L. ROBIN KELLER

BACKGROUND

<u>Address</u>

The Paul Merage School of Business (949) 824-6348 (Office)
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Irvine, California 92697-3125 http://faculty.sites.uci.edu/lrkeller/

<u>Education</u>

Ph.D. UCLA Anderson Graduate School of Management, September 1982
Management Science major with specialization in decision analysis, Marketing minor field
Committee Chairs: Dr. Rakesh Sarin and Dr. Moshe Rubinstein
M.B.A. UCLA Anderson Graduate School of Management, June 1976, Management Science
Major, Thesis: "Customer Needs of First Los Angeles Bank"
B.A. UCLA, June 1974, Mathematics major

<u>Professional</u>
<u>History</u>

PROFESSOR OF OPERATIONS AND DECISION TECHNOLOGIES
The Paul Merage School of Business, University of California, Irvine
Professor Emerita, March 2022-
Full Professor, July 2001- February 2022 (Step VI awarded 7/2017)
Assistant Professor, 1982-89; Associate Professor, 1989-2001
ADMINISTRATIVE ROLES AT UCI:
UC Irvine Campus
Co-chair, Academic Planning Group's Work Group on Merit and Promotion in the Context of a Pandemic, 2020-21
Council on Academic Personnel, Sept. 2016-July 2019; Reserve CAP, 2021-22
Institute for Mathematical Behavioral Sciences, Affiliated Faculty Member, closed in 2022
Executive Committee, 1991-Dec. 2009; Recruiting Committee, 2005-06
John S. and Marilyn Long U.S.- China Institute for Business and Law, Affiliated Faculty
Compliance Lab, UCI Law School, Affiliated Faculty, beginning summer 2016
Graduate Council (oversees graduate programs), 4/92-6/93; Fall 2002-Spring 2004
Chair, Campus Review Committee for UCI Dept. of Education, 2002-04
Committee on Committees, 1995-96, 1999-2000, 2005-06
Ad hoc Conflict of Interest Oversight Committee, 12/95-1997
Conflict of Interest Task Force Committee, 1997-98
Affiliated member of Center for Health Care Management and Policy (when founded in 2004)
Affiliated Core Faculty Member, Institute of Transportation Studies, 2006-on
Graduate Dean's Dissertation Fellowship Review committee chair, Spring 2010
UCI Greek Woman/Man of the Year Judge, January 2014
UCI Test of English Proficiency (TOEP), frequent faculty grader (now faculty do not grade)
Merage School of Business (formerly Graduate School of Management)
Task Force on Teaching Equity & Excellence, Chair, 2016
Member, Search Committee for Merage School Dean, 2013-14
Recruiting Committee for Long Chair in Business/Law, 2011-13
Associate Dean, Full-Time MBA program, 8-06 to 6-30-08
Associate Dean for Research, 1992-93
Director, Doctoral Program, 1985-86, 2009-2013
Chair, Ph.D. Program committee; Oversee PhD Brown Bag Series
Host Annual Welcome Lunch and Alumni Panel in Fall '09-'12

Host Annual Ph.D. Research Fest in Spring '10-'13
Recruit US diversity students: PhD Project Conference, November '10, '11,'12
PhD Project, 11/19/21 talked virtually with potential applicants
Ph.D. Committee, 2002, 2020-21
Dean's Faculty Advisory Committee, 2000-2001
Faculty Board (Personnel and advises Dean), 1997-98
Chair, Personnel (promotion and tenure) Committee, 1992-93; Member, 1991-92
Executive Committee (advises Dean), 1994-95
Masters Program Committee, 1996-98, '19-'20; chair, 2002-04, 05-06
Chair, Task Force on AACSB Accreditation, 1998-99
Chair, GSM Computing Committee, 1999-2000
Voting Rules Task Force, Winter 2001
Organizations and Strategy Recruiting Committee, 2002-03
Economics Recruiting Committee, 2003-04
MBA Focus Committee, 2004; Curriculum Innovation Committee, 2005-06
Operations and Decision Technologies Area
Area Coordinator, '94-5, '96-7, '97-8, '02-3, '03-4, S '09, S '10, S '11, F '12, W '13, F '18, F '20, W '21
ODT Recruiting Committee, '01-02, '03-04, '04-05, '09-10, '11-'12, '12-'13, '18-'19 (co-chair)
Colloquium Coordinator, most recently in 1991-92
Chair, Irvine Conference on Operations Research & Operations Management in the
Information Technology Era, 2000

SABBATICAL, COURTESY, VISITING AND OTHER APPOINTMENTS:

President-elect (2014), President (2015), Past-President (2016), INFORMS
(Institute for Operations Research and the Management Sciences)
Editor-in-Chief, *Decision Analysis,* January 2007-Dec. 2012, published by INFORMS

United States National Academies Committee Memberships:
Committee to Assess the Distribution and Administration of Potassium Iodide in the Event of a Nuclear Incident, Board of Radiation Effects Research, Division of Earth and Life Studies, National Research Council of the National Academies, 2003-2004.
U. S. National Committee for the International Institute for Applied Systems Analysis (IIASA), Board on International Scientific Organizations; January 2007-December 2012 (2 terms). http://sites.nationalacademies.org/PGA/biso/IIASA/index.htm
Committee on Ranking FDA Product Categories Based on Health Consequences, Phases I & II, 2008-11.   Under the Board on Environmental Studies & Toxicology in the Studies under the IOM Executive Office, Institute of Medicine of the National Academies; the IOM is the health arm of the National Academy of Sciences.
Results of Phase I, reported in a Letter report, February 17, 2009
Ranking FDA Product Categories Based on Health Consequences, Phase II
Full book available online in May 2011.
National Research Council of the National Academies Expert Meeting
Empowering the Miner: Gaps and Needs- A Meeting of Experts
Served as an invited expert for this "think tank" meeting, held to discuss how decision science, particularly in risky situations, can help to inform miner safety. The National Institute for Occupational Safety and Health (NIOSH) - Office of Mine Safety and Health Research asked the National Research Council to put together this meeting of experts at the Beckman Center in Irvine, CA on Feb. 19-20, 2014.
Committee for a Study of Performance-Based Safety Regulation, Transportation Research Board, National Academies, 2/2/2016-8/31/2017, full book available 10/2017.
https://www8.nationalacademies.org/cp/CommitteeView.aspx?key=49767
USC   Scientific Advisory Committee member, Homeland Security Center for Risk and Economic Analysis of Terrorist Events (CREATE), June 2005-October 2010.
UC Santa Cruz (Proposed) School of Management Academic Advisory Group, 2007-2010.
UCLA   Visiting Scholar John E. Anderson Graduate School of Management, Fall 1993-Winter 1994.
NSF   Program Director National Science Foundation, Washington, D.C.; Decision, Risk, and Management Science Program, August 1990 - July 1991; Associate Program Director, August

1989-July 1990. Managed review of grant proposals from a $3.23 million annual budget and provided direction for research in decision analysis, risk analysis, and management science.

UCI   Assistant Professor of Social Sciences, 1987-89, courtesy joint appointment

Duke   Visiting Assistant Research Professor   The Fuqua School of Business, Spring 1987

PUBLICATIONS

Research
Interests

Creative Problem Structuring, Cross-Cultural Decision Making, Fairness in Decision Making, Decision Analysis Theory and Applications, Medical Decision Making, Multiple Attribute Decision Making, Probability Judgments, Ambiguity of Probabilities or Outcomes, Risk Analysis for Terrorism, Environmental, Health, and Safety Risks, Time Preferences and Discounting, Utility Models, Models of Risk

Journal
Articles

1. L. Robin Keller, "The Effects of Problem Representation on the Sure-Thing and Substitution Principles," Management Science, Volume 31, No. 6, June 1985, pp. 738-751.

2. L. Robin Keller, "An Empirical Investigation of Relative Risk Aversion," IEEE Transactions on Systems, Man, and Cybernetics, Volume 15, No. 4, 1985, pp. 475-482.

3. L. Robin Keller, "Testing the 'Reduction of Compound Alternatives' Principle," OMEGA, The International Journal of Management Science, Volume 13, No. 4, July-August, 1985, pp. 349-358.

4. L. Robin Keller, Rakesh K. Sarin, and Martin Weber, "Empirical Investigation of Some Properties of the Perceived Riskiness of Gambles," Organizational Behavior and Human Decision Processes, Volume 38, August 1986, pp. 114-130.

5. L. Robin Keller and Rakesh K. Sarin, "Equity in Social Risk: Some Empirical Observations," Risk Analysis, Volume 8, No. 1, March 1988, pp. 135-146.

6. L. Robin Keller and Joanna Ho, "Decision Problem Structuring: Generating Options," IEEE Transactions on Systems, Man, and Cybernetics, Vol. 18, No. 5, September 1988, pp. 715-728.

7. Peter H. Farquhar and L. Robin Keller, "Preference Intensity Measurement," Annals of Operations Research, Vol. 19, 1989, pp. 205-217.

8. L. Robin Keller, "The Role of Generalized Utility Theories in Descriptive, Prescriptive, and Normative Decision Analysis," Information and Decision Technologies, Vol. 15, 1989, pp. 259-271.

9. L. Robin Keller, "Decision Research with Descriptive, Normative, and Prescriptive Purposes-Some Comments," Annals of Operations Research, Vol. 19, (volume on Choice Under Uncertainty edited by Peter Fishburn and Irving H. LaValle), 1989, pp. 485-487. Entire edited volume won 1991 Decision Analysis Publication Award from the ORSA Decision Analysis Special Interest Group.

10. Richard L. Daniels and L. Robin Keller, "An Experimental Evaluation of the Descriptive Validity of Lottery Dependent Utility Theory," Journal of Risk and Uncertainty, Vol. 3, 1990, pp. 115-134.

11. Richard L. Daniels and L. Robin Keller, "Choice-Based Assessment of Utility Functions," Organizational Behavior and Human Decision Processes, Vol. 52, 1992, pp. 524-543.

12. L. Robin Keller, Uzi Segal, and Tan Wang, "The Becker-de Groot-Marschak Mechanism and Generalized Utilized Theories: Theoretical Predictions and Empirical Observations," Theory and Decision, 34:83-97, 1993.

13. Stuart Eriksen and L. Robin Keller, "A Multi-Attribute Utility Approach to Weighing the Risks and Benefits of Pharmaceutical Agents," <u>Medical Decision Making</u>, 1993; 13:118-125.

14. Joanna Ho and L. Robin Keller, "The Effect of Inference Order and Experience-Related Knowledge on Diagnostic Conjunction Probabilities," <u>Organizational Behavior and Human Decision Processes</u>, 1994; 59: 51-74.

15. L. Robin Keller and Rakesh K. Sarin, "Fair Processes for Societal Decisions Involving Distributional Inequalities," <u>Risk Analysis</u>, Vol. 15, No. 1 (February 1995), pp. 49-59.

16. Lauraine G. Chestnut, L. Robin Keller, William E. Lambert, and Robert Rowe, "Measuring Heart Patients' Willingness to Pay for Changes in Angina Symptoms," <u>Medical Decision Making</u>, January-March, Vol. 16, 1996, pp. 65-77.

17. L. Robin Keller and Craig W. Kirkwood, "The Founding of INFORMS: A Decision Analysis Perspective," <u>Operations Research</u>, 47 (1), January-February 1999, 16-28.

18. Young-Hee Cho, L. Robin Keller, and M. Lynne Cooper, "Applying Decision-Making Approaches to Health Risk-Taking Behaviors: Progress and Remaining Challenges," <u>Journal of Mathematical Psychology</u>, 43(2), June 1999, 261-285.

19. Wen-Qiang Bian and L. Robin Keller, "Chinese and Americans Agree on What Is Fair, but Disagree on What Is Best in Societal Decisions Affecting Health and Safety Risks," <u>Risk Analysis</u>, 19 (3), 1999, 433-446.

20. Wen-Qiang Bian and L. Robin Keller, "Patterns of Fairness Judgments in North America and the People's Republic of China," <u>Journal of Consumer Psychology</u>, 8 (3), 1999, 301-320.

21. Monika I. Winn and L. Robin Keller, "A Modeling Methodology for Multi-Objective Multi-Stakeholder Decisions: Implications for Research," <u>Journal of Management Inquiry</u>, Vol. 10, No. 2, June 2001, 166-181. Winner of the "Breaking the Frame Award" at Western Academy of Management meeting in March 2002 by the Journal of Management Inquiry for best paper of 2001.

22. L. Robin Keller and Elisabetta Strazzera, "Examining Predictive Accuracy Among Discounting Models," <u>Journal of Risk and Uncertainty</u>, Vol. 24:2, 143-160, 2002.

