American Sociological Association
Mathematical Sociologist

Message from the Chair: Lynn Smith-Lovin

We are in the run-up to the ASA meetings in Los Angeles: our first in-person meeting in three years. It's very exciting. While travel is still not smooth, it seems quite possible (wear your mask!), and I trust we can have a safe, stimulating meeting.

Elsewhere in this newsletter, you'll see details about the sessions and awards that will be presented in LA. We have an unusually rich set of sessions this year (5 sessions, compared to 1 or 2 in a normal year). (continues on page 2)

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A Message from the Chair Cont.

Lynn Smith-Lovin

We are partnering with three other sections-- Methodology, Culture, and Poverty/Inequality/Mobility—to present fascinating formal mathematical work in those areas. Those sessions will be on our section day, Tuesday. In addition, our own Pam Emanuelson is organizing a general program session on Mathematical Sociology that will be early in the meeting on Saturday afternoon. There is also a special memorial session (see below). Our awards will be given out at the Business Meeting, at 11 am on Tuesday.

Since we have lost two great mathematical sociologists in recent history, I wanted to mention two memorial sessions that will be happening at the meetings. Thomas J. Fararo has been gone a couple of years now and left the Section a wonderful bequest in his will. The Section will honor his memory just before the Business Meeting (at 10 am on Tuesday) organized by his frequent collaborator John Skvoretz. There will be speakers talking about different aspects of Tom's scholarship, with both substance and personal warmth. In addition, David R. Heise passed away in September of this year. The ASA Section on the Sociology of Emotions is using their Chair's Hour for a session memorializing him and his work at noon on Tuesday. Three section members—me, Neil McKinnon, and Amy Kroska—will be talking about his contributions to sociology, to the sociology of emotions, and mentoring younger scholars. Unfortunately, this session conflicts with our own Mathematical Sociology session on Computational Sociology at the same time (co-sponsored with Methodology). So, all of us will be wanting to be in two places at once. Such is the way of the ASA meetings!

I'd like to tell you about some things that we are discussing in Council, both in between meetings and at our Council meeting at 7 am on Tuesday. We will be considering whether to continue the current ad hoc committee on Diversity, Inclusion, and Equity and perhaps whether to make it a more formal, standing committee with an expanded membership. We are also talking about a new ad hoc committee to welcome new members, particularly graduate students and younger scholars. This initiative fits with the ideas that are developing for the use of Tom Fararo's bequest. We have been discussing a more formal mentorship program that would link experienced senior scholars with younger people who would enjoy the interaction and advice about their careers. We were thinking of naming the program after Fararo and incorporating some aspect of the mentor/mentee interaction into our yearly reception. These plans are still in development, so I very much welcome your input. You can write me at smithlov@duke.edu or contact any of your Council

members. We would also like to create a new forum for discussing how to communicate to people outside academia and mentor graduate students who might want to work outside the academy. This is obviously related to our mentorship plans since we will need some great senior mentors who know this world to help young people move into it if that is their goal.

Finally, for the pure fun: we will have a BIG reception the night before our section day (Monday night) at The Strada Eateria and Bar, 825 W 9th St Los Angeles, CA 90015, right next to the convention center. We are reserving the entire restaurant and sharing the space with several other sections (Social Psychology, Emotions, CITAMS, Rationality & Society, Evolution and Biology in Society, and Altruism/Morality/Social Solidarity). There will be drink tickets and plenty of food. So come at 6:30, and get our section activities off to a rousing start.

Can't wait to see you all in Los Angeles!

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2022 Math Soc Section Election Results

Chair Elect (3-year term begins in 2022):
Noah P. Mark, UNC Charlotte

Council Members (3-year term begins in 2022):
Cassie McMillan, Northeastern University
Elizabeth Roberto, Rice University

Student Representative (1-year term begins in 2022):
Roberson Beauvile, Emory University

Noah Mark *Cassie McMillan* *Elizabeth Roberto* *Roberson Beauvile*

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2022 ASA – Annual Meeting

1. Section on Mathematical Sociology Business Meeting
Tuesday, August 9, 11:00 to 11:30 am EDT, JW Marriott, Floor: Level 3, Plaza III

Session Organizer and Chair: Lynn Smith-Lovin, Duke University.

2. Computational Sociology: Methods and Applications (Co-spondored with the Methdology Session)
Tuesday, August 9, 12:00 to 1:30 pm, JW Marriott, Floor: Level 3, Plaza III

Session Organizer and Presider: Xi Song, University of Pennsylvania

This joint session of the Methodology and Mathematical Sociology Sections features work-in-progress that develops new computational methods and/or applies computational methods to novel sources of data such as administrative records, historical archives, text and image data, social media, network data, and data that link traditional social surveys with emerging 'Big Data' in social sciences.

