

Sendhil Mullainathan
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Education

HARVARD UNIVERSITY, CAMBRIDGE, MA, 1993-1998

PhD in Economics

Dissertation Topic: Essays in Applied Microeconomics

Advisors: Drew Fudenberg, Lawrence Katz, and Andrei Shleifer

CORNELL UNIVERSITY, ITHACA, NY, 1990-1993

B.A. in Computer Science, Economics, and Mathematics, magna cum laude

Fields of Interest

Behavioral Economics, Poverty, Applied Econometrics, Machine Learning

Professional Affiliations

UNIVERSITY OF CHICAGO

Roman Family University Professor of Computation and Behavioral Science, January 1, 2019 to present.

University Professor, Professor of Computational and Behavioral Science, and George C. Tiao Faculty Fellow, Booth School of Business, July 1, 2018 to December 31, 2018.

HARVARD UNIVERSITY

Robert C Waggoner Professor of Economics, 2015 to 2018.

Affiliate in Computer Science, Harvard John A. Paulson School of Engineering and Applied Sciences, July 1, 2016 to 2018.

Professor of Economics, 2004 (September) to 2015.

UNIVERSITY OF CHICAGO

Visiting Professor, Booth School of Business, 2016-17.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

Mark Hyman Jr. Career Development Associate Professor, 2002-2004

Mark Hyman Jr. Career Development Assistant Professor, 2000-2002

Assistant Professor, 1998- 2000

SELECTED AFFILIATIONS

Co - Founder and Senior Scientific Director, ideas42

Research Associate, National Bureau of Economic Research

Founding Member, Poverty Action Lab

Member, *American Academy of Arts and Sciences*

Contributing Writer, *New York Times*

Books

Scarcity: Why Having Too Little Means So Much, with Eldar Shafir, 2013. New York, NY: Times Books

[Policy and Choice: Public Finance through the Lens of Behavioral Economics](#), with William J Congdon and Jeffrey Kling, 2011. Washington, DC: Brookings Institution Press

Working Papers

“The Algorithmic Automation Problem: Prediction, Triage, and Human Effort,” with Maithra Raghu, Katy Blumer, Greg Corrado, Jon Kleinberg, and Ziad Obermeyer, 2019.

“A Probabilistic Model of Cardiac Physiology and Electrocardiograms,” joint with Andrew Miller, Ziad Obermeyer, David M. Blei, and John P. Cunningham, arXiv preprint arXiv:1812.00209 (2018).

“Measuring the Stability of EHR- and EKG-based Predictive Models,” joint with Andrew C. Miller, Ziad Obermeyer, Sendhil Mullainathan Machine Learning for Health (NeurIPS Workshop), 2018

“Simplicity Creates Inequity: Implications for Fairness, Stereotypes, and Interpretability,” with Jon Kleinberg, draft, 2018. (<https://arxiv.org/abs/1809.04578>)

“Machine Learning Tests for Effects on Multiple Outcomes,” with Jens Ludwig and Jann Spiess, working paper (<https://arxiv.org/abs/1707.01473>).

“A Machine Learning Approach to Low-Value Health Care: Wasted Tests, Missed Heart Attacks and Mis-Predictions,” with Ziad Obermeyer, 2019, NBER working paper 26168, National Bureau of Economics Research, Inc.

“Making Sense of Recommendations,” with Mike Yeomans, Anuj Shah and Jon Kleinberg, draft 2016.

“The Theory is Predictive, but is it Complete? An Application to Human Perception of Randomness,” with Jon Kleinberg and Annie Liang, draft, 2015.

“The Market for Financial Advice: An Audit Study,” with Markus Noth & Antoinette Schoar June 2010, NBER Working Papers 17929, National Bureau of Economic Research, Inc.

“The Shape of Temptation: Implications for the Economic Lives of the Poor,” with Abhijit Banerjee, 2010, NBER Working Papers 15973, National Bureau of Economic Research, Inc.

“Profitable Investments or Dissipated Cash? Evidence on the Investment-Cash Flow Relationship From Oil and Gas Lease Bidding,” with Marianne Bertrand, 2005, NBER Working Papers 11126, National Bureau of Economic Research, Inc.

"Persuasion in Finance," with Andrei Shleifer, 2005, NBER Working Papers 11838, National Bureau of Economic Research, Inc.

"Executive Compensation and Incentives: The Impact of Takeover Legislation," with Marianne Bertrand, 1998, NBER Working Papers 6830, National Bureau of Economic Research, Inc.