23. Jeffery L. Guyse, L. Robin Keller and Thomas Eppel "Valuing Environmental Outcomes: Preferences for Constant or Improving Sequences," recipient of finalist award in Decision Analysis Society of INFORMS Student Paper Competition. <u>Organizational Behavior and Human Decision Processes</u>, 87, No. 2, March 2002, 253-277.

24. Joanna L. Ho, L. Robin Keller, and Pam Keltyka, "Managers' Variance Investigation Decisions: An Experimental Examination of Probabilistic and Outcome Ambiguity," <u>Journal of Behavioral Decision Making</u>, 14, 257-278, 2001.

25. Joanna L. Ho, L. Robin Keller, and Pam Keltyka, "Effects of Outcome and Probabilistic Ambiguity on Managerial Choices," <u>Journal of Risk and Uncertainty</u>, 24 (2002) 1: 47-74.

26. Joanna L. Ho, L. Robin Keller, and Pamela Keltyka, "How Do Information Ambiguity and Timing of Contextual Information Affect Managers' Goal Congruence in Making Investment Decisions in Good Times vs. Bad Times?" <u>Journal of Risk and Uncertainty,</u> 31 (Sept. 2005) 2: 163-186.

27. S. David Brazer and L. Robin Keller, "A Conceptual Framework for Multiple Stakeholder Educational Decision Making," <u>International Journal of Education Policy and Leadership</u>, 1(3) 1-14. September 18, 2006, retrieved from http://www.ijepl.org. (As of 1-24-07, the article had been

downloaded more than any other in this journal, new at the time (1,056 times). The next closest paper was 802 downloads.)

28. Tianjun Feng and L. Robin Keller, "A Multiple-Objective Decision Analysis for Terrorism Protection: Potassium Iodide Distribution in Nuclear Incidents," <u>Decision Analysis</u>, (June 2006), 3 (2): 76-93, http://da.journal.informs.org/content/3/2/76.abstract.

29. L. Robin Keller, Rakesh K. Sarin, Jayavel Sounderpandian, "An Examination of Ambiguity Aversion: Are Two Heads Better Than One?" <u>Judgment and Decision Making</u>, (Dec. 2007) 2(5), 390-397. (Appeared in Dec. 2007, vol. 2, issue 6, but header on paper says issue 5.) Accepted 12-2007. Available online: http://journal.sjdm.org/vol2.6.htm. Earlier title of working paper with some data not included in final published version: http://repositories.cdlib.org/anderson/dotm/kell001. "An Examination of Ambiguity Aversion in Decisions Made by Dyads," Working Paper kell001, UCLA Decisions, Operations, and Technology Management.

30. Tianjun Feng, L. Robin Keller, Xiaona Zheng. 2008. "Modeling Multi-Objective Multi-Stakeholder Decisions: A Case-Exercise Approach," <u>INFORMS Transactions on Education</u> (online journal: http://ite.pubs.informs.org/). 8(3) 103-114, at http://dx.doi.org/10.1287/ited.1080.0012 .

31. L. Robin Keller, Craig W. Kirkwood (Arizona State University), and Nancy S. Jones, (Baltimore Metropolitan Council). 2010. "Assessing Stakeholder Evaluation Concerns: An Application to the Central Arizona Water Resources System," <u>Systems Engineering</u>. 13(1), 58-71. (Accepted on 8/20/08. DOI 10.1002/sys.20132. Published online in advance of printing on Wiley InterScience www.interscience.wiley.com)

32. Tianjun Feng L. Robin Keller, Xiaona Zheng (Associate Professor at Peking University and former Merage PhD student), 2011, "Decision Making in the Newsvendor Problem: A Cross-national Laboratory Study," <u>OMEGA, The International Journal of Management Science</u>. 39(1) 41-50. (Accepted on 2/17/10, submitted 5/17/09. Online publication in advance of print: 2/22/10. http://dx.doi.org/10.1016/j.omega.2010.02.003)

33. Tianjun Feng, L. Robin Keller, Liangyan Wang (UCI Merage PhD alumna, associate professor at Shanghai Jiao Tong University), and Yitong Wang. October 2010. "Product Quality Risk Perceptions and Decisions: Contaminated Pet Food and Lead-Painted Toys," <u>Risk Analysis</u>, 30(10) 1572–1589 http://onlinelibrary.wiley.com/doi/10.1111/j.1539-6924.2010.01459.x/abstract (Accepted 5/5/10, appeared online prior to print. 0272-4332/10/0100-0001).

34. James M. Leonhardt (Marketing PhD student at the time, now Assistant Professor, Univ. Nevada, Reno), L. Robin Keller and Cornelia Pechmann. October 2011. "Avoiding the Risk of Responsibility by Seeking Uncertainty: Responsibility Aversion and Preference for Indirect Agency When Choosing for Others," <u>Journal of Consumer Psychology</u>, 21(4) 405-413. Accepted 1-28-11, doi:10.1016/j.jcps.2011.01.001. http://www.sciencedirect.com/science/article/pii/S1057740811000155 Working paper version: Available at SSRN: http://ssrn.com/abstract=2015956. Leonhardt received a finalist award in the 2013 Decision Analysis Society of INFORMS Student Paper competition for this paper.

Uncertainty-seeking behavior is currently understood as the result of loss aversion which motivates a preference for the possibility to avoid or lessen an otherwise sure loss. However, when choosing among negative options on behalf of others, we offer responsibility aversion as another possible motive for uncertainty-seeking behavior. Within our conceptual model, responsibility aversion is defined as the preference to minimize one's causal role in outcome generation. Compared to certain options, uncertain options lessen the decision maker's causal role in outcome generation because the outcomes are partially determined by chance. The presence of chance increases indirect agency on behalf of the decision maker and lessens his or her perceived risk of responsibility. The results of five studies support a responsibility aversion motivation behind uncertainty-seeking behavior.

35. Dipayan Biswas (UCI Merage PhD alumnus, Bentley College at the time, now Associate Professor, University of South Florida), L. Robin Keller, Bidisha Burman (Appalachian State). April 2012. "Making probability judgments of future product failures: The role of mental unpacking," <u>Journal of Consumer Psychology</u>, 22(2) 237-248. Accepted 3-9-11, doi:10.1016/j.jcps.2011.03.002, *Available online 27 April 2011.*

http://www.sciencedirect.com/science/article/pii/S1057740811000283.

When consumers mentally unpack (i.e., imagine) the reasons for product failure, their probability judgments of future product failures are higher than when no mental unpacking is undertaken. However, increasing the level of mental unpacking does not lead to monotonically increasing effects on probability judgments but results in inverted U-shaped relationships. Using a two-factor structure, we propose that when consumers undertake mental unpacking, there will be two conflicting processes; while imagining causes for an event will lead to greater perceived probability, the greater difficulty in generating reasons for an event will lead to lower perceived probability.

36. Yitong Wang (UCI Merage doctoral alumnus, Assistant Professor, Tsinghua University when accepted, became a Lecturer (i.e., assistant professor) and Senior Lecturer (early-stage Assoc. Prof.), University of Technology, Sydney; at Alibaba in China since July 2019), Tianjun Feng, L. Robin Keller. December 2013. "A Further Exploration of the Uncertainty Effect," Journal of Risk and Uncertainty, 47(3) 291-310, accepted 1-25-2013. (Request print copy from author http://link.springer.com/article/10.1007%2Fs11166-013-9180-x, only working paper version can be posted online.). Published on 11-24-13 in 'Online First' on SpringerLink.

Individual valuation of a binary lottery at values less than the lottery's worst outcome has been designated as the "uncertainty effect". Our paper aims to explore the boundary conditions of the uncertainty effect by investigating a plausible underlying process and proposing two possible methods. First, we examine how providing an exogenous evaluation opportunity prior to judging the value of the lottery affects individuals' judgments, and find that first valuing the worst outcome and then the lottery eliminates the uncertainty effect. Second, we explore if introducing additional cognitive load dampens how far decision makers correct their initial evaluations, and find that additional cognitive load is able to eliminate the uncertainty effect.

37. Tianjun Feng (UCI Merage doctoral alumnus, Associate Professor at Fudan University), L. Robin Keller, Ping Wu (Fudan University), Yifan Xu (Fudan University). 2014. "An Empirical Study of the Toxic Capsule Crisis in China: Risk Perceptions and Behavioral Responses," 34(4) 698-710, Risk Analysis, accepted 6-18-2013, online in early view on 7-16-13, doi: 10.1111/risa.12099, http://onlinelibrary.wiley.com/doi/10.1111/risa.12099/abstract. (Request print copy from author, only working paper version can be posted online 6 months after print.)

The outbreak of the toxic capsule crisis during April 2012 aroused widespread public concern about the risk of chromium-contaminated capsules and drug safety in China. In this paper, we develop a conceptual model to investigate risk perceptions of the pharmaceutical drug capsules and behavioral responses to the toxic capsule crisis and the relationship between associated factors and these two variables. An online survey was conducted to test the model, including questions on the measures of perceived efficacy of the countermeasures, trust in the State FDA (Food and Drug Administration), trust in the pharmaceutical companies, trust in the pharmaceutical capsule producers, risk perception, concern, need for information, information seeking, and risk avoidance. In general, participants reported higher levels of risk perception, concern, and risk avoidance, and lower levels of trust in the three different stakeholders. The results from the structural equation modeling procedure suggest that perceived efficacy of the countermeasures is a predictor of each of the three trust variables; however, only trust in the State FDA has a dampening impact on risk perception. Both risk perception and information seeking are significant determinants of risk avoidance. Risk perception is also positively related to concern. Information seeking is positively related to both concern and need for information. The theoretical and policy implications are also discussed.

Media coverage by Merage:
"Toxic Capsule Crisis: Study Sheds Light on Health Care Consumer Attitudes in China," Merage Magazine, 2014-2015 issue, printed page 38-39, by Connie Clark. "Toxic Capsule Crisis" at https://merage.uci.edu/news/2014/10/toxic-capsule-crisis.html.

38. Jay Simon (Merage doctoral alumnus, Assistant Professor, at time of publication at Defense Resources Management Institute, Naval Postgraduate School, now American University, Wash. DC), Craig W. Kirkwood, (W. P. Carey School of Business, Arizona State University), L. Robin Keller. Jan.-Feb. 2014. "Decision Analysis with Geographically Varying Outcomes: Preference Models and Illustrative Applications," Operations Research, 62(1) 182-194. Online in Articles in Advance on Dec. 16, 2013. http://pubsonline.informs.org/doi/abs/10.1287/opre.2013.1217. Supplement: http://pubsonline.informs.org/doi/suppl/10.1287/opre.2013.1217/suppl_file/opre.2013.1217-sm.pdf

This paper presents decision analysis methodology for decisions based on data from geographic information systems. The consequences of a decision alternative are modeled as distributions of outcomes across a geographic region. We discuss conditions which may conform with the decision maker's preferences over a specified set of alternatives; then we present specific forms for value or utility functions that are implied by these conditions. Decisions in which there is certainty about the consequences resulting from each alternative are considered first; then probabilistic uncertainty about the consequences is included as an extension. The methodology is applied to two hypothetical urban planning decisions involving water use

and temperature reduction in regional urban development, and fire coverage across a city. These examples illustrate the applicability of the approach and the insights that can be gained from using it.

39. Lindsey E. Minion, MD (Univ. of Arizona Cancer Center & Creighton University at St. Joseph's Hospital and Medical Center, Phoenix); Jiaru Bai (Merage doctoral student); Bradley J. Monk, MD (Gynecologic Oncology, UCI); L. Robin Keller, PhD; Ramez N. Eskander, MD (Gynecologic Oncology, UCI); Gareth K. Forde, MD, PhD, MBA (Gynecologic Oncology, UCI); John K. Chan, MD (California Pacific Palo Alto Medical Foundation, Sutter Cancer Institute, San Francisco), Krishnansu S. Tewari (Gynecologic Oncology, UCI), "A Markov Model to Evaluate Cost-Effectiveness of Antiangiogenesis Therapy Using Bevacizumab in Advanced Cervical Cancer," Gynecologic Oncology, 137 (3), June 2015, 490-496. Accepted 2-28-2015. Available online on 10 March 2015. http://www.sciencedirect.com/science/article/pii/S0090825815006769#.