3. Formal Models of Culture (Co-sponsored by the Sociology of Culture Section):
Tuesday, August 9, 8:00 to 9:30 am, JW Marriott, Floor: Level 3, Plaza III

Session Organizer and Presider: Daniel DellaPosta, Pennsylvania State University

This joint session features formal (mathematical or computational) approaches, broadly speaking, to study culture. These papers could focus, for example, on how culture forms and evolves, how cultural elements relate to one another, or how cultural factors influence thinking and behavior, among other possible topics. We are open to papers that present and develop theoretical models using formal techniques and those that apply formal methods to empirical data. The methods used in these papers could include (but are not limited to) network analysis, word-embedding or other forms of natural language processing, mathematical models, or agent-based computational models.

4. Mathematical and Computational Approaches to Studying Inequality (Co-sponsored by the Inequality, Poverty and Mobility Section):
Tuesday, August 9, 2:00 to 3:30 pm, JW Marriott, Floor: Level 3, Plaza III

Session Organizer and Presider: Siwei Cheng, New York University

This session invites papers that employ mathematical and computational methods, including but not limited to formal modeling, agent-based models, machine learning, network analysis, and text analysis, to study theoretical and empirical aspects of inequality.

5. Advances in Mathmatical Sociology:
Saturday, August 6, 2:00 to 3:30 pm, LACC, Floor: Level 2, 404A

Session Organizer and Presider: Pam Emanuelson, North Dakota State University

This session features papers that advance mathematical or theoretical models of social phenomena.

6. Theoretical Unification and Sociological Theory: An Appreciation of the Contributions of T.J. Fararo:
Tuesday, August 9, 10:00 to 11:00 am, JW Marriott, Floor: Level 3, Plaza III

Session Organizer and Presider: John Skvoretz, University of South Florida

Thomas J. Fararo was one of the pioneers of mathematical sociology. When he passed away in August 2020, he left both an intellectual legacy in the field of mathematical sociology and a financial legacy to the ASA Section on Mathematical Sociology. Tom Fararo viewed mathematical sociology as first and foremost a theoretical activity, an activity whose driving concern should be the unification of disparate theories and theoretical frameworks, setting out these ideas in two books, The Meaning of General Theoretical Sociology: Tradition and Formalization (1989) and Social Action Systems: Foundation and Synthesis in Sociological Theory (2001). The invited panelists, Carter Butts, Willie Jasso, and Gianluca Manzo, along with the organizer, John Skvoretz, will comment on the contributions of T.J. Fararo to sociological theory through mathematical modeling and assess the prospects for the achievement of his vision: the unification of disparate theories and frameworks in sociology.

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Seventh Joint US-Japan Conference on Mathematical Sociology and Rational Choice

Program

August 5th, 2022, Los Angeles Convention Center (LACC), Floor: Level 1, 152

10:00-10:05 Opening Remarks
10:05-10:50 Keynote Speech
Presenter: James A. Kitts (University of Massachusetts)

11:00-12:20 Oral Presentation

1. João M. Souto Maior (New York University) "Black-White Advanced Enrollment Inequalities and the Racial Composition of Schools: an Agent-based Modeling Investigation"

2. Tomohiro Kitamura (Keio University) and Hirohisa Takenoshita (Keio University) "Why Do Parents Invest on Their Children's Education: Explanation by using Mathematical Model"
3. Peng Huang (University of California, Irvine) and Carter T. Butts (University of California, Irvine) "Rooted America: Immobility and Segregation of the Inter-county Migration Networks"
4. Kazuhiro Kezuka (Tokyo Institute of Technology) "The Puzzle of the Japanese View of Religion: Modifying Church and Sect Model and Applying ISSP 2018 Data"

