

SALLIE ANN KELLER

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Biocomplexity Institute and Initiative
Professor of Public Health Sciences
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SUMMARY

Dr. Sallie Ann Keller is an endowed Distinguished Professor in Biocomplexity, Director of the Social and Decision Analytics Division within the Biocomplexity Institute and Initiative at University of Virginia and Professor of Public Health Sciences. Her areas of expertise are social and decision informatics, statistical underpinnings of data science, and data access and confidentiality. Dr. Keller's is a leading voice in creating the science of *all* data and advancing this research across disciplines to benefit society.

Dr. Keller's prior positions include Professor of Statistics and Director of the Social and Decision Analytics Laboratory within the Biocomplexity Institute of Virginia Tech; Academic Vice-President and Provost at University of Waterloo; Director of the Institute for Defense Analyses Science and Technology Policy Institute; the William and Stephanie Sick Dean of Engineering at Rice University; Head of the Statistical Sciences group at Los Alamos National Laboratory; Professor of Statistics at Kansas State University; and Statistics Program Director at the National Science Foundation.

Dr. Keller is a National Associate of the National Academies of Science, Engineering and Medicine and has served as a member of the National Academy of Sciences Board on Mathematical Sciences and Their Applications, the Committee on National Statistics, and has chaired the Committee on Applied and Theoretical Statistics. She is fellow of the American Association for the Advancement of Science, elected member of the International Statistics Institute, fellow and past president of the American Statistical Association, and member of the JASON advisory group.

My Contributions to Science, Engineering, and Training of Students

Contributions to Interdisciplinary Research. A hallmark of my career has been to create massively interdisciplinary programs for statisticians, social scientists, physical scientists, life scientists, and engineers. I created deep collaborations with social and behavioral scientists through the establishment of the survey research center at **Kansas State University**. As statistical sciences group leader at **Los Alamos National Laboratory**, I developed a world-class statistics research group energizing new collaborations with physical scientists and engineers. I added a unique feature to the group, a team of young social and behavioral scientists recruited from top programs to create ethnographic methods that would accelerate interdisciplinary research and formalize the development of prior information for Bayesian calculations. As **Dean of Engineering at Rice University**, I spearheaded the creation of the Oshman Engineering Design Kitchen (OEDK) that has revolutionized engineering education at Rice by providing a collaborative hub where engineering students at all levels tackle real-world design challenges. The OEDK goal is to provide resources including instruments and technicians to lower the barriers to solving real-world problems. As the **Science and Technology Policy Institute Director**, I established deeper connections and insight into the science policy issues facing the Office of Science and Technology Policy (OSTP), the President's Council of Advisors on Science and Technology (PCAST), National Science Foundation, the National Science Board, and science agencies, especially the National Institutes of Health and the National Institute of Standards and Technology. My efforts led to a doubling of the institute's tasking and an expansion of the sponsor base, with the goal to increase STPI's knowledge base to better serve OSTP.

Contributions to Information Integration Technology. My research has focused on developing and connecting new quantitative methods for scientists and engineers facing the toughest problems of assessing materials, parts, components, systems, and systems of systems. **As Leader of the Statistical Sciences Group at Los Alamos National Laboratory,** I created a multi-year research program to develop **“Information Integration Technology”(IIT).** This program invented new methods to combine and model data from diverse sources (e.g., historical test data, surrogate material tests, sub component tests, computer models, and expert judgment). Most reliability testing starts from the premise that you design an experiment and collect specific data to prove reliability. The IIT approach allowed us to take on the difficult task of working the problem in reverse: given the data we have, how do we build a valid model that accurately assesses the system? The research required the innovative use of computer experiments. **It is a flexible approach that incorporates QMU (quantification of margins and uncertainties) and is now an ingrained part of the methodology to conduct reliability analysis. The IIT approach has been adopted by nuclear labs, the military, large manufacturing companies, and is a primary method used by my current research group to integrate survey, administrative, and unstructured data to address social science issues and large scale industrial problems in manufacturing companies.**

Contributions to Confidentiality and Camouflage of Data: The traditional statistical approach to ensure confidentiality had been to release aggregate data, but that approach limits the types of research where individual records would be required. I have developed strategies for measuring the risk of releasing individual record data from federal agencies that comply with the federal regulations that no individually identifiable data be released. My approach blends computing security solutions with statistical tools to deter the types of logical inferences a data requester might make and thus compromise the confidentiality of the data. This provides a decision theoretic framework the problem of inference often called intrusion detection—if someone is given the requested information, could she infer information that is confidential? The problem space includes previous knowledge the requester has, other contacts who might also provide additional information that could cause a breach of confidentiality, and future knowledge coming from events in that requester’s environment.