Objective: To evaluate the cost-effectiveness of bevacizumab in recurrent/persistent and metastatic cervical cancer using recently reported updated survival and toxicology data.
Methods: A Markov decision tree based on the Gynecologic Oncology Group 240 randomized trial was created. The 2013 MediCare Services Drug Payment Table and Physician Fee Schedule provided costs. In the 5-year model subjects transitioned through the following states: response, progression, minor complications, severe complications, death. Patients experiencing a health utility per month according to treatment effectiveness were calculated. Because cervical cancer survival is measured in months rather than years, results were reported in both quality adjusted cervical cancer life months and years (QALmonth, QALY), adjusted from a baseline of having advanced cervical cancer during a month.
Results: The estimated total cost of therapy with bevacizumab is approximately 13.2 times that for chemotherapy alone, adding $73,791 per 3.5 months (0.29 year) of life gained, resulting in an incremental cost-effectiveness ratio (ICER) of $21,083 per month of added life. The ICER increased to $5,775 per month of added life and $24,597/QALmonth ($295,164/QALY) due to the smaller difference in QALmonths. With 75% bevacizumab cost reduction, the ICER is $6,737/QALmonth ($80,844/ QALY), which translates to $23,580 for the 3.5 month (0.29 year) gain in OS.
Conclusions: Increased cost is primarily related to the cost of drug and not the management of bevacizumab-induced complications. Cost reductions in bevacizumab result in dramatic declines in the ICER, suggesting that cost reconciliation in advanced cervical cancer may be possible through the availability of biosimilars, and/or less expensive, equally efficacious anti-angiogenesis agents.
Erratum: In the transitions probability Table 2, the probability of going from "severe complications" to "progress" in one month is 0.9 (not 0), and the probability of going from "severe complications" to "die" is 0 (not 0.9), for both treatment options.

40. Yitong Wang (University Technology Sydney lecturer, i.e., asst. prof.), Liangyan Wang (Shanghai Jiao Tong University assoc. prof. and Merage PhD alumna), L. Robin Keller, "Discounting over Subjective Time: Subjective Time Perception Helps Explain Multiple Discounted Utility Anomalies," International Journal of Research in Marketing, 32 (2015), pp. 445–448, http://dx.doi.org/10.1016/j.ijresmar.2015.08.006. Final version published online: 30-NOV-2015. Accepted in August 2015.

Consumers often face choices involving intertemporal tradeoffs. Existing research suggests that decision makers in general do not obey discounted utility theory because their discount rates are context dependent. Recent literature incorporates decision makers' subjective perception of time into the classic discounted utility model and finds relatively constant discount rates over subjective time. In addition to replicating previous work, we investigated the missing component – the magnitude effect, provided a holistic view via a more comprehensive experiment including multiple anomalies, and found that subjective time perception was able to explain most of the anomalies simultaneously in a single scenario.

41. Baozhou Lu (School of Economics & Management, China University of Petroleum (UPC)), Tao Zhang (Shanghai Jiao Tong Ph.D. student & UPC), Liangyan Wang (Merage Ph.D. alumna, Assoc. Prof. Shanghai Jiao Tong), L. Robin Keller, "Trust Antecedents, Trust and Online Microsourcing Adoption: An Empirical Study from the Resource Perspective," Decision Support Systems, 85 (May 2016) pp. 104–114, accepted March 2016.
http://www.sciencedirect.com/science/article/pii/S0167923616300288.

The online microsourcing marketplace is a new form of outsourcing that is organized over online platforms for the performance of relatively small service tasks. Microsourcing offers a more flexible way to hire contract workers or to outsource. Prior research indicates the importance of individual-level trust when choosing providers in online sourcing marketplaces. We argue that institution-based trust is also crucial for online microsourcing adoptions. Drawing on a trust framework adapted from prior literature, this paper uncovers the trust-building mechanisms in online microsourcing marketplaces, as well as the marketplace-related attributes for online microsourcing adoption. The proposed research model is tested with a data set collected from the clients of a typical marketplace in China – zhubajie.com. The findings suggest that perceptions of resource-based attributes of a marketplace, together with the perceived effectiveness of its intermediary role, can help to build trust towards the marketplace, enhancing trust towards the community of providers and driving the intent to adopt online microsourcing. Thus, this paper confirms the roles of online marketplaces as both the resource pool and the transaction intermediary from the perspective of clients. Finally, this paper not only indicates the relevance of resource

theories in understanding this new trend in outsourcing, but also suggests the importance of trusted relational governance in governing online microsourcing transactions.

42. Liangyan Wang (Merage alumna and Associate Professor of Marketing, Antai Management School, Shanghai Jiao Tong University), Shijian Wang (just graduated student of marketing), L. Robin Keller, Jie Li (Assoc. Prof. of Market., Shanghai Jiao Tong Antai Mgt Sch.), "Thinking Styles Affect Reactions to Brand Crisis Apologies," European Journal of Marketing, 50(Issue 7/8), Sept. 2016, pp. 1263-1289. abstract: http://www.emeraldinsight.com/doi/abs/10.1108/EJM-07-2014-0457, accepted in March 2016.
Permanent link: http://dx.doi.org/10.1108/EJM-07-2014-0457.

Purpose – This article examines how a person's thinking style, specifically holistic versus analytic, and a firm's crisis apology with the remedial solution framed in "why" (vs. "how") terms can interactively impact consumers' perceived efficacy of the firm to respond to the crisis and their impression or evaluation of the brand.

Design/methodology/approach – Hypotheses were tested through three experimental studies involving 308 participants recruited in China. Participants answered survey questions investigating the interactive effects from consumers' thinking style (culture as a proxy in study 1, measured in study 2 or primed in study 3) and a brand's crisis apology with the remedial solution framed in "why" (vs. "how") terms on consumers' perceived efficacy and evaluation of the firm.

Findings –The frame of the remedial solution resulting in a higher evaluation improvement depended on a consumer's thinking style. For holistic thinkers, a "why" (vs. "how") framed remedial solution resulted in a higher evaluation improvement; however, for analytic thinkers, a "how" (vs. "why") framed remedial solution resulted in a higher evaluation improvement. Additionally, the results showed that a consumer's perceived efficacy of the brand being able to successfully respond to the crisis mediated the interactive effects of the remedial solution framing and thinking styles on the evaluation improvement.

Research limitations/implications – Different ways of framing the remedial solution in a firm's apology will have different impacts on people with different thinking styles. Participants in studies 2 and 3 were recruited from samples on campus in China. Additionally, the automobile brand used in this study is fictional to avoid prior brand name or brand commitment impact.

Practical implications – Our findings provide evidence that framing of the remedial solution can be leveraged as a tool to reduce negative impact resulting from a brand crisis. Specifically, our results suggest that companies may do well to employ a "why" framed remedial solution, particularly in cases where consumers are likely to process information holistically. Conversely, a "how" framed remedial solution may be effective in situations where consumers are likely to process information analytically.

Originality/value – This research contributes to the literature, being among the first to consider how the remedial solution framing in a firm's apology can enhance people's evaluation of the brand and decrease the perceived negative impact resulting from the brand crisis.

43. Jiaru Bai (Merage PhD student), Cristina del Campo (Universidad Complutense de Madrid and UCI visitor in 2016), L. Robin Keller, "Markov Chain Models in Practice: A Review of Low Cost Software Options," Publication in English, Spanish version also available: "Modelos de Cadenas de Markov en la Práctica: Una Revisión de Opciones de Software de Bajo Coste," Investigación Operacional, 2017, Volume 38 (Issue 1), pp. 56-62, accepted May 30, 2016. http://rev-inv-ope.univ-paris1.fr/volumes-since-2000/volume-38-2017/.

This paper was written in Spanish (and English) to facilitate communication with Spanish-speaking scholars in Cuba and elsewhere, who aim to conduct Markov cost effectiveness analyses and would benefit from low cost software alternatives. The working paper is in English and Spanish versions:
investigacion_operacional_2016_06_28_Bai_delCampo_Keller_English,
investigacion_operacional_2016_Bai_delCampo_Keller

Markov processes (or Markov chains) are used for modeling a phenomenon in which changes over time of a random variable comprise a sequence of values in the future, each of which depends only on the immediately preceding state, not on other past states. A Markov process (PM) is completely characterized by specifying the finite set S of possible states and the stationary probabilities (i.e. time-invariant) of transition between these states. The software most used in medical applications is produced by TreeAge, since it offers many advantages to the user. But, the cost of the TreeAge software is relatively high. Therefore in this article two software alternatives are presented: Sto Tree and the zero cost add-in program "markovchain"

implemented in R. An example of a cost-effectiveness analysis of two possible treatments for advanced cervical cancer, previously conducted with the Treeage software, is re-analyzed with these two low cost software packages.

44. L. Robin Keller and Yitong Wang (Merage doctoral alumnus) "Information Presentation in Decision and Risk Analysis: Answered, Partly Answered, and Unanswered Questions," 2017, Risk Analysis, *37(6): 1132–1145,* accepted August 7, 2016.

Appeared online in early view prior to print: Information Presentation in Decision and Risk Analysis: Answered, Partly Answered, and Unanswered Questions, Version of Record online: 21 SEP 2016 | DOI: 10.1111/risa.12697

Abstract   Article   PDF(120K)   References

For the last thirty years, researchers in risk analysis, decision analysis, and economics have consistently proven that decision makers employ different processes for evaluating and combining anticipated and actual losses, gains, delays and surprises. While rational models generally prescribe a consistent response, people's heuristic processes will sometimes lead them to be inconsistent in the way they respond to information presented in theoretically equivalent ways. We point out several promising future research directions by listing and detailing a series of answered, partly answered, and unanswered questions.

45. Luping Sun, Xiaona Zheng, Meng Su, L. Robin Keller (2017), "Intention-Behavior Discrepancy of Foreign versus Domestic Brands in Emerging Markets: The Relevance of Consumer Prior Knowledge," Journal of International Marketing, published by the American Marketing Association, 25(1), pp. 91-109, accepted October 20, 2016. doi: http://dx.doi.org/10.1509/jim.15.0123.

Most research on the performance of foreign versus domestic brands in emerging markets examines measures of product evaluation or purchase intention. However, consumers intending to buy a product may switch to competing brands, displaying an intention-behavior discrepancy (IBD). Drawing upon literature on country associations and dual process theory, we examine the difference in IBD of foreign versus domestic brands in emerging markets and the moderating role of prior knowledge. We conducted an intention survey followed by a post-purchase survey in the Chinese automobile and smartphone industries. We found that foreign brands have an advantage on IBD relative to domestic brands, indicating that they have the dual advantage of higher evaluations and lower IBDs. Furthermore, foreign brands' advantage on IBD is smaller for consumers with inaccurate prior knowledge, as they are more likely to systematically reprocess information and discount foreign brands' favorable country associations. For these consumers, overestimating the product reduces foreign brands' advantage to a smaller degree than underestimating it due to confirmation bias. These findings provide implications for brands in emerging markets.

46. L. Robin Keller, Jay Simon (Merage PhD alumnus), January 2019, "Preference Functions for Spatial Risk Analysis", Risk Analysis, 39(1), pp. 244-256, in Special Issue: Advances in Spatial Risk Analysis, accepted 7-31-17, submitted 6-2016, Version of Record appeared online in early view prior to print: Sept. 7, 2017: Abstract   Article   PDF(1822K). In print in Volume 39, Issue1, https://doi.org/10.1111/risa.12892.

When outcomes are defined over a geographic region, measures of spatial risk regarding these outcomes can be more complex than traditional measures of risk. One of the main challenges is the need for a cardinal preference function that incorporates the spatial nature of the outcomes. We explore preference conditions that will yield the existence of spatial measurable value and utility functions, and discuss their application to spatial risk analysis. We also present a simple example on household freshwater usage across regions to demonstrate how such functions can be assessed and applied.

47. James Leonhardt (Merage PhD alumnus, at Univ. of Nevada, Reno), L. Robin Keller, Fall 2018, "Do Pictographs Affect Probability Comprehension and Risk Perception of Multiple-Risk Communications?" Journal of Consumer Affairs, 52(3), pp. 756-769, accepted 12-22-17, published in Early View on 4-6-2018, http://dx.doi.org/10.1111/joca.12185, Leonhardt-Keller- JOCA-Final.

Pictographs can be used to visually present probabilistic information using a matrix of icons. Previous research on pictographs has focused on single rather than multiple-risk options. The present research conducts a behavioral experiment to assess the effect of pictographs on probability comprehension and risk perception for single and multiple-risk options. The creation of the experimental stimuli is informed by a review of the Centers for Disease Control and Prevention's vaccine information sheets. The results provide initial evidence that, in the context of childhood vaccines, the inclusion of pictographs alongside numeric (e.g. 1 in 5) probability information can result in higher probability comprehension and lower risk perception for multiple-risk options but not for single-risk options. These findings have implications for how health-related risks are communicated to the public.

Partially funded by a fellowship (Leonhardt) from the Newkirk Center for Science and Society and conducted under UCI Institutional Review Board's approved research protocol HS# 2009-7037.

