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# David Steinsaltz

## Personal Information

Date of birth 25 October, 1966  
Nationality U.S.

## Education

1983–1987 **Yale University**, New Haven, Connecticut, B.A./M.A. in mathematics.  
*summa cum laude.*

1987–1991 **Harvard University**, Cambridge, Massachusetts.  
M.Sc. in mathematics; adviser: Joe Harris.

1994–1996 **Harvard University**, Cambridge, Massachusetts.  
Ph.D. in mathematics; adviser: Persi Diaconis.

## Work

### University appointments

2014– **Associate Professor**, *University of Oxford*, Department of Statistics.  
Oxford, UK

2007–2014 **University Lecturer**, *University of Oxford*, Department of Statistics.  
Oxford, UK

2005–2007 **Associate Professor**, *Queen's University*, Department of Mathematics and Statistics.  
Kingston, Ontario

2001–2005 **Researcher**, *University of California, Berkeley*.  
Department of Demography  
Berkeley, California

1999–2001 **Jerzy Neyman Visiting Assistant Professor, University of California, Berkeley, Department of Statistics.**  
Berkeley, California

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## Grants

### As Principal Investigator or co-PI

- 1/2016–12/2018 **SOCGEN: Combining Social Science and Molecular Genetic Research to Examine Inequality and the Life Course, £485,000**  
(~ 1/3 in statistics).  
Collaborative ESRC grant as co-PI with PI Melinda Mills and co-PI Nicola Barban (sociology).
- 7/2009 – 6/2012 **Trajectories of Senescence through Markov Models, £204,000.**  
Funded through *New Dynamics of Ageing* scheme, an inter-council programme led by ESRC.
- 4/2006–3/2011 **Stochastic and Statistical Models in the Biodemography of Ageing, C\$106,000.**  
Discovery Grant from the Canadian National Science and Engineering Research Council. Cancelled October 2007 because of departure from Canada.
- 9/2005–8/2006 **Evolutionary Theories of Aging and Social Support, C\$8,640.**  
Queen's University Advisory Research Committee grant

### As named collaborator

- 2/2014–1/2016 **Vitality theory for biodemography.**  
US National Institute on Aging grant, PI Prof. James J. Anderson (U Washington)
- 2008–2010 **The demographic trajectory of the sex ratio in human pregnancy.**  
US National Institute of Child Health & Human Development, PI Dr Steven H. Orzack (Fresh Pond Institute)

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## Teaching

### University lectures given

- 2010,2011,2013–2016 **Introduction to Probability, Statistics, R.**  
Taught introductory modules for students in the Doctoral Training Centres interfacing between Life Sciences and Mathematical Sciences
- 2013–2016 **Statistics M6a, Modern Survival Analysis.**  
A new course, continuing on from Statistics BS3b, introducing more advanced methods in survival analysis.

2008–2010	<b>Statistics BS3b</b> , <i>Statistical lifetime Models</i> . Basic life-table concepts and methods, and introduction to survival analysis.
2009–2012	<b>Quantitative Methods for first-year psychology and human sciences students</b> .
2011, 2012	<b>Part A (2nd year) probability</b> .

I also have five years of full-time lecturing experience (at the assistant or associate professor level) at U.C. Berkeley and Queen's University, in addition to my experience lecturing as a graduate student.

### Tutorials

Since arriving in Oxford I have taught approximately 144 weighted tutorial hours for Worcester College every year, to our approximately 15 students in each year group. These are small-group sessions, usually two or three students and lasting for 30 to 60 minutes, where exercises and general questions about the material are discussed. In the first four years I taught mainly calculus, introduction to manifolds, dynamics, and second-year probability and statistics. Since then, calculus and dynamics have been replaced by first-year probability and statistics, plus graph theory.

### Projects

I have supervised two Part C (fourth-year undergraduate) projects and two MSc projects in most years, totalling about 15 of each since 2008.

### Research students

I have three DPhil students submitting their dissertations in October 2017, and one DPhil student (joint with G. Roberts, University of Warwick) beginning his third year.

Dirk Bester	<b>DPhil</b> , <i>University of Oxford</i> , 2015.
Qhelile Nyathi	<b>MSc by research</b> , <i>University of Oxford</i> , 2014, Joint with Karlijn Morsink (economics).
Karla Fox	<b>PhD</b> , <i>Queen's University (Ontario)</i> , 2011.
Andrey Pavlov	<b>PhD</b> , <i>Queen's University (Ontario)</i> , 2010.

## Training

Workshop in Oxford Computing Service “HPC: Introduction to the Advanced Research Computing service” (24/1/2017).