Contributions to Enhancing the Training of Students. I am an active mentor with a special focus on junior scholars engaged in interdisciplinary team science. At the **IDA Science and Technology Policy Institute,** I created a Fellows program for recent undergraduate university graduates. This successful program prepares fellows for graduate school by having them conduct team-based research on policy issues for federal science and technology agencies. At **Virginia Tech,** I developed and spearheaded the **Data Science for the Public Good program,** which became a center piece of the newly framed Virginia Tech Honors program. Now at the **University of Virginia,** I am **expanding the Data Science for the Public Good program** through partnerships with Oregon State University, Iowa State University, and Virginia Tech. This intensive summer program brings together undergraduate, graduate, and post-doctoral students from multiple disciplines to find solutions to some of the most pressing social issues of our time. The DSPG program provides students with expert data science training while helping policymakers in the local, state, and federal government to improve quality of life in their communities. In the same spirit, I have created a program to **train post-doctoral fellows** to use diverse sources of data, both traditional ones such as surveys, and non-traditional ones, such as administrative data and social media, working in a team science environment on real problems.

Contributions to the Science of All Data. My current research focuses on the development of statistical methods that integrate traditional structured survey data and other statistically designed data collections with new sources of structured (administrative) and unstructured digital data to study social science issues quantitatively at scale. Working with massive data sets, I lead research that builds social and behavioral sciences models that characterize where we live, work, learn, and play. Through this research approach, with applications to local governments, army performance, industry, and official statistics, we identify data and methodological gaps, laying the foundation for creating the Science of *All Data*. I am frequently invited to speak at a variety of data science conferences, including the Data Science Leadership Conference, the NSF-Sloan Foundation Land Grant University Conference, National Academies of Sciences, Engineering, and Medicine, and the editorial board of the new *Harvard Data Science Review*.

EDUCATION

Ph.D. in Statistics, Iowa State University of Science and Technology
M.S. in Mathematics, University of South Florida
B.S. in Mathematics, University of South Florida

EMPLOYMENT

Director, Social and Decision Analytics Division, Biocomplexity Institute and Initiative, University of Virginia, 2018-present
Professor of Public Health Sciences (tenure pending), School of Medicine, University of Virginia, 2018-present
Director and Professor of Statistics, Social and Decision Analytics Laboratory, Biocomplexity Institute of Virginia Tech University, 2013-present
Professor of Statistics, University of Waterloo, 2012-2013
Vice President Academic and Provost, University of Waterloo, 2012-2013
Director, IDA Science and Technology Policy Institute, Washington, D.C., 2010-2012
Adjunct Professor of Statistics, Department of Statistics, Rice University, 2010-2015
William and Stephanie Sick Dean of Engineering, George R. Brown School of Engineering, Rice University, 2005–2010
Professor of Statistics, Department of Statistics, Rice University, 2005–2010
Group Leader, Statistical Sciences, Los Alamos National Laboratory, 1998–2005
Professor and Director of Graduate Studies, Department of Statistics, Kansas State University, 1996–1998
Program Director, Statistics and Probability, Division of Mathematical Sciences, National Science Foundation, 1994–1996
Associate Professor, Department of Statistics, Kansas State University, 1989–1996
Director of Statistical Design and Analysis Unit, Institute of Social and Behavioral Research, Kansas State University, 1990–1998
Adjunct Professor, Department of Computer and Information Sciences, Kansas State University, 1989–1995
Assistant Professor, Department of Statistics, Kansas State University, 1985–1989
Assistant Professor, Department of Mathematics, University of North Carolina at Greensboro, 1983–1985
Research Assistant, Statistical Laboratory, Iowa State University, 1979–1983
Teaching Assistant, Department of Mathematics, University of South Florida, 1978–1979

