

**Extreme Event Decision Making Workshop  
April 29 - 30, 2001**

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## Extreme Event Decision Making Workshop

### Participant brief biographies and research interests

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**Hal Arkes** received his BA from Carleton College and his PhD from the University of Michigan in 1971 in Experimental Psychology. From 1972 to 2000 he was a faculty member in the Department of Psychology at Ohio University. Currently he has a joint appointment in the Department of Psychology at the Ohio State University and at the Center for HOPES (Health Outcomes, Policy, and Evaluation Studies). His primary research interests are in the areas of medical decision making and economic decision making. From 1993 to 1995 and again from 1998 to 2000 he co-directed the Program in Decision, Risk, and Management Science at the National Science Foundation.

Research interests related to extreme event decision making

- Judgment and decision making
- Decision support systems
- Science and public policy

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**Jerome R. Busemeyer** is a Professor of Cognitive Science at Indiana University, Bloomington, Indiana. He received his Ph.D. from University of South Carolina in 1979. He was president of the Society of Mathematical Psychology in 1993, and a member of NIMH and NSF grant review panels from 1993 until 2000, and he is on the editorial boards for *Journal of Mathematical Psychology*, *Journal of Experimental Psychology: Learning, Memory and Cognition*, and *Psychological Review*. He has over 50 publications in top journals in Psychology, and his research has been funded by NSF, NIMH, and NIDA. His research interests include dynamic, emotional, and cognitive models of judgment and decision making, neural network models of function learning, interpolation, extrapolation, methodology for comparing and testing complex models of behavior, and measurement theory with error contaminated data.

Research interests related to extreme event decision making

- Judgment and decision making
- Time pressure, stress, emotion in decision making
- Modeling complex systems

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**Lee Clarke** teaches sociology at Rutgers University. His early work concerned how decision makers choose among risks in very uncertain environments. Publications include: *Acceptable Risk? Making Decisions in a Toxic Environment*, University of California Press, *Organizations, Uncertainties, and Risk*. Edited by James F. Short, Jr. and Lee Clarke, Boulder: Westview Press, "Explaining Choices Among Technological Risks," *Social Problems*; "Oil Spill Fantasies," *Atlantic Monthly*, "Sociological and Economic Theories of Markets and Nonprofits," *American Journal of Sociology*, "The Disqualification Heuristic: When Do Organizations Misperceive Risk?" *Research in Social Problems and Public Policy*, "Prosaic Organizational Failure," *American Behavioral Scientist*. Clarke's most recent book is *Mission Improbable*:

*Using Fantasy Documents to Tame Disaster*, University of Chicago Press. He has written about the Y2K problem, and is currently writing a book about the idea of worst cases.

Research interests related to extreme event decision making

Judgment and decision making	Risk communication
Decision analysis	Technological risk
Time pressure, stress, emotion in decision making	Public involvement
Modeling complex systems	Natural hazards
Expertise	Emergency management
Forecasting	Science and public policy
Risk management	Political/organizational decision making
Risk perception	Policy analysis

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**Michael L. DeKay** is an Assistant Professor in the H. John Heinz III School of Public Policy and Management and in the Department of Engineering and Public Policy, both at Carnegie Mellon University. He has a BS (1985) in chemistry from the California Institute of Technology, an MS (1987) in chemistry from Cornell University, and an MA (1992) and a PhD (1994) in social psychology from the University of Colorado. Before moving to Pittsburgh in 1996, he spent two years as a Post-Doctoral Fellow and Health Services Research Specialist at the Wharton School and the Veterans Affairs Medical Center in Philadelphia.

His research is focused on judgment and decision making in the environmental and medical domains. Current projects include ranking risks to health, safety, and the environment; perception of ecological risks; and precautionary reasoning. Other recent work has involved risk categorization, prioritization of species-preservation programs and candidates for organ transplantation, defensive use of diagnostic tests, cost-effectiveness of strategies for genetic testing, efficiency and equity in medical decisions, individual versus aggregate risk in medical practice and policy, nurse involvement in euthanasia, and probabilistic standards of proof in action/inaction decisions.

