

Alexander Murray-Watters

Department of Sociology. University of California, Irvine

✉ amurrayw@uci.edu 🌐 [amurrayw](https://www.amurrayw.com) 🌐 [amurrayw.com](https://www.amurrayw.com) | Updated: February 27, 2026

EDUCATION

Ph.D. Sociology. University of California, Irvine. Expected 2026

M.A. Demographic and Social Analysis. University of California, Irvine. 2026

M.S. Logic, Computation and Methodology. Carnegie Mellon University. Pittsburgh, PA 2014
Thesis: *The DM Algorithm: A Causal Search Algorithm for the Discovery of MIMIC Models, with an Attempt to Recover a Protein Signalling Network from a High-Dimensional Ovarian Cancer Dataset.*
Advisors: Clark Glymour and Richard Scheines http://www.amurrayw.com/papers/masters_thesis_final.pdf

Dual Degrees (Honors): B.S. in Economics & Statistics and B.A. in Philosophy. Additional coursework in computer science. Carnegie Mellon University. Pittsburgh, PA. HSS Senior Honors. 2013

Senior Honors Thesis (Dietrich College of Humanities and Social Sciences): *Causal Discovery and MIMIC Models.* Advisor: Clark Glymour. http://www.amurrayw.com/papers/thesis_final.pdf

Additional Education

Mathematical Modeling and Simulation Summer School on Statistical Modeling and Data Analysis. Oberwolfach Research Institute for Mathematics (MFO). 2018

Additional coursework in mathematics. University of Nevada. Reno, NV. Summers 2010, 2011, 2012, 2016

Research and Teaching Interests

Causal Discovery and Modeling	Machine Learning/AI
Empirical Validation of Computational Simulation Models	Demography
Non-Probability Sampling	Public Health
Social Network Analysis	Social Psychology
Crime and Law	Organizations

PROFESSIONAL EMPLOYMENT

Research Associate. (05/17-08/20). Leibniz Institute for the Social Sciences (GESIS). Perform statistical analyses consultations. Conceptualize and write manuscripts and conference presentations. Develop and teach courses on programming in R and machine learning. Supervisor: Stefan Zins.

Research Associate/Systems Analyst. (8/14-5/17). Center for Causal Discovery. Carnegie Mellon University. Developed, improved, and applied causal search algorithms and machine learning methods for extracting biomedical/genomic knowledge from big data and high dimensional data. Identified appropriate statistical techniques and conducted analyses involving the use of a super computer through University of Pittsburgh. Conceptualized and wrote manuscripts. Developed instructional materials and syllabi for use in summer workshops on causal search. Supervisors:

NIH Projects (2014-2017): Clark Glymour and Richard Scheines. DARPA Project (2014-2015): Peter Spirites.

PEER-REVIEWED PUBLICATIONS

Murray-Watters, A. (forthcoming). Participant Protection in the Age of ICE: Risk, Hazard, and Data of Vulnerable Respondents. Chapter to appear in E. Wroten & D. Chancey (Eds.). *Families in Social & Political Upheaval: Lessons from the Israeli - Palestinian Conflict*. Groves Monograph on Marriage and Families Series. University of Michigan Press.

Murray, C.I., Reuter, J.C., & Murray-Watters, A. (forthcoming). Improving Research Methods and Expanding Intersectionality: The Case of Nonreligious Parents in the United States of America. Chapter to appear in E. Wroten & D. Chancey (Eds.). *Families in Social & Political Upheaval: Lessons from the Israeli - Palestinian Conflict*. Groves Monograph on Marriage and Families Series. University of Michigan Press.

Murray, C.I., & Murray-Watters, A. (forthcoming, 2026). Dynamics of Unity and Struggle: Law vs the Lived Experience of Mixed Immigration Status Families. Chapter to appear in K. Doneker & B. Settles (Eds.), *Family Trauma: Exploring Adversity, Resilience and Hope Across the Lifespan*. Groves Monograph on Marriage and Families Series. University of Michigan Press.

Murray-Watters, A., Zins, S., Sakshaug, J. W., & Cornesse, C. (2025). Averaging Non-Probability Online Surveys to Avoid Maximal Estimation Error. *Journal of Official Statistics*, 41(2), 700-724. <https://doi.org/10.1177/0282423X241312775>

Murray-Watters, A., Zins, S., Silber, H., Gummer, T., & Lechner, C. (2023). River Sampling-a Fishing Expedition: A Non-Probability Case Study. *Methods, Data, Analyses: A Journal for Quantitative Methods and Survey Methodology (mda)*, 17(1), 3-27.