Publications

"Dissecting Racial Bias in an Algorithm Used to Manage the Health of Populations," with Ziad Obermeyer, Brian Powers, and Christine Vogeli, *Science*, 366(6464), pp.447-453, 2019.

"Direct Uncertainty Prediction for Medical Second Opinions," with Maithra Raghu, Katy Blumer, Jon Kleinberg, Rory Sayres, Ziad Obermeyer, and Robert Kleinberg, International Conference on Machine Learning (ICML), 2019.

"Discriminative Regularization for Latent Variable Models with Applications to Electrocardiography," with Andrew Miller, Ziad Obermeyer and John Cunningham, International Conference on Machine Learning (ICML), 2019.

"Discrimination in the Age of Algorithms," joint with Jon Kleinberg, Jens Ludwig, and Cass Sunstein, *Journal of Legal Studies*, 2018.

"An exercise in self-replication: Replicating Shah, Mullainathan, and Shafir (2012)," with Anuj Shah and Eldar Shafir, *Journal of Economic Psychology* (2018)

"A Comparison of Patient History- and EKG-based Cardiac Risk Scores," joint with Andrew C. Miller and Ziad Obermeyer, Proceedings of the AMIA Summit on Clinical Research Informatics (CRI), 2019

"Debt Traps? Market Vendors and Moneylender Debt in India and the Philippines," with Dean Karlan and Benjamin N. Roth (2018), forthcoming *American Economic Review: Insights*. (Also National Bureau of Economic Research working paper 24272).

"Predictive Modeling of US Healthcare Spending in Late Life," with Liran Einav, Amy Finkelstein and Ziad Obermeyer (2018), *Science* 29 Jun 2018: Vol. 360, Issue 6396, pp. 1462-1465. DOI: 10.1126/science.aar5045

"Algorithmic Fairness," joint with Jon Kleinberg, Jens Ludwig and Ashesh Rambachan (2018), *AEA Papers and Proceedings* (Vol. 108, pp. 22-27). (Non refereed).

"Money in the Mental Lives of the Poor," with Anuj Shah, Jiaying Zhao and Eldar Shafir (2018). *Social Cognition*, 36(1), 4-19.

"Human Decisions and Machine Predictions," with Jon Kleinberg, Himabindu Lakkaraju, Jure Leskovec and Jens Ludwig, *Quarterly Journal of Economics*, 133.1 (2018): 237-293. (also: NBER Working Papers 23180, National Bureau of Economic Research, Inc.)

"Individual differences in normal body temperature: longitudinal big data analysis of patient records," with Obermeyer, Ziad, and Jasmeet K. Samra (2017), *British Medical Journal* 359

"The Selective Labels Problem: Evaluating Algorithmic Predictions in the Presence of Unobservables," with Jon Kleinberg, Himabindu Lakkaraju, Jure Leskovec and Jens Ludwig (2017), *Proceedings of the 23rd ACM SIGKDD International Conference on Knowledge Discovery and Data Mining*.

"Comparison-Based Choices," with Jon Kleinberg and Johan Ugander (2017) *Proceedings of the 17th ACM Conference on Economics and Computation (EC)*.

"Does Machine Learning Automate Moral Hazard and Error?" with Ziad Obermeyer (2017), *American Economic Review*, May 2017, 107 (5): 476-80. (Non refereed)

"Machine Learning: An Applied Econometric Approach," with Jann Spiess (2017), *Journal of Economic Perspectives*, Spring 2017, 31 (2): 87-106.

"Inherent Trade-Offs in the Fair Determination of Risk Scores," with Jon Kleinberg and Manish Raghavan (2017). *Proceedings of the 8th Conference on Innovations in Theoretical Computer Science (ITCS)*.

"Thinking, Fast and Slow? Some Field Experiments to Reduce Crime and Dropout in Chicago", with Heller, S. B., Shah, A. K., Guryan, J., Ludwig, J., and Pollack, H. A. (2015). (Formerly National Bureau of Economic Research No. 21178) *Quarterly Journal of Economics*, February 2017, 132 (1): 1-54

"Assessing Human Error Against a Benchmark of Perfection," with Ashton Anderson and Jon Kleinberg, *Proceedings of the 22nd ACM SIGKDD International Conference on Knowledge Discovery and Data Mining 2016*.