13:20-14:20 Poster Sessions

1. Hiroshi Ishida (University of Tokyo) "Does College Education Promote Social Mobility? Evaluating College as the Great Equalizer Hypothesis in Japan"
2. Elizabeth Roberto (Rice University) "Segregation and the built environment: A Novel Measurement Approach"
3. Teruki Sanada (Doshisha University) "Has Shadow Education Become Popular?"
4. Yurie Momose (University of Tokyo) "Life Course Study on Adult Health and Social Exclusion in Japan"
5. Hiroki Takikawa (University of Tokyo) and Zeyu Lyu (University of Tokyo) "Differences in response to behavior restriction policies under the COVID-19 epidemic in Japan in terms of gender, age group, and income level of the residence."
6. Kikuko Nagayoshi (University of Tokyo), Takashi Yoshida (Shizuoka University), and Hirohisa Takenoshita (Keio University) "Legitimation of Wage Inequality by Gender in Japan: Why Japanese Women Accept Wage Gap by Gender?"
7. Selena M. Livas (The University of California, Irvine) "International environmental treaties from a network perspective"
8. Loring J. Thomas (University of California, Irvine) and Carter T. Butts (University of California, Irvine) "Modelling Endogenous Vertex and Edge Dynamics using ERGM and Generalized Location Systems"
9. Carter T. Butts (University of California, Irvine) "Models for Networks with Cross-boundary Demographic Exchange"
10. Zhemeng Xie (Tohoku University) "Measuring the changes of sociological methods through word embedding"

14:30-15:50 Oral Presentation 2

1. Sabrina Mai (University of California, Irvine), Scott L. Renshaw (University of California, Irvine), Carter T. Butts (University of California, Irvine), and Jeannette Sutton (University at Albany, SUNY) "Changing Topics: Causal Narrative Networks of COVID-19 Communications"
2. Zeyu Lyu (University of Tokyo) "Analysis of Affective Polarization in Social Media"
3. Takakuwa Ranka (Tokyo Institute of Technology) ""Menhera" and selfie: from SNS hashtag analysis"
4. Scott L. Renshaw (University of California, Irvine), Selena M. Livas (University of California, Irvine), Miruna G. Petrescu-Prahova (University of Washington), and Carter T. Butts (University of California, Irvine), "Modeling Complex Interactions in a Disrupted Environment: Relational Events in the WTC Response"

15:50-15:55 Best Paper Awards

15:55-16:00 Closing Remarks

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

Co-organizers:
Kikuko Nagayoshi (University of Tokyo), Gianluca Manzo (Sorbonne University), Jun Kobayashi (Seikei University), Richard Edward Gardner (UC Irvine), Kazuhiro Kezuka (Tokyo Institute of Technology)

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James S. Coleman Award for Lifetime Achievement in Mathematical Sociology

Dr. Guillermina Jasso, Professor of Sociology and Silver Professor of Arts and Science at New York University, will receive the Section's James S. Coleman Award.

Willie, as she is known, has broad substantive interests (ranging from distributive justice to inequality to international migration and beyond) and deep expertise in sociological Methodology (especially mathematical methods for theory and factorial survey methods for empirics). In mathematical sociology alone, she has proposed a new specification of the justice evaluation function (AJS, 1978), building on it, developed a new empirically testable mathematical theory of distributive justice (ASR, 1980), extended justice to the larger set of comparison processes and described methods for their theoretical and empirical analysis (Sociological Methodology, 1990), constructed two new justice indices that can measure the amount of experienced injustice and allow comparison of the amount of injustice across places and over time (ASR, 1999), and invented an integrated mathematical framework for studying status (ASR, 2001), to name only a few. She has also written a long series of other papers, including seven in the Journal of Mathematical Sociology, that report scientific properties of the justice evaluation function and the status function, their new testable implications for a wide range of topical domains, a proposed theoretical unification, and two new families of probability distributions. Receiving this award is just a simple recognition of her extensive, significant, and long-time contribution to mathematical sociology.

Besides being a top-notch researcher, Willie is also a very kind and caring senior faculty. She participates in ASA meetings consistently. At ASA meetings and other venues, she has provided valuable professional advice and emotional support to numerous people, especially newcomers. To be frank, many of us look up to her as a

mentor and role model. Hence, this award also recognizes her continuous contribution to the professional development of many sociologists.

Upon being notified of this award, Willie said, receiving the award is "deeply meaningful because Coleman was one of my teachers at Hopkins and because of the magnificent list of previous winners." Thank you, Willie and other pioneers, for carrying us forward!!

The Coleman Award committee was chaired by me and consisted of Elisa Bienenstock, Benjamin Cornwell, Alina Arseniev-Koehler, Gianluca Manzo, and Trent Mize. I thank all the members for their excellent work. I also thank Section Chair Lynn Smith-Lovin for her valuable guidance.

Weihua An, Emory University

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2022 Award for Progress in Mathematical Sociology

Harrison C. White, Emeritus Giddings Professor of Sociology, Columbia University

Ronald L. Breiger, Regents Professor and Professor of Sociology, Statistics & Data Science, and Government & Public Policy, University of Arizona

Ronald S. Burt, Distinguished Professor, Department of Management and Technology, Bocconi University and Charles M. Harper Leadership Professor of Sociology and Strategy, University of Chicago

For their work on structural equivalence.