Murray-Watters, A. & Glymour, C. (2015). What Is Going on Inside the Arrows? Discovering the Hidden Springs in Causal Models. *Philosophy of Science*, 82 (4): 556-586. [Erratum: 2016. 83 (1): 170]. DOI: 10.1086/682962 and DOI: 10.1086/684247. <http://www.journals.uchicago.edu/doi/abs/10.1086/682962>

UNDER REVIEW AND IN PROGRESS

Murray-Watters, A. Burning the Haystack to Save the Needle: Dimension Reduction and Privacy in Text and Network Data. DOI: 10.31235/osf.io/z35g6. <https://osf.io/preprints/socarxiv/z35g6/>

Murray-Watters, A., & Zins, S. Undue Influence: Identifying “Problematic” Interviewers in Surveys.

Murray-Watters, A. Spotting Matryoshka: Clustering Memetic Image Data using Twitter’s Election Integrity Dataset.

Murray-Watters, A., Lechner, C. M., & Bluemke, M. easyPCA: An R Package for the Bass-ackwards Procedure.

Lechner, C. M., Bluemke, M., Ignácz, Z., & Murray-Watters, A. easyLCA: An R package for a Latent Class Analysis Variant of the Bass-ackwards Procedure.

Murray-Watters, A., Kemmelmeier, M., & Hales, A. Memetic Model of Methodological Multiplication: The Verdict Certainty Index and Its Statistical Fallacy.

STATISTICAL/SOFTWARE DEVELOPMENT AND PROGRAMS

Murray-Watters, A., Lechner, C. M., & Bluemke, M. easyPCA: An R Package for the Bass-ackwards Procedure.

Lechner, C. M., Bluemke, M., Ignácz, Z., & Murray-Watters, A. easyLCA: An R package for a Latent Class Analysis Variant of the Bass-ackwards Procedure.

Murray-Watters, A. SocHive: A Hive Plot Convenience Wrapper for Social Scientists.

Murray-Watters, A. An implementation of the DM causal search algorithm. Available as part of the Tetrad program (in Java) or alternatively in R (version is no longer maintained). 1. Tetrad: <https://github.com/cmu-phil/tetrad> 2. R Wrapper for Tetrad routine: <https://github.com/bd2kccd/r-causal/blob/development/R/dm.R> 3. R (deprecated): <https://github.com/amurrayw/detect.MIMIC>

Murray-Watters, A. A program for enumerating TETRAD constraints in a directed cyclic graph. Available at: https://github.com/amurrayw/tetrad_constraint_enquirer.

Jason Capehart, Seung Su Han, Alexander Murray-Watters, and Elizabeth Silver (authors in alphabetical order). Developed Natural Language Processing (NLP) software used to build first- and second- order Markov models based on text. For use with R. In process of submission to the CRAN (R repository). I implemented the group's extension of this software's application to build simulated text from a Markov model based on the blog of Professor Cosma Shalizi, titled "Pseudo-Three-Toed Sloth." Shalizi posted this slide on his blog (Dec. 7, 2011); titled "My Work Here is Done (Intro to Statistical Computing)." Available with Shalizi comments: <http://bactra.org/weblog/843.html>.

PROFESSIONAL PRESENTATIONS

Murray-Watters, A., Beresford, F., Smith, H., Mackin, S., Butts, C. (submitted) *Cultura Ignota: Large Language Models Perform Alien Cultures*. Annual Meeting of the American Sociological Association. New York City, NY

Murray-Watters, A., Beresford, F., Smith, H., Mackin, S., Butts, C. (submitted) *Darmok and Jalad at Tanagra? Large Language Models Perform Alien Cultures*. Sunbelt 2026: Annual Conference of the International Network for Social Network Analysis. Daytona Beach, FL

Murray-Watters, A., Zins, S., & Sakshaug, J. (October 2025) *Nonprobability Samples and Uncertainty: Avoiding Maximal Estimation Error Via Averaging*. 65 ISI World Statistics Congress. The Hague, Netherlands. (Invited presentation for paper session sponsored by the *Journal of Official Statistics*)

Murray-Watters, A., Wang, C. Hipp, J., Lakon, C., & Butts, C. (August 2025) *Behavioral Responses to Contextual Interventions: Evaluating In-Silico Public Health Interventions*. Annual Meeting of the American Sociological Association. Chicago, IL.