"The Psychological Lives of the Poor," with Frank Schilbach and Heather Schofield, *American Economic Review*. May 2016, 106 (5): 124-127. (Non refereed)

"Productivity and Selection of Human Capital with Machine Learning," with Aaron Chalfin, Oren Danieli, Andrew Hillis, Zubin Jelveh, Michael Luca, and Jens Ludwig, *American Economic Review*. May 2016, 106 (5): 435-440. (Non refereed)

"Getting to the Top of Mind: How Reminders Increase Saving," with Dean Karlan, Margaret McConnell, & Jonathan Zinman, *Management Science*. December 2016, 62 (12): 3393 - 3411

"Self Control at Work: Evidence from a Field Experiment," with Supreet Kaur & Michael Kremer, *Journal of Political Economy*, 2016, 123 (6), 1227-1277

"Behavioral Hazard in Health Insurance," with Katherine Baicker & Joshua Schwartzstein, 2015, *The Quarterly Journal of Economics*, 2015, 130(4), 1623-1667

“Prediction Policy Problems,” with Jon Kleinberg, Jens Ludwig and Ziad Obermeyer, *American Economic Review* (May), 2015. (Non-refereed)

“Scarcity Frames Value,” with Anuj Shah and Eldar Shafir, *Psychological Science*. April 2015, 26 (4): 402-412.

“Learning through Noticing,” with Rema Hanna & Joshua Schwartzstein, *The Quarterly Journal of Economics* 129.3 (2014): 1311-1353.

“Externalities, Internalities, and the Targeting of Energy Policy,” with Hunt Allcott and Dmitry Taubinsky, *Journal of Public Economics*, Vol. 112 (April) 2014, pages 72-88.

“Behavioral Design: A New Approach to Development Policy,” with Saugato Datta, *Review of Income and Wealth* 60.1 (2014): 7-35.

“Poverty Impedes Cognitive Function,” with Anandi Mani, Eldar Shafir, and Jiaying Zhao, *Science*, August 30 2013, 341(6149): 976-980.

“Targeting with Agents,” with Paul Niehaus, Antonia Atanassova, & Marianne Bertrand, *American Economic Journal: Economic Policy* 5 (1), 2013, pp. 206-38

"Notes on behavioral economics and labor market policy," with Linda Babcock, William Congdon and Lawrence Katz, *IZA Journal of Labor Policy* 1, no. 1 (2012): 1-14.

"Health Insurance Coverage and Take- Up: Lessons from Behavioral Economics," with Baicker, Katherine and William J. Congdon. *Milbank Quarterly* 90.1 (2012): 107-134.

“Some Consequences of having too Little,” with Anuj K. Shah & Eldar Shafir, *Science*, November 2 2012, 338 (6107): 682-685.

“A Reduced Form Approach to Behavioral Public Finance” with Joshua Schwartzstein & William J. Congdon, *Annual Review of Economics*, 2012.

“Comparison Friction: Experimental Evidence from Medicare Drug Plans,” with Jeffrey Kling, Eldar Shafir, Lee Vermeulen, & Marian V. Wrobel. *Quarterly Journal of Economics*, 127:1 (February 2012), 199-235.

“Mechanism Experiments and Policy Evaluations,” with Jens Ludwig & Jeffrey R. Kling, *Journal of Economic Perspectives*, 25:3 (Summer 2011), 17-38.

“Helping Consumers Know Themselves,” with Emir Kamenica & Richard Thaler *American Economic Review: Papers and Proceedings* 2011, 101(3), 417-22. (Non-refereed)

“Rigidity in Microfinancing: Can One Size Fit All?” with Dean Karlan, *QFinance* (June 2010).

