

Curriculum Vitae

Personal Information

Name: Mark G. Orr

Affiliation: Social & Decision Analytics Lab
Virginia Bioinformatics Institute
Virginia Tech
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Education & Training

Degree Type	Discipline	Institution	Year
Fellowship	Epidemiology	Columbia University	2011-14
Certificate	Agent-based Modeling	Argonne National Laboratory	2013
Certificate	System Dynamics	Massachusetts Inst. Of Technology	2009
Certificate	Complex Systems	NIH – Inst. on Systems Science And Health	2009
Postdoctoral	Behavioral Neuroscience	Albert Einstein Coll. Medicine	2004-05
Postdoctoral	Computational Psych.	Carnegie Mellon University	2002-04
Ph.D.	Cognitive Psychology	University of Illinois at Chicago	2003
M.A.	Cognitive Psychology	University of Illinois at Chicago	1999
B.A.	Psychology, Cum Laude	West Chester University	1994

Research Experience

2016 - 2019 -- *Forum Fellow*, Global Forum for Urban and Regional Resilience, Virginia Tech
2014 - *present* -- *Associate Research Professor*, Virginia Tech, Virginia Bioinformatics Institute
2011 - 2014 -- *Epidemiology Merit Fellow*, Columbia University, Dept. of Epidemiology
2011 - 2014 -- *Associate Research Scientist*, Columbia University, Dept. of Epidemiology
2008 - 2011 -- *Associate Research Scientist*, Columbia University, Population & Fam. Health
2008 - 2009 -- *Statistical Consultant*, Population Council, New York, NY
2006 - 2010 -- *Statistical Consultant*, Allen Guttmacher Institute, New York, NY
2006 - 2008 -- *Senior Analyst*, Columbia University, Population & Fam. Health
2005 - 2006 -- *Statistical Consultant*, New York State Psychiatric Institute, New York, NY
1997 - 2000 -- *Research Associate*, Annenberg Foundation/Suzuki Music School, Chicago.
1995 - 1996 -- *Research Associate*, Reading Area Community College, Office of Institutional Research

Honors & Awards

Feb, 2016 Global Forum Faculty Fellow (Three year), Virginia Tech
July, 2011 Epidemiology Merit Fellow (Three year), Columbia University, Mailman S. Pub. Hlth.
July, 2002 National Research Service Award (Two-year Institutional), National Institutes of Health
May, 2001 Provost's Award for Dissertation Research, University of Illinois at Chicago
April, 2001 Piorkowski Award in Cognitive Psychology, University of Illinois at Chicago
May, 2000 Junior Investigator Fellowship from the New York Academy of Sciences

Research Interests

Psychology: Health behavior; measurement theory; attitude formation; decision-making; cognitive science; learning; computational modeling; neurophysiology of decision-making

Epidemiology/Community and Population Health: Health disparities in obesity; sexual health; HIV; adolescent sexual-risk; alcohol dependence in military populations; addiction; statistical/methodological advances (agent-based population models/dynamic social networks)

Computational Modeling/Complex Systems: Application of complex systems theory to community and population health behavior; theory of networked cognitive systems

Research Support

Active or In Process

National Science Foundation Orr (PI) 9/1/15 – 8/31/18
Title: *IBSS: Understanding social diffusion dynamics among networked cognitive systems*
Amount: \$950,000
Role: *Principal-Investigator*

Army Research Institute Keller (PI) 9/1/15 – 8/31/18
Title: *Towards an Integrated Data Framework for Understanding the Context of Military Environments*
Amount: \$1,690,000
Role: *Co-Investigator*

Completed

Patient-Centered Outcomes Research Institute Mielenz (PI) 03/1/13 – 05/1/15
Title: *The Person-Centered Wellness Home Across the Life Course*
Amount: \$420,000
Role: *Co-Investigator*

National Science Foundation Gershon (PI) 12/1/12-09/30/14
Title: *Systems-Level Mass Fatality Preparedness*
Amount: \$503,000
Role: *Co-Investigator*

National Institutes of Health Orr (PI) 1/2011-1/2013
Title: *Computational Modeling of Individual-Health Behavior*
Amount: \$330,000
Role: *Principle Investigator*

