Dean Knox

CONTACT INFORMATION	Operations, Information, and Decisions Department 500 Jon M. Huntsman Hall 3730 Walnut St. Philadelphia, PA 19104	dcknox@upenn.edu www.dcknox.com www.policingresearch.org

EDUCATION

Massachusetts Institute of Technology — Cambridge, MA
Ph.D., Political Science — August 2011–May 2017
Committee: Adam Berinsky, Fotini Christia, Danny Hidalgo, Teppei Yamamoto (chair)

University of Illinois at Urbana–Champaign — Urbana–Champaign, IL
B.S., Nuclear Engineering — August 2004–May 2008

POSITIONS

Wharton School, University of Pennsylvania — Philadelphia, PA
Assistant Professor — July 2020–
Operations, Information, and Decisions Department; Statistics and Data Science (secondary)
Affiliations: Analytics at Wharton; Quattrone Center for the Fair Administration of Justice

Princeton University — Princeton, NJ
Assistant Professor, Department of Politics — July 2018–July 2020
Affiliations: Center for Statistics & Machine Learning; Center for the Study of Democratic Politics

Microsoft Research — New York, NY
Postdoctoral Researcher, Computational Social Science group — July 2017–June 2018

AWARDS, HONORS & FELLOWSHIPS

Science & NOMIS Foundation	Early career award for interdisciplinary research, 2021
Carnegie Corporation of New York	Andrew Carnegie fellow, 2021
American Association for the Advancement of Science	Annual meeting featured paper, 2021
Society for Political Methodology	Gosnell prize for excellence in political methodology, 2020
Society for Political Methodology	John T. Williams dissertation prize, 2016
Society for Political Methodology	Best poster at annual meeting, 2015
National Science Foundation	Graduate research fellowship, 2013–2016
Massachusetts Institute of Technology	Presidential graduate fellowship, 2012–2013
Foreign Policy magazine	Best writing in global political economy, 2010

STATISTICAL CONSULTING

Department of Justice Civil Rights Division	2020–
American Civil Liberties Union	2020–
Philadelphia Police Advisory Commission	2019–
NAACP Legal Defense Fund	2021–2022

JOURNAL ARTICLES

16. Justin Grimmer, Dean Knox, and Brandon Stewart. 2023. "Naïve regression requires weaker assumptions than factor models to adjust for multiple cause confounding." *Journal of Machine Learning Research*, Vol. 24, Iss. 182.

15. Guilherme Duarte, Noam Finkelstein, Dean Knox, Jonathan Mummolo, and Ilya Shpitser. 2023. "An automated approach to causal inference in discrete settings." *Journal of the American Statistical Association* (Theory & Methods).

14. Andrew Reece, Gus Cooney, Peter Bull, Christine Chung, Bryn Dawson, Casey Fitzpatrick, Tamara Glazer, Dean Knox, Alex Liebscher, and Sebastian Marin. 2023. "The CANDOR corpus: Insights from a large multimodal dataset of naturalistic conversation." *Science Advances* (Research Article), Vol. 9, Iss. 13.

Author contributions: "Apart from AR and GC, the remaining authors are listed alphabetically ... **DK** and GC designed the section "Characteristics of good and bad conversationalists," with support from AR; **DK** also performed the analyses and wrote the Supplementary Materials, with support from GC, AR, AL, and PB. **DK**, GC, and AR are responsible for the section "A qualitative glance at the corpus—Topical, relational, and demographic diversity." AL and **DK** created the pipeline to process the raw data into analysis-ready data, with support from AR, SM, and GC ... GC drafted the initial manuscript. AR and **DK** provided edits to the initial manuscript ... GC handled the peer review process, with support from **DK** and AR."

