



Review of Proposals for Research on Statistical Methodologies for Assessing Variables in Eyewitness Performance

DETAILS

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**Review of Proposals for Research on Statistical
Methodologies for Assessing Variables in**

**Eyewitness
Performance**

Committee on the Review of Proposals for
Research on Statistical Methodologies for Assessing
Variables in Eyewitness Performance

Committee on Science, Technology, and Law
Policy and Global Affairs

Committee on Applied and Theoretical Statistics
Division on Engineering and Physical Sciences

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This report has been reviewed in draft form in accordance with procedures approved by the National Academies of Sciences, Engineering, and Medicine's Report Review Committee. The purpose of this independent review is to provide candid and critical comments that will assist the institution in making its published report as sound as possible and to ensure that the report meets institutional standards for objectivity, evidence, and responsiveness to the study charge. The review comments and draft manuscript remain confidential to protect the integrity of the process.

We wish to thank Joe S. Cecil, Federal Judicial Center, for his review of this report and for overseeing the review process. Appointed by the National Academies, he was responsible for making certain that all review comments were carefully considered. Responsibility for the final content of this report rests entirely with the authoring committee and the institution.

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1

Introduction

Recognizing the importance of eyewitness identifications in courts of law and motivated by data showing that at least one erroneous eyewitness identification was associated with almost 75 percent of cases where defendants were later exonerated by DNA evidence, in 2013 the Laura and John Arnold Foundation asked the National Academy of Sciences to undertake an assessment of the scientific research on eyewitness identification and offer recommendations to improve eyewitness performance. In response to this request, the National Research Council (NRC) appointed an ad hoc committee to assess research in the social and behavior sciences and research on vision, memory, and cognition; identify gaps in the existing body of literature; and suggest other research questions to be pursued that would further our understanding of eyewitness identification and that might offer additional insight into law enforcement and courtroom practice. That committee issued its report, *Identifying the Culprit: Assessing Eyewitness Identification*, in 2014.

The report provided findings and recommendations for

- identifying and facilitating best practices in eyewitness procedures for the law enforcement community,
- strengthening the value of eyewitness identification evidence in court, and
- improving the scientific foundation underpinning eyewitness identification.¹

The Arnold Foundation took particular note of Recommendation 11 of the report. That recommendation called for additional research on system² and estimator³ variables. Specifically, the 2014 report recommended

¹National Research Council. 2014. *Identifying the Culprit: Assessing Eyewitness Identification*. Washington, DC: The National Academies Press, p. 2.

²System variables are characteristics of procedures and practices (e.g., lineup configurations or the content and nature of instructions provided to an eyewitness when asked to make an identification) that can be controlled by the criminal justice system. See National Research Council, p. 16.

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broad use of statistical tools that can render a discriminability measure to evaluate eyewitness performance... and a rigorous exploration of methods that can lead to more conservation responding (such as witness instructions) but [that] do not compromise discriminability.⁴

As a result of its assessment of the scientific literature related to eyewitness identification, the committee that authored the 2014 report concluded that it could not “draw definitive conclusions about which lineup procedure (sequential or simultaneous) is preferable.”⁵ That committee further observed that “the identification of factors (such as specific lineup procedures or states of other system variables) that can objectively improve eyewitness identification performance must be among the top priorities for this field.”⁶

The 2014 report called for researchers engaged in research on eyewitness identification to work more closely with the law enforcement community to identify additional variables that might influence eyewitness performance in order to understand more fully practical issues associated with strategies aimed at influencing eyewitness performance.

CHARGE TO THE COMMITTEE

In order to stimulate new and innovative research on statistical tools and the interrelationships between system and estimator variables, the Arnold Foundation in 2015 again called upon the National Academies of Sciences, Engineering, and Medicine. It requested that the National Academies assist the foundation in (1) developing a request for proposals for additional research on eyewitness identification and (2) assessing the scientific merit and research design of submitted proposals.

To carry out this new project, the National Academies appointed an ad hoc committee comprised of some members of the committee that authored the 2014 report on eyewitness identification and additional members with statistical expertise. This committee held two meetings and participated in numerous conference calls. At its first meeting,⁷ the committee heard from several experts who discussed the dominant approaches for assessing eyewitness performance and considered statistical approaches relevant to eyewitness identification research.

³ Estimator variables are characteristics of the conditions under which an eyewitness event occurs (e.g., the visibility conditions at the time of the event, whether or not a weapon is present, the race of the culprit versus that of the eyewitness, etc.) that are beyond the control of the criminal justice system. See National Research Council, p. 17.

