Dean Eckles

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Research Interests: Marketing, social networks and peer effects, applied statistics for causal inference and big data, design of field experiments, persuasion, human–computer interaction

Education

Stanford University

2008 – 2012 PhD Communication
2010 – 2011 MS Statistics
2006 – 2007 MS Symbolic Systems
2002 – 2006 BA Philosophy, with Honors
2002 – 2006 BS Symbolic Systems

Employment

Massachusetts Institute of Technology

2017 – *KDD Career Development Professor in Communications and Technology*
2017 – *Affiliated Faculty, Institute for Data, Systems & Society*
2015 – *Assistant Professor of Marketing, Sloan School of Management*

Facebook

2012 – 2015 *Scientist*
2010 – 2012 *Intern, Consultant & Researcher-in-Residence*

Nokia

2007 – 2009 *Research Scientist*

Working papers and papers under review

† Authors in alphabetical author or joint first-authorship. * Student, intern, and mentored postdoc coauthors.

Evaluating stochastic seeding strategies in networks.
Chin, A.,†* Eckles, D.,† & Ugander, J.†
Working paper. Available at `https://arxiv.org/abs/1809.09561`.

Long ties accelerate noisy threshold-based contagions.
Eckles, D.,† Mossel, E.,† Rahimian, M. A.,†* & Sen, S.†
Working paper. Available at `https://arxiv.org/abs/1810.03579`.

Bias and high-dimensional adjustment in observational studies of peer effects.
Eckles, D., & Bakshy, E.
Under review. Available at `https://arxiv.org/abs/1706.04692`.

Thompson sampling with the online bootstrap.
Eckles, D.,† & Kaptein, M.†
Under review. Available at `http://arxiv.org/abs/1410.4009`.

Refereed journal articles

Exact p-values for network interference.
Athey, S.,† Eckles, D.,† & Imbens, G. W.† (2018)
Journal of the American Statistical Association, 113(521).

Design and analysis of experiments in networks: Reducing bias from interference.
Eckles, D.,† Karrer, B.,† & Ugander, J.† (2017)
Journal of Causal Inference, 12(1).

Social influence and political mobilization: Further evidence from a randomized experiment in the 2012 U.S. Presidential Election.
Jones, J. J., Bond, R. M., Bakshy, E., Eckles, D., & Fowler, J. H. (2017)
PLoS ONE 12(4).

Estimating peer effects in networks with peer encouragement designs.
Eckles, D., Kizilcec, R.F.,* & Bakshy, E. (2016)
Proceedings of the National Academy of Sciences, 113(27).

Bootstrapping data arrays of arbitrary order.
Owen, A. B. & Eckles, D. (2012)
Annals of Applied Statistics, 6(3).

Heterogeneity in the effects of online persuasion.
Kaptein, M. & Eckles, D. (2012)
Journal of Interactive Marketing, 26(3).

Requirements for mobile photoware.
Ames, M.,† Eckles, D.,† Naaman, M.,† Spasojevic, M.,† & Van House, N.† (2010)
Personal and Ubiquitous Computing, 14(2).

Articles in refereed Computer Science conference proceedings

Learning causal effects from many randomized experiments using regularized instrumental variables.
Peysakhovich, A., & Eckles, D. (2018)
In: *WWW 2018: Proceedings of the International Conference on the World Wide Web*. IW3C2 / ACM.

Social influence and reciprocity in online gift giving.
Kizilcec, R. F.,* Bakshy, E., Eckles, D., & Burke, M. (2018)
In: *CHI 2018: Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*. ACM.

Designing and deploying online field experiments.
Bakshy, E., Eckles, D., & Bernstein, M. (2014)
In: *WWW 2014: Proceedings of the International Conference on the World Wide Web*. ACM.

Rumor cascades.
Friggeri, A., Adamic, L., Eckles, D., & Cheng, J. (2014)
In: *ICWSM 2014: Proceedings of the International Conference on Weblogs and Social Media*. AAAI.