- “Self Control and the Development of Work Arrangements,” with Supreet Kaur & Michael Kremer, *American Economic Review: Papers and Proceedings*, May 2010, 100, 624-628. (Non-refereed)
- “Behavior and Energy Policy,” with Hunt Allcott, *Science* 5 March 2010: 1204-1205.
- “Affirmative Action in Education: Evidence from Engineering College Admissions in India,” with Marianne Bertrand & Rema Hanna, *Journal of Public Economics*, 94 (1-2), 2010: 16-29.
- “What’s Advertising Content Worth? Evidence from a Consumer Credit Marketing Field Experiment,” with Marianne Bertrand, Dean Karlan, Eldar Shafir, & Jonathan Zinman, 2010. *The Quarterly Journal of Economics*, Vol. 125, No. 1: 263–305.
- “Behavioral Economics and Tax Policy,” with William J. Congdon & Jeffrey R. Kling, *National Tax Journal*, 62:3 (September 2009), 375-386.
- “Sticking With Your Vote: Cognitive Dissonance and Political Attitudes,” with Ebonya Washington, *American Economic Journal: Applied Economics*, 1(1), 2009:86-111.
- “Labor Market Discrimination in Dehli: Evidence from a Field Experiment,” with Abhijit Banerjee, Marianne Bertrand, & Saugato Datta, *Journal of Comparative Economics*, 37(1), 2009:14-27.
- “Limited Attention and Income Distribution,” with Abhijit V. Banerjee, *American Economic Review*, 98(2), 2008:489-93.
- “Why Don’t People Insure Late-Life Consumption? A Framing Explanation of the Under-Annuitization Puzzle,” with Jeffrey Robert Brown, Jeffrey R. Kling, & Marion V. Wrobel, *American Economic Review*, 98 (2), 2008: 304-09.
- “Coarse Thinking and Persuasion,” with Joshua Schwartztein & Andrei Shleifer, *The Quarterly Journal of Economics*, 123(2) 2008: 577-619.
- “Obtaining a Driver’s License in India: An Experimental Approach to Studying Corruption,” with Marianne Bertrand, Simeon Djankov, & Rema Hanna, *The Quarterly Journal of Economics*, 22(4), 2007: 1639-1676.
- “Development Economics Through the Lens of Psychology,” *Proceedings of the Annual Bank Conference on Development Economics*, 2006. (Non-Refereed)
- “Behavioral Economics and Marketing in Aid of Decision-Making among the Poor,” with Marianne Bertrand, & Eldar Shafir, 2006, *Journal of Public Policy and Marketing*, 25, 1, 8-23.
- “Implicit Discrimination,” with Marianne Bertrand & Dolly Chugh, *American Economics Review*, 95(2), 2005:94-98.

- “The Market for News,” with Andrei Shleifer, *American Economic Review*, 95(4), 2005: 1031-1053.
- “Do Cigarette Taxes Make Smokers Happier?” with Jonathan Gruber, *The B.E. Journal of Economic Analysis and Policy*, 5(1), 2005.
- “Psychology, Behavioral Economics, and Public Policy,” with On Amir, Dan Ariely, Alan Cooke, David Dunning, Nicholas Epley, Botond Koszegi, Donald Lichtenstein, Nina Mazar, Drazen Prelec, Eldar Shafir, & Jose Silva, 2005, *Marketing Letters*, 16 (3-4), p. 443-454. (Non-refereed)
- “A Behavioral Economics View of Poverty,” with Marianne Bertrand, & Eldar Shafir, 2004, *American Economic Review*, 94, 2, 419-423.
- “Are Emily and Greg More Employable than Lakisha and Jamal? A Field Experiment on Labor Market Discrimination,” with Marianne Bertrand, *American Economic Review*, 94(4), September 2004: 991-1013.
- “How Much Should We Trust Difference-in-Difference Estimates?” with Marianne Bertrand & Esther Duflo, *The Quarterly Journal of Economics*, 119(1), 2004: 249-275.
- “Pyramids,” with Marianne Bertrand, *Journal of the European Economic Association*, 1(2-3), April/May 2003: 478-83. (Non-refereed)
- “Enjoying the Quiet Life? Corporate Governance and Managerial Preferences,” with Marianne Bertrand, *Journal of Political Economy*, 111(5), October 2003: 1043-1075.
- “Public Policy and Extended Families: Evidence from South Africa,” with Marianne Bertrand & Douglas Miller, *World Bank Economic Review*, 17(1), 2003: 27-50.
- “A Memory-Based Model of Bounded Rationality”, *Quarterly Journal of Economics*, 117(3), August 2002: 735-774.
- "Ferretting Out Tunneling: An Application to Indian Business Groups," with Marianne Bertrand & Paras Mehta, *The Quarterly Journal of Economics*, 117(1), February 2002: 121-48.
- “Behavioral Economics,” with Richard Thaler, *International Encyclopedia of Social Sciences*, Pergamon Press, 1st edition, October 1, 2001: 1094-1100. (Non-refereed)
- “Are CEOs Rewarded for Luck? The Ones Without Principals Are,” with Marianne Bertrand, *The Quarterly Journal of Economics*, 116(3), August 2001: 901-32. (Longer version available as “Do CEOs Set Their Own Pay? The Ones Without Principals Do,” National Bureau of Economic Research Working Paper #7604).
- “Do Firm Boundaries Matter?” with David Scharfstein, *American Economic Review Papers and Proceedings*, 91(2), May 2001: 195-199. (Non-refereed)

“Do People Mean What They Say? Implications for Subjective Survey Data,” with Marianne Bertrand. Shorter version: *American Economic Review Papers and Proceedings*, 91(2), May 2001: 67-72. (Non-refereed)

“Network Effects and Welfare Cultures,” with Marianne Bertrand & Erzo F.P. Luttmer, *Quarterly Journal of Economics*, 115(3), August 2000: 1019-1055.