⁴ National Research Council, pp. 117-118.

⁵ National Research Council, p. 118.

⁶ *Ibid.*

⁷ See Appendix B for the meeting agenda.

At that meeting, a representative from the foundation gave the committee the following charge:

1. Develop text for a Request for Proposals (RFP) that addresses Recommendation 11 of the 2014 NRC report, *Identifying the Culprit: Assessing Eyewitness Identification*, that called for additional research on system and estimator variables in eyewitness performance. Develop criteria to be used in evaluating the scientific merit and research design of proposals submitted to the Laura and John Arnold Foundation to further advance understanding of statistical tools appropriate for validating the reliability of eyewitness performance.
2. Upon receipt of all proposals from the Arnold Foundation, meet to evaluate the proposals based upon scientific merit and research design.

Prior to their appointment to the committee, prospective members submitted a conflict-of-interest and bias statement and were screened for potential financial conflicts of interest. At the committee's first meeting in September 2015, the Executive Office of Policy and Global Affairs of the National Academies held a bias and conflict-of-interest discussion with the committee in order to identify conflicts of interest and establish that the committee was intellectually balanced. The issue of potential or perceived conflict of interest or bias was again examined when the initial set of proposals was received, and the PGA Executive Office determined that no conflicts of interest existed for the committee members in relation to the researchers who had submitted proposals in response to the RFP from the Arnold Foundation.

Per the agreement with the Arnold Foundation, this report describes, in the following chapter, the development of the request for proposals, the processes followed by the committee as it evaluated the proposals, and the committee's general assessment of the scientific merit and research design of the proposals overall. It does not provide evaluations of individual proposals or the names of applicants. This information has been provided to the foundation for internal use.

It should be noted that the foundation will make the ultimate decision regarding which, if any, proposals to fund after it has the opportunity to consider the committee's assessments of the scientific merit and research design of each proposal and to consider other relevant criteria that the foundation may deem are applicable to the goals and mission of the foundation.

2

The Development of the Request for Proposals/Evaluation of Formal Proposals

In response to the request by the Laura and John Arnold Foundation and with input from foundation staff, the committee developed text for a Request for Proposals (RFP) (see Appendix C) that addresses Recommendation 11 of the 2014 National Research Council (NRC) report, *Identifying the Culprit: Assessing Eyewitness Identification*. In Recommendation 11, the committee called for

- a. a broad exploration of the merits of different statistical tools for use in the evaluation of eyewitness performance;
- b. a broad exploration of the effects of different system variables (e.g., additional variants on lineup procedures, witness lineup instructions) and estimator variables (e.g., presence or absence of weapon, elapsed time between incident and identification task, levels of stress) and—importantly—interactions between these variables using either the ROC approach or other tools for evaluation of binary classifiers that can be shown to have advantages over existing analytical methods; and
- c. the scientific community engaged in studies of eyewitness identification performance [to] work closely with law enforcement to identify other system and estimator variables that might influence performance and practical issues that might preclude certain strategies for influencing performance [...and] that policy decisions regarding changes in procedure should be made on the basis of evidence of superiority and should be made in consultation with police departments to determine which procedure yields the best combination of performance and practicality.⁸

⁸See National Research Council. 2014. *Identifying the Culprit: Assessing Eyewitness Identification*. Washington, DC: The National Academies Press. Contextual information and the complete text of Recommendation 11 appear on pages 117-119 of the report.

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In developing the RFP, the committee established criteria to be used in evaluating the scientific merit and research design of proposals submitted to the foundation. While proposals were not to be constrained by the particular ideas raised in Recommendation 11 of the NRC's 2014 report, proposals designed to further advance the understanding of statistical tools appropriate for validating the reliability of eyewitness performance were to be particularly encouraged.

Via email correspondence and a series of conference calls, the committee drafted and reached consensus on the language of the RFP.

In keeping with the 2014 recommendation, the RFP specifically called for research to explore “the effects on eyewitnesses of different system variables (e.g., variants on lineup procedures or instructions given to eyewitnesses) and estimator variables (e.g., presence or absence of weapon, lighting conditions and distances, elapsed time between the incident and the identification task, levels of stress) and the interactions between these variables.” The RFP further stated that proposed research should “use statistical evaluation tools to improve upon existing methods.” It emphasized that proposed research should exhibit strong research design, using, for example, “random assignment, when feasible, and other research methodologies that allow for the strongest possible causal inferences when random assignment is not feasible.”