PROFESSIONAL MEMBERSHIPS

American Statistical Association (ASA)
Institute of Mathematical Statistics (IMS)
International Statistical Institute (ISI)
American Association for the Advancement of Science (AAAS)

HONORS

- Elected Member of International Statistical Institute, 2012
- Jerome Sacks Award for Outstanding Cross-Disciplinary Research, National Institute of Statistical Sciences, 2010
- John V. Atanasoff Research and Discovery Award, Iowa State University, 2009
- Fellow of the American Association for the Advancement of Science, 2005
- National Associate of the National Academy of Sciences, 2002
- Founder's Award American Statistical Association, 2002
- Fellow of the American Statistical Association, 1997
- Director's Award for Outstanding Program Management, National Science Foundation, 1996
- Kansas Academy of Sciences Lecturer, 1993
- Mu Sigma Rho Statistics Award, Iowa State University, 1982
- Pi Mu Epsilon Outstanding Scholar Award, University of South Florida, 1982

EDITORIAL SERVICE

- Inaugural Editorial Board, *Harvard Data Science Review*, 2018-present
- Editorial Advisory Board, *Journal of Privacy and Confidentiality*, 2009-2011
- Associate Editor, *Statistical Science*, 2001-2008
- Guest Editor, special issue of *Statistical Science* on Reliability, 2004–2005
- Associate Editor, *Journal of Computational and Graphical Statistics*, 1996–1999
- Associate Editor, *Journal of the American Statistical Association*, 1991–1994
- Management Committee, *Journal on Computational and Graphical Statistics*, 1993–1995
- Founding Editor, *ASA Statistical Computing and Statistical Graphics Newsletter*, 1990–1992

SERVICE TO THE PROFESSION

NATIONAL ACADEMIES

- Committee on Social and Behavioral Sciences for National Security: A Decadal Survey, Board on Behavioral, Cognitive, and Sensory Sciences, Division of Behavioral and Social Sciences and Education, 2017-present
- Program Committee Chair, Summit on Social and Behavioral Sciences for National Security, Division of Behavioral and Social Sciences and Education, 2016
- Committee on Strengthening Data Science Methods for Department of Defense Personnel and Readiness Mission, Board of Mathematical Sciences and Statistical Applications, National Academy of Engineering, 2015-2017
- Committee on National Statistics, the National Academies, 2009–2015
- Committee to Review the Quality of the Management and of the Science and Engineering Research at the Department of Energy's National Security Laboratories, National Academies 2011-2012
- Committee on the Evaluation of Quantification of Margins and Uncertainty (QMU) Methodology Applied to the Certification of the Nation's Nuclear Weapons Stockpile, National Research Council, 2007–2009
- Chair of National Academy of Sciences panel study on Defense Modeling, Simulation, and Analysis: Meeting the Challenge, 2004–2006

- Computer Science and Technology Board Committee on Information Technology and Federal Services, National Research Council 1998–2002
- NRC/NIST Information Technology Laboratory Review Committee, Chair the Statistics Engineering Division sub-committee, 2002–2004
- Chair of the National Academy of Sciences’ Committee on Applied and Theoretical Statistics, 2001–2003, member of committee in 2000
- National Academy of Sciences’ Board on Mathematical Sciences and Their Applications, 2001–2003
- Committee on the Research on Future Census Methodology, National Statistics Panel 1999–2003

BOARDS

- Scientific Advisory Board, Canadian Statistical Sciences Institute, 2016-present
- Senior Advisory Board, Center for Statistics and Applications in Forensic Evidence, 2016-present
- Board of Trustees, Institute for Pure and Applied Mathematics, 2013-present
- National Security Agency Advisory Board Future of Computing Panel 2014-2017
- Board of Directors, Fields Institute for Research in Mathematical Sciences, 2012-2014
- Board of Trustees of the Institute of Pure and Applied Mathematics, 2009–2010
- Science Board of the Santa Fe Institute, 2008–2010
- External Advisory Board of the Southwest Research Institute, 2009–2010
- Advisory Board of the Center for Discrete Mathematics & Theoretical Computer Science, 2008–2012
- SIAM Science Policy Board, 2003–2006
- Interface Foundation Board Member, 1993–1997