13. Courtney Hilton, Cody Moser, Mila Bertolo, Harry Lee-Rubin, Dorsa Amir, Constance Bainbridge, Jan Simson, Dean Knox, Luke Glowacki, Andrzej Galbarczyk, Grazyna Jasienska, Cody Ross, Mary Beth Neff, Alia Martin, Laura Cirelli, Sandra Trehub, Jinqi Song, Minju Kim, Adena Schachner, Tom Vardy, Quentin Atkinson, Jan Antfolk, Purnima Madhivanan, Anand Siddaiah, Caitlyn Placek, Gul Deniz Salali, Sarai Keestra, Manvir Singh, Scott Collins, John Patton, Camila Scaff, Jonathan Stieglitz, Cristina Moya, Rohan Sagar, Brian Wood, Max Krasnow, Samuel Mehr. 2022. "Acoustic regularities in infant-directed speech and song across cultures." *Nature Human Behavior* (Article), Vol. 6.

    Author contributions: "CBH and SAM led analyses, with additional contributions from CJM, MB, **DK**, and MMK ... **DK** conducted code review."

    Selected coverage: <u>New York Times</u>, <u>The Guardian</u>, <u>NPR</u>

12. Fotini Christia, Elizabeth Dekeyser, and Dean Knox. 2022. "Evidence on the nature of sectarian animosity from a geographically representative survey of Iraqi and Iranian Shia pilgrims." *Nature Human Behavior* (Article), Vol. 6.

11. Dean Knox, Christopher Lucas, and Wendy K. Tam Cho. 2022. "Testing causal theories with learned proxies." *Annual Review of Political Science* (Invited), Vol. 25.

10. Dean Knox. 2021. "Revealing racial bias: Causal inference can make sense of imperfect policing data." *Science* (Essay), Vol. 374, Iss. 6568.

    Selected coverage: <u>AAAS</u>, <u>Science News</u>, <u>Penn Today</u>

9. Dean Knox and Christopher Lucas. 2021. "A dynamic model of speech for the social sciences." *American Political Science Review* (Manuscript), Vol. 115, Iss. 2.

    Recognition: Gosnell Prize for Excellence in Political Methodology, "awarded for the best work in political methodology presented at any political science conference during the preceding year"

8. Bocar Ba, Dean Knox, Jonathan Mummolo, and Roman Rivera. 2021. "The role of officer race and gender in police-civilian interactions in Chicago." *Science* (Research Article), Vol. 371, Iss. 6530.

    Recognition: *Science* print edition cover article; featured paper, AAAS Annual Meeting
    Discussion: Phillip Atiba Goff. 2021. "Asking the right questions about race and policing." *Science* (Perspective), Vol. 371, Iss. 6530.

    Selected coverage: <u>Associated Press</u> (<u>Washington Post</u>, <u>L.A. Times</u>, <u>New York Post</u>, <u>U.S. News</u>, <u>NBC News</u>), <u>Scientific American</u>, <u>Science</u> (news), <u>USA Today</u>, <u>The Guardian</u>, <u>CNN</u>, <u>Science News</u>

7. Dean Knox, Will Lowe, and Jonathan Mummolo. 2020. "Administrative records mask racially biased policing." *American Political Science Review* (Manuscript), Vol. 114, Iss. 3.

    Selected coverage and impact: <u>City of Chicago Office of Inspector General</u>, <u>Scientific American</u>, <u>FiveThirtyEight</u>

6. Fragile Families Challenge Team. 2020. "Measuring the predictability of life outcomes with a scientific mass collaboration." *Proceedings of the National Academy of Sciences* (Research Report), Vol. 117, Iss. 15.

Author contributions: "... MJS, IL, ATK, **DK**, and SM wrote the paper."

5. Dean Knox and Jonathan Mummolo. 2020. "Making inferences about racial disparities in police violence." *Proceedings of the National Academy of Sciences* (Letter), Vol. 117, Iss. 3.

     Related: public statement (endorsed by 871 researchers across 20 disciplines); PNAS editorial statement; retraction of Johnson et al. (2019)

4. Dean Knox and Jonathan Mummolo. 2020. "Toward a general causal framework for the study of racial bias in policing." *Journal of Political Institutions and Political Economy*, Vol. 1 (Invited).