Murray-Watters, A., & Butts, C. (June 2025) *Comparing the Performance of Regularized Maximum Likelihood and Maximum Pseudolikelihood Estimation Methods for ERGMs*. Sunbelt 2025: Annual Conference of the International Network for Social Network Analysis. Paris, France.

Murray, C.I., Reuter, J.C., & Murray-Watters, A. (June 2025). *Improving Research Methods and Data Privacy of Vulnerable Participants: The Case of Nonreligious Parents*. Groves Conference on Marriage and Families. Washington, D.C.

- Murray-Watters, A., & Zins, S. (August 2024). *Interviewer Clusters: Detecting Problematic Interviewers in Survey Data*. Annual Meeting of the American Sociological Association. Montreal, Canada.
- Murray-Watters, A., & Zins, S. (June 2024). *Detecting Problematic Interviewers – Exploring Observation Clustering*. Sunbelt 2024: Annual Conference of the International Network for Social Network Analysis. Edinburgh, Scotland.
- Murray-Watters, A., & Butts, C. (August 2023). *Expansiveness, Dependence and Popularity*. Annual Meeting of the American Sociological Association. Philadelphia, PA.
- Murray-Watters, A., & Butts, C. (June 2023). *Expansiveness, Popularity, and Dependence*. Sunbelt 2023: Annual Conference of the International Network for Social Network Analysis. Portland, OR.
- Murray-Watters, A., & Butts, C. (July 2022). *Degeneracy and Extrapolative Stability in Stochastic Actor Oriented Models: Detection and Avoidance*. Sunbelt 2022: Annual Conference of the International Network for Social Network Analysis. Cairns, Australia.
- Murray-Watters, A., & Butts, C. (January 2021). *Do Stochastic Actor Oriented Models Hide Degeneracy?: A Simulation Study*. North American Social Networks Conference (NASN). Virtual.
- Murray-Watters, A., & Murray, C. (March 2020). *When Anonymization Isn't Enough: Finding Ways to Protect Privacy of Participants and Researchers in an Era of Big Data*. Annual Meeting of the Pacific Sociological Association. Eugene, OR. (Conference cancelled during pandemic).
- Murray-Watters, A., Zins, S., Silber, H., Gummer, T., & Lechner, C. (November 2019). *River Sampling – Still Fishing: A Non-Probability Case Study*. Robert Koch-Institut Panel Workshop. Berlin, Germany.
- Murray-Watters, A., Zins, S., Silber, H., Gummer, T., & Lechner, C. (May 2019). *River Sampling – a Fishing Expedition: A Non-Probability Case Study*. Paper presented at the Annual Conference of the American Association for Public Opinion Research (AAPOR). Toronto, Canada.
- Murray-Watters, A. (March 2019). *When Weighting Goes Wrong: The Implications of M-bias for Analyzing Survey Data*. (Poster) European Causal Inference Meeting. Bremen, Germany.
- Murray-Watters, A., Zins, S., Sakshaug, J. (February 2019). *Are These Things Even Consistent? Examining the Properties of Non-Probability Samples*. SurvConf19: Vierte Konferenz der SurveyStatistiker des deutschsprachigen Raumes. Bamberg, Germany.
- Murray-Watters, A. (October 2018). *Using Dimension Reduction to 'Anonymize' Data*. GESIS Research Day. Cologne, Germany.
- Murray-Watters, A. (September 2018). *Alternative Views of Alternative Views: New Methodologies for Analyzing and Visualizing Big Data*. Studying Opinions and Populations in Online Text Data Workshop. Mannheim, Germany.
- Zins, S., Silber, H., Gummer, T., Lechner, C., & Murray-Watters, A. (June 2018). *Comparing Complex Measurement Instruments across Probabilistic and Non-probabilistic Online Surveys*. Workshop on Probability-Based and Nonprobability Survey Research. Mannheim, Germany.
- Murray-Watters, A. (March 2018). *The Effective Combination and Display of Social Networks and Auxiliary Information*. Tagung des Arbeitskreises für mathematisch-statistische Methoden des statistischen Bundesamts. Wiesbaden, Germany.

Murray-Watters, A., & Murray, C. (April 2017). *Technology, Risks and Protections of Vulnerable Research Participants*. 59th Annual Meeting of the Western Social Science Association. San Francisco, CA.

Murray-Watters, A. (April 2016). *Citizens United and Donation Networks in Nevada: A Graphical Analysis*. Annual Meeting of the Western Social Science Association. Political Science Section. Reno, NV. Replication files available: https://github.com/amurrayw/Nevada_Campaign_Donation_Networks

Murray-Watters, A., & Glymour, C. (November 2014). *Discovering Endogenous Latent Structure*. Biennial Meeting of the Philosophy of Science Association. Chicago, IL.