48. Cristina del Campo (Merage visitor in 2019 and 2016, Universidad Complutense de Madrid), Jiaru Bai (UCI Merage PhD alumna, now SUNY Stony Brook Assistant Professor), L. Robin Keller, "Comparing Markov and non-Markov Alternatives for Cost-effectiveness Analysis: Insights from a Cervical Cancer Case", <u>Operations Research for Health Care</u>. Volume 21, June 2019, Pages 32-43. https://doi.org/10.1016/j.orhc.2019.04.001. Accepted 4-1-2019, posted online 4-3-19 prior to final proof edits: https://www.sciencedirect.com/science/article/pii/S2211692318301097#!.

Markov models allow medical prognosis to be modeled with health state transitions over time and are particularly useful for decisions regarding diseases where uncertain events and outcomes may occur. To provide sufficient detail for operations researchers to carry out a Markov analysis, we present a detailed example of a Markov model with five health states with monthly transitions with stationary transition probabilities between states to model the cost and effectiveness of two treatments for advanced cervical cancer A different approach uses survival curves to directly model the fraction of patients in each state at each time period without the Markov property. We use this alternative method to analyze the cervical cancer case and compare the Markov and non-Markov approaches. These models provide useful insights about both the effectiveness of treatments and the associated costs for healthcare decision makers.

49. Jeffery L. Guyse (Merage PhD alumnus, Professor, Technology and Operations Management, College of Business Administration, California State Polytechnic University, Pomona), L. Robin Keller, Candice H. Huynh (Merage PhD alumna, Assistant Prof., Cal Poly, Pomona), "Valuing Sequences of Lives Lost or Saved Over Time: Preference for Uniform Sequences", <u>Decision Analysis,</u> 17(1):24-38, March 2020, https://doi.org/10.1287/deca.2019.0397, accepted June 5, 2019. Author accepted version May 20, 2019. Published online in advance of print at https://pubsonline.informs.org/toc/deca/0/0; https://pubsonline.informs.org/doi/pdf/10.1287/deca.2019.0397 on 2-19-2020.

Winner of the 2020 Clemen-Kleinmuntz <u>Decision Analysis</u> Best Paper Award, formerly called the <u>Decision Analysis</u> Special Recognition Award. This award, with a $2000 prize, is given annually for the paper most worthy of recognition published in the <u>Decision Analysis</u> journal (published by INFORMS) for that year.

Policymakers often make decisions involving human mortality risks and monetary outcomes that span across different time periods and horizons. Many projects or environmental regulation policies involving risks to life, such as toxic exposures, are experienced over time. The preferences of individuals on lives lost or saved over time should be understood to implement effective policies. Using a within-subject survey design, we investigated our participants' elicited preferences (in the form of ratings) for sequences of lives saved or lost over time at the participant level. The design of our study allowed us to directly observe the possible preference patterns of Negative Time Discounting or a Preference for Spreading from the responses. Additionally, we embedded factors associated with three other prevalent anomalies of intertemporal choice (Gain/Loss Asymmetry, Short/Long Asymmetry, and the Absolute Magnitude Effect) into our study for control. We find that our participants exhibit three of the anomalies: Preference for Spreading, Absolute Magnitude Effect and Short/Long Term Asymmetry. Furthermore, fitting the data collected, Loewenstein and Prelec's model for the valuation of sequences of outcomes allowed for a more thorough understanding of the factors influencing the individual participants' preferences. Based on the results, the standard discounting model does not accurately reflect the value that some people place on sequences of mortality outcomes. *Preferences for uniform sequences should be considered in policymaking, rather than applying the standard discounting model.*

50. Jay Simon (Merage PhD alumnus, Associate Professor, American University), Donald Saari (Professor Emeritus, UCI Social Science), L. Robin Keller, "Interdependent Altruistic Preference Models", <u>Decision Analysis</u>, 17(3), Sept. 2020, pp. 189-207, accepted 2-26-2020. https://pubsonline.informs.org/doi/abs/10.1287/deca.2020.0411 Published Online: 10 June 2020.

Finalist for the 2020 <u>Decision Analysis</u> Special Recognition Award.

Altruistic preferences, or the desire to improve the well-being of others even at one's own expense, can be difficult to incorporate into traditional value and utility models. It is straightforward to construct a multi-attribute preference structure for one decision maker that includes the outcomes experienced by others. However, when multiple individuals incorporate one another's well-being into their decision making, this creates complex interdependencies that must be resolved before the preference models can be applied. We provide representation theorems for additive altruistic value functions for two-person, n-person, and group outcomes in which multiple individuals are altruistic. We find that in most cases it is possible to resolve the preference interdependencies and that modeling the preferences of altruistic individuals and groups is tractable.

51. Leonhardt, J. M. (Merage PhD alumnus, Univ. of Nevada, Reno), Keller, L. R., & Lembke, Ronald S. (UN Reno) "Communicating Health Risks to the Public", <u>Przegląd Organizacji</u> (<u>Organization Review</u> in English), 2021, number 1, pp. 39-44, accepted 1-20-2021. Journal website available in

Polish (PL) and English (EN): *https://przegladorganizacji.pl/artykul/2021/10.33141po.2021.01.05*, https://przegladorganizacji.pl. (In a collaboration between Merage doctoral alumnus Jim Leonhardt's University of Nevada, Reno (UNR) and SGH Warsaw School of Business, he gave a talk in Poland and was invited to contribute a refereed chapter in a book with papers by UNR-SGH collaborators. We co-authored a paper for that collection, submitted 3-31-20, originally as a potential book chapter, which is now appearing as a special issue in this Polish journal. The authors are grateful for support from the UNR College of Business, the SGH Warsaw School of Economics, and the Newkirk Center for Science and Society.)

Press coverage of paper
https://merage.uci.edu/news/2021/04/A-Pictograph-Is-Worth-A-Thousand-Words-Communicating-Health-Risks-for-Medications-and-Vaccines.html

Health risks, such as the probability of experiencing a side effect from a medication, are typically communicated numerically. However, presenting risks in strictly numeric formats is problematic considering that the public often experiences difficulty in comprehending strictly numeric probabilities. To help overcome this problem, Leonhardt and Keller (2018) tested the efficacy of using pictographs to visually present probabilistic information to health consumers. They found that the addition of pictographs alongside numeric probability information increased probability comprehension and lessened the perceived risk of a multiple risk health option. Here, we review relevant work on probability format and build on general evaluability theory to posit why pictographs may result in lower risk perceptions of multiple risk options. We discuss current limitations in our understanding of how the public perceives multiple risk options, and we highlight opportunities for future research. For instance, we introduce Quick Response (QR) codes as a potential tool to help consumers view health risks in multiple formats on the Internet.

52. Alexander Robinson (Merage PhD, CSX), L. Robin Keller, Cristina del Campo (Complutense University of Madrid, former Merage visitor), "Building Insights on True Positives vs. False Positives: Bayes' Rule", Decision Sciences Journal of Innovative Education, 20:4, October 2022, 224-234, accepted 2-27-2022, in Special Issue: Teaching Data Analytics and Statistics. https://onlinelibrary.wiley.com/doi/10.1111/dsji.12265. (Will post accepted version 24 months after publication on 10-1-2024. Supplemental Word dsji12265-sup-0001-appendix.docx and Excel files dsji12265-sup-0002-appendix.xlsx are freely available).

Covid-19 pandemic policies requiring disease testing provide a rich context to build insights on true positives vs false positives. Our main contribution to the pedagogy of data analytics and statistics is to propose a method for teaching updating of probabilities using Bayes' Rule reasoning to build understanding that true positives and false positives depend on the prior probability. Our instructional approach has three parts. First, we show how to construct and interpret raw frequency data tables, instead of using probabilities. Then, we use dynamic visual displays to develop insights and help overcome calculation avoidance or errors. For greater insights, we look at graphs of positive predictive values and negative predictive values for different priors. The learning activities we use include lectures, in-class discussions and exercises, breakout group problem solving sessions, and homework.

 Beyond learning to update the probability of having the disease given a positive test result, material can cover naive estimates of the positive predictive value, the common mistake of ignoring the disease's base rate, debating the relative harm from a false positive versus a false negative, and creating a new disease test.

53. Liangyan Wang (Merage PhD alumna), Qin Wang, Eugene Y. Chan, and L. Robin Keller, "Counterfeits can Benefit Original Products when People are Caught using Counterfeits", (2024) forthcoming in Psychology & Marketing, accepted 1-1-2024.

Existing literature has examined the influence of a counterfeit on the original brand in the prior or middle purchase phases. Our work aims to expand the literature by analyzing the post-purchase phase of counterfeit consumption. In four studies, we examine the effects of product message appeal (symbolic vs. utilitarian) and self-construal (interdependent vs. independent) on preference changes and purchase intentions of consumers toward original products when they are caught using counterfeits. Individuals with interdependent (vs. independent) self-construal are more likely to increase their preference and purchase intention for original products after being caught using symbolic rather than utilitarian counterfeits. Moreover, face restoration mediates the interaction effect between product message appeal and self-construal on the purchase intent of consumers in procuring original products. The patterns are consistent in both hypothetical scenarios and counterfeit consumption experience. Our work suggests that companies or brand, whose products are often copied or imitated should pay more attention to establishing their unique characteristics and the primary value of their product delivered to the consumers through product design and marketing mix strategies.

Chapters
in Books
Numbered from 100,
from earliest date

117. Jeffery L. Guyse (Merage alumnus and Professor, California State Polytechnic University, Pomona), Candice H. Huynh (Merage alumna and Associate Professor, Cal Poly, Pomona), L. Robin Keller, Jay Simon (Merage alumnus and Associate Professor, American University), "When Are

We Willing to Wait? Prescriptive Challenges in Evaluating Intertemporal Outcomes", December 2021, rev. March 2022, accepted chapter in the forthcoming book edited by Matthias Seifert, Florian Federspiel and Gilberto Montibeller, *Behavioral Decision Analysis*, for the *Springer International Series in Operations Research and Management Science*.

The classic normative model for intertemporal preferences uses a constant discount rate, but behavioral experiments have shown that people do not tend to make choices consistent with a constant discount rate. We first present normative models for time preferences, then discuss descriptive results for choices between single outcomes occurring at different times. People often have different implicit discount rates for different types of scenarios, and several anomalies arise consistently. We contrast those results with findings for preferences for sequences of multiple outcomes over time. People tend to prefer increasing or constant sequences of outcomes over time, especially when the outcomes are non-monetary in nature. This suggests a willingness to wait for improvement, but not in the way that classical discounting would prescribe. We end with prescriptive nudges to improve dynamic consistency and pose questions still to be resolved about how decisions involving outcomes over time can be improved prescriptively.

116. Stuart Eriksen, Candice H. Huynh, and L. Robin Keller. 2013. "Decision Trees," in Saul I. Gass and Michael C. Fu (eds.) <u>Encyclopedia of Operations Research & Management Science</u>, 3rd edition. Springer London, Limited, (7 pages). ISBN 1441911545, 9781441911544, http://www.springer.com/business+%26+management/operations+research/book/978-1-4419-1137-7. Updated version of chapter by Eriksen and Keller, in Saul I. Gass and Carl M. Harris (eds.), <u>Encyclopedia of Operations Research and Management Science</u>, Kluwer Academic Publishers, Hingham, MA, 1996, pp. 159-161; second centennial edition, 2001, pp. 202-205, ISBN 0-7923-7827-X.

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113. L. Robin Keller, Tianjun Feng, and Yitong Wang. Copyright 2010, Online January 14, 2011, January 2011 in print. "Fairness and Equity in Societal Decision Analysis," in JJ Cochran et al. (eds.), <u>Wiley Encyclopedia of Operations Research and Management Science</u>, Hoboken (NJ): Wiley. [Chapter PDF link] (9 pages). http://onlinelibrary.wiley.com/doi/10.1002/9780470400531.eorms0317/full (Invited and refereed. Accepted 4/29/10, submitted 2/22/10. Proofs completed 7/12/10, DA section, Topical editor Ali Abbas invited this submission.)

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Abstracts

Liangyan Wang, Qin Wang, L. Robin Keller, and Eugene Chan (2017), "Counterfeits Can Benefit Original Brands When People Are Caught Using Counterfeits: The Role of Face Restoration", in NA (North American) - Advances in Consumer Research Volume 45, eds. Ayelet Gneezy, Vladas Griskevicius, and Patti Williams, Duluth, MN : Association for Consumer Research, pp. 948-950.
http://www.acrwebsite.org/volumes/1023927/volumes/v45/NA-45

> We examine consumers' preference and purchase intentions for genuine products after they are caught using counterfeit versions. We show that consumers with an interdependent self-construal increase their preference for genuine products when caught using counterfeit symbolic (vs. functional) products because they wish to restore face.