This award for Progress in Mathematical Sociology is a new honor, to be given annually starting in 2022. Our section currently offers awards for specific publications (the Harrison White Outstanding Book Award and the Outstanding Article Publication Award) as well as for career accomplishments (the James S. Coleman Distinguished Career Achievement Award). This new award differs in scope. The award honors a discovery, technical innovation, or invention representing a significant contribution to progress in mathematical sociology. The contribution may have been made at any time prior to the award year. While this contribution will ordinarily be described in one or more publications, this award recognizes the intellectual contribution itself, and not any publication arising from it. Up to three individuals may share a given award, provided that all meet the selection criteria. This year, the

Harrison C. White *Ronald L Breiger* *Ronald S. Burt*
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selection committee chose Professors White, Breiger, and Burt as recipients of this honor, while recognizing the deep and important contributions of Franzoi Lorraine, Scott A. Boorman, and John Boyd, among others, to the earliest development and applications of structural equivalence.

This deeply structural insight – that two nodes are structurally equivalent when they have the same pattern of relationships with the same others – became the foundational consideration underpinning the development of network methods for classifying nodes into positions and roles, and to methods for discovering the underlying structure of interactions within social networks. The earliest work theoretically elaborated on this insight with the development of role algebras, blockmodeling techniques for detecting latent structure of social systems, and methods for compressing network structures without loss of information. These new revelations and tools led to an explosion of intellectual work in structural sociology and eventually influenced intellectual and scientific endeavors well outside our field. These techniques have long since diffused to the study of natural (nonhuman) and physical (built) systems as well. Structural equivalence and its related formalizations are also core to the operation of contemporary machine learning techniques and AI recommender systems.

From the nomination letter:

"The development of structural equivalence is one of the great advances in mathematical sociology; like so many great discoveries, it is wonderfully simple after the fact, but its development was the product of deep and extended engagement with the question of how to make sense of the complexity of network structure."

"In the past 50 years, structural equivalence has spawned a wide range of theoretical, empirical, and technical innovations, and has been established as a foundational element of our thinking about role structures. It is also one of our most successful exports, with uses in fields ranging from engineering and computer science to molecular biology. It is a contribution of the sort we should all aspire to make. "

The progress award committee members were Noah E. Friedkin, Phillip Bonacich, John Skvoretz, and Dawn T. Robinson (chair). The committee took pleasure in deliberating about the array of potential candidates for this inaugural Award for Progress in Mathematical Sociology. Since the award is new, there are decades of important contributions to mathematical sociology from which to choose and there were some significant and innovative intellectual accomplishments nominated. While such a vast array of deserving contributions could be paralyzing, in the end, the committee could think of no other single contribution with as transformative, expansive, and lasting impact on mathematical sociology as the insights developed from the construct of structural equivalence.

The award will be presented at the Business Meeting of the Mathematical Sociology Section at the Annual Meetings of the American Sociological Association on August 9, 2022.

Dawn T Robinson, University of Georgia

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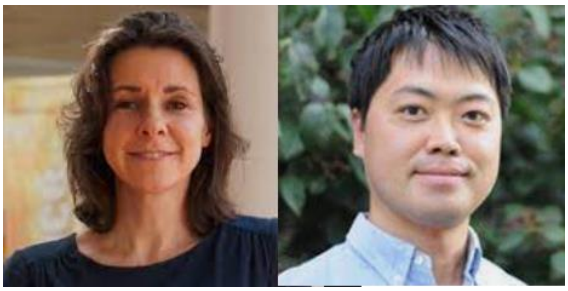
Outstanding Article Publication Award in Mathematical Sociology

Ten papers were nominated for the Outstanding Article Publication Award in Mathematical Sociology this year. The quality of these submissions was uniformly exceptional, and articles were published in a wide range of sociological and interdisciplinary journals, utilized a diverse array of mathematical approaches, and applied these tools to various substantive questions. And although award committee members varied in what factors we viewed as more or less important in determining an "outstanding" publication for our Section, there was exactly one paper that was a consensus favorite: the brilliant "Networks, Property, and the Division of Labor," by Emily Erikson and Hirokazu Shirado (ASR 2021).