Foundation staff asked that the RFP, in keeping with the foundation's core objective “to address our nation's most pressing and persistent challenges using evidence-based, multi-disciplinary approaches,” emphasize that “interdisciplinary research partnerships and/or research performed in collaboration with law enforcement agencies and the judiciary” be encouraged.

The RFP described four areas of research of particular interest to the foundation:

1. research that yields an improved understanding of the relative merits of simultaneous and sequential lineup procedures;
2. research that assesses the effectiveness of other lineup procedures;
3. research that helps characterize the evidentiary strength of an eyewitness's identification or nonidentification of a suspect from a lineup. This is the binary classification problem of eyewitness identifications, which raises questions such as how to properly handle different kinds of error, which have different consequences; and
4. research from the broader scientific community that addresses the wide range of issues related to eyewitness identifications, such as how the probability of a correct identification varies with estimator variables including, but not limited to, those mentioned above.

The RFP indicated that proposals were to be evaluated against four criteria:

1. *IMPORTANCE*: Is the applicant proposing research that could produce important improvement in our understanding of eyewitness identification and the ability to reduce eyewitness identification errors? Could

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the insights arising from the proposed research be applied within the constraints of real-world conditions?

2. *EXPERIENCE OF THE RESEARCHER(S) AND RELEVANCE OF THEIR BACKGROUND(S)*
3. *STUDY DESIGN*: Is the applicant's proposed study design likely to result in strong and useful insights? If the proposed study involves a randomized trial, can high-value data be collected?
4. *PARTNERS*: Does the applicant's team include all parties needed to perform the proposed study?

Finally, the RFP described the grant application process, which began with applicants submitting letters of interest that included a description of work to be performed. The committee assisted the Arnold Foundation in broadly distributing the RFP.

For the letters of interest, applicants were asked to address all four selection criteria listed above, but it was not expected that applicants would have finalized all aspects of the study design and partnership agreements. All four criteria were, however, used as a basis for evaluation when each full proposal was reviewed by the committee. While the committee would provide the foundation with assessments of the merits of each proposal, the foundation would make final decisions as to which proposals were ultimately funded.

In total, 20 letters of interest were received by the Arnold Foundation and then provided to the committee. The committee was asked to evaluate the letters against the criteria above and provide an evaluation of the letters to the foundation. The foundation, taking into account the committee's evaluation, invited nine applicants to submit formal proposals. Nine proposals were received by the foundation and these were transmitted to the committee for review.

In July 2016, the committee met via conference call and at an in-person meeting to assess and draft text that provided its evaluation of the nine invited full proposals. In considering the full proposals, the committee, in keeping with its charge, evaluated the scientific merit and research design of the proposals. Based upon the criteria set forth by the RFP, the committee developed a list of questions by which to gauge the merit of the individual proposals:

1. Does the proposed research ask a new or interesting question?
2. Is the proposed research actionable/operationalizable in some way?
3. Does the researcher/research team have the appropriate toolkit/expertise to carry out the proposed research?
4. Does the proposed research offer an appropriate mechanism to collect data/evaluate collected data?
5. Does the proposed research develop new statistical approaches and/or apply existing approaches not previously employed to evaluate the accuracy of eyewitness identifications?
6. Does the proposal demonstrate that the researcher(s) has/have appropriate knowledge of the relevant scientific literature?

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7. Does the proposed research have the potential to significantly impact eyewitness identification procedures and is there a mechanism that would allow for dissemination of the research to the relevant stakeholder community/communities?
8. Does the proposed research directly address items a and b of Recommendation 11 of the NRC report (see page 5)?

Based upon the application of these criteria, the committee found three proposals to be superior and found four additional proposals of interest and of significant scientific merit. The committee found the remaining two proposals to be inadequate.

With regard to study design, the committee observed some unevenness among the proposals. While several proposals provided detailed study designs, other proposals made only general statements about how the project would be conducted.

The committee noted that the members of the various research teams involved in the three proposals in the superior category and the four proposals of significant scientific merit possess the necessary academic qualifications and experience with which to carry out the proposed research projects.

The committee noted unevenness with regard to the identification of research partners. While several proposals provided detailed information about extramural partnerships, others did not.

The proposals raised two issues that the foundation might consider as it seeks to advance eyewitness identification research by supporting the current projects or other future research: (1) there is intrinsic value in making research data widely available, and projects that collect large data sets should be encouraged to share the data widely, and (2) a relationship between the scientific and law enforcement communities is necessary at all stages of a research project if the research is to have actionable outcomes.