Juliet Elizabeth Wolford, Jiaru Bai, Ramez Hassef Eskander, Robin Keller, Lindsey E Minion, John K. Chan, Bradley J. Monk, Krishnansu Sujata Tewari; University of California, Irvine, Orange, CA; University of California Irvine Paul Merage School of Business, Irvine, CA; University of California Irvine Medical Center, Orange, CA; Palo Alto Medical Foundation, San Francisco, CA; University of Arizona Cancer Center at Dignity Health St. Joseph's Hospital and Medical Center, Phoenix, AZ; "Evaluating the cost-effectiveness of current FDA-approved PARP inhibitors for the treatment of recurrent ovarian cancer", 2017 American Society of Clinical Oncology (ASCO) Annual Meeting published Abstract, https://meetinglibrary.asco.org/record/148172/abstract, Poster orally presented June 3, 2017

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Media
Interviews &
Contributions

One of 10 women interviewed and spotlighted for longtime contributions to operations research: Kara Tucker, "Powerful, pragmatic pioneers: Personal profiles of 10 pillars of the O.R. profession who blazed trails, broke barriers and busted down doors for others to follow (plus one 'Rising Star')", OR/MS Today, 46(1) February 2019, https://pubsonline.informs.org/do/10.1287/orms.2019.01.14/full/. Magazine editorial (https://pubsonline.informs.org/do/10.1287/orms.2019.01.10/full/) explains selection process; more than 30 candidates were first considered and 10 were selected (Peter Horner, "Pioneer Women of O.R.").

L. Robin Keller and Craig W. Kirkwood, "The Decision to Form INFORMS", Invited Column for OR/MS Today, February 2020, Volume 47, number 1.

> We were chief financial officers for The Institute of Management Sciences (TIMS) and the Operations Research Society of America (ORSA), respectively, during portions of the period leading up to the merger to form INFORMS, and we were actively involved in analyses to support decision making about the potential merger. Keller and Kirkwood (1999) provides a definitive record of those analyses, and we will provide a few additional thoughts looking back from 2020.

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approximately thirty specific concerns within the seven categories of: Central Arizona socio-economic impacts, financial and technical requirements, health and safety, impacts on the natural/biophysical environment, indirect/external impacts, political impacts & governance, and sufficiency of water supplies. Responses were obtained from experts in policy, planning, engineering, hydrology, and other fields within governmental, private sector, and interest group organizations. The results show areas of agreement and disagreement among stakeholders, as well as some priorities that may have implications for the role of the Decision Center for a Desert City.
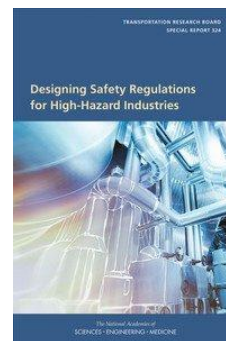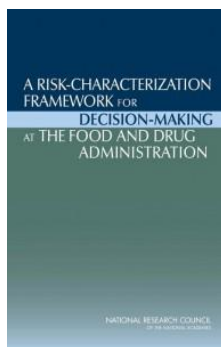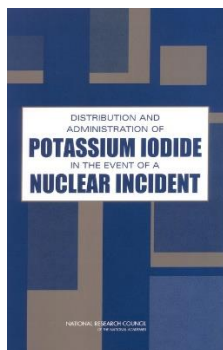
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Book is authored by the "Committee"

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Accompanying the report, a <u>two-page summary</u> provides a condensed version of the findings from this report. <u>Highlights from Designing Safety Regulations for High-Hazard Industries</u>

Book is authored by the "Committee" https://www8.nationalacademies.org/cp/CommitteeView.aspx?key=49767

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DONALD MOYNIHAN, University of Wisconsin, Madison
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JAMES WATSON, American Bureau of Shipping

Media coverage by Merage:
https://merage.uci.edu/news/2018/04/new-books-from-professor-keller-and-dean-spangenberg.html

"TRB Special Report 324: Designing Safety Regulations for High-Hazard Industries, examines key factors relevant to government safety regulators when choosing among regulatory design types, particularly for preventing low-frequency, high consequence events. In such contexts, safety regulations are often scrutinized after an incident, but their effectiveness can be inherently difficult to assess when their main purpose is to reduce catastrophic failures that are rare to begin with. Nevertheless, regulators of high-hazard industries must have reasoned basis for making their regulatory design choices.

Asked to compare the advantages and disadvantages of so-called "prescriptive" and "performance-based" regulatory designs, the study committee explains how these labels are often used in an inconsistent and misleading manner that can obfuscate regulatory choices and hinder the ability of regulators to justify their choices. The report focuses instead on whether a regulation requires the use of a means or the attainment of some ends—and whether it targets individual components of a larger problem (micro-level) or directs attention to that larger problem itself (macro-level). On the basis of these salient features of any regulation, four main types of regulatory design are identified, and the rationale for and challenges associated with each are examined under different high-hazard applications.

Informed by academic research and by insights from case studies of the regulatory regimes of four countries governing two high-hazard industries, the report concludes that too much emphasis is placed on simplistic lists of generic advantages and disadvantages of regulatory design types. The report explains how a safety regulator will want to choose a regulatory design, or combination of designs, suited to the nature of the problem, characteristics of the regulated industry, and the regulator's own capacity to promote and enforce compliance. This explanation, along with the regulatory design concepts offered in this report, is intended to help regulators of high-hazard industries make better informed and articulated regulatory design choices."

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Tianjun Feng, L. Robin Keller, Xiaona Zheng, "Home Depot in San Juan Capistrano: Multiple Objective Multi-Stakeholder Decision," Excel-based case, recipient of finalist award, November 2005, INFORMS Case Competition sponsored by INFORMS Forum on Education. To obtain case files, see online publication Paper #30 by Feng, T., L. R. Keller, X. Zheng. 2008. http://pubsonline.informs.org/doi/abs/10.1287/ited.1080.0012, *INFORMS Trans. Ed.* 8(3) 103-114, for supplemental files (HomeDepotCase.xls , SummaryofHomeDepotCase.xls).

Research
Projects

Cristina del Campo (Complutense University of Madrid), Jiaru Bai (Merage PhD alumna, Wake Forest University, Fall 2022-, SUNY Stony Brook), L. Robin Keller, "Modeling Cost-effectiveness Analysis of Treatment Sequencing", latest version January 2022.

In clinical practice, patients with cancer often undergo treatment with a sequence of drugs, usually because of diminishing effectiveness over time or resistance development. However very few cost-effectiveness analyses have included that fact in their model. This paper aims at closing that gap by presenting a model that reflects the possibility of the patient switching from one therapeutic agent to another one throughout the long-term duration of his/her life.

Amy Williams (Merage PhD student) and L. Robin Keller (with Shuya Yin), "Environmentally conscious consumers and retail return behavior", February 2022.

Product returns plague retailers and customers alike for the added logistical, monetary, and environmental cost. This research examines the latter piece: customer return behavior by their environmental consciousness. Product returns incur an environmental cost, whether that be with carbon emissions from delivery vehicles, consuming more packaging to resell, or waste if the product ends up in landfill. Consequently, consumers who are environmentally conscious should care about their penchant for returns. We conducted a study to examine the relationship between consumers' environmental consciousness and their return behavior.

L. Robin Keller, Jay Simon (Merage Ph.D. alumnus, Kogod School of Business, American University), "Key Points for Communicating Clearly About Risk in Business", targeted for a professional business journal, latest version Dec. 2020, first version 6-2-2020.

There are many definitions of risk. When risk communications in an organization are not specific and deliberate, stakeholders will not all share a common understanding of the risk being faced, and decision quality will suffer. This paper explores the components of risk, the challenges of communicating them, and guidance on how to overcome those challenges.

Ali Esmaeeli (ODT PhD student), L. Robin Keller, "Geographically weighted multi-attribute modeling of quality of service for Uber autonomous car assignments", 2019.

In this paper we present a model for maximizing quality of service for Uber autonomous car assignments. The model allows the company to differentiate between different regions of a map and to use different parameters of quality of service. We suggest methods for finding weights for attributes and regions and for finding attribute value functions. We also present a heuristic algorithm for finding the best car assignment based on the model in an efficient time.

Juliet Wolford, MD, Jiaru Bai, Ramez Eskander, MD, Robin Keller, Lindsey E. Minion, MD, Gareth K. Forde, MD, PhD, MBA, John K. Chan, MD, Bradley J. Monk, MD, Krishnansu S. Tewari, MD, "A Markov Model To

Objective: Evaluate cost-effectiveness of the recently approved, PARP inhibitor, olaparib, in the setting as it is approved, 4th line therapy for women with BRCA-deficient ovarian carcinoma. Since olaparib is an oral preparation, and therefore Medicare is not authorized to pay for the drug; we hypothesize that the assumed cost prohibitive oral olaparib will be balanced to the cost of the frequently used more toxic, chemotherapeutic agents when factoring in the infusion costs, pretreatment costs, and toxicity costs.

Methods: Overall costs were calculated for each drug regimen employing toxicity costs, individual drug cost, pretreatment costs and infusion costs. Therapies were divided into groups: olaparib, non-platinum agents, chemotherapy with bevacizumab, and platinum regimens. A Markov model was created using Data 4.0 (TreeAge Pro 2014) and showed patients transitioning through response, hematological complications, non-hematological complications, fifth line and onward, and death. Ovarian cancer survivability is measured in months rather than years; therefore results were reported in quality adjusted ovarian cancer life months (QALmonth), adjusted from a baseline of having advanced ovarian cancer during a month. Utilizing data extracted from the associated registration trials, complications costs were compiled using the Medicare data for 2015 to determine the overall costs of treatment and associated complications.

Results: In the model we created, the platinum group dominated, with olaparib exhibiting an estimated cost approximately 5.3 times more than the platinum therapy group, adding $81,108 prior to progression. In comparing the cost-effectiveness calculated from the model utilizing the average PFS for each group, the platinum group proved to be most cost-effective at $1,672, next was the non-platinum group at $6,688, olaparib at $10,291, and lastly the bevacizumab group at $12,482. The only positive incremental cost-effectiveness ratio [ICER] was of the nonplatinum group with an ICER of $35,567, which shows a $35,567 increase in cost over the 1.2 months progression free survival [PFS] with olaparib therapy. The last two regimens, platinum and bevacizumab have negative ICERs of -$54,435 and -$56,091, respectively, representing the increased progression free survival [PFS] yet low cost of platinum therapy to olaparib and the high cost of bevacizumab and decreased PFS to olaparib.

Conclusion: The primary expense of olaparib lies in the high cost of the drug, rather than the complications associated with its use. Reconciliation of incremental clinical benefits with exponentially rising costs remains problematic. Even minimal reductions in olaparib will prove to be beneficial to the cost-effectiveness and will allow access to an effective medication that is better tolerated and easier to administer.

Jay Simon and L. Robin Keller, "Modeling Decisions with Multiple Health Conditions with Reference-Dependent Multi-Attribute Expected Utility," working paper, 6/2009.

Medical and other health-related decisions often do not incorporate all of the available information, and may not adequately address the preferences of the decision maker. These decisions involve some interesting theoretical and modeling issues when analyzed using multi-attribute utility. They arise frequently in the medical domain, but also in regard to personal lifestyle choices. It is possible to formulate a reasonably straightforward expected utility model, provided that we impose some conditions on the preferences of the decision maker. These conditions help determine the types of contexts for which the model will be valid. We then extend the initial work to a novel reference-dependent expected utility model, which captures the notion of adaptation, and thus gives a better approximation of the level of utility actually experienced by the decision maker. This work is supported by a doctoral dissertation grant from the National Science Foundation in Decision, Risk and Management Science (Award # 0823458).

Dipayan Biswas and L. Robin Keller, "The Effects of Peer Presence and Warning Signs on Beach-Goers' Perceived Probabilities of Going in Polluted Beach Water: Implications for Public Policy Regulations," Working paper, June 2003.

L. Robin Keller and Jeffery L. Guyse on decision problem structuring; generating possible events. (MBS Working paper 99-19)

Xiaona Zheng, Tianjun Feng, L. Robin Keller, and Dipayan Biswas on "Using a Time-weighted Approach to Measure Multiple Attribute Utility," working paper Dec. 2005.

Dipayan Biswas, Tianjun Feng, L. Robin Keller and Xiaona Zheng, "Modeling Multiobjective Multistakeholder Perspectives for Environmental Problems: Two Huntington Beach Pollution Decisions."