PROFESSIONAL ASSOCIATIONS

- Chair, Chair Elect, Past AAAS Chair Section U (statistics), 2014-2017
- Program Committee for AAAS, 2011-2014
- Committee on Nominations Committee of AAAS, 2009–2011
- Executive Committee of AAAS Section U, the Statistics Section, Elected Member-at-Large, 1999–2002
- Elected American Statistical Association President: President Elect 2005, President and Chairman of the ASA Board of Directors 2006, Past President 2007, member of executive committee 2005–2007
- Chair of Committee of Presidents of Statistical Societies, 2001–2003
- Elected Member of the *ASA* Board of Directors, 1999–2001
- Committee of Presidents of Statistical Societies Lecturer
- Overall Program Chair for the Joint Statistical Meetings, 1997
- Committee of Presidents of Statistical Societies Presidents’ Award Committee Member, 1996–1998, Chair 1999
- Section Chair of the *ASA* Statistical Computing Section, 1996
- Program Chair of the *ASA* Statistical Computing Section, 1994
- Program Chair-Elect of the *ASA* Statistical Graphics Section, 1994
- Committee on Meetings, *ASA* 1993–98
- Committee on Nominations Committee of the *American Association for the Advancement of Science*
- Program Chair of the *ASA* Statistical Education Section, 1991

OTHER PROFESSIONAL CONTRIBUTIONS

- *JASON* Study Group, 2007–present
- Steering Committee, Big Data program, Canada Statistical Sciences Institute, 2013-2017
- President’s Advisory Panel for the Department of Statistics, *Carnegie Mellon University*, 2013
- Scientific Panel on Statistical Sciences for *International Council for Industrial and Applied Mathematics*, 2008–2011
- Chair of External Review Committee, *Purdue University* Statistics Department, 2010
- Chair of the Network Grand Challenge Advisory Board for *Sandia National Laboratory*, 2007–2010
- EPA/Office of Research and Development's *National Center for Environmental Research* Standing Subcommittee (Federal Advisory Committee), 2007– 2010
- *Department of Energy* Office of Science Task Force to develop a strategic plan for the Applied Mathematics Program, 2007–2008
- External Review Committee, *Purdue University* Statistics Department, 2004
- External Review Committee, *Harvard University* Statistics Department 2004
- Chair of the *Fourth International Conference on Mathematical Methods in Reliability*, 2004
- Chair of *Interface 2000*: Symposium on the Interface of Statistics and Computation Sciences
- National Advisory Committee for Statistics and Applied Mathematical Sciences Institute (SAMSI), 2002–2007
- President’s Advisory Panel for the Department of Statistics, *Carnegie Mellon University*, 2002
- Geostatistical Sciences Project Review Committee, *National Center for Atmospheric Research*, 2001–2003
- Executive Committee of the *National Institute of Statistical Sciences*, 1999–2003
- Continuous service on *National Science Foundation* Review Panels throughout the foundation
- Continuous service on *Department of Energy*, Office of Science Review Panels
- Referee for professional journals and funding agencies in Statistics, Mathematics, Computer Science, and Engineering, Social Sciences, and Policy

FUNDING – CURRENT, PENDING, AND COMPLETED SINCE 2014

CURRENT

- U.S. Army Research Institute (ARI), 2017-2022, The Social Component of The Human Dimension: Leveraging Existing DoD Data Towards Optimized Individual And Team Performance in the Army, \$3,027,401, Principal Investigator
- U.S. Army Research Institute (ARI), 2015-2019, Towards an Integrated Data Framework for Understanding the Context of Military Environments, \$1,978,163, Principal Investigator
- U.S. Department of Agriculture (USDA) (National Science Foundation (NSF)), 2016-2021, \$2,500,000, Use Statistical and Survey Methodology Research to Improve or Redesign Surveys, Principal Investigator
- U.S. Department of Agriculture (USDA), Economic Research, 2018-2019, \$400,000, Impacts of Infrastructure Development on Rural Property Values, Principal Investigator
- Alfred P. Sloan Foundation, 2018-2019, Census 2030, \$125,000, Principal Investigator

PENDING

- U.S. Department of Agriculture (USDA), Applied and Foundational Research Initiative

(AFRI), Food and Agriculture Cyberinformatics and Tools (FACT), 2019-2021, \$1,000,000, FACT: Three-State Data Science for the Public Good Coordinated Innovation Network, Principal Investigator.