Workshop in Oxford Researcher Training “Introduction to public engagement with research” (18/10/2016).

Workshop in Oxford Researcher Training on “Narrative and Storytelling Skills” (9/12/2015).

Workshops at the Oxford Learning Institute on “Supervising DPhil Students” (11/3/2015) and “Examining DPhil Students” (12/3/2015).

Workshops on “Designing Lecture Courses” and “Assessment” in 2006 at the Queen’s University Centre for Teaching and Learning.

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## Administration and other service

### Statistics Department, University of Oxford

2015–16	<b>Chair of Good Practice Steering Group.</b>
2014–16	<b>Examiner for Part C,</b> ( <i>statistics chair 2015–16</i> ).
2009–12	<b>Examiner for Part A,</b> ( <i>statistics chair 2010–12</i> ).
2008–11	<b>Academic committee.</b>
2010–12, 2015–	<b>Department Librarian.</b>
2008–9, 2013–15	<b>New Home Committee.</b>
2008–11	<b>Graduate studies Committee.</b>

### Worcester College

2014–	<b>Finance Committee.</b>
2013–	<b>Investment Subcommittee.</b>
2013–	<b>Library Committee.</b>
2010–2014	<b>Domus Committee.</b>
2008–2012	<b>Computing Committee.</b>
2007–	<b>Governing Body.</b>

### External

2011–	<b>Member of ESRC Peer Review College.</b>
2015	<b>External examiner for doctoral dissertations: University of Liverpool, University of Kaiserslautern.</b>

In the past five years I have served as referee for *Annals of Probability*, *Annals of Applied Probability*, *Annales de l'Institut Henri Poincaré*, *Mathematical Biosciences*, *Journal of Theoretical Biology*, *Electronic Communications in Probability*, *Bernoulli*, *Stochastic Processes and Applications*, *Journal of Statistical Physics*, *Nature*, *Science*, *Evolutionary Ecology Research*, *The American Naturalist*, *Demographic Research*, and *Linear Algebra and Applications*; for Springer UK (textbook); and as a reviewer for *Math Reviews*.

## Outreach

In addition to my popular-science writing — see below under *Other Publications* — I have participated in events to inform young people about science. On 7 September, 2015 I gave a talk on sex ratios to year-12 pupils visiting oxford for a "Statistics Taster Day". On 20 September, 2017 I participated in the launch event of Oxplore (<https://explore.org/>), an Oxford University initiative to introduce young people to "big ideas". For the launch event they brought together scholars from across the university to discuss with the students different approaches to the question "Would you want to live forever?" I presented a statistical/demographic approach.

## Languages

English	<b>fluent</b>	<i>mother tongue</i>
German	<b>fluent</b>	<i>oral and written</i>
French	<b>good</b>	<i>oral and written</i>
Dutch	<b>fair</b>	<i>oral and written</i>
Spanish	<b>fair</b>	<i>oral and written</i>
Hebrew	<b>fair</b>	<i>oral and written</i>

## Computer Skills

languages	C++, Python	statistical	R
text	L <sup>A</sup> T <sub>E</sub> X, MS Word	mathematical	Maple, Mathematica, MATLAB