Tianjun Feng and L. Robin Keller, "Modeling the Effects of Reference Point Dependence on Supplier Selection and Competition." Working paper, August 2008.

We introduce a buyer's value functions in both a standard non-reference dependent model and a reference point dependent model to study the buyer's supplier choices over two time periods on a two-attribute space, over price and delivery time guarantee. Homogeneous buyers are considered in a service market. We provide an analysis to show that early entrants can attain a first mover advantage due to the effects of reference point dependence and loss aversion. In addition, we analytically show that buyers may have asymmetric responses to price promotions of the suppliers (i.e., asymmetric patterns of price competition) if buyers are more loss averse on delivery time guarantee than they are on price. We also provide an analysis for asymmetric patterns of competition on delivery time guarantee if buyers have higher loss aversion on price. Some managerial insights are discussed for a competitive service market based on our model analysis.

PRESENTATIONS AT SCIENTIFIC MEETINGS, UNIVERSITIES, AND COMMUNITY GROUPS

1110. Amy Williams (presenter) and L. Robin Keller (co-author), "Environmentally Conscious Consumers and Retail Purchasing and Returning Behavior" in session on Socially Responsible Operations Decisions co-chaired by Williams and Keller, INFORMS annual conference, Phoenix, Oct. 2023.

> Results of a lab study on consumer product returns and environmental consciousness, an analytical study on bracketing (buying multiple versions at once and thus returning at least one version) vs. sequential purchasing, and a lab study on ways to nudge reduction in bracketing by posting statements on the ordering website page.

1109. Amy Williams (presenter) and L. Robin Keller (co-author), "The Paradox of the Environmentally Conscious: When Product Return Behavior Misaligns with Intentions", accepted poster, Society for Judgment and Decision Making, Nov. 2022, UCSD.

> **Topic:** This research examines customer retail return behavior by their environmental consciousness.
> **Motivation**: Returned inventory incurs major environmental costs through transportation, packaging, and disposal of returned goods. Reducing return rates should be a win-win for the environment, consumers, and retailers.
> **Methods / findings:** Through a lab study, we found that more (vs. less) environmentally conscious consumers were more likely to return items because they purchased multiple sizes of the same item at once. We analytically modeled this purchase behavior and found that an environmentally conscious consumer should preference buying sequentially.
> **Impact:** This incongruence could impact the way retailers present product information and help consumers understand blind-spots in their behavior, reducing return rates.

1108. Amy Williams (co-author) and L. Robin Keller (presenter), "Environmentally Conscious Consumers and Retail Return Behavior", invited flash talk, INFORMS Annual meeting, Oct. 2022, Indianapolis.

> As product returns increase, so does the environmental impact of those returns, a concern for both retailers and consumers. Through a lab study, we found that participants who were more (vs. less) environmentally conscious were more likely to buy multiple sizes of the same item at once and return more frequently. Modeling this analytically, we confirmed that this purchasing behavior is less environmentally friendly.

1107. Qi Yan and L. Robin Keller, invited session co-chairs for INFORMS Annual Meeting, Indianapolis, on Consumer decisions involving social media, e-commerce or live commerce. October 16-19, 2022. Keller chaired conference session and presented recorded co-authored talk "A Study of Product Returns in the China Live Commerce Industry", recorded by Qi Yan.

> In traditional e-commerce, customers need to read the long text descriptions of the product and try to understand the instructions of usage. In live commerce, consumers can just watch the streamers showing them the size, color, and functions of products. Our project connects the customer return behavior to this new way of shopping by examining different aspects of live commerce. We found that the contents, the people, the shopping purposes, and the brands have significant influences on the return rate.

1106. Amy Williams (speaker), L. Robin Keller (co-author). "Would environmentally conscious consumers make fewer (or more) retail returns?", accepted in Young Scholars' Workshop, Behavioral Operations Conference, Sam M. Walton College of Business, University of Arkansas, June 13-15, 2022.

1105. L. Robin Keller's recent conference participation (no talks), virtual and in person
    Behavioral Decision Research in Management, Chicago, June 2024 (planned)
    Society for Risk Analysis, Washington DC, Dec. 2023
    Society for Judgment and Decision Making Annual conference, Nov. 2023, San Francisco
    Decision Analysis Society (DAS) Advances in Decision Analysis conference
       Hosted by UVA's Darden School, Northern Virginia, June 22-24, 2022, in person
    Society for Judgment and Decision Making Annual conference, Feb. 10-12, 2022, virtual attendee
    DAS/Society for Risk Analysis conference June 22-23, 2021, virtual attendee

1104. L. Robin Keller, Session chair and Panelist for Peter Fishburn Memorial Panel session, held in person with some pre-recorded talks, INFORMS Annual Meeting, Anaheim, Oct. 24-27, 2021.
https://drive.google.com/file/d/10zS1br6nCnpfwFTatBUFzQ3SyfxYK1kn/view?usp=sharing
https://drive.google.com/file/d/1lyf-LSR-kBrVJ_3l1nJJCpZ3TP3FIrwI/view?usp=sharing.

1103. Qi Yan (live presenter), L. Robin Keller, "Inviting Celebrities to Live Commerce: More Sales or More Returns?", INFORMS Annual Meeting, Anaheim, Oct. 24-27, 2021.

Live commerce, a new popular way of shopping, is a combination of e-commerce and live streaming. Professional sellers introduce and make sales of products during live streaming. Sometimes, they invite celebrities to join the live video stream because of various reasons. Fans of the celebrities will follow the stream and make purchases in real time to validate their popularity. The large flow to the streaming channel helps the streamer become more acknowledged. However, more returns may occur after the event because of the cancellations of transactions from the fans. The net effect of inviting celebrities joining live commerce and how fit they are to the products need to be examined.

1102. Candice Huynh (presenter, Merage Ph.D. alumna, California State Polytechnic University-Pomona), Jeffery Guyse (Merage Ph.D. alumna, Cal Poly Pomona), L. Robin Keller, "Lives Saved vs. Lives Lost in Survey Research: Investigating Methodological Consistency", Northeast Decision Sciences Institute 50th Annual Conference 2021, held virtually, March 26-27, 2021. https://nedsi2021.exordo.com/programme/presentation/230

Seven different elicitation procedures are employed in a between-subjects experiment over hypothetical scenarios involving lives either being saved or lost over time. Inspired by a study by Frederick (2003) which included lives being saved in 6 of the 7 procedures (choice, matching, total, sequence, equity, & context) and lives lost in just one of the cases (rating), we incorporate a completely balanced and symmetrical design with both lives saved and lives lost for all 7 methodologies. The effect on saved and lost asymmetry along with the contextual effect of the questionnaire design itself are analyzed.

1101. L. Robin Keller, Panelist (as Ramsey Medalist), "DAS at 40: Legends among us", INFORMS Annual Meeting (Virtual), Nov. 9, 2020.

This year marks the 40th Anniversary of the Decision Analysis Society. Much has been accomplished in these years and even more remains in front of us. How best to guide the future of Decision Analysis if not through the words of its legends? Join us to discuss the future of DAS with Ramsey medalists David Bell, Bob Clemen, Jim Dyer, Simon French, Raimo Hämäläinen, Ralph Keeney, L. Robin Keller, Don Kleinmuntz, D. Warner North, Gregory Parnell, Elisabeth Paté-Cornell, Rakesh Sarin, James Smith, Carl Spetzler, Detlof von Winterfeldt and Robert Winkler.

1100. L. Robin Keller (presenter), Jay Simon, "Key points for communicating clearly about risk", INFORMS Annual Meeting (Virtual), flash talk, Nov. 12, 2020.

It is important to be clear so others know what you mean when you say something is risky (e.g., a specific adverse outcome such as a financial loss or pandemic vs. a gamble with probabilities of different possible outcomes). Know also what would increase the riskiness (e.g., more risky if outcomes in a gamble shift downward or are multiplied by a number larger than one) and what would mitigate the riskiness (e.g., hedging or designing new action alternatives). Finally, it is important to understand what is meant by risk aversion.

1099. Qi Yan (presenter), Cristina del Campo, L. Robin Keller, "Tip Or Not Tip? A Study of Viewer's Willingness To Tip Under The Influences of Income, Lottery Incentives, Winning Probability And Streamer Contract", INFORMS Annual Meeting (Virtual), flash talk, Nov. 12, 2020.

Online streaming brings in huge profits to the platforms with majority comes from the tips given by the viewers. We study whether the split of tips between streamer and platform affects viewers' willingness to tip, under the influences of income, incentives, and winning probability. We conducted an online survey that the participants were randomly assigned one version of the questions. The *Split* version, assuming that the platform splits the tips with the streamer with an unknown exact ratio, has 403 responses. The *All* version, assuming that the platform takes no tips and the streamers get all, has 508 entries. We conducted hypothesis testing over different scenarios and find significant differences.

1098. (Delayed due to COVID) L. Robin Keller, Invited Keynote Speaker, "Building Insights by Modeling Stakeholders' Multiple Objectives", International Federation of Operations Research Societies (IFORS) conference, Seoul, Korea, June 21-26, 2020. (Held Aug. 22-27, 2021 as a virtual conference, Keynote talk pre-recorded and delivered California time Aug. 23, followed with live question session.)

Including multiple objectives in decision models can provide greater insights for decision makers. Examining the perspectives of multiple stakeholders builds understanding and can help to creatively design new alternative actions to resolve conflicts.

Constructing a hierarchy of each stakeholder's objectives with respect to a decision situation can provide insights on areas of agreement and disagreement. Sometimes, one objectives hierarchy is suitable for a set of stakeholders, and differences in opinions can be characterized by differences in a stakeholder's tradeoff weights between the objectives. Examples include planning for protection against radioactive iodine releases in nuclear incidents and analysis for the founding of INFORMS.

In other cases, a separate objectives hierarchy will be constructed for each stakeholder because their objectives are so different that construction of separate hierarchies better represents their divergent perspectives. Examples include a tuna fish

supplier source selection decision, a prostate cancer treatment decision, and a building supply store facility location. Having modeled stakeholders' objectives and the performance of possible actions on their objectives, model results can show how much agreement there is among stakeholders on each possible action. Dynamic sensitivity analysis can be conducted using Excel sliders on the objectives' weights, to rapidly see how the preferred action may change with weight changes. Sometimes each stakeholder's model will be combined into one overall model to determine one overall value score for an alternative action, either by weighting each stakeholder equally, or applying different weights to different stakeholders. In spatial decisions involving socio-economic and environmental outcomes, such as household freshwater planning, each subregion can be seen as a stakeholder to the overall decision and could be given a weight in the overall value calculation.

1097. Moderator for Jay Simon 12-18-19 public webinar for the Society for Decision Professionals and the Decision Analysis Society of INFORMS on our joint work in Operations Research and Risk Analysis on "Modeling Geographic Preferences for Policy Decisions". Merage alumnus Jay Simon was the speaker presenting the slides and I took questions from the audience submitted online and relayed them to Jay, with some added comments from me.

1096. L. Robin Keller, invited panelist on "Future of Decision Analysis and Multi-criteria Decision Making in the Age of Big Data, AI, and Social Media" with Rakesh Sarin and Greg Parnell, Hawaii International Conference on System Sciences (HICSS) Maui Conference, Jan. 7-10, 2020.

The fourth industrial revolution appears to be Big Data, Data Science, and Analytics. Big data has resulted from the desire of individuals for anytime access to news and entertainment and for continual connection through social media; business's desire to understand and influence the buying habits of current and potential customers; and the government's desire to provide better services. In addition, automation and Artificial Intelligence are now embedded in almost all manufactured product (e.g., automobiles) and service delivery (e.g. natural language). To meet the demand of employers and the interests of students, universities are rushing to develop Data Science and/or Analytics undergraduate and professional degrees. One popular analytics categorization includes descriptive analytics (what data can inform us about the past), predictive analytics (what data can help us predict the future needs or behaviors), and prescriptive analytics (how our preferences and inform our decision-making). The purpose of this panel is to explore how decision analysis and multi-criteria decision-making can play an important role in data science and analytics.

1095. Jeffery L. Guyse (Presenter, Merage alumnus, Cal Poly Pomona), Candice Huynh (Merage alumna, Cal Poly Pomona), L Robin Keller, "Lives Saved vs. Lives Lost in Survey Research: Investigating Methodological Consistency", accepted talk, Annual Conference of Decision Sciences Institute, November 23-25, 2019.

Seven different elicitation procedures are employed in a between-subjects experiment over hypothetical scenarios involving lives either being saved or lost over time. The effect on the responses due to the outcome being saved or lost and the contextual effect of the questionnaire design itself are analyzed for the elicitation methods.