Uncertainty in online experiments with dependent data: An evaluation of bootstrap methods.
Bakshy, E., & Eckles, D. (2013)
In: *KDD 2013: Proceedings of the ACM SIGKDD International Conference on Knowledge Discovery and Data Mining*. ACM.

Social influence in social advertising: Evidence from field experiments.
Bakshy, E.†, Eckles, D.†, Yan, R., & Rosenn, I. (2012)
In: *EC 2012: Proceedings of the ACM Conference on Electronic Commerce*. ACM.

Selecting effective means to any end: Futures and ethics of persuasion profiling.
Kaptein, M. & Eckles, D. (2010)
In: *Proceedings of Persuasive Technology 2010*, Lecture Notes in Computer Science. Springer.

Social responses in mobile messaging: Influence strategies, self-disclosure, and source orientation.
Eckles, D., Wightman, D., Carlson, C., Thamrongrattanarit, A., Bastea-Forte, M., & Fogg, B. J. (2009)
In: *CHI 2009: Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*. ACM.

Over-exposed? Privacy patterns and considerations in online and mobile photo sharing.
Ahern, S.,† Eckles, D.,† Good, N. S.,† King, S.,† Naaman, M.,† & Nair, R.† (2007)
In: *CHI 2007: Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*. ACM.

The behavior chain for online participation: How successful Web services structure persuasion.
Fogg, B. J. & Eckles, D. (2007)
In: *Proceedings of Persuasive Technology 2007*, Lecture Notes in Computer Science. Springer.

Work in progress

Tie strength and peer effects in broadcast–interpersonal communication technologies.
with Rene Kizilcec* & Eytan Bakshy

Information-theoretic measures of habit in behavioral data.
with Christos Nicolaides

Social influence and habits: Evidence from a field experiment in exercise.
with Christos Nicolaides

Discount bundling via dense product embeddings.
with Madhav Kumar* & Sinan Aral

Automating robust randomization inference with adversarial training.
with Alex Chin*

Edited books and chapters

Randomized experiments to detect and estimate social influence.
Taylor, S.J., & Eckles, D. (2018)
In: *Spreading Dynamics in Social Systems*, Lehmann, S., & Ahn, Y. Y., ed. Springer Nature.

Informing the design of mobile health messaging services with user research.
Eckles, D. (2009)
In: *Texting 4 Health*, B. J. Fogg & R. Adler, ed. Stanford Captology Media.

Mobile Persuasion: 20 Perspectives on the Future of Behavior Change
Fogg, B. J. & Eckles, D., ed. (2007)
Stanford Captology Media.

Comments in journals

Discussion of "Optimal treatment allocations in space and time for on-line control of an emerging infectious disease".
Eckles, D.,† Kaptein, M.† (2018)
Forthcoming in *Journal of the Royal Statistical Society: Series C (Applied Statistics)*.

Field studies of psychologically targeted ads face threats to internal validity.
Eckles, D.,† Gordon, B. R.,† Johnson, G. A.† (2018)
Proceedings of the National Academy of Sciences, 115(23).

Theses

Identifying Peer Effects in Online Communication Technologies.
Doctoral dissertation, Stanford University (2012).
Granted the Nathan Maccoby Outstanding Dissertation Award.

Mobile Persuasive Technology and Influencing Self-Disclosure Behavior.
Master's thesis, Stanford University (2007).

Radical Interpretability and Parasitism: Justifying the Principle of Charity.
Honors thesis, Stanford University (2006).

Magazine articles

Envisioning persuasion profiles: Challenges for public policy and ethical practice.
Kaptein, M., Eckles, D., & Davis, J. (2011)
interactions, 18.

Selected refereed extended abstracts and workshop papers

Social influence, habits, and disrupted performance environments.
Eckles, D., Nicolaides, C., Aral, S. (2017)
In: *Advances in Consumer Research abstracts*. Association for Consumer Research.

Mobile user experience research: Challenges, methods & tools.
Nakhimovsky, Y., Eckles, D., & Riegelsberger, J. (2009)
In: *CHI '09 extended abstracts on Human factors in computing systems*. ACM Press.

