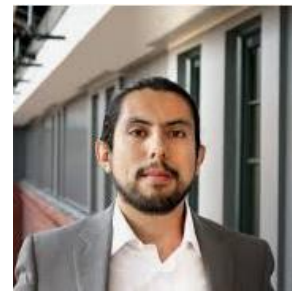
We also wanted to let our members know that the Section website (<http://www.mathematicalsociology.org>) is now housed in a server at the University of South Carolina. Thanks to the webmaster, Matt Brashears, for keeping the site up and running!

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

Newsletter Co-editors



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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.