

PAUL E. SMALDINO

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Research Interests: Social and cultural evolution, cooperation, communication, learning and development, collective behavior, game theory, networks, mathematical and computational modeling, philosophy of science

PROFESSIONAL EXPERIENCE

- 2016- Assistant Professor, Cognitive and Information Sciences, University of California, Merced
- 2016- Faculty Member, Quantitative and Systems Biology graduate group, UC Merced
- 2015-2016 Lecturer, Department of Psychology, University of California, Davis
- 2015-2016 Postdoctoral Scholar, Departments of Political Science and Computer Science, University of California, Davis
- 2014-2015 Postdoctoral Scholar, Department of Anthropology, University of California, Davis
- 2011-2014 Postdoctoral Fellow, Center for Advanced Modeling in the Social, Behavioral, and Health Sciences, Johns Hopkins University
- 2005-2007 Research Associate, Departments of Psychology and Neural Science, New York University

EDUCATION

- 2011 Ph.D., Psychobiology. University of California, Davis
- 2007 M.A., Psychology. New School for Social Research, New York, NY
- 2002 B.A., Physics. Wesleyan University, Middletown, CT

ADVANCED TRAINING

- 2012 Summer Institute on Bounded Rationality. Max Planck Institute for Human Development, Berlin
- 2010 Modeling Dynamical Systems Workshop. University of California, Davis, CA
- 2008 Graduate Workshop in Computational Social Science Modeling. Santa Fe Institute, Santa Fe, NM

PUBLICATIONS (PDFs at <http://smaldino.com/wp/publications>)

SCHOLARLY PUBLICATIONS

Smaldino PE (in press) The evolution of the social self: Multidimensionality of social identity solves the coordination problems of a society. In AC Love & WC Wimsatt (Eds.), *Beyond the meme: Development and structure in cultural evolution*. University of Minnesota Press.

Turner MA, **Smaldino PE** (in press) Paths to polarization: How extreme views, miscommunication, and random chance drive opinion dynamics. *Complexity*.

Contreras Kallens P, Dale R, **Smaldino PE** (in press) Cultural evolution of categorization. *Cognitive Systems Research*.

Smaldino PE, Aplin LM, Farine DR (2018) Sigmoidal acquisition curves are good indicators of conformist transmission. *Scientific Reports* 8:14015.

Smaldino PE (2018) Modeling the evolution of strategies for learning and decision making. *Evolutionary Behavioral Sciences* 12: 173–176.