- U.S. Army Research Institute (ARI), Developing Predictive Models of U.S. Army Career Pathways through the Integration of Multiple Army Administrative and Other Data Sources, 2019-2022, \$1,824,979, Principal Investigator

COMPLETED (alphabetical list)

- American Statistical Association (National Science Foundation (NSF)), 2016, REU Site: Diverse Undergraduate Research Experiences in Statistics, \$38,666, Principal Investigator
- Arlington County, Virginia, 2017-2018, Identifying Current Status, Performance Metrics, and Options for Improving Customer Services Through Arlington County Call Centers, \$40,000, Principal Investigator
- Fairfax County, Virginia, 2017, Developing a Data-driven Approach to Inform the Decline in Youth Physical Activity in Fairfax County, \$50,000, Principal Investigator
- Gallup, Inc., 2016-2017, (Defense Advanced Research Projects Agency), Leveraging Smart Cities Sensor Technology for Urban Population Assessment, \$49,285, Co-Principal Investigator
- Laura and John Arnold Foundation, 2016, \$144,000, Principal Investigator
- MITRE Corporation (U.S. Census Bureau), 2015-2016, A Pilot Study to Establish Data Use and Quality Standards for Using New Sources of Structured and Unstructured Data, \$578,499, Principal Investigator
- MITRE Corporation (Centers for Medicare and Medicaid Services), 2015, Independent Assessment of the Health Care Delivery Systems and Management Processes of the Department of Veterans Affairs (VA Choice), \$99,997, Principal Investigator
- National Network of Public Health Institutes (NNPHI), (Robert Wood Johnson Foundation (RWJF)), Creating a Culture of Health - Obtaining a Diverse and Broad Perspective on Role of Health Information Technology (HIT), 2014-2015, \$175,000, Principal Investigator
- National Science Foundation (NSF), 2013-2015, REU Site: Modeling and Simulation in Systems Biology, \$386,157, Principal Investigator starting in 2014
- Procter & Gamble, 2014-2016, P&G End-to-End (E2E) Digitization and Supply Chain Modeling, \$525,000, Co-Principal Investigator
- Procter & Gamble, 2014, Brazil Problem, \$75,000, Principal Investigator
- Procter & Gamble, 2014, P&G Sankey Visualization for United Kingdom (UK) & North America (NA) Shipments, \$50,000, Co-Principal Investigator
- Procter & Gamble, 2015-2016, Transportation and Warehousing - Developing a Portfolio of Collaborative Research Principal Investigator, \$105,874, Co-Principal Investigator

INVITED PROFESSIONAL LECTURES

Dr. Keller is invited and presents lectures at numerous national and international conferences, workshops, and research groups each year.

Dr. Keller meets with officials at the Office of Management and Budget (OMB), Office Science Technology Policy (OSTP), Census Bureau, U.S. Department of Defense (DoD), U.S. Department of Agriculture (USDA), many other federal and state agencies, and Congress, particularly on topics related to the use of data to provide evidence in decision-making to address societal challenges.