1094. Jiaru Bai (speaker), Cristina del Campo, L. Robin Keller, "Challenges in Modelling Time Dependent Transitions in Cost-effectiveness Analysis" in invited session co-chaired by Keller and del Campo on "Healthcare Decision Analysis", INFORMS Annual; Meeting, Seattle, WA, Oct. 20-23, 2019.

We propose challenges in estimating Markov model parameters with limited clinical data. With limited data from registration trials, we developed a way to estimate time-dependent transition probabilities in a Markov model for cancer progression. The method is applied to cervical cancer data in a clinical study.

1093. Alexander Robinson (speaker), Cristina del Campo, L. Robin Keller, "Enhancing Understanding of Probability Updating with Bayes' Rule" in invited session co-chaired by Keller and del Campo on "Healthcare Decision Analysis", INFORMS Annual; Meeting, Seattle, WA, Oct. 20-23, 2019.

The process of calculating updated probabilities via Bayes' theorem and interpreting them should be improved to avoid errors and enhance understanding. Updating probabilities given new evidence is a technique that has applications in a number of fields, in particular healthcare. Stating probabilities as numbers of people out of a total number will help health care providers, care givers and patients better understand and retain the information.

1092. L. Robin Keller, Ramsey Medalist Panel Chair and Panelist, Advances in Decision Analysis conference at Bocconi University, Milan, Italy, June 19-21, 2019, sponsored by the Decision Analysis Society of INFORMS.

1091. L. Robin Keller, panelist and mentor at Women in Economics and Business Workshop, April 26, 2019, UC Irvine, organized by graduate students.

1090. L. Robin Keller, "Spatial Preference Models with Multiple Objectives across Multiple Geographic Regions", Institute for Mathematical Behavioral Science, UCI, invited colloquium speaker, Dec. 6, 2018.

This talk presents decision analysis methodology for decisions based on data from geographic information systems. The consequences of a decision alternative are modeled as distributions of outcomes across a geographic region. We discuss conditions that may conform with the decision maker's preferences over a specified set of alternatives; then we present specific forms for value or utility functions that are implied by these conditions. Decisions in which there is certainty about the consequences resulting from each alternative are considered first; then probabilistic uncertainty about the consequences is included as an extension. Two hypothetical urban planning decisions are modeled: one on water use and temperature reduction in regional urban development and one on fire coverage across a city.

One of the remaining challenges is the need for a cardinal preference function that incorporates the spatial nature of the outcomes. We explore preference conditions that will yield the existence of spatial measurable value and utility functions. Such measurable preference functions allow simpler assessment procedures and a strength of preference interpretation of the results. We present a simple example on household freshwater usage across regions.

1089. Jeffery L. Guyse (Presenter, Merage alumnus, Cal Poly Pomona), L Robin Keller, Candice Huynh (Merage alumna, Cal Poly Pomona), ¨Valuing Sequences of Lives Lost or Saved Over Time: Preference for Uniform Sequences", invited talk in session on Behavioral Decision Analysis with Mortality and Health Outcomes, co-chaired by Keller and Guyse, INFORMS Annual Meeting, Phoenix, Nov. 2018.

We present our within-subject survey using subjective ratings for sequences of lives lost or saved over time, with factors embedded for anomalies. The prediction results for the standard discounting model (SDM) are analyzed. A model by Loewenstein & Prelec (L&P) for valuation of sequences was then fit to the survey data and compared to the best fits of the SDM. In all cases, the L&P model performed better than the SDM at predicting the individual normalized ratings for these sequences. We conclude that preferences for uniform sequences should be considered in policy making, rather than presuming people have a preference for declining sequences of mortality outcomes.

1088. Jeffery L. Guyse, Candice Huynh (presenter), L Robin Keller, "Lives Saved vs. Lives Lost in Survey Research: Investigating Methodological Consistency", invited talk in session on Behavioral Decision Analysis with Mortality and Health Outcomes, co-chaired by Keller and Guyse, INFORMS Annual Meeting, Phoenix, Nov. 2018.

Seven different elicitation procedures are employed in a between-subjects experiment over hypothetical scenarios involving lives either being saved or lost over time. Inspired by a study by Frederick (2003) which included lives being saved in 6 of the 7 procedures (choice, matching, total, sequence, equity, & context) and lives lost in just one of the cases (rating), we incorporate a completely balanced and symmetrical design with both lives saved and lives lost for all 7 methodologies. The effect on the survey responses due to the outcome being saved or lost along with the contextual effect of the questionnaire design itself are both analyzed for each of the 7 elicitation procedures employed.

1087. Jay Simon (presenter) and L. Robin Keller, "Preferences in Spatial Decision Making", EURO conference, July 2018, Valencia, Spain.

1086. Liangyan Wang (presenter), Qin Wang, Eugene Chan, Robin Keller, "Behavioral Decision Making", INFORMS International Conference in Taiwan, in invited session chaired by Liangyan Wang, under cluster chair Yitong Wang, June 2018.

In the current investigation, we examine consumers' preference and purchase intentions for genuine products after they are caught using counterfeit versions. We show in five studies that consumers with an interdependent self-construal increase their preference for genuine products when caught using counterfeit symbolic (vs. functional) products.

1085. Jiaru Bai (presenter, Binghamton University), L. Robin Keller, "Markov Cost-effectiveness Analysis for Cancer Treatment", invited talk in Healthcare Decision Analysis session chaired by L. Robin Keller, INFORMS Annual Meeting, Houston, Oct. 2017.

We present a way to build a Markov decision tree to model cancer progression and cost-effectiveness analysis for two or more cancer treatments. We propose several problems researchers can encounter in this kind of research and provide possible solutions.

1084. L. Robin Keller, moderator, Meet the Editors Panel, in session co-chaired by L. Robin Keller and Saurabh Bansal, INFORMS Annual Meeting, Houston, Oct. 2017.

1083. Jay R. Simon (presenter), L. Robin Keller, "Spatial Decision Analysis", invited talk, INFORMS Annual Meeting, Houston, Oct. 2017.

1082. Liangyan Wang (presenter), Qin Wang, L. Robin Keller, and Eugene Chan, "Counterfeits Can Benefit Original Brands When People Are Caught Using Counterfeits: The Role of Face Restoration", Advances in Consumer Research conference, Oct. 2017, San Diego.

We examine consumers' preference and purchase intentions for genuine products after they are caught using counterfeit versions. We show that consumers with an interdependent self-construal increase their preference for genuine products when caught using counterfeit symbolic (vs. functional) products because they wish to restore face.

1081. Juliet Elizabeth Wolford (Poster presenter), Jiaru Bai, Ramez Hassef Eskander, L. Robin Keller, Lindsey E Minion, John K. Chan, Bradley J. Monk, Krishnansu Sujata Tewari, "Evaluating the cost-effectiveness of current FDA-approved PARP inhibitors for the treatment of recurrent ovarian cancer", American Society of Clinical Oncology (ASCO) conference, June 3, 2017, Chicago, Poster abstract published in J Clin Oncol 35, 2017 (suppl; abstr 5516), http://abstracts.asco.org/199/AbstView_199_193762.html

Background: Unlike approved IV administered therapies, Medicare is under no obligation to cover prescription medicines. We sought to evaluate the cost-effectiveness of the two FDA-approved orally administered PARP inhibitors (PARPi), olaparib and rucaparib. **Methods:** A Markov model was created in TreeAge Pro 2015 with nodes in the chain allowing patients to transition through response, hematological complications, non-hematological complications, progression, and death. Separately, the PARP inhibitors were compared with IV administered drugs approved for recurrent ovarian cancers including platinum-based, non-platinum, and bevacizumab-based regimens. Toxicity and mean PFS rates for the different agents were obtained from registration trial data. Costs of IV chemotherapy, managing toxicities, infusions, and supportive care were estimated using 2015 Medicare data. Incremental cost-effectiveness ratios (ICER) were calculated and survival was reported in quality adjusted life months. **Results:** Platinum-based combinations were the most cost-effective at $1,672/PFS mo as compared to non-platinum agents ($6,688/mo), bevacizumab-containing regimens ($12,482/mo), olaparib ($13,3731/mo), and rucaparib ($14,034/mo). Considering a cost of $114,478 for olaparib and $137,068 for rucaparib prior to progression, costs associated with PARPi were 7.1 to 8.3X more than platinum combinations. To better compare the registration trial data to PARPi data, probability was adjusted to 2nd line for rucaparib, revealing it's ICERs' of per month of life added to be $26,997 for bevacizumab, $17,757 for non-platinum, and $79,585 for platinums. Using the adjusted-to-2nd-line probabilities for olaparib, exhibited ICERs were $16,549 for bevacizumab, $25,637 for non-platinums and $72,083 for platinums. **Conclusions:** The high costs of PARPi were not balanced by costs of infusion and managing toxicities of IV drugs typically associated with lower response rates and shorter PFS in the recurrent space. Balancing incremental clinical benefit with novel therapies remains problematic and could widen disparities among those with limited access to care.

1080. Jiaru Bai (presenter and session chair), Cristina Del Campo and L. Robin Keller, "Challenges In Markov Modeling of Cancer Treatment," invited talk in cluster on Computational Decision Analysis under cluster chair Jay Simon, INFORMS Computing Society ICS2017 conference, January 2017, Austin, Texas.

We present a way to build a Markov decision tree to model cancer progression and cost-effectiveness analysis for two or more cancer treatments. We propose several problems researchers can encounter in this kind of research and provide possible solutions.

1079. Jay Simon (presenter), L. Robin Keller, "Spatial Preference Functions for Risk Analysis," invited talk in Spatial Multicriteria Analysis session, INFORMS Annual Meeting, Nashville, Nov. 2016.

When outcomes are defined over a geographic region, measures of spatial risk regarding these outcomes can be more complex than traditional measures of risk. One of the main challenges is the need for a cardinal preference function that incorporates the spatial nature of the outcomes. We explore preference conditions that will yield the existence of spatial measurable value and utility functions, and discuss their application to spatial risk analysis.

1078. L. Robin Keller, Invited Panelist on "Advice from Award Winning Researchers" in Decision Analysis Society Cluster, joint with Junior Faculty Interest Group, INFORMS Annual Meeting, Nashville, Nov. 2016.

Robin Keller is the 2016 INFORMS Past President and an INFORMS Fellow. She was the 2015 Ramsey Medalist and the Editor-in-Chief of *Decision Analysis* (2007-2012). Hints: Read widely, make small commitments at first to new co-authors, and figure out how to not procrastinate on revisions.

1077. Jiaru Bai (presenter), L. Robin Keller, "Challenges in Markov Modeling of Cancer Treatment," invited talk in Models in Medical Decision Making session, INFORMS Annual Meeting, Nashville, Nov. 2016.

We present a way to build a Markov decision tree to model cancer progression and cost-effectiveness analysis for two or more cancer treatments. We propose several problems researchers can encounter in this kind of research and provide possible solutions.

1076. Ali Esmaeeli (presenter), L. Robin Keller, "Geographically Weighted Multi-attribute Decision Making for Taxi Assignment," invited talk in Spatial Multicriteria Analysis session, INFORMS Annual Meeting, Nashville, Nov. 2016.

The taxi assignment problem is usually considered as one part of the more general vehicle routing problem (VRP) with a known value function. In this work, we extend this viewpoint to match the problem more with the real world conditions. We consider a map with weighted regions and propose a method to find the best option for each taxi request based on two different attributes. These attributes are the average response time for each region and the rate of accepted requests for each region. We show how to combine these attributes and how to include the region weights into the main value function. Moreover, we present a method for finding the best assignment option based on our defined value function.

1075. Ali Esmaeeli (presenter) and L. Robin Keller, "Real-time Multiple Attribute Taxi Assignment on Weighted Regions," INFORMS International conference, Kona, Hawaii June 2016.

In this paper we provide a model for the assigning problem in a taxi company from a decision modeling perspective. In our model, different regions of a map have different values for the taxi company. We calculate the desirability of the assignment using two attributes. These attributes are the average response time and the rate of accepted requests for each region. We show how we can calculate weights for regions and attributes in our model. Moreover, we define a value function and an algorithm which can be used to evaluate the value of an assignment in our model.

1074. Jiaru Bai (presenter) and L. Robin Keller, based on work with UCI Physician co-authors, "A Markov Decision Tree Model to Evaluate Cost-Effectiveness of Ovarian Cancer," INFORMS International conference, Kona, Hawaii June 2016.