- Smaldino PE**, Flamson TJ, McElreath R (2018) The evolution of covert signaling. *Scientific Reports* 8: 4905.
- Smaldino PE** (2018) Social identity and cooperation in cultural evolution. *Behavioural Processes*.
- Smaldino PE**, D'Souza R, Maoz Z (2018) Resilience by structural entrenchment: Dynamics of single-layer and multiplex networks following sudden changes to tie costs. *Network Science* 6: 157–175.
- Marriott C, Borg JM, Andras P, **Smaldino PE** (2018) Social learning and cultural evolution in artificial life. *Artificial Life* 24: 5–9.
- Smaldino PE**, Janssen MA, Hillis V, Bednar J (2017) Adoption as a social marker: Innovation diffusion with outgroup aversion. *Journal of Mathematical Sociology* 41: 26–45.
- Waring TM, Goff SH, **Smaldino PE** (2017) The coevolution of economic institutions and sustainable consumption via cultural group selection. *Ecological Economics* 131: 524–532.
- Smaldino PE** (2017) Models are stupid, and we need more of them. In R Vallacher, SJ Read, & A Nowak (Eds.), *Computational social psychology* (pp. 311–331). New York: Psychology Press.
- Smaldino PE**, McElreath R (2016) The natural selection of bad science. *Royal Society Open Science* 3: 160384.
- Makowsky MD, **Smaldino PE** (2016) The evolution of power and the divergence of cooperative norms. *Journal of Economic Behavior & Organization* 126: 75–88.
- Richerson PJ, Baldini R, Bell A, Demps K, Frost K, Hillis V, Mathew S, Newton EK, Naar N, Newson L, Ross C, **Smaldino PE**, Waring TM, Zefferman MR (2016) Cultural group selection plays an essential role in explaining human cooperation: A sketch of the evidence [target article]. *Behavioral and Brain Sciences* 39: e30.
- Smaldino PE** (2016) Not even wrong: Imprecision perpetuates the illusion of understanding at the cost of actual understanding [commentary on RF Baumeister et al]. *Behavioral and Brain Sciences* 39: e137.
- Smaldino PE** (2016) It's all connected, man. A review of César Hidalgo's *Why Information Grows: The Evolution of Order, from Atoms to Economies*. *Cliodynamics* 7: 175–180.
- Smaldino PE**, Calanchini J, Pickett CL (2015) Theory development with agent-based models. *Organizational Psychology Review* 5(4): 300–317.
- McElreath R, **Smaldino PE** (2015) Replication, communication, and the population dynamics of scientific discovery. *PLOS ONE* 10(8): e0136088.
- Schank JC, **Smaldino PE**, Miller ML (2015) Evolution of fairness in the dictator game by multilevel selection. *Journal of Theoretical Biology* 382: 64–73.
- Waring TM, Kline MA, Brooks JS, Goff SH, Gowdy JM, Janssen MA, **Smaldino PE**, Jacquet J (2015) A multi-level evolutionary framework for sustainability analysis. *Ecology and Society* 20(2): 34.
- Smaldino PE**, Epstein JM (2015) Social conformity despite individual preferences for distinctiveness. *Royal Society Open Science* 2: 140437.
- Klein EY, Chelen J, Makowsky MD, **Smaldino PE** (2015) The need for more integrated epidemic modeling, with emphasis on antibiotic resistance. In R Melnik (Ed.), *Mathematical and computational modeling: With applications in the natural and social sciences, engineering, and the arts* (pp. 121–134). New York: Wiley.

- Smaldino PE**, Newton EK (2015) Teaching as an exaptation [commentary on MA Kline]. *Behavioral and Brain Sciences* 38: e66.
- Smaldino PE** (2014) The cultural evolution of emergent group-level traits [target article]. *Behavioral and Brain Sciences* 37(3): 243–295.
- Smaldino PE**, Lubell M (2014) Institutions and cooperation in an ecology of games. *Artificial Life* 20: 207–221.
- Smaldino PE**, Newson L (2014) Parent-offspring conflict in mate choice: A commentary on the study by van den Berg, Fawcett, Buunk, and Weissing. *Evolution and Human Behavior* 35: 155–157.
- Smaldino PE**, Waring TM (2014) Let the social sciences evolve [commentary on DS Wilson et al]. *Behavioral and Brain Sciences* 37(4): 437.
- Smaldino PE**, Newson L, Schank JC, Richerson PJ (2013) Simulating the evolution of the human family: Cooperative breeding increases in harsh environments. *PLOS ONE* 8(11): e80753.
- Smaldino PE** (2013) Cooperation in harsh environments and the emergence of spatial patterns. *Chaos, Solitons & Fractals* 56: 6–12.
- Smaldino PE**, Schank JC, McElreath R (2013) Increased costs of cooperation help cooperators in the long run. *The American Naturalist* 181: 451–463.
- Smaldino, PE** (2013) Measures of individual uncertainty for ecological models: Variance and entropy. *Ecological Modelling* 254: 50–53.
- Smaldino PE**, Richerson PJ (2013) Human cumulative cultural evolution as a form of distributed computation. In P Michelucci (Ed.), *Handbook of human computation* (pp. 979–992). New York: Springer.
- Smaldino PE** (2013) Book review of ‘Complex human dynamics: From minds to societies,’ edited by A Nowak, K Winkowska-Nowak, D Brée. *Journal of Artificial Societies and Social Simulation* 16(14).
- Smaldino PE**, Pickett CL, Sherman JW, Schank JC (2012) An agent-based model of social identity dynamics. *Journal of Artificial Societies and Social Simulation* 15(4): 7.
- Smaldino PE**, Schank JC (2012) Movement patterns, social dynamics, and the evolution of cooperation. *Theoretical Population Biology* 82: 48–58.
- Smaldino PE**, Richerson PJ (2012) The origins of options. *Frontiers in Neuroscience* 6: 50.
- Smaldino PE**, Schank JC (2012) Human mate choice is a complex system. *Complexity* 17(5): 11–22.
- Smaldino PE**, Schank JC (2012) Invariants of human emotion [commentary on KA Lindquist et al]. *Behavioral and Brain Sciences* 35: 164.
- Smaldino PE**, Lubell M (2011) An institutional mechanism for assortment in an ecology of games. *PLOS ONE* 6(8): e23019.
- Pickett CL, **Smaldino PE**, Sherman JW, Schank JC (2011) Agent-based modeling as a tool for studying social identity processes: The case of optimal distinctiveness theory. In RM Kramer, GJ Leonardelli, & RW Livingston (Eds.), *Social cognition, social identity, and intergroup relations: A festschrift in honor of Marilyn Brewer* (pp. 127–143). New York: Psychology Press.
- Blümel R, **Smaldino PE** (1999) Induction accelerator for crystalline beams. *Physics Letters A* 260: 495–501.