“Agents With and Without Principals,” with Marianne Bertrand, *American Economic Review Papers and Proceedings*, 90(2), May 2000: 203-208.

“Is there Discretion in Wage Setting?” with Marianne Bertrand, *Rand Journal of Economics*, 30(3), Autumn 1999: 535-554.

“Resource Bounds and Combinations of Consensus Objects,” with Jon M. Kleinberg, *Proceedings of the 12th Annual ACM Symposium on Principles of Distributed Computing*, ACM Press, 1993.

Book Chapters

“Social Policy: Mechanism Experiments and Policy Evaluations,” with William Congdon, Jeffrey Kling and Jens Ludwig, *Handbook of Economic Field Experiments*, 2, 389-426.

“Corruption” with Abhijit Banerjee & Rema Hanna, 2012, *Handbook of Organizational Economics*

“Does Less Market Entry Regulation Generate More Entrepreneurs? Evidence from a Regulatory Reform in Peru,” with Philipp Schnabl in *International Differences in Entrepreneurship*, eds. Josh Lerner & Antoinette Schoar, The University of Chicago Press, 2010: 159-179.

“Savings Policy and Decision Making in Low Income Households,” with Eldar Shafir in *Insufficient Funds: Savings, Assets, Credit and Banking Among Low-Income Households*, eds. Michael Barr & Rebecca Blank, Russell Sage Foundation Press, 2009: pp. 121-145.

“The Impact of Electoral Debate on Public Opinion: An Experimental Investigation of the 2005 New York City Mayoral Election” with Ebonya Washington & Julia R. Azari in *Political Representation* eds. Ian Shapiro, Susan C. Stokes, Elisabeth Jean Wood, & Alexander S. Kirshner, Cambridge University Press, 2009: 324-342.

“The Case for Behaviorally Informed Regulation ,” with Michael S. Barr & Eldar Shafir in *New Perspectives on Regulation* , eds. David Moss & John Cisternino, The Tobin Project, Cambridge, MA, 2009, 25-62.

“Behaviorally Informed Home Mortgage Credit Regulation,’ with Michael S. Barr & Eldar Shafir, in *Borrowing to Live Consumer and Mortgage Credit Revised*, eds. Nicolas P. Retsinas & Eric S. Belsky, Brookings Institution Press, Washington D.C., 2008: 170-203.

“Psychology and Development Economics,” in *Yrjö Jahnsson Foundation 50th Anniversary Conference on Economic Institutions and Behavioral Economics*, eds. Peter Diamond & Hannu Vartiainen, Princeton University Press, Princeton, New Jersey, 2007.

“Better Choices to Reduce Poverty,” in *Understanding Poverty*, eds. Abhijit Vinayak Banerjee, Roland Benabou & Dilip Mookherjee, Oxford University Press, 2006:379-389.

Other Articles (and more general writings)

“A Guide to Solving Social Problems with Machine Learning,” with Ludwig, Jens and Jon Kleinberg. *Harvard Business Review* December 8 (2016).

"Algorithms Need Managers, Too," with Luca, Michael and Jon Kleinberg. *Harvard Business Review* 94 (2016): 96-101.

“We Built Them, But We Don't Understand Them,” with Jon Kleinberg, in *What to Think About Machines That Think: Today's Leading Thinkers on the Age of Machine Intelligence*. (J. Brockman, editor). Harper Perennial 2015.

“Spotting Bubbles on the Rise,” *Harvard Business Review* (2010) Volume: 88, Issue: 3, 41-57.

“Take-up: Why Microfinance Take-up Rates Are Low & Why It Matters,” with Dean Karlan, Jonathan Morduch, Financial Access Initiative framing note, June 2010.

“Psychology and Economics: What it Means for Microfinance,” with Sudha Krishnan, Financial Access Initiative framing note, April 2008.

“An Opt-Out Home Mortgage System,” with Michael S. Barr, & Eldar Shafir, Hamilton Project Discussion Paper 2008-14, The Brookings Institution.

“Behaviorally Informed Financial Services Regulation,” with Michael S. Barr & Eldar Shafir, 2008, New America Foundation White Paper.

“Is Microfinance Too Rigid?” with Dean Karlan, Financial Access Initiative framing note, December 2007.

“Microentrepreneurs and Their Money: Three Anomalies,” with Bindu Ananth & Dean Karlan, Financial Access Initiative framing note, August 2007.

“Market Efficiency Versus Behavioral Finance,” with Bruce Stangle, *Journal of Applied Corporate Finance*, 17(3), 2005: 124-136.