3. Samuel Mehr, Manvir Singh, Dean Knox, Daniel Ketter, Daniel Pickens-Jones, Stephanie Atwood, Christopher Lucas, Nori Jacoby, Alena Egner, Erin Hopkins, Rhea Howard, Joshua Hartshorne, Mariela Jennings, Jan Simson, Constance Bainbridge, Steven Pinker, Timothy O'Donnell, Max Krasnow, and Luke Glowacki. 2019. "Universality and diversity in human song." *Science* (Research Article), Vol. 366, Iss. 6468.

     Author contributions: "... **DK** designed and implemented all analyses, with support from SAM and CL ... SAM, **DK**, and MS designed the static figures and SAM and **DK** created them..."

     Discussion: W. Tecumseh Fitch and Tudor Popescu. 2019. "The world in a song." *Science* (Perspective), Vol. 366, Iss. 6468.

     Selected coverage: Reuters, *Newsweek*, *Wall Street Journal*, *Forbes*, *Nature* (news), *Scientific American*, *Popular Science*, *The Times* of London, *El País*, *Le Monde*

2. Dean Knox, Teppei Yamamoto, Matthew Baum, and Adam Berinsky. 2019. "Design, Identification, and Inference in Patient Preference Trials." *Journal of the American Statistical Association* (Applications and Case Studies), Vol. 114, Iss. 528.

1. Dean Knox. 2012. "Nuclear security and nuclear emergency response in China." *Science & Global Security*, Vol. 20, Iss. 1.

SUBMITTED

17. Bocar Ba, Jacob Kaplan, Dean Knox, Mayya Komisarchik, Rachel Mariman, Jonathan Mummolo, Roman Rivera, and Michelle Torres. "Political Diversity in U.S. Police Agencies."

18. Taylor Damann, Dean Knox, and Christopher Lucas. "A framework for studying causal effects of speech style: Application to U.S. presidential campaigns."

19. Naijia Liu, Matthew Baum, Adam Berinsky, Allison Chaney, Justin de Benedictis-Kessner, Andy Guess, Dean Knox, Christopher Lucas, Rachel Mariman, and Brandon Stewart. "Algorithmic recommendations have limited effects on polarization: A naturalistic experiment on YouTube."

IN PROGRESS

Dean Knox. "`ffgrep`: Scalable approximate string matching."

Max Goplerud, Dean Knox and Christopher Lucas. "The rhetoric of parliamentary debate: Measuring conflictual speech in New Zealand floor speeches."

Dean Knox, Jake Hofman, and Duncan Watts. "The structure and dynamics of diffusive conversations."

Dean Knox. "A new model for analyzing paths: Determinants and effects of U.S. Interstate routes."

Fotini Christia, Dean Knox, and Jaffar Al-Rikabi. "Networks of sectarianism: Experimental evidence on access to services in Baghdad."

Fotini Christia and Dean Knox. "Geographic segregation in Baghdad: Detecting out-group aversion in walking routes."

OTHER WRITING

Dean Knox and Jonathan Mummolo. 2020. "A widely touted study found no evidence of racism in police shootings. It's full of errors." *Washington Post*, 15 July.

Dean Knox and Jonathan Mummolo. 2020. "It took us months to contest a flawed study on police bias. Here's why that's dangerous." *Washington Post*, 28 January.

Fotini Christia, Elizabeth DeKeyser and Dean Knox. 2016. "To Karbala: Surveying religious Shi'a from Iran and Iraq." Translated as "Ila Karbalā: dirāsa mashiyya 'an Shi'iat Iran Wāl-Irāq" *Dirāsāt Fikriyya, Dirasat Fikriya.* Nasr Al-Husaini, Aya Al-Raoof, Hasan Al-Asadi (trans.); Hasan Nadhem, Ali Hakam Saleh (eds.). Kufa University Press. 2018. Beirut, Lebanon.