WORKS IN PROGRESS

Hilbert M, Barnett G, Blumenstock J, Contractor N, Diesner J, Frey S, González-Bailón S, Lamberson PJ, Pan J, Peng TQ, Shen C, **Smaldino PE**, van Atteveldt W, Waldherr A, Zhan J, Zhu JH. Computational communication science: A methodological catalyzer for a maturing discipline. Under review at *Communication Research*.

Smaldino PE, Palagi E, Burghardt GM, Pellis SM. The evolution of two types of play. Under review at *The American Naturalist*.

Schank JC, Miller ML, **Smaldino PE**. The evolution of fair offers with low rejection thresholds in the Ultimatum Game. *Working paper*. [bioRxiv: 162313]

Smaldino PE, Lukaszewski A, von Rueden C, Gurven M. Niche diversity can explain cross-cultural differences in personality structure. *In prep*.

Smaldino PE, Turner MA, Contreras Kallens PA. How does funding allocation affect reproducibility? *In prep*.

Tiokhin L, Lakens D, **Smaldino PE**. What do mathematical models teach us about how to improve science? *In prep*.

Atkisson C, **Smaldino PE**. How the structure of multiplex networks influences patterns of cooperation. *In prep*.

Yarkoni T, Eckles D, Heathers J, Lane J, Levenstein M, **Smaldino PE**, White JM. Enhancing and accelerating social science via automation: Opportunities and challenges. *In prep*.

POPULAR PRESS ARTICLES

Smaldino PE (2016) Why isn't science better? Look at career incentives. *The Conversation*.

SELECTED MEDIA COVERAGE

Nature: The mathematics of science's broken reward system (November 16, 2016)

The Economist: Why bad science persists (September 24, 2016)

Pacific Standard: Where does bad science come from (September 23, 2016)

The Atlantic: The inevitable evolution of bad science (September 21, 2016)

Times Higher Education: 'Bad science' spreads through natural selection (September 21, 2016)

BBC World Service: Why bad science is rewarded (September 21, 2016)

The Guardian: Cut-throat academia leads to 'natural selection of bad science' (September 20, 2016)

Vox: The 7 biggest problems facing science (September 7, 2016)

New Scientist: Evolutionary forces are causing a boom in bad science (July 8, 2016)

AndrewGelman.com: "The natural selection of bad science" (June 1, 2016)

Daily Mail: Why all hipsters look the same (March 10, 2015)

Pacific Standard: Can rebellion breed conformity (March 6, 2015)

Discover: Math explains why hipsters all look the same (March 4, 2015)

International Business Times: Math helps explain why we all look the same (March 5, 2016)

RESEARCH GRANTS

2017–2018 'Models of Selection in Scientific Ecosystems.' DARPA. PI; \$115,302.