UKY PHSSR Center (RWJF PHSSR) Merrill (PI) 10/1/11 –09/30/12
Title: *Health Officers Advice Networks*
Amount: \$215,000
Role: *Co-Investigator*

Inst. for Social and Economic Resh. in Policy (Columbia Un.) Orr (PI) 9/11 – 5/12
Title: *Developing Complex Systems Approaches to Population Health*
Amount: \$28,000
Role: *Principal Investigator*

Inst. for Social and Economic Resh. in Policy (Columbia Un.) Orr (PI) 9/09 – 5/10
Title: *Social Dynamics of Sexual Initiation: A Complex Systems Approach*
Amount: \$28,000
Role: *Principal Investigator*

Inst. for Social and Economic Resh. in Policy (Columbia Un.) Orr (PI) 7/08 - 1/09
Title: *Social dynamics of pregnancy and contraceptive risk*
Amount: \$15,000
Role: Principal Investigator

Research Service

NSF – Review Panel Member, March 31st-April 1st, 2016

NIH Ad-hoc Reviewer, July 24th-25th, 2012.
Special Emphasis Panel 2012/10 ZGM1 BBCB-9 (MS)

Army Research Office Reviewer for ARO Core Programs, Oct. 2014.

Publications

Journal Articles/Book Chapters:

Printed or in press:

Orr, M. G., Galea, S. G., Kaplan, G. A. (in press). Neighborhood Food, Physical Activity, and Educational Environments and Black/White Disparities in Obesity: A Complex Systems Simulation Analysis. *Journal of Epidemiology and Community Health*.

Orr, M. G. (Forthcoming Spring 2016). Systems of behavior and human health. In Galea, S. & El-Sayed, A. (Eds.), *Systems Science and Population Health*. Oxford University Press: Oxford, UK.

Orr, M. G., Chen, D. (Forthcoming Spring 2016). Computational models of health behavior. In Vallacher, R., Nowak, A., & Read, S. (Eds.), *Computational Models in Social Psychology*. Psychology Press/Routledge: New York.

Orr, M. G., Galea, S., Kaplan, G. K. (Forthcoming Winter 2016). Understanding macrosocial policy using complex systems methods: A case study in population health. *Policy*

approaches to In Kaplan, G. K., (Eds), Growing Inequality: Bridging Complex Systems, Population Health, and Health Disparities. Westphalia Press: Washington, DC.

Merrill J. A., **Orr M. G.**, Chen D. Y., Zhi Q., Gershon, R. R. (2016). Are we ready for mass fatality incidents? Preparedness of the US mass fatality infrastructure. Disaster Medicine & Public Health Preparedness, 10,(1):87-97.

Orr, M. G., Ziemer, K., Lewis, B., Keller, S. (2015). Mathematical and Computational Simulation of Behavioral and Social Drivers of Population Health. In Spittle, M. & Kaplan, R. (Eds.), Emerging behavioral and social science perspectives on population health: AHRQ Press

Minguez, M., Santelli, J., Gibson, E., **Orr, M. G.**, Shamat, S. (2015). Reproductive health impact of a school health center. Journal of Adolescent Health, 56, 338-344.

Gershon R. R., **Orr M. G.**, Zhi Q., Merrill J. A., Chen D. Y., Riley H. E., Sherman M. F. (2014). Mass fatality preparedness among medical examiners/coroners in the United States: a cross-sectional study. BMC Public Health. 14(1):1275. [Epub ahead of print]

Orr, M. G., Galea, S., Riddle, M., Kaplan, G. A. (2014). Reducing Racial Disparities in Obesity: Simulating the Effects of Improved Education and Social Network Influence on Diet Behavior. Annals of Epidemiology, 24, 563-69.

Orr, M. G., Prescott, M. R., Cohen, G. H., Calabrese, J. R., Tamburrino, M. B., Liberzon, I., Galea, S. (2014). Potentially modifiable deployment characteristics and new-onset alcohol abuse or dependence in the US National Guard. Drug and Alcohol Dependence, 142, 325-332

Orr. M. G., & Plaut, D. C. (2014). Complex systems and health behavior change: Insights from cognitive science. American Journal of Health Behavior, 38(3), 404-413.