Auditory priming for upcoming events.
Sohn, T., Takayama, L., Eckles, D., & Ballagas, R. (2009)
In: *CHI '09 extended abstracts on Human factors in computing systems*. ACM Press.

Photos for information: A field study of cameraphone computer vision interactions in tourism.
Cuellar, G.,* Eckles, D., & Spasojevic, M. (2008)
In: *CHI '08 extended abstracts on Human factors in computing systems*. ACM.

Zonetag: Designing context-aware mobile media capture to increase participation.
Ahern, S.,† Davis, M.,† Eckles, D.,† King, S.,† Naaman, M.,† Nair, R.,† Spasojevic, M.,† & Yang, J. H. I.† (2006)
In: *Adjunct Proceedings of Ubicomp*, Workshop on Pervasive Image Capture and Sharing.

Software releases

PlanOut
Open-source software framework for designing and deploying online randomized experiments. In Python and PHP.
with Eytan Bakshy and Michael Bernstein.
`http://facebook.github.io/planout/`

icsw: Inverse compliance score weighting
Tools to estimate average treatment effects with an instrumental variable by re-weighting observations using a model of compliance. In R.
with Peter M. Aronow and Kyle Peyton
`https://cran.r-project.org/web/packages/icsw/`

Multiway bootstrap
Statistical inference using data with multiway dependencies. In R.
`https://github.com/deaneckles/multiway_bootstrap`

Patents

Systems and methods for content presentation.
Tas, M.S., Kant, V., Marra, G.M., Eckles, D., & Dudin, Y.O.
Facebook. Published U.S. patent application 14975433.

Network-aware product rollout in online social networks.
Marlow, C. A., Eckles, D., Karrer, B., Ugander, J., Backstrom, L. S., & Kleinberg, J.
Facebook. Granted U.S. patent 9934514.

Determining user personality characteristics from social networking system communications and characteristics.
Nowak, M., & Eckles, D.
Facebook. Granted U.S. patent US 8825764.

Method, apparatus and computer program product for providing gaze information.
Eckles, D.
Nokia. Published U.S. patent application US 20100054526.

System and method for providing highly readable text on small mobile devices.
Fogg, B. J., Cuellar, G. S., & Eckles, D.
Stanford University. Granted U.S. patent US 8458152.

Selected coverage of my research (press & books)

Facebook explored unpicking personalities to target ads.
Rory Cellan-Jones.
BBC News. April 2018.
`https://www.bbc.com/news/technology-43869911`

The scant science behind Cambridge Analytica's controversial marketing techniques.
Elizabeth Gibney.
Nature. March 2018.
`https://www.nature.com/articles/d41586-018-03880-4`

Cambridge Analytica's 'mindf*** tool' could be totally useless.
Stephen Armstrong.
Wired, March, 2018.
`https://www.wired.co.uk/article/cambridge-analytica-facebook-psychographics`

Chaos Monkeys: Obscene Fortune and Random Failure in Silicon Valley.
Antonio Garcia Martinez (2016)
HarperCollins. Part III. New York Times Bestseller.

Persuasion Profiling: How the Internet Knows What Makes You Tick.
Maurits Kaptein (2015).
From the Dutch: *Digitale verleiding: Hoe beinvloedingsprofielen de online marketing op z'n kop zetten*.
Business Contact.

Facebook wants to know why you're sharing this bogus Obamacare story.
Dino Grandoni.
Huffington Post, May 5th, 2014.

Invisible decider: The subtle persuader in your pocket.
Helen Knight.
New Scientist, (2680), April 2012.

The Filter Bubble: What the Internet Is Hiding from You.
Eli Pariser (2011).
Penguin Press. Chapters 4 & 5. New York Times Bestseller.

Welcome to the brave new world of persuasion profiling.
Eli Pariser.
Wired, May 2011.

Anti-social networks? We're just as cliquey online.
Laura Sydell.
NPR All Things Considered, February 2011.

Appland: How smartphones are transforming our lives.
Richard Fisher.
New Scientist, (2722), August 2009.