2017–2020 'RR: Collaborative Research: Tracking Scientific Progress in Social Psychology.' NSF. Collaborator (PI: Alexa Tullett, University of Alabama); \$324,458.

INVITED WORKSHOP AND WORKING GROUP PARTICIPATION

Technical Exchange on Complex Social Systems. Center for Open Science (August 2018)
Understanding the Mechanisms and Evolution of Play. Konrad Lorenz Institute (July 2018)
Integrating Different Perspectives on Social Learning. Santa Fe Institute (April 2018)
Re-Computing the Social Sciences. University of California, Davis (May 2017)
Beyond the Meme: Articulating Dynamic Structures in Cultural Evolution. Univ of Minnesota (October 2014)
Human Computation Roadmap Summit. Woodrow Wilson Center, Washington, DC (June 2014)
Evolution of Sustainability Working Group. National Institute for Mathematical and Biological Synthesis (NIMBioS), University of Tennessee (March 2014, November 2014)
Evolutionary Approaches to Sustainability and Social-Ecological Systems: A Catalyst Workshop. University of Maine, Schoodic Education and Research Center (May 2013)
Simulating Cultural Evolution Retreat. University of Maine (February 2013)
Epistemology Think Tank: New Measures for Models. MIDAS Center, University of Pittsburgh (May 2011)

PRESENTATIONS

INVITED TALKS

School of Human Evolution and Social Change, Arizona State University, November 2018
Department of Anthropology, University of Missouri, September 2018
Max Planck Institute for Evolutionary Anthropology, Leipzig, Germany, August 2018
Department of Earth System Science, Stanford University, January 2018
Te Pūnaha Matatini, Auckland, New Zealand, December 2016
Department of Biochemistry, Otago University, Dunedin, New Zealand, December 2016
Faculty of Medical and Health Sciences, University of Auckland, New Zealand, December 2016
Institute of Natural and Mathematical Sciences, Massey University, Auckland, New Zealand, December 2016
Social Dynamics and Complexity Group, University of California, Irvine, November 2016
Max Planck Institute for Evolutionary Anthropology, Leipzig, Germany, October 2016
Institute for Advanced Study, Toulouse, France, May 2016
Center for Behavior, Evolution, and Culture, UCLA, February 2016
Department of Psychology, UC Davis, December 2015
Department of Communication, UC Davis, May 2015
Berkeley Institute for Data Science, UC Berkeley, April 2015.
Santa Fe Institute, December 2013
Center for the Study of Complex Systems, University of Michigan, November 2013
National Socio-Environmental Synthesis Center (SESYNC), University of Maryland, October 2013
School of Human Evolution and Social Change, Arizona State University, February 2013
Computational Biology Group, National Institutes of Health, December 2012
Department of Emergency Medicine, Johns Hopkins University, April 2011
Department of Physics, University of California, Davis, November 2010
Department of Environmental Science and Policy, University of California, Davis, April 2010

CONFERENCE TALKS

American Anthropological Association Meeting. San Jose, CA. November 2018.
Cultural Evolution Society Meeting. Tempe, AZ. October 2018.
California Workshop on Evolutionary Social Science. Santa Barbara, CA. May 2018.
Cultural Evolution Society Meeting. Jena, Germany. September 2017.
Human Behavior and Evolution Society Meeting. Boise, ID. May 2017.
The Science of Evolution and the Evolution of the Sciences. Institute of Philosophy, KU Leuven, Belgium. October 2016.
Conference on Complex Systems (**starred talk). Tempe, AZ. October 2015.