Christia, Fotini, Elizabeth Dekeyser, and Dean Knox. 2016. "Shiites are participating in the world's largest pilgrimage today. Here is how they view the world." *Monkey Cage (Washington Post)*, 21 November 2016.

Christia, Fotini, Elizabeth Dekeyser, and Dean Knox. 2016. "Mapping Shiite opinion: Insights from the Arba'een pilgrimage." *Foreign Affairs*, 24 October 2016.

Jakobson, Linda and Dean Knox. 2010. "New foreign policy actors in China." Stockholm: SIPRI. Translated as "Chuugoku no atarashii taigai seisaku: Darega donoyouni kettei shite irunoka." 2011. Tokyo: Iwanami Shoten.

Jakobson, Linda, Paul Holtom, Dean Knox, and Peng Jingchao. 2011. "China's energy and security relations with Russia." Stockholm: SIPRI.

Book Chapters   Fotini Christia, Elizabeth Dekeyser, and Dean Knox. Forthcoming. "Piety and religious communalism among Shiites in Iraq and Iran." *The Oxford Handbook of Politics in Muslim Societies*, eds. Melani Cammett and Pauline Jones. Oxford University Press.

Dean Knox. 2012. "The Comprehensive Test Ban Treaty: Foundations, context, and outlook." In *Handbook of Nuclear Proliferation*, ed. Harsh V. Pant. Routledge.

Grants   Claire Kelling, Dean Knox, Gregory Lanzalotto, and Tarak Shah. 2023. "National Institute of Statistical Sciences forum on police use of force." National Science Foundation. $20,000. Principal investigator.

Guilherme Duarte, Haosen Ge, Jacob Kaplan, Dean Knox, Gregory Lanzalotto, Rachel Mariman, and Jonathan Mummolo. 2022. "Statistical methodology for measuring racial bias in police traffic enforcement with incomplete information." Arnold Ventures. $1,205,813. Principal investigator.

Dean Knox. 2021. "Eliminating statistical barriers to evidence-based policing reforms." Andrew Carnegie Fellowship. $200,000. Principal investigator.

Christopher Lucas and Dean Knox. 2021. "Computational methods for speech analysis." National Science Foundation, Division of Social and Economic Sciences (Methodology, Measurement, and Statistics). $249,318. Principal investigator.

Dean Knox, Rachel Mariman, Jonathan Mummolo, Olga Russakovsky, and Brandon Stewart. 2021. "Computational analysis of police body-worn camera footage." Microsoft. $200,000. Principal investigator.

Dean Knox, Rachel Mariman, Jonathan Mummolo, Olga Russakovsky, and Brandon Stewart. 2021. "Computational analysis of police body-worn camera footage." Princeton Data-driven Social Science Initiative. $74,525. Principal investigator.

Guilherme Duarte, Dean Knox, and Jonathan Mummolo. 2021. "An automated solution to causal inference in discrete settings." Analytics at Wharton, The Wharton School of the University of Pennsylvania. $22,575. Principal investigator.

Dean Knox, Rachel Mariman, Jonathan Mummolo, Olga Russakovsky, and Brandon Stewart. 2021. "Making police-civilian interactions safer." Microsoft Azure Credits for Racial Equity Research. $75,000. Principal investigator.

Dean Knox, Rachel Mariman, Jonathan Mummolo, and María Aránzazu Rodríguez. 2020. "Reforming police misconduct investigations." Analytics at Wharton, The Wharton School of the University of Pennsylvania. $31,000. Principal investigator.

Naijia Liu, Matt Baum, Adam Berinsky, Justin de Benedictis-Kessner, Andy Guess, Dean Knox, Christopher Lucas, and Brandon Stewart. 2020. "Do online video recommendation algorithms increase affective polarization?" Facebook Foundational Integrity Research: Misinformation and Polarization Research Award. $100,000. Principal investigator.