Text streaming service lets users read material as fast as they can.
Michael Bazeley.
San Jose Mercury News, May 2005. Syndicated in Knight Rider papers.

Reading phone text one word at a time.
Ina Fried and Michael Kanellos.
CNET News, July 2005.

Teaching

MIT

2016 – 2017 Course creator & sole instructor
Marketing Analytics
MBA elective in using analysis of quantitative data to inform, make, and automate marketing decisions.

2016 Course creator & sole instructor
Experimental Design and Analysis
Doctoral seminar in the design of experiments, especially field experiments in the social sciences, and randomization inference.

2016 Course creator & sole instructor
Effective and Ethical Experimentation
Short course for MBA students on the basics of field experiments in business and public policy, and relevant ethical and regulatory frameworks.

Udacity

2013 – 2014 Course creator & instructor
Exploratory Data Analysis Using R (with Moira Burke, Chris Saden & Solomon Messing)
Designed curriculum for course on exploratory data analysis, including data visualization, basic statistical concepts, and high-dimensional exploration. Partially based on experience teaching Facebook's internal DataCamp. `https://www.udacity.com/course/ud651`

Stanford University

2011 Course creator & sole instructor
Persuasion, Contagion & Compliance-Gaining in Online Media
Conceived and taught new course combining psychological and network levels of analysis to understand and engineer the spread of attitudes and behaviors through social media. Twice-weekly lectures. Creating assignments and exams. Advising term papers.

2009, 2011 Teaching assistant
Phenomenological Foundations of Cognition, Language & Computation
Discussion and lecturing. Assisting with curriculum revision. Advising and grading term papers.

2007 – 2010 Research practicum mentor

Experimental Research in Advanced User Interfaces
Guiding teams of undergraduate and graduate students to design, run, and analyze randomized experiments. As mentor in 2007, 2009, and 2010; as industry advisor in 2008.

2006 Teaching assistant
Persuading People Online and via Mobile Phones
Developing new curriculum and assignments, lecturing, leading discussions, designing course online community, grading assignments.

Selected invited talks

2018.06.12 *Automating robust randomization inference*
Network Causal Inference and Design of Experiments symposium, NetSci 2018. Paris.

2018.06.11 *Randomization inference in networks*
Statistical Inference for Network Models symposium, NetSci 2018. Paris.

2018.05.24 *Peer effects in online networks*
New York City Data Science Seminar, joint between NYU, Cornell Tech, Columbia, Facebook AI Research & Microsoft Research.

2018.04.20 *Bias and high-dimensional adjustment in observational studies of peer effects*
Marketing seminar, Cox School of Business, Southern Methodist University.

2018.04.17 *Bias and high-dimensional adjustment in observational studies of peer effects*
Marketing seminar, Rady School of Management, UCSD.

2018.04.06 *Experimenting with networked products*
Using Corporate Data to Improve Outcomes conference, Becker–Friedman Institute, University of Chicago.

2018.03.10 *Estimating peer effects with peer encouragement designs*
Computational Social Science seminar, University of Pennsylvania.

2018.03.07 *Randomization inference in networks*
Center for Business Education and Research, NYU Shanghai.

2018.02.28 *Network effects in broadcast–interpersonal media: Evidence from field experiments on Facebook.*
Operations, Information & Technology seminar, Stanford University Graduate School of Business.

2018.02.12 *Habits, social influence, and changing contexts*
Joint Marketing seminar, Rotterdam School of Management & Erasmus School of Economics.

2018.02.07 *Habits, social influence, and changing contexts*
Marketing seminar, Tilburg University

2018.01.30 *Habits, social influence, and changing contexts*
Marketing seminar, University of Chicago Booth School of Business.

2018.01.30 *Randomization inference in networks*
Research on Algorithms and Incentives in Networks (RAIN) seminar, Stanford University.

2017.12.01 *Randomization inference in networks*
Human Dynamics Group seminar, MIT Media Lab

2017.11.02 *Statistical and causal inference in networks*
Center for Data Science seminar, New York University

2017.09.07 *Learning about peer effects from many experiments: Regularized instrumental variable methods for massive meta-analysis.*
Machine Learning and Friends seminar, University of Massachusetts, Amherst.