Cultural Evolution of Technology (CCS satellite workshop). Tempe, AZ. October 2015.
 Society for Experimental Social Psychology Conference. Denver, CO. September 2015.
 International Society for the History, Philosophy, and Social Science of Biology Meeting. Montreal, Canada. July 2015.
 Human Behavior and Evolution Society Meeting. Columbia, MO. May 2015.
 Society for Personality and Social Psychology Meeting, Pre-conference on Dynamical Systems and Computational Modeling. Long Beach, CA. February 2015.
 Society for Personality and Social Psychology Meeting, Pre-conference on Dynamical Systems and Computational Modeling. Austin, TX. February 2014.
 European Human Behaviour and Evolution Association Conference. Amsterdam, Netherlands. March 2013.
 Society for Personality and Social Psychology Meeting, Pre-conference on Dynamical Systems and Computational Modeling. New Orleans, LA. January 2013.
 International Conference for Complex Systems. Boston, MA. June 2011.
 European Human Behaviour and Evolution Association Conference. Geißen, Germany. March 2011.
 Midwest Political Science Association Conference. Chicago, IL. March 2011.
 Regional Graduate Student Conference on Animal Behavior, Davis, CA. February 2009.

POSTERS

Smaldino PE (2013, July) *The cultural evolution of emergent group-level traits*. Human Behavior and Evolution Society Conference. Miami Beach, FL.
 Smaldino PE (2012, July) *Simple heuristics for models of complex social behavior*. Summer Institute on Bounded Rationality, Max Planck Institute for Human Development. Berlin, Germany.
 Smaldino PE, Schank JC, McElreath R (2012, April) *Increased costs of cooperation help cooperators in the long run*. Consilience Conference. St. Louis, MO.
 Smaldino PE, Lubell MN (2011, April) *An institutional mechanism for assortment in an ecology of games*. UC Davis Psychology Department Annual Conference. ***Winner, Best Student Poster***
 Smaldino PE, Lubell MN (2010, December) *Gatekeeping promotes cooperation in an ecology of games*. Workshop on Computational Social Science and the Wisdom of Crowds, Neural Information Processing Systems Conference. Whistler, Canada.

TEACHING AND MENTORING

Postdoctoral Supervision

Thomas Flamson 2016–2017

Graduate Student Advising

Karie Moorman (committee co-chair), Cognitive and Information Sciences, UC Merced	current
Matthew Turner (committee member), Cognitive and Information Sciences, UC Merced	current
Daniel Schloesser (committee member), Cognitive and Information Sciences, UC Merced	current
Brandon Batzloff (committee member), Cognitive and Information Sciences, UC Merced	current
Amin Boroomand (committee chair), Quantitative and Systems Biology, UC Merced	current
Taran Rallings (committee member), Quantitative and Systems Biology, UC Merced	current
Tyrome Sweet (committee member), Quantitative and Systems Biology, UC Merced	current
Matt Miller (External dissertation committee member), Psychology, UC Davis	current
Pablo Contreras Kallens (committee chair; transferred to Cornell University), CIS, UC Merced	2017–2018
Giulio Galdi, Visiting PhD Student in Development Economics, University of Florence	Fall 2017

Undergraduate Student Advising

Roberto Bernal, ‘Modeling the maintenance of bilingualism’, Summer research, UC Merced 2018

Instructor

Introduction to Cognitive Science, UC Merced	Spring 2018
Minds, Technology, & Society (graduate level), UC Merced	Spring 2018
Cultural Evolution and Human Behavioral Ecology (graduate level), UC Merced	Fall 2017

Modeling Social Behavior (graduate level), UC Merced	Spring 2017
Agent-Based Modeling, UC Merced	Spring 2017
Introduction to Biological Psychology, UC Davis	Summer 2015
Agent-Based Modeling, UC Davis	Fall 2010

Extra-mural Instructor

Workshop on Agent-Based Modeling, SIPS Conference, Grand Rapids, MI	June 2018
Workshop on Agent-Based Modeling, Eindhoven University of Technology, Netherlands	September 2017
Computational Modeling of Social Behavior (graduate level), Aarhus University, Denmark	August 2017