The committee also noted that many of the submitted proposals are guilty of the “prosecutor’s fallacy.” That is, they assume that we really know who the guilty party is and then seek to find the probability that the correct person will be identified by a given eyewitness identification process. But in criminal procedures we do not generally know who committed the crime, so the proper question in examining various processes for eyewitness identification is, “What is the probability that the ‘truth’ revealed by the process will be correct?” That is a very different question and will generally lead to very different probabilities.

To illustrate, consider the analogous situation with drug testing, for which we normally have good information from laboratory experiments about the reliability of a test, which is the probability of finding the truth when the truth is known. If the drug test for a person on trial came back positive, and the reliability of the test is known to be, say, 99%, a prosecutor might say that the test shows with a very high probability that the defendant was using drugs. But that is not really the correct assertion for the purposes of trial because it ignores the false positives from those tests (which are analogous to erroneous eyewitness

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identifications). Rather, the appropriate question is, “What is the probability that, when a drug test comes back positive, the test is correct?”

The committee mentions this only to say that care must be taken with the research proposals it evaluated. Experienced researchers should be able to focus clearly on the proper questions, and none of the proposals received was excluded because of this apparent imprecision.

The committee is delighted that the foundation has taken this important step to advance eyewitness identification research and looks forward to further activity in this area.

Appendix A

Biographical Information of Committee and Staff

Chair

DAVID BANKS obtained an M.S. in applied mathematics from Virginia Tech in 1982, followed by a Ph.D. in statistics in 1984. He won a National Science Foundation (NSF) Postdoctoral Research Fellowship in the Mathematical Sciences, which he completed at the University of California, Berkeley. In 1986 he was a visiting assistant lecturer at the University of Cambridge, and then joined the Department of Statistics at Carnegie Mellon University in 1987. In 1997 he went to the National Institute of Standards and Technology, then served as chief statistician of the U.S. Department of Transportation, and finally joined the U.S. Food and Drug Administration in 2002. In 2003, he returned to academics at Duke University.

Dr. Banks was the coordinating editor of the *Journal of the American Statistical Association*. He co-founded the journal *Statistics and Public Policy* and served as its editor. He co-founded the Section on National Defense and Homeland Security of the American Statistical Association (ASA), and has chaired that section, as well as the ASA sections on Risk Analysis and on Statistical Learning and Data Mining. In 2003, he led a research program at the Statistical and Applied Mathematical Sciences Institute (SAMSI) on Data Mining; in 2008, he led a research program at the Isaac Newton Institute on Theory and Methods for Complex, High-Dimensional Data; in 2012, he led another SAMSI research program, on computational advertising. He has published 74 refereed articles, edited eight books, and written four monographs.

Dr. Banks is past president of the Classification Society and has twice served on ASA Board of Directors. He is currently the president of the International Society for Business and Industrial Statistics. He is a fellow of the ASA and of the Institute of Mathematical Statistics, and he recently won the ASA's Founders Award.

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His research areas include models for dynamic networks, dynamic text networks, adversarial risk analysis (i.e., Bayesian behavioral game theory), human rights statistics agent-based models, forensics, and certain topics in high-dimensional data analysis.

Members

THOMAS D. ALBRIGHT (NAS) is Professor and Director of the Vision Center Laboratory and Conrad T. Prebys Chair in Vision Research at the Salk Institute for Biological Studies. His laboratory focuses on the neural structures and events underlying the perception of motion, form, and color. Albright is a leader in the study of the brain systems underlying visual perception and memory in primates. His work has demonstrated the importance of context in information processing and provides a foundation for determining how the brain detects the features of retinal images and integrates them into a perceptual whole. Dr. Albright holds a B.S. degree in psychology from the University of Maryland and a Ph.D. in psychology and neuroscience from Princeton University.

RICHARD A. BERK holds a B.A. in psychology from Yale University and a Ph.D. in sociology from the Johns Hopkins University. Dr. Berk was previously a Distinguished Professor of Statistics at the University of California, Los Angeles. Professor Berk is an elected fellow of the ASA, the American Association for the Advancement of Science, and the Academy of Experimental Criminology. His research interests include statistical learning procedures and applied statistics more generally. He has published extensively on program evaluation, criminal justice, environmental issues, and applied statistics. Professor Berk's two most recent books are *Statistical Learning from a Regression Perspective* (Springer Series in Statistics, 2008) and *Criminal Justice Forecasts of Risk: A Machine Learning Approach* (Springer Briefs in Computer Science, 2012).