2017.03.02 *Estimating peer effects with peer encouragement designs and massive meta-analysis.*
Econometrics and Statistics seminar, University of Chicago Booth School of Business.

2017.02.15 *Estimating peer effects in networks with peer encouragement designs.*
Applied Statistics seminar, Institute for Quantitative Social Science, Harvard University.

2017.02.02 *Learning about peer effects from many experiments: Regularized instrumental variable methods for massive meta-analysis.*
Marketing seminar, Columbia University Graduate School of Business.

2017.01.27 *Learning about peer effects from many experiments: Regularized instrumental variable methods for massive meta-analysis.*
Marketing seminar, Johnson Graduate School of Business, Cornell University.

2017.01.13 *Network effects in broadcast–interpersonal media: Evidence from field experiments on Facebook.*
Global Center for Big Data and Mobile Analytics, Fox School of Business, Temple University.

2016.12.8 *Network effects in broadcast–interpersonal media: Evidence from field experiments on Facebook.*
Marketing seminar, Wharton School of the University of Pennsylvania.

2016.12.2 *Network effects in broadcast–interpersonal media: Evidence from field experiments on Facebook.*
Network Science Institute, Northeastern University.

2016.12.1 *Learning causal models from many experiments.*
Department of Statistics, Boston University.

2016.11.12 *Learning causal models from many experiments.*
Causal Inference Conference, Columbia University.

2016.10.12 *Network effects in broadcast–interpersonal media: Evidence from field experiments on Facebook.*
Marketing seminar, Questrom School of Business, Boston University.

2016.08.03 *Comments on machine learning in econometrics.*
Talks invited by *Journal of Business and Economic Statistics*, Joint Statistical Meetings 2016, Chicago.

2016.08.01 *Randomized experiments in large networks.*
Invited talks, Joint Statistical Meetings 2016, Chicago.

2016.02.10 *Estimating effects in networks with peer encouragement designs.*
Marketing seminar. Kellogg School of Management, Northwestern University.

2016.01.27 *Estimating effects in networks with peer encouragement designs.*
Operations Research Center (ORC) IAP Seminar. MIT.

2015.12.09 *Estimating effects in networks with peer encouragement designs.*
Artificial Intelligence seminar. Radboud University.

2015.12.07 *Causality, randomized experiments, and statistical inference in social networks.*
Tutorial at Workshop on Algorithms and Models for the Web-graph (WAW) 2015. Eindhoven, Netherlands.

2015.10.06 *Learning and experimenting with behavior in networks .*
Advancing Wellbeing Seminar Series. MIT Media Lab.

2015.9.30 *Learning, experimenting, and decision-making with networked products.*
Initiative on the Digital Economy. MIT Sloan School of Management.

2015.7.24 *Identifying effects in networks with peer encouragement designs.*
Department of Statistics. University of California, Berkeley.

2015.6.1 *Rumor cascades.*
Collective Intelligence 2015. Santa Clara, California.

2015.3.27 *Identifying effects in networks with peer encouragement designs.*
Arthur M. Sackler Colloquium on Drawing Causal Inference from Big Data. National Academy of Sciences.

2015.3.9 *Learning, experimenting, and decision-making with networked products.*
Cornell Tech, New York City.

2015.3.4 *Learning, experimenting, and decision-making with networked products.*
Department of Industrial Engineering and Operations Research. University of California, Berkeley.

2015.1.23 *Peer effects in online networks: Causal inference with and without experiments.*
Berkeley Institute for Data Science, University of California, Berkeley.

2014.12.01 *Peer effects and interventions in online networks: Learning with and without experiments.*
Department of Biostatistics. Bloomberg School of Public Health, Johns Hopkins University.

2014.10.28 *Peer effects in online networks: Mechanism experiments, observational studies, and global treatments.*
Technology Management Seminar. Tel Aviv University School of Business.

2014.10.08 *Peer effects in online networks: With and without experiments.*
Marketing Seminar. Stanford Graduate School of Business.