Orr, M. G., & Merrill, J. A. (2013). Diffusion of innovation across a national local health department network: A simulation approach to policy development using agent-based modeling, Frontiers in Public Health Services and Systems Research, 2(5), Article #3: <http://uknowledge.uky.edu/frontiersinphssr/vol2/iss5/3>

Orr, M. G., Thrush, R., & Plaut, D. C. (2013). The Theory of Reasoned Action as parallel constraint satisfaction: Towards a dynamic computational model of health behavior. PLOS: One. 8(5): e62490. doi:10.1371/journal.pone.0062490

Santelli, J., Edelstein, Z., Mathur, S., Wei, Y., Zhang, W., **Orr, M. G.**, Higgins, J., Nalugoda, F., Gray, R., Wawer, M., Serwadda, D., (2013) Behavioral, biological, and demographic risk and protective factors for new HIV infections among youth in Rakai, Uganda. Journal of Acquired Immune Deficiency Syndromes, 63(3), 393-400

- Merrill, J.A., **Orr, M.G.**, Jeon, C.Y., Wilson, R. V., Storrick, J., Carley, K.M. (2012). Topology of local health officials' advice networks: Mind the gaps. Journal of Public Health Management and Practice. 18(6): 602-608
- Merrill, J. A., Carley, K. M., **Orr, M. G.**, Jeon, C. Y., Storrick, J. (2012). Patterns of interaction among local public health officials and the adoption of recommended practices. Frontiers in Public Health Services and Systems Research, 1(1), Article 6.
- Stanekzai, M.R., Todd, C. S., **Orr, M. G.**, Bayan, S., Rasuli, M. Z., Wardak, S. R., Strathdee, S. A. (2012). Baseline assessment of community knowledge and attitudes towards drug use and harm reduction in Kabul, Afghanistan, Drug and Alcohol Review, 31(4), 451-60
- Orr, M. G.** & Evans, C. (2011). Understanding long-term diffusion dynamics in the prevalence of adolescent sexual initiation: A first investigation using agent-based modeling. Research In Human Development. 8(1), 48-66.
- Lindberg, L. & **Orr, M. G.** (2010). Neighborhood-level influences on young men's sexual and reproductive health behaviors. American Journal of Public Health, 101(2), 271-274.
- Waddell, E., **Orr, M.G.**, Sackoff, J.S., Santelli, J.S. (2010). Pregnancy risk among black, white, and Hispanic teen girls in New York City public schools. Journal of Urban Health, 87(3), 426-439.
- Santelli, J.A., **Orr, M.G.**, and Lindberg, L., Diaz, D.C. (2009). Changing Behavioral Risk for Pregnancy among High School Students in the United States, 1991-2007, Journal of Adolescent Health, 45(1), 25-32.
- Santelli, J.A., Sandfort, T.G., **Orr, M. G.** (2009). U.S./European differences in condom use. Letters to the editor. Journal of Adolescent Health, 44(3), 306
- Santelli, J. A., Lindberg, L., **Orr, M. G.**, Finer, L. B. , Speizer, I., (2009). Exploring key dimensions of pregnancy intentions. Studies in Family Planning, 40(2), 87-100
- Santelli, J.A, Carter, M., **Orr, M. G.**, Dittus, P. (2009). Trends in sexual risk behaviors, by non-sexual risk behavior involvement, U.S. high school students, 1991-2007. Journal of Adolescent Health, 44(4), 372-379.
- Santelli, J. A., Sandfort, T, **Orr, M. G.** (2008). Transnational comparisons of adolescent contraceptive use: What can we learn from these? Archives of Pediatrics & Adolescent Medicine, 2008 Jan;162(1):92-94.
- Sandfort, T, **Orr, M. G.**, Santelli, J.A., Hirsh, J.H. (2008). Long-term health consequences of timing of sexual initiation: Results from a national U.S. study, American Journal of Public Health, Jan;98(1):155-61.