Research interests related to extreme event decision making:

- Judgment and decision making
- Decision analysis
- Value elicitation
- Risk perception
- Risk communication
- Technological risk
- Public involvement

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**Klara Farago**

Teaching in: Social psychology, Decision making, Organizational psychology

Research fields: Risk perception, Risk communication, Economic psychology, Organizational decision making

Research interests related to extreme event decision making

- Judgment and decision making
- Time pressure, stress, emotion in decision making
- Risk perception
- Risk communication
- Public involvement
- Political/organizational decision making

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**Charles Herrick** is a principal in Stratus Consulting's Washington, D.C. office. Dr. Herrick has more than 17 years of experience in environmental information policies and applications, environmental program management and evaluation, applied environmental policy analysis, and science/policy assessment in an environmental context. Before joining the firm, he was vice president of Princeton Economic Research, associate director of the Council on Environmental Quality, and assistant director of the National Acid Precipitation Assessment Program. He has published articles in journals such as *Global Environmental Change*, *Issues in Science and Technology*, and *Science, Technology, and Human Values*. Most recently, he contributed two invited essays to a book from Island Press titled *Prediction: Science, Decision Making, and the Future of Nature*. He also serves as a peer reviewer on several NAS and USGCRP panels. Dr. Herrick holds a PhD in public policy from the American University in Washington, D.C., an MA in political theory from the University of Colorado, and a BA in political science from Fort Lewis College.

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At the National Science Foundation since 1976, **Rachelle D. Hollander** manages a group of programs in the Division of Social and Economic Sciences, and directs the Societal Dimensions of Engineering, Science and Technology (SDEST) program. SDEST supports research and education projects on ethics and engineering, science, and technology; and on issues for public investment in research, science and technology. Hollander received her doctorate in philosophy in 1979 from the University of Maryland, College Park; she has written articles on applied ethics in numerous fields, and on science policy and citizen participation. Dr. Hollander is a Fellow of the American Association for the Advancement of Science (AAAS), and she has served on the Council of the Society for Social Studies of Science (4S). She is a member of a number of other professional societies, and on the editorial board of several journals.

Research interests related to extreme event decision making

- Ethics and risk

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**Julie Irwin** received her BA (high honors) in Psychology and English from the College of William and Mary. She received an MA and Ph.D. in Cognitive Psychology from the University of Colorado; her thesis advisor was Gary McClelland. After graduate school she completed a post-doctoral fellowship in quantitative psychology at the University of Illinois.

Her primary research interest is judgment and decision making. Her research has been published in marketing, psychology, economics, and multidisciplinary journals. She recently edited a special issue of the *Journal of Consumer Psychology*, and was appointed to the editorial board of *Organizational Behavior and Human Decision Processes*. In 1995 she was awarded a three-year National Science Foundation grant (in collaboration with James H. Davis) to study group

judgment. Last spring she was the recipient of the business school's annual Research Excellence Award for Assistant Professors.

Before joining the University of Texas at Austin in 1999, she served on the faculty in marketing at the Stern School of Business at New York University, and as a visiting professor at The Wharton School of the University of Pennsylvania.

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**Alex Kirlik** is currently with the School of Industrial & Systems Engineering, the School of Psychology, and the College of Computing at Georgia Tech, where he is also Coordinator of Cognitive Science Academic Programs. Beginning Summer 2001 he will join the University of Illinois, where his affiliations will be with the Beckman Institute, the departments of Psychology and Mechanical & Industrial Engineering, and the Institute of Aviation & Applied Psychology. He received his MS and PhD in Industrial & Systems Engineering from Ohio State in 1989, with a focus on human-machine systems. Since that time his research has concerned understanding and supporting cognition in complex sociotechnical systems, with an emphasis on the effects of increasing levels of information technology and automation. Applications have included health care, commercial aviation, military command and control, and public safety.

Research interests related to extreme event decision making

Judgment and decision making

Modeling complex systems

Expertise

Planning

Distributed cognition (across humans and artifacts)

Cognitive engineering (supporting cognition in sociotechnical systems)

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**Howard Kunreuther** is the Cecilia Yen Koo Professor of Decision Sciences and Public Policy at the Wharton School, University of Pennsylvania, Chair of the Operations and Information Management Department and Co-Director of the Wharton Risk Management and Decision Processes Center. He has a long-standing interest in ways that society can better manage low probability-high consequence events as it relates to technological and natural hazards.

He currently is involved in a joint research project between the Wharton Risk Center and Wharton Financial Institutions Center on Managing Catastrophic Risk that is concerned with ways to reduce losses and provide financial protection against large-scale natural disasters. He is also interested in the role that third parties and insurance can play improving risk management of industrial facilities and reducing the chances and consequences of accidents.

Research interests related to extreme event decision making

Decision Processes for Low Probability High Consequence Events

Catastrophic Risk Management

Role of Market Mechanisms (e.g. Insurance, Incentives, Third Parties)

Linking Science with Policy

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**Barbara Mellers.** I am a professor of psychology, with training in quantitative methods and models. I did my graduate work at the University of Illinois, and then spent the next 15 years at

the University of California at Berkeley. For the last six years, I have been enjoying Ohio State University. My research interests are in the areas of judgment and decision making. I have developed mathematical models to describe fair distributions of costs and resources, preference reversals, contextual effects, and buying/selling price differences. More recently, I have turned my attention to psychological models of how emotions influence choice. I am interested in factors that shape anticipated emotions, the effects of anticipated emotions on choice, the accuracy of anticipated emotions, and last, but not least, the effects of immediate emotions experienced by the decision maker at the time of choice.