## Refereed Publications

- [1] Graeme T Spence, David Steinsaltz, and Thomas R Fanshawe. "A Bayesian approach to sequential meta-analysis". In: *Statistics in Medicine* (2016).
- [2] Jonathan D Tammam, David Steinsaltz, DW Bester, Turid Semb-Andenaes, and John F Stein. "A randomised double-blind placebo-controlled trial investigating the behavioural effects of vitamin, mineral and n-3 fatty acid supplementation in typically developing adolescent schoolchildren". In: *British Journal of Nutrition* 115.02 (2016), pp. 361–373.
- [3] RA Catalano, RJ Currier, and David Steinsaltz. "Hormonal evidence of selection in utero revisited". In: *American Journal of Human Biology* 27.3 (2015), pp. 426–431.
- [4] Steven Hecht Orzack, J William Stubblefield, Viatcheslav R Akmaev, Pere Colls, Santiago Munné, Thomas Scholl, David Steinsaltz, and James E Zuckerman. "The human sex ratio from conception to birth". In: *Proceedings of the National Academy of Sciences* 112.16 (2015), E2102–E2111.
- [5] Daniel Cownden and David Steinsaltz. "Effects of Competition in a Secretary Problem". In: *Operations Research* 62.1 (2014), pp. 104–113.
- [6] Kenneth W Wachter, David Steinsaltz, and Steven N Evans. "Evolutionary shaping of demographic schedules". In: *Proceedings of the National Academy of Sciences* 111.Supplement 3 (2014), pp. 10846–10853.
- [7] Steven Neil Evans, David Steinsaltz, and Kenneth W Wachter. *A mutation-selection model with recombination for general genotypes*. Vol. 222. *Memoirs of the American Mathematical Society*. AMS, 2013.
- [8] Kenneth W Wachter, Steven N Evans, and David Steinsaltz. "The age-specific force of natural selection and biodemographic walls of death". In: *Proceedings of the National Academy of Sciences* 110.25 (2013), pp. 10141–10146.
- [9] Martin Kolb and David Steinsaltz. "Quasilimiting behavior for one-dimensional diffusions with killing". In: *The Annals of Probability* 40.1 (2012), pp. 162–212.
- [10] David Steinsaltz, Gurjinder Mohan, and Martin Kolb. "Markov models of aging: theory and practice". In: *Experimental Gerontology* 47.10 (2012), pp. 792–802.
- [11] David Steinsaltz and Steven Hecht Orzack. "Statistical methods for paleodemography on fossil assemblages having small numbers of specimens: an investigation of dinosaur survival rates". In: *Paleobiology* 37.1 (2011), pp. 113–125.
- [12] David Steinsaltz, Shripad Tuljapurkar, and Carol Horvitz. "Derivatives of the stochastic growth rate". In: *Theoretical Population Biology* 80.1 (2011), pp. 1–15.
- [13] Kenneth W. Wachter, David Steinsaltz, and Steven N. Evans. "Vital rates from the action of mutation accumulation". In: *Journal of Population Ageing* 2.1–2 (2009), pp. 5–22.

- [14] Kelvin Yen, David Steinsaltz, and Charles Vernon Mobbs. "Validated analysis of mortality rates demonstrates distinct genetic mechanisms that influence lifespan". In: *Experimental Gerontology* 43.12 (2008), pp. 1044–1051.
- [15] Steven N. Evans and David Steinsaltz. "Damage segregation at fissioning may increase growth rates: A superprocess model". In: *Theoretical Population Biology* 71.4 (2007), pp. 473–90.
- [16] David Steinsaltz and Steven N. Evans. "Quasistationary distributions for one-dimensional diffusions with killing". In: *Transactions of the American Mathematical Society* 359.3 (Mar. 2007), pp. 1285–1324.
- [17] David Steinsaltz and Lloyd Goldwasser. "Ageing and Total Quality Management: Extending the reliability metaphor for longevity". In: *Evolutionary Ecology Research* 8 (Dec. 2006), pp. 1445–59.
- [18] David Steinsaltz and Kenneth W. Wachter. "Understanding mortality rate deceleration and heterogeneity". In: *Mathematical Population Studies* 13.1 (2006), pp. 19–37.
- [19] David Steinsaltz. "Reevaluating a test of the heterogeneity explanation for mortality plateaus". In: *Exp. Geron.* 40 (2005), pp. 101–13.
- [20] David Steinsaltz, Steven N. Evans, and Kenneth W. Wachter. "A generalized model of mutation-selection balance with applications to aging". In: *Adv. Appl. Math.* 35.1 (2005), pp. 16–33.
- [21] David Steinsaltz and Steven N. Evans. "Markov mortality models: Implications of quasistationarity and varying initial conditions". In: *Theoretical Population Biology* 65.4 (June 2004), pp. 319–37.
- [22] Steven N. Evans and David Steinsaltz. "Estimating some parameters of NK fitness landscapes". In: *The Annals of Applied Probability* 12.4 (2002), pp. 1299–1321.
- [23] Michael Scheutzow and David Steinsaltz. "Chasing balls through martingale fields". In: *Annals of Probability* 30.4 (2002), pp. 2046–80.
- [24] David Steinsaltz. "The Politics of French Language in Shakespeare's History Plays". In: *SEL Studies in English Literature 1500-1900* 42.2 (2002), pp. 317–334.
- [25] David Steinsaltz. "Convergence of moments in a Markov-chain central limit theorem". In: *Indagationes Mathematicae* 12.4 (2001), pp. 533–55.
- [26] David Steinsaltz. "Random logistic maps and Lyapunov exponents". In: *Indagationes Mathematicae* 12.4 (2001), pp. 557–84.
- [27] Michael Cranston, Michael Scheutzow, and David Steinsaltz. "Linear bounds for stochastic dispersion". In: *The Annals of Probability* 28.4 (2000), pp. 1852–69.
- [28] Michael Cranston, Michael Scheutzow, and David Steinsaltz. "Linear expansion of isotropic Brownian flows". In: *Electronic Communications in Probability* 4.12 (1999), pp. 91–101.
- [29] David Steinsaltz. "Locally contractive iterated function systems". In: *The Annals of Probability* (1999), pp. 1952–1979.