- Sussman, E., Horváth, J., Winkler, I. and **Orr, M. G.** (2007). The role of attention in the formation of auditory streams. Perception & Psychophysics, 69, (1), 136-152.
- Orr, M. G.** & Ohlsson, S. (2005). Relationship between complexity and liking as a function of expertise. Music Perception, 22, (4), 583-610.
- Orr, M. G.** & Ohlsson, S. (2001). The relationship between musical complexity and liking in jazz and bluegrass. Psychology of Music, 29, (2), 108-127.
- Renner, M. J., Feiner, A. J., **Orr, M. G.**, & Delaney, B. A. (2000). Environmental enrichment for new world primates: Introducing food-irrelevant objects and *direct and secondary effects. Journal of Applied Animal Welfare Science, 3, (1), 23-32.
- Orr, M. G.** & Ohlsson, S. (1999). Effects of music expertise on evaluative judgments. In M. Hahn and S. C. Stoness (Eds.), Proceedings of the 21st Annual Conference of the Cognitive Science Society (p. 809). Mahwah, New Jersey: Lawrence Erlbaum Associates, Inc.
- Matzelle, R., Rosenberg, B. & **Orr, M. G.** (1996). A study of the term and semester calendars in a two year community college. Reading, PA: Reading Area Community College. (ERIC Document Reproduction Service No. ED 389355)

Manuscripts Under Review:

- Schaefer Ziemer, K., Pires, B., Lancaster, V., Keller, S., **Orr, M.**, & Shipp, S. (under review). Explaining High School Dropout: Geographic Disparities in Kentucky. Manuscript submitted for publication in *Youth & Society*.
- Schaefer Ziemer, K., Keller, S., Angelotti, K., Norman, B., **Orr, M.**, Pires, B., & Shipp, S. (under review). Assessing alternative sources of data for education research. Manuscript submitted for publication in *Education Next*.

Presentations (* denotes invited presentation)

- *Gershon, R. M., Merrill, J., **Orr, M. G.**, Zhi, Q., Sherman, M. (2014, April). Mass Fatalities and the Death Care Sector. Invited keynote for the British Columbia Funeral Association. Vancouver, BC, Canada.
- ***Orr, M. G.** (2013, July). Modeling Health Behavior Dynamics: Individuals, Populations, Place and the In-Between. Invited speaker for the 4th Annual Workshop on Dynamic Modeling for Health Policy: Cross-leveraging Dynamic Modeling and Digital Epidemiology. University of Saskatchewan, Saskatoon, CA.

- *Orr, M. G.** (2013, April). Social Networks and Population Health. Invited speaker for the Advanced Seminar on Modeling for Public Health and Clinical Research, Columbia University Mailman School of Public Health, New York, NY.
- *Orr, M. G.** (2013, Feb.) Modeling Health Behavior Policy: Motivation, An Example & The Future. Invited speaker to the Complex Systems Approaches to Health student group at the Columbia University Mailman School of Public Health, New York, NY.
- Galea, S., **Orr, M.G.**, Osgood, N., Mintz, R., Riddle, M., Kaplan, G.A. (Dec. 2012). Competing policy priorities in a resource constrained world: Identifying the most effective policy interventions to reduce black/white disparities in obesity. Presentation at the Science of eliminating health disparities: Building a healthier society, National Harbor, MD.
- *Orr, M. G. (2012, June).** Nearly decomposable systems, causal inference, and validation: Using computational models of people and populations in epidemiology. Invited panel speaker for a symposium on “The use of a complex systems approach in epidemiological research: If and when it’s worth it.” At the Annual Meeting of the Society for Epidemiological Research, Minneapolis, Minnesota.
- *Orr, M. G.** (2012, May). Agent Simulations in Health Behavior. Invited panel speaker for a symposium on “Systems perspectives in health” sponsored by the Complex Systems Approaches to Health student group at the Columbia University Mailman School of Public Health, New York, NY.
- *Orr, M. G.** (2012, April). Understanding obesity: A complex systems/ecological approach. Invited speaker for “Public Health Week” at the Montclair State University, Montclair, NJ.
- *Orr, M. G. & Kosenko, A.** (2012, February). Understanding obesity: A complex systems/ecological approach. Invited lecture to the Quantitative Methods in Social Sciences seminar at the Institute for Social and Economic Research in Policy, Columbia University, New York, NY.
- *Orr, M. G.** (2012, February). (Reverse)Engineering health behavior. Invited workshop lecture for synergy between engineering and public health, Columbia University School of Engineering, New York, NY.
- *Orr, M. G.** (2012, January). The social dynamics of health behavior: A neural network account of the theory of reasoned action. Invited pre-conference Workshop Lecture for the Annual Meeting of the Society for Personality and Social Psychology, San Diego, CA.
- Orr, M. G.** (2009, October). Long-term dynamics of social norms. Annual meeting of the Society for the Study of Human Development, Ann Arbor, MI
- *Santelli, J.S., Lindberg, L., Orr, M.G., Jones, R., Speizer, I., Finer, L.B.** (2008, March). Exploring key dimensions of pregnancy intentions among youth. Annual Meeting of the Society for Adolescent Medicine (SAM), Greensboro, NC.