REFEREED PUBLICATIONS

1. S. Keller, G. Korkmaz, C. Robbins, and S. Shipp, 2018. New Opportunities to Observe and Measure Intangible Inputs to Innovation: Definitions, Operationalization, and Examples. *Proceedings of the National Academy of Sciences (PNAS)*, 115 (50):12638-12645.
2. G. Korkmaz, C. Kelling, C. Robbins, and S. Keller, 2018. Modeling the Impact of R Packages Using Dependency and Contributor Networks. IN 2018 IEEE/ACM International Conference on Advances in Social Network Analysis and Mining (ASONAM), 511-514. IEEE.
3. B. Pires, I. Crandell, M. Arnsbarger, V. Lancaster, S. Keller, A. Schroeder, S. Shipp, W. Kang, and P. Robinson, 2018. Predicting Postsecondary Trajectories in Virginia High Schools using Publicly Available Data, *Statistical Journal of the IAOS*, 3(4):553-565.
4. S. Keller, Nusser, S., Shipp, S., and Woteki, C., 2018. Helping Communities Use Data to Make Better Decisions, *Issues in Science and Technology*, Spring:83-89.
5. B. Pires, G. Korkmaz, K. Ensor, D. Higdon, S. Keller, B. Lewis, B., and A. Schroeder, 2018. Estimating individualized exposure impacts from ambient ozone levels: A synthetic information approach. *Environmental Modelling & Software*, 103:146-157.
6. S. Keller, and S. Shipp. 2018, *Building Resilient Cities: Harnessing the Power of Urban Analytic*, in *The Resilience Challenge: Looking at Resilience through Multiple Lens*, Charles C Thomas Ltd Publishers.
7. S. Keller, S. Shipp, G. Korkmaz, E. Molfino, J. Goldstein, V. Lancaster, B. Pires, D. Higdon, D. Chen, A. Schroeder, 2018. Harnessing the power of data to support community-based research. *WIREs Comp Stat* 2018. doi: [10.1002/wics.1426](https://doi.org/10.1002/wics.1426)
8. K. S. Ziemer, B. Pires, V. Lancaster, S. Keller, M. Orr, and S. Shipp., 2018. A New Lens on High School Dropout: Use of Correspondence Analysis and the Statewide Longitudinal Data System. *The American Statistician*, 72(2):191-198.
9. S. A. Keller, V. Lancaster, S. Shipp, S., 2017. Building Capacity for Data Driven Governance - Creating a New Foundation for Democracy, *Statistics and Public Policy*, 4:1-11.
10. B. Pires, J. Goldstein, D. Higdon, S. Reese, P. Sabin, G. Korkmaz, S. Ba, K. Hamall, A. Koehler, S. Shipp, S., and S. Keller, 2017. A Bayesian Simulation Approach for Supply Chain Synchronization, in the *Simulation Conference (WSC)*, 2017 Winter (pp. 571-1582). IEEE.
11. S. A. Keller, G. Korkmaz, M. Orr, A. Schroeder, S. Shipp., 2017. The Evolution of Data Quality: Understanding the Transdisciplinary Origins of Data Quality Concepts and Approaches, *Annual Review of Statistics and Its Application*, 4:85-108.
12. E. Molfino, G. Korkmaz, S.A. Keller, A. Schroeder, S. Shipp, and D. Weinberg., 2017. Can Administrative Housing Data Replace Survey Data? *Cityscape*, 19(1):265-292.
13. National Academies of Science, Engineering, and Medicine, 2017. *Strengthening Data Science Methods for Department of Defense Personnel and Readiness Mission*, (S. Keller Committee member), The National Academies Press, doi:10.17226/23670.