SCOTT McNAMARA is currently serving a third term as the Oneida County (NY) District Attorney. He received his undergraduate degree from Syracuse University with a major in mathematics and a J.D. from Vermont Law School. McNamara has been a prosecutor for over 24 years and has handled thousands of cases. Many of his cases have involved narcotic and homicide prosecutions. McNamara has served as the lead prosecutor assigned to the Oneida County Drug Task Force and chaired the Oneida County District Attorney's Office Death Penalty Committee. From 2001 until 2006, McNamara represented the district attorney's office on the Joint Terrorism Task Force. During his tenure as district attorney, he created an Economic Crime Unit, a Conviction Integrity Unit, and a Second Chance Program and was appointed a community liaison to improve communication between the district attorney's office and the diverse

population it serves. In addition, McNamara initiated a procedure of video recording all police interrogations in Oneida County. He also implemented a policy to video record eyewitness identification procedures and to obtain a confidence statement as part of standard police procedure. McNamara is currently a commissioner on the New York State Commission on Forensic Science. He is also the President-elect of the District Attorneys Association of the State of New York and a current member of the Committee of the Center for Prosecutor Integrity, reviewing law enforcement use of the “victim-centered” investigation approach. McNamara was a member of the National Academies’ committee that issued the 2014 report *Identifying the Culprit: Assessing Eyewitness Identification*.

EUGENE WONG (NAE) served as professor in the Electrical Engineering and Computer Sciences (EECS) Department at the University of California, Berkeley. He joined the faculty in 1962, where he pursued his research interests in database management systems, optimization algorithms, stochastic processes, and neural networks. From 1985 to 1989, he served as Department Chair, during which time he led the department through its greatest period of growth to become the largest academic department on the Berkeley campus and one of the highest ranked departments in its field. Dr. Wong retired from the EECS Department in 1994 as Professor Emeritus. Prior to coming to Berkeley, Dr. Wong was an NSF Postdoctoral Fellow at the University of Cambridge (1959-1960) and a researcher at IBM Research Center in Yorktown, New York (1960-1962).

In 1980, Dr. Wong co-founded Relational Technology, Inc., later renamed the INGRES Corporation, which was a leading provider of database software products. While in Hong Kong from 1994 to 1996, he was instrumental in building an internet backbone for Asia, first as CEO of SuperNet, Ltd., and then as founder of the Asia Internet Holding Company. From 1998 to 2005, he was variously a director, chief scientist, and CEO of Versata, Inc., a public software company serving the distributed enterprise applications market.

Besides Professor Wong’s academic and entrepreneurial attainments, he has a distinguished record of national and international public service. From 1990 to 1993, he was the Associate Director of the Office of Science and Technology Policy, Executive Office of the President, under George H. Bush, where he played a leading role in efforts that led to the U.S.-Japan cooperative program in optoelectronics and to the federal initiatives on high performance computing and communications and on advanced manufacturing technology. While there he also contributed to the enacted version of the High Performance Computing Act of 1991. From 1998 to 2000, he was an assistant director at NSF for engineering, where he inaugurated major initiatives in microsystems, information technology, nanotechnology, service-sector engineering, and biotechnology. In addition, Dr. Wong has served on numerous advisory committees of national and international

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organizations (NAE; National Research Council; NATO; Chairman of the Council of Advisors on Innovation and Technology, Office of the Chief Executive, Hong Kong; and the Science and Technology Advisory Group, Office of the Prime Minister of Taiwan). Most recently, he served as Interim Director of Information and Communication Technologies for Science Foundation Ireland.

Dr. Wong received his B.S., A.M., and Ph.D. degrees in electrical engineering from Princeton University in 1955, 1958, and 1959, respectively.

SANDY L. ZABELL is professor of mathematics and statistics at Northwestern University. He was assistant professor of statistics at the University of Chicago from 1974 to 1979, and joined Northwestern University in 1980. He is a Fellow of the ASA and the Institute of Mathematical Statistics. In the past he has served as an Associate Editor of the *American Mathematical Monthly* and the *Journal of Mathematical Analysis and Applications*, and Book Review Editor of the *Annals of Probability*. His principal research interests revolve around mathematical probability (in particular, large deviation theory) and Bayesian statistics (in particular, the study of exchangeability). He has also written extensively on the history and philosophical foundations of probability and statistics. Professor Zabell has had a long-standing involvement in the legal applications of statistics, including serving on three panels of the National Research Council and teaching courses on statistics at both the University of Chicago and Northwestern law schools. One of his primary interests at present is forensic science, in particular the statistical issues arising from the use of DNA in human identification. He has spoken numerous times at forensic science conferences and lectured on forensic DNA identification in courses at Northwestern. He is also interested in the statistical proof of employment discrimination and the legal uses of sampling. In addition to his scholarly interests, he has assisted legal counsel over the years in more than 200 cases, both civil and criminal.