Emily Erikson *Hirokazu Shirado*

It's easy to see why because it's tough to think of a strength this paper doesn't have. A model work for mathematical sociologists- and, frankly, anyone in our discipline- Erikson and Shirado address one of the most classic and central questions about society (the development of the division of labor) using sophisticated computational models (simulating coordination and specialization among a networked population) and generate impactful but counterintuitive findings (including that a division of labor is more likely to evolve when agents' ability to specialize is constrained). Congratulations to Emily and Hiro! And a huge thanks to this year's stellar award committee: James Evans, Freda Lynn, Em Maloney, and David Schaefer.

Kevin Lewis, UCSD

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Geoffrey Tootell Mathematical Sociology Outstanding Dissertation-in-Progress Award Winner and Honorable Mention

Winner: Peng Huang (UCI): "Dynamics of Population Flow Networks: A Dissertation Proposal"

Congratulations to Peng Huang, this year's winner of the Geoffrey Tootell Mathematical Sociology Outstanding Dissertation-in-Progress Award! Huang's proposal develops and applies novel mathematical models, bringing a network perspective to study migration. In their work, Huang proposes to evaluate and advance computational methods for modeling of valued/weighted networks under the framework of exponential-family random graph models (ERGMs). The proposed
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dissertation will go on to apply these methods to advance understanding of intercounty migration networks in the U.S. Huang demonstrates a strong and promising record as a junior researcher in the field of mathematical sociology. The proposed dissertation work is an excellent mix of advancing mathematical sociology with important substantive applications, including policy relevance. The award committee believes the work is poised to contribute to the field significantly.

Honorable Mention: Ke Nie (UCSD): "Steer the Sound: Organizing, Regulating, and Practicing Musical Creativity in China"

Congratulations to Ke Nie, whose proposed dissertation earned an honorable mention for the Geoffrey Tootell Mathematical Sociology Outstanding Dissertation-in-Progress Award! Nie proposes a creative and ambitious project that sits at the intersection of mathematical sociology and culture. The award committee was particularly impressed with the progress Nie has made on the project to date. Speaking to the questions of cultural innovation, Nie's work will bring computational techniques to measure and understand artistic creativity and its possible linkage to state regulation. In doing so, Nie aims to apply methods rarely used in sociology, and the award committee saw the exciting potential impact of doing so. We are looking forward to the results of Nie's ambitious project.

Emma S. Spiro, University of Washington

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Best Graduate Student Article in Mathematical Sociology

This year's Mathematical Sociology Graduate Student Paper Award is given to Ian Lundberg and colleagues for their paper, "What is your Estimand? Defining the Target Quantity Connects Statistical Evidence to Theory", published in 2021 in the American Sociological Review. They make a compelling argument that researchers must clearly specify the theoretical quantity to be determined in service of research, the empirical quantity that is used to provide an estimate of that theoretical quantity, and the estimation method used to connect the two. While we often assume these connections to be clear and obvious, Lundberg et al. show that there are often disconnects and mismatches in published research and, as a consequence, that results often do not show what they are purported to show. This is not a paper about a particular statistical model, and indeed mathematical sociology goes far beyond statistics or quantitative Methodology as usually understood. Instead, this paper is about all statistical models and how we

can improve research practice dramatically by making the connections between concepts more explicit and clear. Besides enabling more straightforward replication, this effort ensures that the researcher thinks deeply about how what they want to do connects to what they are doing. Lundberg et al.'s paper fits within the finest traditions of mathematical sociology by emphasizing how mathematics can be used to precisely represent theoretical or substantive ideas and how transformations of data and estimation are inextricably bound up with these representations. This year's committee, jimi adams, Matthew Brashears (chair), Hannah Dickens, Rebecca Johnson (recused), and Mustafa Yavas, are pleased to make this award and encourage everyone to take this paper's advice to heart.

Matthew Brashears, University of South Carolina

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Work by Members of Our Community

Jasso, Guillermina, and Bernd Wegener. 2022. "An Empirically Based Just Linear Income Tax System." Journal of Mathematical Sociology 46(2):195-225. [link]

Manzo Gianluca, Agent-based Models and Causal Inference [Book]. Wiley Series on Compuational and Quantitative Social Science [link]

Nunner, Hendrik, Arnout van de Rijt and Vincent Buskens. 2022. Prioritizing High-Contact Occupations Raises Effectiveness of Vaccination Campaigns. Scientific Reports 12:737. [link]

Sifuentes David, Téllez Iván and Zazueta Jorge, Exploring the Gender Gap in a Glosed Market Niche. Explicit Solutions of an ODE model. Journal of Dynamics and Games [link]

Zazueta Jorge, The Technology Adoption Dilemma [Chapter]. Tecnologías Disruptivas y su Impacto en la Vida Social y Económica de México, Plaza y Valdéz [link]

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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.