- Santelli, J.S., **Orr, M.G.**, Lin, A.J. (2007, Nov.). Trends in sexual behaviors and contraceptive use in US high school students: 1991-2005: Are positive trends faltering? American Public Health Ass. Meeting, Wash. D.C.
- Santelli, J.S., Carter, M., Dittus, P, **Orr, M.G.** (2007, Nov). Co-variation in sexual and nonsexual risk behaviors over time among U.S. high school students 1991-2005. American Public Health Ass. Meeting, Wash. D.C.
- Santelli, J.S., Lindberg, L., **Orr, M.G.**, Jones, R., Speizer, I.S., Finer, L.B. (2007, Nov.). Exploring key dimensions of pregnancy intentions. American Public Health Ass. Meeting, Wash. D.C.
- Orr, M. G.** (2000, August). Incidental learning and skilled memory theory. Poster accepted for presentation at International Conference for Music Perception and Cognition, Keele, UK.
- Orr, M. G.** (2000, May). Perceived complexity of music: chunking vs. perceptual learning. Poster presentation at the Biological Foundations of Music Conference (A New York Academy of Sciences Conference), New York, New York.
- Orr, M. G.** (2000, April). Perceived complexity of music: chunking vs. perceptual learning. Paper accepted for presentation at the Midwestern Psychological Association's Annual Conference, Chicago, IL.
- Orr, M. G.**, Ohlsson, S, & Miller, L. K. (1999, August). The inverted-U theory: Does it explain expert behavior? Paper presented at the Society for Music Perception and Cognition's Conference 1999, Evanston, IL.
- Orr, M. G.** & Ohlsson, S. (1999, June). Recognition memory for melodies: Implicit learning, expertise, and musical structure. Poster presented at the annual meeting of the American Psychological Society, Denver, CO.
- Orr, M. G.**, Ohlsson, S., & Miller, L. K. (1999, April). The interaction between expertise, complexity and liking in music. Paper presented at the Midwestern Psychological Association's Annual Conference, Chicago, IL.
- Orr, M. G.** & Ohlsson, S. (1999, March). Recognition memory for melodies: Implicit learning, expertise, and musical structure. Paper presented at the Sigma Xi Graduate Student Research Forum, University of Illinois at Chicago, Chicago, IL.
- Orr, M. G.** & Miller, L. K. (1997, August). Aesthetic response to music: Genre and training effects. Paper presented at the Society for Music Perception and Cognition Annual Conference 1997, Cambridge, MA.

Renner, M. J., Feiner, A. J., Delaney, B. A., & Orr, M. G., (1994, June). Monkeys in toyland: Human infant toys as environmental enrichment for zoo primates. Poster session presented at the annual meeting of the American Psychological Society, Washington, DC.

Renner, M. J., Feiner, A. J., Delaney, B. A., & Orr, M. G., (1994, June). Monkeys in toyland: Human infant toys as environmental enrichment for zoo primates. Poster session presented at the annual meeting of the Animal Behavior Society, Seattle, WA.