Murray-Watters, A. (May 2013). *An Algorithm for Discovering MIMIC Models*. Meeting of the Minds (undergraduate research conference). Carnegie Mellon University.

Murray-Watters, A. (submitted & approved; Dec 2011). *US/ISAF Attributed Civilian Casualties and Insurgent Caused Violence*. Submitted for presentation at the annual conference of the Western Economic Association International. San Francisco, CA. July, 2012. (Statistical analysis utilizing the Wikileaks Afghan dataset.) In 2012, I received notice that due to an unusually high number of faculty/graduate submissions they had reversed their original position, and that this year they were not accepting any undergraduate submissions. However, along with their apology they awarded me a 1-year extension of my student membership.

RESEARCH EXPERIENCE

Graduate Student Researcher. (Summer 2022, 2023, 2024, 2025, Spring 2025, Fall 2025 - present; senior RA 2025-present). Networks, Computation, and Social Dynamics Lab. University of California, Irvine. Principal Investigator: Carter Butts. Designed, implemented and interpreted stochastic actor oriented model (SAOM) simulations exploring model degeneracy, as well as simulated intervention studies on teenage smoking behavior. Designed, programmed, and interpreted exponential random graph model (ERGM) simulations on the effects of node-level fixed effects (i.e., sociality effects). Presented research at conferences. Grant funded position.

Research Assistant (unpaid volunteer). (2012 – 2017). Created a MEMETIC model. Developed and ran Monte Carlo simulations (using R) that demonstrate a flaw in a common method in the field of psychology and law. Conceptualize and write manuscripts. Supervisor: Markus Kemmelmeier. Dept. of Sociology and Interdisciplinary Social Psychology Program, University of Nevada, Reno.

Graduate Research Assistant. (Summer 2013). Implemented algorithm from senior thesis in R. Wrote and ran simulations. Supervisor: Clark Glymour. CMU.

Undergraduate Research Assistant. (March 2012 – August 2012). NSF Research Training Grant. Algorithms, Experiments, and Implementation of Recommender Systems. Implemented a Gibbs sampler and fixed faulty code in R. Supervisor: Mike Finegold, Dept of Statistics, CMU.

Volunteer Intern. (June-July 2007). University of Cambridge, England Keith Priestley's seismology lab. Assist with computer/IT issues and use of specialized software. Integrated cultural experience/interaction with university community and British politics.

TEACHING EXPERIENCE

Graduate Teaching Assistant. (Fall 2023, Winter 2024, Fall 2024). *Introduction to Sociology*. On-line (Fall 2023, Fall 2024) or in-person (Winter 2024) courses with discussion/recitation groups. University of California, Irvine. Irvine, USA.

Graduate Teaching Assistant. (Winter 2021, Fall 2021, Winter 2023, Lead GTA: Spring 2024, Winter 2025). *Business Decisions*. University of California, Irvine. Irvine, USA. (Instructor: Carter Butts)

Instructor of Record. Alexander Murray-Watters and Jan-Philipp Kolb. March 2020. *Introduction to Machine Learning using R*. IAB short course. Doctoral level. Nuremberg, Germany.

Instructor of Record. Alexander Murray-Watters and Jan-Philipp Kolb. 2018 and 2019. *Introduction to Data Analysis with R*. GESIS Summer School. Doctoral level. Cologne, Germany.

Instructor of Record. Alexander Murray-Watters and Jan-Philipp Kolb. 2019. *Introduction to Machine Learning using R*. GESIS short course. Doctoral level. Mannheim, Germany.

Graduate Teaching Assistant. (June 8–11, 2015). Center for Causal Discovery Summer Workshop. Carnegie Mellon University. Pittsburgh, USA.

Graduate Teaching Assistant. Fall 2013. Introduction to Philosophy. Carnegie Mellon University. Pittsburgh, USA. Conducted 2 weekly recitation sections for 80-100 graded assignments and developed weekly instructional materials including lecture material for recitation sessions when students had trouble with a concept. Supervisor: Mara Harrell.

HONORS, FELLOWSHIPS, AND AWARDS

Doctoral Fellowship, School of Social Sciences. University of California, Irvine. 2 years (6 quarters) of full support. 2020

Awarded/Selected as Participant. Mathematical Modeling and Simulation Summer School on Statistical Modeling and Data Analysis. 2018. Oberwolfach Research Institute for Mathematics (MFO).