Dean Knox, Jonathan Mummolo, Olga Russakovsky, and Brandon Stewart. 2020. "Making Police-Citizen Interaction Safer: Large-Scale Computational Analysis of Visual Law Enforcement Records." School of Engineering and Applied Science Innovation Research Grant, Princeton University. $150,000. Principal investigator.

Dean Knox. 2019. "A toolkit for the quantitative analysis of audiovisual speech data." Schmidt DataX Research Award. $100,000. Principal investigator.

Dean Knox and Andy Guess. 2019. "Do video personalization algorithms polarize users?" Innovative Ideas in the Social Sciences, Dean for Research, Princeton University. $50,000. Principal investigator.

TEACHING	Wharton STAT/OIDD 4770/7770: Introduction to Data Science in Python. Fall 2022.
	Princeton POL574: Statistical Machine Learning. Spring 2019, Spring 2020.
	Princeton POL571: Probability. Fall 2018, Fall 2019.
	Institute for Political Methodology summer camp. Summer 2015. Teaching assistant.
	MIT 17.806: Machine Learning. Spring 2015. Teaching assistant.
	MIT 17.802: Causal inference. Spring 2014. Teaching assistant.

INVITED TALKS	École Polytechnique Fédérale de Lausanne	2023
	ETH Zurich	2023
	University of Maryland	2023
	Harvard University	2023
	New York University	2022
	University of California, Los Angeles	2022
	University of Washington	2022
	Stanford University	2022
	University of Michigan	2021
	Microsoft Research	2021
	National Institute of Statistical Sciences	2021
	Yale University	2021
	Facebook	2021
	New York University	2021
	Harvard University	2021
	Massachusetts Institute of Technology	2020
	Stanford University	2020
	University of California, Berkeley	2020
	American Civil Liberties Union	2020
	Japanese Society for Quantitative Political Science	2020
	Wharton School, University of Pennsylvania	2019
	University of California, San Diego	2019
	New York University	2017
	University of Southern California	2017
	Brown University	2016
	Duke University	2016
	Emory University	2016
	Michigan University	2016

New York University, Shanghai	2016
Pennsylvania State University	2016
Princeton University	2016
Rochester University	2016
University of California, San Diego	2016

CONFERENCE PRESENTATIONS

"Imperfect data and optimal allocation of data-collection resources"
Society of Political Methodology annual meeting. (Stanford, 2023)
American Causal Inference Conference. (Austin, 2023)
Workshop on AI and Analytics for Social Good. (University of Maryland, 2023)

"Learning from imperfect identification strategies: automating causal inference when classic assumptions fail"
Asian Political Methodology Conference. (Singapore, 2023)
Society for Political Methodology annual meeting. (St. Louis, 2022)

"An automated approach to causal inference in discrete settings"
American Causal Inference Conference. (Berkeley, 2022) Latin American Political Methods Meeting. (Mexico City, 2021) Society for Political Methodology annual meeting. (Online, 2021)

"Quantifying discrimination in contaminated data with automatic causal bounds"
Federal Reserve Banks of Cleveland and Philadelphia, Conference on Artificial Intelligence in Consumer Finance: Defining and Insuring Fairness. (Online, 2021)

"More than words: How political rhetoric shapes voters' affect and evaluation"
Japanese Society for Quantitative Political Science winter meeting. (Waseda, 2020)
Society for Political Methodology annual meeting. (Online, 2021)

"Do online video recommendation algorithms increase polarization?"
Facebook Responsible Recommender Systems Workshop. (Online, 2021)
American Political Science Association annual meeting. (Online, 2020)
Society for Political Methodology annual meeting. (Online, 2021)

"Estimating racial bias with contaminated data"
Georgetown Law, Howard University, and The Lab @ DC Reimagining Police Stops Workshop (Online, 2020)