2014.02.03 *Peer effects and global treatments: Design and analysis of experiments in networks.*
Symbolic Systems Forum. Stanford University.

2013.11.11 *Peer effects and global treatments: Design and analysis of experiments in networks.*
Data, Inference, and Society Seminar. Stanford University Graduate School of Business.

2013.11.7 *Peer effects and global treatments: Design and analysis of experiments in networks.*
Department of Statistics. UC Davis.

2013.10.2 *Design and analysis of experiments in networks.*
Computational Statistics and Neuroscience Seminar. Department of Statistics. Columbia University.

2013.10.1 *Design and analysis of experiments in networks.*
Social Media and Political Participation seminar. New York University.

2013.4.22 *Estimating peer effects with mechanism experiments, observational data, and encouragement designs.*
Statistical & Machine Learning Approaches to Network Experimentation Workshop. Heinz College. Carnegie Mellon University.

2012.11.27 *Identifying peer effects with and without experiments.*
Causal Consulting Seminar. Department of Biostatistics. University of California, Berkeley.

2012.10.27 *Identifying peer effects with and without experiments.*
Information Systems Seminar. Department of Information, Operations, and Management Sciences. New York University Stern School of Business.

2012.8.6 *Identifying peer effects in online communication.*
Workshop on Computational Advertising. Statistical and Applied Mathematical Sciences Institute (SAMSI).

2012.5.8 *Identifying peer effects in online communication.*
Workshop on User-Centered Modeling. Institute for Mathematics and Its Applications (IMA). University of Minnesota.

2012.3.7 *Identifying peer effects in online communication behaviors.*
Research on Algorithms and Incentives in Networks (RAIN) Seminar. Stanford University.

2011.12.14 *Causal inference for peer effects in online behavior.*
Workshop on Current Challenges in Statistical Learning. Banff International Research Station (BIRS).

Professional service

2012 – 2018 Reviewer, *Management Science*
2016 – 2018 Reviewer, *Marketing Science*
2015 – 2018 Reviewer and Invited Non-member Editor, *Proceedings of the National Academy of Sciences*
2018 – Reviewer, *Science*
2017 – 2018 Reviewer, *Annals of Statistics*

2017 – 2018 Reviewer, *Journal of the American Statistical Association*
2017 – 2018 Reviewer, *Journal of the Royal Statistical Society*
2017 – 2018 Reviewer, *Journal of Marketing Research*
2017 – 2018 Reviewer, *Science Advances*
2016 – 2018 Reviewer, *Information Systems Research*
2015 – 2017 Reviewer, *Review of Economics and Statistics*
2017 Reviewer, *Review of Economic Studies*
2017 Reviewer, *American Economic Journal: Applied Economics*
2017 Reviewer, *Personality and Social Psychology Bulletin*
2017 Reviewer, *Journal of the Association for Consumer Research*
2015 Reviewer, *Epidemiologic Methods*
2012 Reviewer, *Annals of Applied Statistics*
2011 Reviewer, *IEEE Transactions on Affective Computing*
2009, 2011 Reviewer, *International Journal of Human-Computer Studies*
2010 Reviewer, *ACM Transactions on Computer–Human Interaction*
2009 Reviewer, *Communications of the Association for Information Systems*
2008 Reviewer, *IEEE Pervasive Computing*
2008 Reviewer, *IEEE Computer Graphics and Applications*

2013, 2017 Program Committee, ACM Conference on Electronic Commerce (EC)
2007 – 2010 Program Committee, International Conference on Persuasive Technology
2008 Posters Chair and Program Committee, International Conference on Mobile and Ubiquitous Systems, Dublin
2007 Associate Chair, Mobile Persuasion, Stanford University
2007 Organizing Committee, International Conference on Persuasive Technology, Stanford University

2009 – 2015 Reviewer, SIGCHI Conference on Human factors in computing systems (CHI)
2008 – 2013 Reviewer, ACM Conference on Computer Supported Cooperative Work (CSCW)
2009 Reviewer, International Conference on Ubiquitous Computing (Ubicomp)