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**M. Granger Morgan** is Head and Professor of Engineering and Public Policy at Carnegie Mellon University where he also holds the Lord Chair Professor in Engineering as well as academic appointments in both the Department of Electrical and Computer Engineering and in The H. John Heinz III School of Public Policy and Management. He holds a Ph.D. from the Department of Applied Physics and Information Sciences at the University of California at San Diego (1969) where he did experimental studies of radio star scintillation.

Professor Morgan has interests in integrated assessment of large complex policy problems that involve science and technology; in the treatment of uncertainty in quantitative policy analysis; in risk analysis, management and communication; in the improvement of health, safety and environmental regulation, in technical and policy issues related to electric power, and in several other applied areas of technology and public policy.

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**John Mulvey** is a Professor of Operations Research and Financial Engineering and a founding member of the Bendheim Center for Finance at Princeton University. His specialty is strategic planning, with an emphasis on stochastic optimization.

He has implemented financial risk management systems for many companies, including Pacific Mutual, American Express, Towers Perrin/Tillinghast, Merrill Lynch, American Re-Insurance, Siemens, and Falcon Asset Management (Swiss Re). These systems link the key risks and assist the company in making high-level decisions. In addition, he has designed significant planning systems for government agencies, including the Office of Tax Analysis for the Treasury Department, the Joint Chiefs of Staff in the Defense Department, and personal planning for the U.S. Army.

He holds a B.S. (1969) in General Engineering and an M.S. (1969) in Computer Science from the University of Illinois, Urbana, and received an M.S. (1974) and a Ph.D. (1975) from UCLA in Management Science. He worked for TRW Systems Group for six years as a project manager. Afterwards, he taught for three years at Harvard University (Business School and Economics Dept.) before moving to Princeton in 1978. He has edited four books, recently *Worldwide Asset and Liability Modeling*, Cambridge University Press, and published over 100 scholarly papers.

Research interests related to extreme event decision making

- Decision analysis
- Decision support systems
- Modeling complex systems
- Forecasting
- Risk management

Securitization (ability of market to absorb risks, such as earthquakes, hurricanes, and weather risks. Much work on novel, new instruments)

Systemic risks (e.g. to financial system. This issue came up when Long Term Capital Management ran into trouble -- early fall 1998 and Greenspan helped with their bail out, claiming that the entire financial structure was at risk.)

Risk audits (coming out of the KontraG bill in Germany)

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**Jeryl L. Mumpower** is currently the Interim Dean of the School of Public Health at the University at Albany, State University of New York. He also serves as Associate Provost and Dean of Graduate Studies. He holds appointments as a Professor of Public Administration, Public Policy, and Information Science. Previously, he has served as Director of the Center for Policy Research and as the Associate Director at the Rockefeller Institute of Government. A faculty member of the University at Albany since 1984, he recently returned from a two-year appointment as director of the Decision, Risk, and Management Science program at the National Science Foundation.

Professor Mumpower received his B. A. from the College of William and Mary and his Ph.D. in social and quantitative psychology from the University of Colorado, Boulder. He is author or editor of nine books and more than fifty book chapters and articles. His research has addressed basic and applied topics in risk analysis and management; environmental policy, negotiation, individual and group decision making processes, and the use of scientific expertise in public policy making. He is a Fellow of the Society for Risk Analysis and is currently the area editor for social and decision sciences for the Society's journal *Risk Analysis*.

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**Thomas R. Stewart** is Director of the Center for Policy Research, Rockefeller College of Public Affairs and Policy, State University of New York at Albany. He received his Ph.D. in psychology from the University of Illinois. He was formerly with the Graduate School of Public Affairs and the Center for Research on Judgment and Policy at the University of Colorado and the Environmental and Societal Impacts Group at the National Center for Atmospheric Research. He was a faculty fellow in the Office of Coastal Zone Management, National Oceanic and Atmospheric Administration. He is a cognitive psychologist who specializes in theoretical, methodological and applied studies of judgment and decision making. His applied research interests focus on the application of judgment and decision research to problems involving scientific and technical expertise and public policy, including studies of regional air quality policy, visual air quality judgments, weather forecasting judgment and the use of weather forecasts in decision making, scientists' judgments about global climate change, and medical decision making.