14. National Academies of Sciences, Engineering, and Medicine, 2017. *Social and Behavioral Sciences for National Security: Proceedings of a Summit* (S. Keller Committee Chair). Washington DC, The National Academies Press, doi: 10.17226/24710.
15. S. A. Keller, S. Shipp, and A. Schroeder, A., 2016. Does Big Data Change the Privacy Landscape? A Review of the Issues. *Annual Review of Statistics and Its Application*, 3:161-180.
16. National Research Council, 2012. *Managing for High Quality Science and Engineering at the NNSA National Security Laboratories*, prepared by committee (S. Keller Committee member), The National Academies Press.
17. National Research Council, 2008. *Evaluation of Quantification of Margins and Uncertainties Methodology for Assessing and Certifying the Reliability of the Nuclear Stockpile*, prepared by committee (S. Keller-McNulty Committee member), The National Academies Press.
18. D. M. Steinburg, S. Bisgaard, S. Doganaksoy N. Fisher, B. Gunter, G. Hahn, S. Keller-McNulty, J. Kettenring, W.Q. Meeker, D. C. Montgomery, 2008. *The Future of Industrial Statistics: A Panel Discussion*. *Technometrics*, 50(2):103-127.
19. S. Keller-McNulty, 2007. From Data to Policy: Scientific Excellence is our Future. *Journal of the American Statistical Association*, 102(478):395-399.
20. S. Keller-McNulty, 2006. Editor of Special Issue on Reliability. *Statistical Sciences*, 21.
21. B. Williams, D. Higdon, J. Gattiker, L. Moore, M. McKay, and S. Keller-McNulty, 2006. Combining Experimental Data and Computer Simulations with an Application to Flyer Plate Experiments. *Bayesian Analysis*, 1, Number 4, pp. 765-792.
22. National Research Council, 2006. *Defense Modeling, Simulation, and Analysis: Meeting the Challenge*, prepared by the BMSA Committee on Modeling, Simulation, and Analysis in Support of Defense Transformation (S. Keller-McNulty chair), The National Academies Press
23. S. Keller-McNulty, C. Nakhleh, and N. Singpurwalla, 2005. A Paradigm for Masking (Camouflaging) Information. *International Statistics Reviews*, 73(3):331-349.
24. S. Keller-McNulty, G. D. Wilson, and A.G. Wilson, 2005. Impact of Technology on the Scientific Method, with discussion. *Chance*, 18(4):4-16.
25. Keller-McNulty, S. and Huzurbazar, A.V., 2005. Committee of Presidents of Statistical Societies (COPSS). *Encyclopedia of Biostatistics*, 2.
26. T. R. Bement, J. M. Booker, S. A. Keller-McNulty, N. Singpurwalla, 2003. Testing the Untestable: Reliability in the 21st Century, *IEEE Transactions on Software Reliability*, 52:1, 118-124.
27. R. Berk, P. Bickel, K. Campbell, K. Fovell, S. Keller-McNulty, E. Kelly, R. Linn, B. Park, A. Perelson, N. Roupail, J. Sacks, and F. Schoenberg, 2002. *Workshop on Statistical Approaches for the Evaluation of Complex Computer Models*, *Statistical Sciences*, 17:173-192.
28. S. Keller-McNulty and M. McNulty, 2002. "Show Me the Data: Statistical Representation," *Theoria and Historia Scientiarum*, 6:75-85.

29. National Research Council, 2000. Information Technology Research for Crisis Management, prepared by the CSTB Committee on Computing and Communications Research to Enable Better Use of Information Technology in Government (S. Keller-McNulty Committee member), The National Academies Press.
30. National Research Council 2000. Information Technology Research for Federal Statistics, prepared by the CSTB Committee on Computing and Communications Research to Enable Better Use of Information Technology in Government (S. Keller-McNulty Committee member), The National Academies Press.
31. Buja, A., & Keller-McNulty, S. 1999. Introduction to the special section on massive datasets. *Journal of Computational and Graphical Statistics*, 8(3), 544-544.
32. S. Keller-McNulty and E. A. Unger, 1998. A Remote Access Database System Prototype for the Release of Confidential Data, *Journal of Official Statistics*, 14(4):346-360.
33. V. Lancaster and S. Keller-McNulty, 1998. A Review of Composite Sampling Methods, *Journal of the American Statistical Association*, 93(443):1216-1230.
34. V. Lancaster and S. Keller-McNulty, 1998. Composite Sampling, Part II, *Environmental Testing & Analysis*, 7(5):14-17.
35. V. Lancaster and S. Keller-McNulty, 1998. Composite Sampling, Part I, *Environmental Testing & Analysis*, 7(4):15-19.
36. G. Chen and S. Keller-McNulty, 1998. Estimation of Identification Disclosure Risk in Microdata, *Journal of Official Statistics*, 14(1):79-96.
37. R. Becker and S. Keller-McNulty, 1996. Presentation Myths. *American Statistician*, 50(4).
38. S. Keller-McNulty and E. A. Unger, 1993. Database Systems: Inferential Security. *Journal of Official Statistics*, 9(2):475-500.
39. M. N. Satern and S. Keller-McNulty, 1992. Use of Position-Time Graphs to Compare Free Throw Shooting Styles of Adult Male and Female Basketball Players. *Journal of Human Movement Studies*, 22(1):13-33.
40. S. Keller-McNulty, 1991. Comment: Enhancing Access to Microdata while Protecting Confidentiality: Prospects for Future. *Statistical Science*, 6(3):234-235.
41. B. Harms and S. Keller-McNulty, 1991. Error-Free Solution to a Toeplitz System of Equations. *IEEE Transaction of Acoustics, Speech, and Signal Processing*, 39(5):1212-1215.
42. S. Keller-McNulty, M. S. McNulty, and D. Gustafson, 1991. Stochastic Models for Software Science. *Journal of Systems and Software*, 16:59-68.
43. R. M. Jaeger and S. Keller-McNulty, 1991. Procedures for Eliciting and Using Judgments of the Value of Observed Behaviors on Military Job Performance Tests. A.K. Wigdor, B.F. Green, Jr. (Eds.), *Performance assessment for the workplace: Technical issues*. Washington, DC; The National Academies Press.