Dr. Zabell received his A.B. from Columbia College in 1968, his A.M. (in biochemistry and molecular biology) from Harvard University in 1971, and his Ph.D. (in mathematics) from Harvard University in 1974.

Staff

STEVEN KENDALL, Ph.D., is program officer for the Committee on Science, Technology, and Law. Dr. Kendall has contributed to numerous National Academies of Sciences, Engineering, and Medicine reports, including *International Summit on Human Gene Editing: A Global Discussion* (2015); *Identifying the Culprit: Assessing Eyewitness Identification* (2014); *Positioning Synthetic Biology to Meet the Challenges of the 21st Century* (2013); the *Reference Manual on Scientific Evidence*, 3rd Edition (2011); *Review of the Scientific Approaches*

Used During the FBI's Investigation of the 2001 Anthrax Mailings (2011); *Managing University Intellectual Property in the Public Interest* (2010); and *Strengthening Forensic Science in the United States: A Path Forward* (2009). Dr. Kendall completed his Ph.D. in the Department of the History of Art and Architecture at the University of California, Santa Barbara, where he wrote a dissertation on 19th-century British painting. Dr. Kendall received his M.A. in Victorian art and architecture at the University of London. Prior to joining the National Research Council in 2007, he worked at the Smithsonian American Art Museum and The Huntington in San Marino, California.

ANNE-MARIE MAZZA, Ph.D., is the senior director of the Committee on Science, Technology, and Law. Dr. Mazza joined the National Academies of Sciences, Engineering, and Medicine in 1995. She has served as senior program officer with both the Committee on Science, Engineering, and Public Policy and the Government-University-Industry Research Roundtable. In 1999 she was named the first director of the Committee on Science, Technology, and Law, a newly created activity designed to foster communication and analysis among scientists, engineers, and members of the legal community. Dr. Mazza has been the study director on numerous National Academies' reports, including *International Summit on Human Gene Editing: A Global Discussion* (2015); *Identifying the Culprit: Assessing Eyewitness Identification* (2014); *Positioning Synthetic Biology to Meet the Challenges of the 21st Century* (2013); *Reference Manual on Scientific Evidence*, 3rd Edition (2011); *Review of the Scientific Approaches Used During the FBI's Investigation of the 2001 Anthrax Letters* (2011); *Managing University Intellectual Property in the Public Interest* (2010); *Strengthening Forensic Science in the United States: A Path Forward* (2009); *Science and Security in a Post 9/11 World* (2007); *Reaping the Benefits of Genomic and Proteomic Research: Intellectual Property Rights, Innovation, and Public Health* (2005); and *Intentional Human Dosing Studies for EPA Regulatory Purposes: Scientific and Ethical Issues* (2004). Between October 1999 and October 2000, Dr. Mazza divided her time between the National Academies and the White House Office of Science and Technology Policy, where she served as a senior policy analyst responsible for issues associated with a Presidential Review Directive on the government-university research partnership. Before joining the National Academies, Dr. Mazza was a senior consultant with Resource Planning Corporation. She is a fellow of the American Association for the Advancement of Science. Dr. Mazza was awarded a B.A., M.A., and Ph.D. from George Washington University.

SCOTT T. WEIDMAN is the director of the Board on Mathematical Sciences and their Applications (BMSA). He joined the National Academies of Sciences, Engineering, and Medicine in 1989 with the Board on Mathematical Sciences and moved to the Board on Chemical Sciences and Technology in 1992. In 1996 he established a new board to conduct annual peer reviews of the Army Research Laboratory, which conducts a broad array of science, engineering, and

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human factors research and analysis, and he later directed a similar board that reviews the National Institute of Standards and Technology. Dr. Weidman has been full time with the BMSA since mid-2004. During his National Academies' career, he has staffed studies on a wide variety of topics related to mathematical, chemical, and materials sciences, laboratory assessment, risk analysis, and science and technology policy. His current focus is on building up the National Academies' capabilities and portfolio related to all areas of analysis and computational science. He holds bachelor degrees in mathematics and materials science from Northwestern University and M.S. and Ph.D. degrees in applied mathematics from the University of Virginia. Prior to joining the National Academies, he had positions with General Electric, General Accident Insurance Company, Exxon Research and Engineering, and MRJ, Inc.