Research interests related to extreme event decision making

Judgment and decision making

Expertise

Forecasting

Science and public policy

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**William (Al) Wallace** is Professor, Decision Sciences and Engineering Systems, Rensselaer Polytechnic Institute and Research Director of Rensselaer's Center for Infrastructure and Transportation Studies. As a researcher and a consultant in Management Science and

Information Systems, Professor Wallace has over 25 years experience in and research on the development of decision technologies for industry and government. He is presently engaged in research on the application of artificial intelligence to problems in incident management and emergency response, issues in trust and ethical decision making, and in studying the impact of visualization technologies on problem solving and decision making. Professor Wallace has, since 1990, authored and edited 6 books and over 70 articles and papers - out of a total of over 200 archival publications. He has held academic positions at Carnegie-Mellon University and the State University of New York at Albany, was a research scientist at the International Institute of Environment and Society, Science Center, West Berlin, Germany and a project engineer at Illinois Institute of Technology Research Institute; was Visiting Professor, Polyproject: Risk and Safety of Technical Systems, Swiss Federal Institute of Technology, Zurich, and Visiting Professor, Faculty of Systems Engineering and Policy Analysis, Delft University of Technology, Delft, Netherlands. He was selected as a Visiting U.S. Faculty, Management Information Systems, Decision Support Systems, National Center for Industrial Science and Technology Management Development, Dalian, People's Republic of China. Professor Wallace recently was an Expert, Division of Civil and Mechanical Systems, National Science Foundation, and Consultant, Board on Infrastructure and the Constructed Environment, National Research Council, National Academies. His awards include the International Emergency Management Conference Award for Outstanding Long-Term Dedication to the Field of Emergency Management and Third Millennium Medal from The Institute of Electrical and Electronics Engineers (IEEE). His educational background includes a B.Ch.E. from Illinois Institute of Technology and a Master of Science and Doctorate in Management Science from Rensselaer Polytechnic Institute. Professor Wallace is a Navy veteran.

Research interests related to extreme event decision making

- Decision support systems
- Risk management
- Natural hazards
- Emergency management

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**Elise A. Weaver.** I am currently completing a post-doctoral stint at the University at Albany, SUNY, working with Tom Stewart, having graduated with a Ph.D. in Psychology in 1999 from Duke University, specializing in social psychology and judgment. Our current project looks at the nature of good judgment and whether it is a separable skill from intelligence and memory. Other projects I am developing include a study of stakeholder judgment and decision making guided by conflicting goals, and a system dynamics model of Ken Hammond's (1996) description of how decision thresholds in policy making might cycle over time in response to pressure from constituencies representing individuals affected by the errors (false negatives and false positives) resulting from decision uncertainty. I have a strong interest in quantitative modeling and computer simulation, including structural equation modeling and system dynamics simulation and I will be starting as an assistant professor at Worcester Polytechnic Institute in Psychology/System Dynamics this fall.

Research interests related to extreme event decision making

- Judgment and decision making
- Value elicitation
- Modeling complex systems

## Public involvement

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**Rae Zimmerman** is Professor of Planning and Public Administration at New York University's Robert F. Wagner Graduate School of Public Service, where she is Director of the Urban Planning Program and Director of the National Science Foundation (NSF)-funded Institute for Civil Infrastructure Systems (ICIS) that promotes collaboration among disciplines and interests around urban infrastructure issues. Major areas of research and teaching are environmental planning with an emphasis upon water resources and hazardous wastes; risk assessment and risk management applications to environmental health and engineering; and socioeconomic dimensions of environmental and transportation infrastructure. Her recent research funded by the NSF and the U.S. EPA includes social and environmental measures of urban infrastructure performance; adaptability of agency decision-making in the NY region to global climate change; farmers' attitudes and the adoption of agricultural practices that protect water quality; and social and economic characteristics of communities with inactive hazardous waste sites. Publications appear in journals and edited books on environmental health, hazardous waste policy and risk. For close to twenty years, she has worked on environmental and social aspects of large water treatment, transportation, and waste disposal infrastructure for the U.S. EPA, local governments, and engineering consulting firms. Professor Zimmerman is a former President of the international Society for Risk Analysis, a Fellow of the American Association for the Advancement of Science, and is currently a member of the National Research Council's Board on Infrastructure and the Constructed Environment, the U.S. EPA's Board of Scientific Counselors, the National Drinking Water Advisory Council Research Working Group, and has served on the U.S. EPA Science Advisory Board Subcommittee on Residual Risk. She received a Bachelors degree in Chemistry from the University of California (Berkeley), a Master of City Planning from the University of Pennsylvania, and a Ph.D. in Planning from Columbia University.

### Research interests related to extreme event decision making

Judgment and decision making	Risk communication
Decision analysis	Technological risk
Modeling complex systems	Public involvement
Expertise	Natural hazards
Forecasting	Emergency management
Risk management	Science and public policy
Risk perception	Policy analysis