Guest Lecturer

'Agent-based modeling.' Intelligent Adaptive Systems, UC Merced	Spring 2018
'Reciprocity' & 'Multilevel selection.' Fundamentals of Animal Behavior, UC Davis	Winter 2016
'False positives, replication, and bias.' Industrial Organization and Energy, UC Davis	Spring 2015
'Game theory.' Graduate Seminar on Evolutionary Genomics, NIH	Fall 2012
'Design of agent-based models.' Modeling Sustainability, University of Maine, Orono	Fall 2011, Fall 2013

Teaching Assistant (*indicates TA-taught lab component)

Statistical Rethinking (graduate-level Bayesian stats with R), UC Davis	Winter 2015
Agent-Based Modeling, UC Davis	Winter 2008, Winter 2009, Spring 2010
Developmental Psychobiology*, UC Davis	Fall 2008, Fall 2009, Winter 2010
Physiological Psychology*, UC Davis	Summer 2009
Human Learning and Memory*, UC Davis	Spring 2009
Research Methods in Psychology, UC Davis	Fall 2007, Summer 2008
Special Relativity and Chaos Theory, Wesleyan University	Fall 2000

PROFESSIONAL ACTIVITY

REVIEWER:

Journals: *Adaptive Behavior* • *American Naturalist* • *Artificial Life* • *Behavioral and Brain Sciences* • *Behavioural Processes* • *BMC Evolutionary Biology* • *Cognition* • *Cognitive Science* • *Cognitive Systems Research* • *Current Anthropology* • *Ecological Psychology* • *Ecology and Society* • *eLife* • *Europhysics Letters* • *Evolution and Human Behavior* • *Evolution: Education and Outreach* • *Evolutionary Anthropology* • *Evolutionary Behavioral Sciences* • *Frontiers in Human Neuroscience* • *Games* • *Human Nature* • *Journal of Artificial Societies and Social Simulation* • *Journal of Economic Behavior and Organization* • *Journal of Mathematical Sociology* • *Journal of the Royal Society Interface* • *Journal of Theoretical Biology* • *Nature* • *Nature Communications* • *Philosophical Transactions of the Royal Society B* • *PLOS Computational Biology* • *PLOS ONE* • *PNAS* • *Royal Society Open Science* • *Scientific Reports* • *Social Cognition* • *Society & Natural Resources* • *Studies in History and Philosophy of Science* • *Theoretical Population Biology*

Conferences: *ALife 2016* • *CogSci 2017* • *Cultural Evolution Society 2018*

Funders: *National Science Foundation* {Cultural Anthropology, SciSIP} • *Swiss National Science Foundation*

PROFESSIONAL SERVICE:

Program Committee. Social Learning and Cultural Evolution Workshop, ALIFE '16, Cancun, Mexico (July 2016)
 Program Committee. Graduate Workshop on Multiplex Social Networks, UC Davis (April 2016)
 Program Committee. Graduate Workshop on Agent-Based Modeling, Johns Hopkins University (July 2014)
 Faculty Search Committee. Center for Advanced Modeling, Johns Hopkins University (2012, 2013)
 Course Development: Agent-Based Modeling (undergraduate), UC Merced (Spring 2017)
 Course Development: Modeling Social Behavior (graduate), UC Merced (Spring 2017)
 Ad hoc Faculty Appointment Committee, UC Merced (Spring 2017)
 Committee on Research Computing, UC Merced (Summer 2017–present)
 Faculty Advisor. Data and Analytical Science User Group, UC Merced (Summer 2017–present)

Faculty Search Committee. Cognitive & Information Sciences, UC Merced (2017–2018)
Organizing Committee. 2nd annual Cultural Evolution Society Meeting, Tempe, AZ (Fall 2018)
Publication Committee. Cultural Evolution Society (Fall 2017–present)
UC Merced campus rep. California Workshop on Evolutionary Social Science (Spring 2018–present)
Faculty Search Committee. Cognitive & Information Sciences, UC Merced (2018–2019)
Faculty Merit Review Committee. Cognitive & Information Sciences, UC Merced (2018–2019)
Communications Committee. Cognitive & Information Sciences, UC Merced (2017–present)
Distinguished Cognitive Scientist Award Committee. CIS, UC Merced (2018–2019)