CMU Senior Leadership Award. 2013. Carnegie Mellon University.

Dietrich College Senior Honors Program. 2013. Carnegie Mellon University.

Foreign Affairs Student Essay Contest. 2011. Sponsored by the journal, *Foreign Affairs*, the Council of Foreign Relations, and the Association of Professional Schools of International Affairs. Six awards were given (first place and 5 honorable mentions); I received one of the 5 honorable mentions (from among 280 submissions from across the world). Award announcement available on the journal's website: <https://web.archive.org/web/20130905094353/http://www.foreignaffairs.com/classroom/bulletin-board/erik-mortensen-wins-foreign-affairs-student-essay-contest-1>

Odyssey Program Member, 2009-2011, Carnegie Mellon University: Invited academic research program for students identified as graduate research potential.

Dean's List, with Honors, Humanities & Social Sciences, CMU (Spring 2009, Spring 2011, Fall 2012); with High Honors (Fall 2011)

First Place. Rotary Business Academy. Northern Nevada. Team leader of GNUWeb (website design & marketing competition). Student team: conceptualize, design & market a site for Rotary-identified client. \$1,000 prize.

PROFESSIONAL SERVICE

Reviewer, Conference submissions on use of artificial intelligence (AI). American Psychology-Law Society (AP-LS)

Reviewer, Conference submissions. *BigSurv18*

PROFESSIONAL MEMBERSHIPS

American Sociological Association. Section Memberships: Mathematical Sociology; Methodology; Crime, Law, and Deviance; Sociology of Population

American Statistical Association

Association for Computing Machinery (ACM) – SIGKDD, SIGCAS, SimSig, and SIGEVO

International Statistical Institute

International Network for Social Network Analysis (INSNA)

National Farm Union of Scotland

SKILLS AND INTERESTS

Programming Languages: R, Java, sed/AWK, C, Python (scikit-learn, pandas, PyTorch, etc), Ruby, Common Lisp, JavaScript

Operating Systems: Linux (Debian, Fedora, Arch), UNIX, Windows 3.1/98/2000/XP/Vista/7/10/11, MAC OS X

Software: LaTeX, Sweave, Git, Emacs, GNU make, Eclipse, MiniTab, SPSS, STATA, Photoshop, Apache, Inkscape, LibreOffice, Microsoft Office

Languages: Native speaker of English; Level A1 knowledge of German; Some knowledge of Mandarin Chinese

Activities: Mountaineering, Motorcycling, Recreational Programming, Hacking

Music: Alto saxophone (jazz and classical)

Organizations: Electronic Frontier Foundation (EFF); Foundation for Individual Rights and Expression (FIRE)

International Experience: Attended early primary school at Bun-Sgoil Bhorrodail, Isle of Skye, Scotland. Extensive travel throughout Scotland and England. Lived and worked in Germany for 3 years. Moderate travel in France and Italy.

Citizenship Dual Citizen - USA & Europe (UK/Scotland). Place of Birth: USA

REFERENCES

Current References

PhD Advisor

Carter Butts
Chancellor's Professor
Dept. of Sociology
SSPA 2145
University of California, Irvine
Irvine, CA 92697
Phone: (949)824-8591
buttsc@uci.edu

Doctoral Committee

David Schaefer
Professor
Dept. of Sociology
4253 Social Science Plaza B
University of California, Irvine
Irvine, CA 92697
Phone: (949) 824-6245
drschaef@uci.edu

Supervisor

Stefan Zins, PhD
(Formerly of GESIS)
Researcher
Dept. Statistical Methods (KEM)
IAB
Nuremberg, Germany
Phone: +49 (911) 179 7891
Stefan.Zins@iab.de

Previous References

Masters Research Advisor

Clark Glymour, PhD
Alumni University Professor
Baker Hall 135L
Dept. of Philosophy
Carnegie Mellon University
Phone: 412-268-2933
cg09@andrew.cmu.edu

Masters Research Co-Advisor

Richard Scheines, PhD
Dean
Dietrich College of Humanities and Social Sciences
Baker Hall 154
Carnegie Mellon University
Phone: 412-268-2831
scheines@cmu.edu

Undergraduate Advisor

Cosma Shalizi, PhD
Associate Professor
Dept. of Statistics
Baker Hall 132
Carnegie Mellon University
5000 Forbes Ave.
Pittsburgh, PA 15213-3890
Phone: 412-268-7826
cshalizi@stats.cmu.edu