KAROLINA KONARZEWSKA is program coordinator for the Committee on Science, Technology, and Law. She is a master's student of economics at George Mason University. She holds a master's degree in international relations from New York University and a bachelor's degree in political science from the College of Staten Island, City University of New York. Prior to joining the National Academies of Sciences, Engineering, and Medicine, she worked at various research institutions in Washington, D.C., where she covered political and economic issues pertaining to Europe, Russia, and Eurasia.

Appendix B

Committee Meeting Agendas

MEETING 1 WASHINGTON, DC SEPTEMBER 28, 2015

MONDAY, SEPTEMBER 28, 2015

OPEN SESSION

- | | |
|----------|---|
| 8:30 am | Continental Breakfast |
| 9:00 am | Opening Remarks and Introductions

Chair:
David Banks, Duke University |
| 9:15 am | Overview of NRC report <i>Identifying the Culprit: Assessing Eyewitness Identification</i> and Discussion with Committee

Speaker:
Tom Albright, Salk Institute for Biological Studies and report committee co-chair |
| 10:00 am | Overview of Statistical Issues Arising in Eyewitness Identification Research and Discussion with Committee

Speaker:
Karen Kafadar, University of Virginia, Charlottesville |
| 10:45 am | Break |
| 11:00 am | Charge to the Committee and Discussion with Sponsor

Speaker:
Joanna Weiss, Laura and John Arnold Foundation |

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12:00 pm Lunch

1:00 pm Selecting from a Lineup – Binary Classification Problem –
Statistical Approaches

Speakers:
Gary L. Wells, University of Iowa
John T. Wixted, University of California, San Diego

2:30 pm Adjourn to Closed Session

**MEETING 2
WOODS HOLE, MA
JULY 23-24, 2016**

MEETING CLOSED IN ITS ENTIRETY.

Appendix C

Laura and John Arnold Foundation Request for Proposals

20 *Statistical Methodologies for Assessing Variables in Eyewitness Performance***PROJECT OVERVIEW AND REQUEST FOR PROPOSALS:****IMPROVING PERFORMANCE AND RELIABILITY OF EYEWITNESS IDENTIFICATION****Overview**

The Laura and John Arnold Foundation (LJAF) is a 501(c)(3) private foundation, whose core objective is to address our nation's most pressing and persistent challenges using evidence-based, multi-disciplinary approaches.

Request for Proposals

LJAF is pleased to issue the following request for proposals for research designed to assess and improve the performance and reliability of eyewitness identifications. Designing eyewitness identification procedures – and interpreting their results – is challenging, and current practices are not as reliable as one might hope. Numerous interesting open questions merit attention from the broad research community, and the Foundation especially encourages interdisciplinary research partnerships and/or research performed in collaboration with law enforcement agencies and the judiciary.

This call for proposals stems from the findings and recommendations of the 2014 National Academy of Sciences' (NAS) report, *Identifying the Culprit: Assessing Eyewitness Identification* (see <http://www.nap.edu/catalog/18891/identifying-the-culprit-assessing-eyewitness-identification>). That report was the result of the Foundation's request to the NAS to assess the state of research on eyewitness identification. In its report, the NAS found that, while "past research has appropriately identified the variables that may affect an individual's ability to make an accurate identification," because of "the complex nature of eyewitness identification, the practical difficulties it poses for experimental research, and the still ongoing evolution of statistical procedures in the field of eyewitness identification research, there remains ... substantial uncertainty about the effect and the interplay of these variables on eyewitness identification."¹

In general, this request for proposals aims to address the research challenges raised in Recommendation 11 of the NAS's report,² but proposals need not be constrained by the particular ideas raised there.

The Foundation specifically seeks proposals for research that explores the effects on eyewitnesses of different system variables (e.g., variants on lineup procedures or instructions given to eyewitnesses) and estimator variables (e.g., presence or absence of weapon, lighting conditions and distances, elapsed time between the incident and the identification task, levels of stress) and the interactions between these variables. It envisions that much of this research will use statistical evaluation tools to improve upon existing methods. To address questions about the effectiveness of various eyewitness identification procedures, the Foundation encourages experimental designs using random assignment, when feasible,

¹ National Research Council. *Identifying the Culprit: Assessing Eyewitness Identification*. Washington, DC: The National Academies Press, 2014.