"The structure and dynamics of diffusive conversations"
American Political Science Association annual meeting. (Washington, D.C., 2019)

"The bias is built in: How administrative records mask racially biased policing"
Society for Political Methodology annual meeting. (MIT, 2019)
Asian Political Methodology Conference. (Doshisha, 2019)

"A dynamic model of speech for the social sciences"
Society for Political Methodology annual meeting. (BYU, 2018)
Asian Political Methodology Conference. (SNU, 2018)

"The nature and origins of sectarian animosity"
Association for Analytical Learning about Islam and Muslim Societies conference (Princeton, 2018)

"The rhetoric of parliamentary debate: Measuring conflictual speech in New Zealand floor speeches"
Midwest Political Science Association annual meeting. (Chicago, 2019)
American Political Science Association annual meeting. (Philadelpha, 2016)

"A model for path data"
Society for Political Methodology, annual meeting. (Houston, 2016)
American Political Science Association annual meeting. (San Francisco, 2015)
New Faces in Political Methodology conference. (Penn State, 2015)

"Networks of sectarianism: Experimental evidence on access to services in Iraq."
Multidisciplinary University Research Initiative (MURI) meeting. (UPenn, 2016)
Midwest Political Science Association annual meeting. (Chicago, 2016) Association for Analytical
Learning about Islam and Muslim Societies conference (Stanford, 2016)

"Words don't fit the picture: Using computer vision to measure speaker sentiment in videos."
Midwest Political Science Association annual meeting. (Chicago, 2016)
NYU-CESS Experimental Political Science conference. (NYU, 2016)

"Design, identification, and inference in patient preference trials."
Society for Political Methodology, annual meeting. (UGA, 2014)
Poster presentation. Atlantic Causal Inference Conference. (UPenn, 2015)

"Identifying peer effects under homophily with an instrumental variable: Patronage and promotions in the Chinese bureaucracy"
Poster presentation. Society for Political Methodology, annual meeting. (UGA, 2014)
Midwest Political Science Association, annual meeting. (Chicago, IL, 2013)

"Markov chain simulation of policy diffusion."
Poster presentation. Midwest Political Science Association, annual meeting. (Chicago, IL, 2012)

SERVICE	National Institute of Statistical Science, Police Use of Force Forum	Co-organizer, 2023
	Society of Political Methodology	Annual Meeting Program Committee, 2023
	Wharton Decision Processes Seminar	Co-organizer, 2022–2023
	UPenn Computational and Data-Dependent Research Working Group	Core Faculty, 2022–2023
	Wharton Undergraduate Data Analytics Club	Faculty Advisor, 2020
	Princeton Fellowship of Woodrow Wilson Scholars	Acting Director, 2019–2020
	Princeton Quantitative Social Science Colloquium	Faculty Co-coordinator, 2018–2020
	MIT Political Methodology Research Seminar	Student Coordinator, 2015
	MIT Political Methodology Workshop Series	Organizer, 2014
	MIT Political Economy Breakfast Series	Student Co-coordinator, 2014
	MIT Political Science Graduate Student Research Design Group	Co-organizer, 2013–2014
	Harvard-MIT-BU Chinese Politics Research Workshop	Co-organizer, 2012–2013

ADVISING   Naijia Liu (2022 Ph.D., Department of Politics, Princeton University).
Assistant Professor, Department of Government, Harvard University.

REFEREE SERVICE   *Science, Proceedings of the National Academy of Sciences (PNAS), PNAS Nexus, Nature Human Behavior, Science Advances, Journal of the American Statistical Association, Annals of Applied Statistics, Journal of the Royal Statistical Society: Series C, Journal of Causal Inference, American Political Science Review, American Journal of Political Science, Journal of Politics, Political Analysis, Political Science Research and Methods, Economics & Politics, Sociological Methods and Research, Journal of Quantitative Criminology, PLOS One,* National Science Foundation (Methodology, Measurement, and Statistics)