- [30] David Steinsaltz. "Fluctuation bounds for sock-sorting and other stochastic processes". In: *Discrete Applied Mathematics* 86.1 (1998), pp. 109–123.
- [31] David Steinsaltz. "Zeno's walk: a random walk with refinements". In: *Probability Theory and Related Fields* 107 (1997), pp. 99–121.
- [32] David Steinsaltz. "Kafka's Geometry". In: *Seminar: A Journal of Germanic Studies* 28.4 (1992), pp. 334–350.
- [33] David Steinsaltz. "Instability of baroclinic waves with bottom slope". In: *Journal of Physical Oceanography* 17.12 (1987), pp. 2343–2350.

## Other Publications

- [1] David Steinsaltz. "How to build a probability microscope". In: *Nautilus* 44.4 (2017). URL: <http://nautil.us/issue/44/luck/-how-to-build-a-probability-microscope>.
- [2] David Steinsaltz. "Profile: Steve Evans". In: *IMS Bulletin* 46.1 (Jan. 2017), pp. 3–4. URL: <http://bulletin.imstat.org/2016/12/profile-steve-evans/>.
- [3] David Steinsaltz. "How to Fake It So No One Notices". In: *Nautilus* 42 (Nov. 2016). URL: <http://nautil.us/issue/42/fakes/how-to-fake-so-no-one-notices>.
- [4] David Steinsaltz. "Will 90 become the new 60?" In: *Nautilus* 36 (May 2016). URL: <http://nautil.us/issue/36/aging/will-90-become-the-new-60>.
- [5] David Steinsaltz, J. William Stubblefield, and James E. Zuckerman. "The gender mystery starts nine months before birth". In: *Nautilus* 27 (Aug. 2015).
- [6] Lynne S Cox, Penelope A Mason, Mark C Bagley, David Steinsaltz, Aneta Stefanovska, Alan Bernjak, Peter VE McClintock, Anna C Phillips, Jane Upton, Joanna E Latimer, et al. "Understanding ageing: biological and social perspectives". In: *The New Science of Ageing*. Ed. by Alan Walker. Policy Press, 2014, pp. 25–76.
- [7] David Steinsaltz. "The value of nothing: Review of *The Quants* by Scott Patterson". In: *Notices of the American Mathematical Society* 58.5 (2011), pp. 699–704.
- [8] David Steinsaltz. "Stochastic models of aging and mortality". In: *Proceedings of the Workshop on Dynamical Stochastic Modeling in Biology*. Ed. by Marianne Hübner and Michael Sørensen. 2004, pp. 100–5.
- [9] David Steinsaltz. "Galileo and the Copernican controversy". In: *Renaissance* 8.6 (2003), pp. 55–8.
- [10] David Steinsaltz. "From conquest to expulsion: The Jews of medieval England". In: *Renaissance* 4.1 (1999), pp. 37–43.

## Publications Submitted or in Preparation

- [1] Ryan Christ, Chris Holmes, and David Steinsaltz. "Scaleable screening for quadratic forms". In preparation. Aug. 2017.



- [2] Jan Cosgrave, Jessica Philips, Ross Haines, David Steinsaltz, and Katharina Wulff. "A Novel Analysis of Nocturnal Heart Rate and Heart Rate Variability in Insomnia Sufferers and Good Sleepers: Using multiple scale entropy to identify reduced physiological complexity in nocturnal heart rate in insomnia sufferers". In preparation. Sept. 2017.
- [3] David Steinsaltz, DW Bester, Ben Seligman, and David H. Rehkopf. "Very short term Blood Pressure Variability and long-term Mortality: evidence from the Third National Health and Nutrition Examination Study." Manuscript in preparation. 2017.
- [4] Andi Wang, Gareth O. Roberts, Martin Kolb, and David Steinsaltz. "Theoretical properties of quasistationary Monte Carlo methods". Submitted Annals of Applied Probability, arXiv:1707.08036. July 2017.
- [5] Fan Wang and David Steinsaltz. "Transfer operators for Markov matrix products". In preparation. Sept. 2017.
- [6] David Steinsaltz, Andrew Dahl, and Kenneth W Wachter. "Statistical properties of simple random-effects models for genetic heritability". Under revision for Electronic Journal of Statistics. bioRxiv: 087304. Nov. 2016.
- [7] David Steinsaltz and Shripad Tuljapurkar. "Stochastic growth rates for life histories with rare migration or diapause". arXiv:1505.00116. 2016.