² *Ibid.* See pp. 117-119.

and other research methodologies that allow for the strongest possible causal inferences when random assignment is not feasible.

Among the many ways that may be explored as options for improving the reliability and efficacy of eyewitness identifications, the Foundation is particularly interested in:

- 1) research that yields an improved understanding of the relative merits of simultaneous and sequential lineup procedures;
- 2) research that assesses the effectiveness of other lineup procedures;
- 3) research that helps characterize the evidentiary strength of an eyewitness's identification or non-identification of a suspect from a lineup. This is the binary classification problem of eyewitness identifications, which raises questions such as how to properly handle different kinds of error, which have different consequences³; and/or
- 4) research from the broader scientific community that addresses the wide range of issues related to eyewitness identifications, such as how the probability of a correct identification varies with estimator variables including, but not limited to, those mentioned above.

Application Process and Selection Criteria:

The proposal submission process will be two-staged. Initially, applicants should submit a letter of interest including a description of work to be performed. This document, which should be no more than three pages in length, should be received no later than April 8, 2016. Statements of interest will be examined by a newly-appointed committee of experts established by the National Academies of Sciences, Engineering, and Medicine.

Taking account of comments from the expert committee, the Foundation will invite some applicants to submit a formal proposal. All invitations for formal proposals will be issued by May 6, 2016, and include a template for proposal submission including: 1) a short narrative statement describing the work to be performed; 2) a detailed project budget; 3) a list of project milestones; 4) the principal investigator's curriculum vitae; and 5) a description of project deliverables. The deadline for formal proposals will be June 24, 2016.

The letters of interest and proposals will be evaluated against the following criteria:

➤ **IMPORTANCE:** Is the applicant proposing research that could produce important improvement in our understanding of eyewitness identification and the ability to reduce eyewitness identification errors? Could the insights arising from the proposed research be applied within the constraints of real-world conditions?

³ Binary classification is the task of classifying the elements of a set into two groups—in the case of eyewitness identification, into the groups “suspect” and “non-suspect.” The former group should have, at most, one member. However, an eyewitness may not only correctly identify a suspect from a lineup or correctly recognize that a suspect is absent, but he or she may incorrectly identify an innocent individual as the suspect (a false positive) or not identify a guilty individual as the suspect (a false negative). Errors of this type are important to consider, as either of the latter two outcomes have implications for the reliability of identifications.

22 *Statistical Methodologies for Assessing Variables in Eyewitness Performance*➤ **EXPERIENCE OF THE RESEARCHER(S) AND RELEVANCE OF THEIR BACKGROUND(S)**➤ **STUDY DESIGN:** Is the applicant's proposed study design likely to result in strong and useful insights. If the proposed study involves a randomized trial, can high-value data be collected?➤ **PARTNERS:** Does the applicant's team include all parties needed to perform the proposed study?

For the letter of interest: While applicants are asked to address all four selection criteria above, it is not expected that applicants will have finalized all aspects of the study design and partnership agreements. However, all four criteria will be evaluated when a full proposal is reviewed.

When full proposals are received, they will be reviewed by the National Academies of Sciences, Engineering, and Medicine committee described above. That committee will provide the Foundation with assessments of the merits of each proposal, but the Foundation will make the final decision as to which proposals are funded.

The Foundation will consider funding projects of varying scope and duration. While proposals for short-term, high-impact research are encouraged, the Foundation recognizes and appreciates the benefits of multi-institutional research projects that foster collaborations between academia and practitioners such as law enforcement agencies or other government entities. Research projects may, therefore, be performed by individual researchers or multi-member teams. The level of research funding will be commensurate with project size.

The following table shows the requested application materials and timeline:

<u>Stage of application process</u>	<u>Date</u>
All prospective applicants are asked to submit a letter of interest (maximum three pages)	<i>Deadline:</i> April 8, 2016
Applicants will be notified whether they are invited to submit a full proposal (full proposals must be invited)	May 6, 2016
Invited applicants submit a full proposal (maximum six pages)	<i>Deadline:</i> June 24, 2016
Applicants will be notified whether they have been selected for award	August 2016
Grants will be awarded	October 2016

Letters of interest should be emailed to EWIDresearch@arnoldfoundation.org with an email subject line of LJAF CJ RFP-2016-01.