44. E. A. Unger and S. Keller-McNulty, 1990. The Deterrent Value of Natural Change in a Statistical Database. Proceedings of the 13th Annual National Computer Security Conference, 16(1):59-68.
45. E. A. Unger, S. Keller-McNulty, and P. Connelly, 1990. Natural Change in Dynamic Databases as a Deterrent to Compromise by Trackers. Sixth Annual Computer Security Applications Conference. IEEE Computer Society Press.
46. S. Keller-McNulty and M. S. McNulty, 1989. Response to: Resolving the Software Science Anomaly. Journal of Systems and Software, 10:69-73.
47. M. N. Satern, S. P. Messier and S. Keller-McNulty, 1989. The Effect of Ball Size and Basket Height on the Mechanics of the Basketball Free Throw. Journal of Human Movement Studies, 16(3):123-138.
48. S. Keller-McNulty and W. J. Kennedy, 1987. Error-Free Computation of the Moore-Penrose Inverse with Application to Linear Least Square Analysis. Journal of Statistical Computation and Simulation, 27:45-64.
49. S. Keller-McNulty and M. S. McNulty, 1987. The Independent Pairs Assumption of Hypothesis Tests Based on Rank Correlation Coefficients. American Statistician, 41(1):40-41.
50. S. Keller-McNulty and J. J. Higgins, 1987. Effect of Tail Weight and Outliers on Power and Type-I Error of Robust Permutation Tests for Location. Communications in Statistics, B16(1):17-35
51. S. Keller-McNulty and W. J. Kennedy, 1986. An Error-Free Generalized Matrix Inversion and Least Squares Method Based on Bordering. Communications in Statistics, B15(3):769-786.
52. S. Keller-McNulty and W. J. Kennedy, 1985. Error-Free Computation of a Reflexive Generalized Inverse. Linear Algebra and Its Applications, 67:157-167.
53. S. Keller-McNulty, 1982. Exact generalized inverses and solution to linear least squares problems using multiple modulus residue arithmetic, dissertation-thesis, DOI: 10.31274/rd-180813-13090

INVITED PAPERS, BOOKS, CHAPTERS, AND OTHER PUBLICATIONS

1. S. Keller and J. HeimeL, 2015. Leadership: An Untold Story. In A. Golbeck, Ingram Olkin, Y. Ge (Eds.), *Leadership and Women in Statistics*. In A. Golbeck, Ingram Olkin, Y. Ge (Eds.), CRC Press, Boca Raton, Florida.
2. B. Pires, G. Korkmaz, K. Ensor, D. Higdon, S. Keller, B. Lewis and A. Schroeder, 2015. [Towards an in silico Experimental Platform for Air Quality: Houston, TX as a Case Study](#). Computational Social Science Society of America Conference, Santa Fe. New Mexico.
3. S. Keller, S. Koonin, S. Shipp, 2012. Big data and city living – what can it do for us? *Significance*, 9(4).
4. S. Keller, 2010. Vital Statistics, *Nature*, 467:914.
5. Y. Armijo, N. Limnios, S. Keller-McNulty and A. Wilson, 2005. *Modern Statistical and Mathematical Methods in Reliability*. Edited volume from the 2004 international symposium on Mathematical Methods in Reliability, World Scientific Press.

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