Teaching Experience

Mentorship

Subject (<i>Undergraduate (U), Graduate (G), Postdoctoral (P)</i>)	Institution	Date
Experimental Psychology (U)	University of Illinois at Chicago	1998-2002
Computational Modeling of Social Processes (G) (<i>Advisor to Nathan Lane</i>)	Columbia University	Fall-Sp 2009-10
Practicum in Computational Modeling of Social Process (G) (<i>Advisor to Clare Evans</i>)	Columbia University	Summer 2010
Computational Modeling of Social Processes (G) (<i>Primary Thesis Advisor to Clare Evans</i>)	Columbia University	Fall-Sp 2010-11
Computational Modeling of Social Processes (G) (<i>Advisor to Andrew Kosenko</i>)	Columbia University	Fall-Sp 2011-12
Computational Modeling of Health Behavior (P) (<i>Advisor to Roxanne Thrush</i>)	Columbia University	Sp 2011-Sp 2013
Computational Modeling of Social Processes (G) (<i>Primary Thesis Advisor to Daniel Chen</i>)	Columbia University	Fall-Sp 2013-14
Computational Modeling of Social Processes (G) (<i>Primary Thesis Advisor to Janet Hui</i>)	Columbia University	Fall-Sp 2013-14
Practicum in Computational Modeling of Social Processes (G) (<i>Advisor to Elizabeth Luppa</i>)	Columbia University	Fall-Sp 2013-14
Data Science and Psychology (P) (<i>Advisor to Kathryn Ziemer</i>)	Virginia Tech	Fall 2014 – pres.
Computational Modeling of Social Processes (G) (<i>Doctoral Candidate Advisor to Daniel Chen</i>)	Virginia Tech	Sp 2015 – pres.

Course Instructor

Subject (<i>Undergraduate (U) or Graduate (G)</i>)	Institution	Date
Statistics in the Behavioral Sciences (U)	University of Illinois at Chicago	Spring 2000
Quantitative Methods Tutorial (workshop) (G)	Columbia University	Spring 2007-08
Advanced Stat Methods Using Stata (workshop) (G)	Guttmacher Institute	Winter 2007

Complex Systems Approach to Health Behavior (workshop) (G)	Columbia University	Spring 2010
Health and Human Sexuality (U)	Penn State-Berks	Fall 2010
Introduction to Cognitive Psychology (U)	Penn State-Berks	Spring 2011
Introduction to Agent-Based Modeling for Social and Political Process (G)	Virginia Tech	Spring 2016

Teaching Interests

Psychology: Health Psychology, Measurement and Evaluation in Health, Sexuality, Cognition/Cognitive Science, Computational Modeling of Psychological Processes, Research Methods, Statistics, Advanced Statistics, Computer Methods in Psychology, Computer Programming for Psychologists

Epidemiology/Public Health/Policy: Health Behavior and Education, Health Behavior, Computational Modeling of Social Processes, Introduction to Epidemiological Methods and Biostatistics, Social Network Analysis, Agent-Based Modeling + Policy Analysis

Curriculum Development

*Development of Simulations for Public Health Education, Columbia University
2-1-12 to present*

University Service

Committees:

*Committee on Development of Simulations for Public Health Education, Columbia University
Chairs, Sandro Galea & Melissa Begg
2-1-12 to 5-1-14*

*NIH/CDC Institute for Systems Science and Health 2010, Columbia University
Chair, Patricia Mabry (NIH-OBSSR)
10-1-10 to 7-1-10*

*Future of Public Health Working Group, Columbia University
Chair, Linda Fried
9-1-09 to 9-1-11*

*Implementation and Systems Science in Population and Family Health, Columbia University
Chair, Joanne Csete
8-1-09 to 6-1-10*

Peer-Review Service

Review Board
American Journal of Health Behavior (current)

Ad Hoc

American Journal of Public Health
Journal of Adolescent Health
Studies in Family Planning
American Journal of Preventive Medicine
Psychological Science
Obesity
Futures

Society Membership

Cognitive Science Society
Society for Personality and Social Psychology
Society for Epidemiological Research