We present a way to build a Markov decision tree to model cancer progression and cost-effectiveness analysis for two or more cancer treatments. Olaparib, platinum-based combinations, non-platinum agents, and bevacizumab-containing regimens are compared for the treatment of recurrent ovarian cancer using the Incremental Cost Effectiveness Ratio (ICER). We also propose several problems researchers can encounter in this kind of research and provide possible solutions.

1073. L. Robin Keller, "Nudges," invited talk to UCI Merage alumni, May 14, 2016.

1072. Plenary speaker, Program Committee Member, and Special Track Organizer, 12th International Conference on Operations Research (ICOR 2016), Havana, Cuba; March 8-11, 2016, http://samm.univ-paris1.fr/12th-ICOR-2016, co-sponsored by INFORMS. L. Robin Keller (presenter), Jiaru Bai, Cristina del Campo, "A Markov Decision Tree Model to Evaluate Cost-Effectiveness of Cervical Cancer Treatments." Also organized a set of talks by INFORMS members for the program committee.

We evaluated the cost-effectiveness of adding the new drug bevacizumab to chemotherapy treatment of advanced cervical cancer. A Markov decision tree was created using recent clinical trial data. In the 5-year model, subjects transitioned through the following monthly states: response to the treatment, progression of the disease, minor complications, severe complications, and death. The 2013 US MediCare Services Drug Payment Table and Physician Fee Schedule provided costs, in US dollars.

On average, patients survived 14.7 months at a US medical system cost of $5,938 with chemotherapy alone vs. 17.7 months at a cost of $79,097 with chemo plus bevacizumab. The estimated total cost of therapy with bevacizumab is approximately 13.3 times that for chemotherapy alone, adding $73,159 per 3.0 months of life gained. So the incremental cost effectiveness ratio (ICER) is $24,386 extra cost/extra month.

Patients experienced a health quality level each month depending on the treatment effectiveness and on any complications, ranging from 0 for death to 1 for the baseline of 1 month responding to advanced cervical cancer treatment. Patients survived 11.2 quality adjusted life months (QALmonths[cc]) with chemo alone vs. 13.9 QALmonths[cc] with chemo plus bevacizumab. The ICER ratio increased to $27,096/QALmonth[cc] due to the smaller difference in QALmonths[cc].

Increased costs associated with bevacizumab therapy for advanced cervical cancer are primarily due to the cost of the drug and not the management of bevacizumab-induced complications. Possible future cost reductions in bevacizumab or biosimilars would result in dramatic declines in the added cost of gaining more months of life.

We present two low-cost software alternatives to the Treeage software to compute Markov decision trees: StoTree by Gordon Hazen and a program we wrote in R using the Markov chain package.

1071. L. Robin Keller, invited talk, Multi-Objective Multi-Stakeholder Decision Analysis," Systems Analysis 2015 Conference, Session 5: Addressing Diversity in Social Systems, International Institute for Applied Systems Analysis (IIASA), Laxenburg, Austria. Nov. 11-13, 2015.

Recording: https://www.youtube.com/watch?v=cdMfVlIAWzg Robin Keller IIASA talk
A key component of systems analysis is examining the perspectives and actions of multiple stakeholders. Constructing a hierarchy of each stakeholder's objectives with respect to a decision situation can provide insights on areas of agreement and disagreement. Sometimes, one objectives hierarchy is suitable for a set of stakeholders, and differences in opinions across stakeholders can be characterized by differences in the multiple objectives' weights. Examples include planning for protection against radioactive iodine releases in nuclear incidents and analysis for the merger of the Operations Research Society of America and The Institute of

Management Sciences to become INFORMS. In other cases, an objectives hierarchy will be constructed for each stakeholder because their objectives are so different that construction of separate hierarchies better represents their divergent perspectives. Examples include a tuna fish supplier source selection decision (from the perspectives of the StarKist company, environmentalists, and the San Diego tuna fishing fleet), a prostate cancer treatment decision (of former Intel CEO Andy Grove, his family, his company, and his doctors), and the potential siting of a new Home Depot building supply store.

Having modeled stakeholders' objectives, dynamic sensitivity analysis can be conducted using sliders in Excel on the objectives' weights, to rapidly see how the preferred action may change with weight changes. It would also be possible to examine the perceived fairness across stakeholders of anticipated environmental changes or proposed societal policies. Just as groups may differ in objectives, they may also differ in their perception of risks. In particular, scientists and laypeople often judge the magnitude of risks very differently.

1070. L. Robin Keller, "Ramsey Medal Acceptance Speech," INFORMS conference, Philadelphia, Nov. 2015.

1069. Jay Simon (Presenter), based on work in collaboration with Craig W. Kirkwood and L. Robin Keller, "Decision Analysis with Geographically Varying Outcomes," invited talk in session on spatial MCDA, INFORMS conference, Philadelphia, Nov. 2015.

This work develops theory to support decisions based on data from geographic information systems (GIS). Preference conditions are introduced, leading to corresponding value and utility functions over GIS data for both single-attribute and multiple-attribute cases. These models of preferences are then applied to example decisions based on GIS data.

1068. Jiaru Bai (presenter), L. Robin Keller, "Markov Cost-Effectiveness Analysis for Cancer Treatment," invited talk, INFORMS conference, Philadelphia, Nov. 2015.

We present a way to build a Markov decision tree to model cancer progression and cost-effectiveness analysis for two or more cancer treatments. We propose several problems researchers can encounter in this kind of research and provide possible solutions.

1067. Jiaru Bai (presenter), L. Robin Keller, "Markov Cost-Effectiveness Analysis for Cancer Treatment," invited talk, INFORMS Healthcare conference, Nashville 7-29 to 7-31-15.

We present a way to build a Markov decision tree to model cancer progression and cost-effectiveness analysis for two or more cancer treatments. We propose several problems researchers can encounter in this kind of research and provide possible solutions. The method is used for a clinical study comparing two cervical cancer treatments. This talk is based on "A Markov Model to Evaluate Cost-effectiveness Antiangiogenesis Therapy Using Bevacizumab in Advanced Cervical Cancer" by Lindsey E. Minion, Jiaru Bai, Bradley J. Monk, L. Robin Keller, Eskander N. Ramez, Gareth K. Forde, John K. Chan, Krishnansu S. Tewari.

1066. Jay Simon, Craig W. Kirkwood, L. Robin Keller (presenter), "Decision Analysis with Geographically Varying Outcomes: Preference Models and Applications," invited talk in session on spatial MCDA in the Multiple Criteria Decision Aiding stream at the EURO Conference, Glasgow, Scotland, July12 – 15, 2015.

We present decision analysis methodology for decisions based on data from geographic information systems. We discuss conditions that may conform with the decision maker's preferences over a set of alternatives, and we present specific forms for value or utility functions that are implied by these conditions. The methodology is applied to two hypothetical urban planning decisions involving water use and temperature reduction in regional urban development, and fire coverage across a city.

1065. L. Robin Keller (presenter), Jay Simon, "Teaching Multi-Objective Multi-Stakeholder Decision Modeling With Cases," presented as a main talk at the 11TH International Workshop on Operations Research, Havana, Cuba, March 10-13, 2015, http://samm.univ-paris1.fr/11th-IWOR-Habana-March-10-13-2015.

Many operations researchers know about the use of decision analysis to decide among alternative investments (such as pharmacological research and development) using decision trees with chance nodes to compute expected monetary value of different alternatives. Such an analysis aims to maximize a single evaluation measure for a single decision maker. We demonstrate less widely known decision analysis techniques using spreadsheet models of the multiple objective perspectives of the decision stakeholders. We show how to teach students to analyze real-life decision problems using case examples and discuss specific skills students are expected to learn, such as dynamic sensitivity analysis using sliders in Excel on objectives' weights, and typical student questions and errors during case discussion. This methodology has been taught successfully in business courses for both MBAs (including health care executive MBAs) and undergraduate students.
Sometimes, one objectives hierarchy is suitable for a set of stakeholders, and differences in opinions across stakeholders can be characterized by differences in the multiple objectives' weights. Examples include the analysis for the merger of the Operations Research Society of America and The Institute of Management Sciences to become INFORMS and planning for protection against radioactive iodine releases in nuclear incidents. In other cases, an objectives hierarchy will be constructed for each stakeholder because their objectives are so different that construction of separate hierarchies better represents their divergent perspectives. Examples include a prostate cancer treatment decision (of former Intel CEO Andy Grove, his family, his company, and his doctors), a tuna fish supplier source selection decision (from the perspectives of the StarKist company, environmentalists, and the San Diego tuna fishing fleet), and the potential siting of a new Home Depot building supply store. Sources: http://pubsonline.informs.org/doi/pdf/10.1287/educ.1090.0066, http://dx.doi.org/10.1287/ited.1080.0012.

1064. L. Robin Keller (poster presenter), with Tianjun Feng (UCI Merage doctoral alumnus, Associate Professor at Fudan University), Ping Wu (Fudan University), Yifan Xu (Fudan University), "An Empirical Study of the Toxic Capsule Crisis in China: Risk Perceptions and Behavioral Responses," Society for Risk Analysis conference, Dec. 7-10, 2014, Denver.

> The outbreak of the toxic capsule crisis during April 2012 aroused widespread public concern about the risk of chromium-contaminated capsules and drug safety in China. In this paper, we develop a conceptual model to investigate risk perceptions of the pharmaceutical drug capsules and behavioral responses to the toxic capsule crisis and the relationship between associated factors and these two variables. An online survey was conducted to test the model, including questions on the measures of perceived efficacy of the countermeasures, trust in the State FDA (Food and Drug Administration), trust in the pharmaceutical companies, trust in the pharmaceutical capsule producers, risk perception, concern, need for information, information seeking, and risk avoidance. In general, participants reported higher levels of risk perception, concern, and risk avoidance, and lower levels of trust in the three different stakeholders. The results from the structural equation modeling procedure suggest that perceived efficacy of the countermeasures is a predictor of each of the three trust variables; however, only trust in the State FDA has a dampening impact on risk perception. Both risk perception and information seeking are significant determinants of risk avoidance. Risk perception is also positively related to concern. Information seeking is positively related to both concern and need for information. The theoretical and policy implications are also discussed.

1063. Yitong Wang (poster presenter, Merage alumnus, University of Technology, Sydney); Liangyan Wang (Merage alumna, Shanghai Jiaotong University); L. Robin Keller, "Discounting over Subjective Time: One Step towards a Unified Theory of Intertemporal Choice," Society for Judgment and Decision Making conference, Long Beach, Nov. 2014.

> Decision makers often face choices involving inter-temporal tradeoffs. Existing research suggests that decision makers in general do not obey discounted utility theory as their discount rates are context dependent. Looking at discounting behavior from a rather different angle, we first showed that the difference in temporal perception was able to explain the magnitude effect, and further we showed that subjective time perception was able to explain multiple anomalies of discounted utility theory simultaneously in a single context. Our finding helps in developing a unified theory for inter-temporal decision making.

1062. James Leonhardt (Merage alumnus, New Mexico State University, poster presenter); L. Robin Keller, "Risk Perception of Multi-risk Options: Health Consumers' Perceived Vaccine Risk," Society for Judgment and Decision Making conference, Long Beach, Nov. 2014.

> We compared the effect of probability format on risk perception of single- vs. multi-risk options to understand how probability format may affect health consumers' perceived vaccine risk. The results of two experiments, involving 1,000 parents, suggest that the presence (vs. absence) of pictographs increases the evaluability and influence of side effect probability (vs. symptom) on risk perception. However, for the presence of pictographs to lower risk perception, an evaluation mode (e.g., joint) or a risk option type (e.g., multiple) that allows for the comparison of probability values is necessary.

1061. Jay Simon (co-presenter, Merage doctoral alumnus, Assistant Professor, Defense Resources Management Institute, Naval Postgraduate School), Craig W. Kirkwood (W. P. Carey School of Business, Arizona State University), L. Robin Keller (presenter), "Decision Analysis with Geographically Varying Outcomes: Preference Models and Applications," INFORMS National meeting, San Francisco, Nov. 2014, in invited session on Spatial Analysis for Multicriteria Decisions, chaired by Jay Simon.

> We present decision analysis methodology for decisions based on data from geographic information systems. We discuss conditions that may conform with the decision maker's preferences over a set of alternatives, and we present specific forms for value or utility functions that are implied by these conditions. The methodology is applied to two hypothetical urban planning decisions involving water use and temperature reduction in regional urban development, and fire coverage across a city.

1060. Jiaru Bai (presenter, Merage doctoral student) and L. Robin Keller (co-author), "Markov Cost-Effectiveness Analysis For Cancer Treatment." INFORMS National meeting, San Francisco, Nov. 2014, in invited session on Spatial Analysis for Multicriteria Decisions, chaired by Jay Simon.

> We present a way to build a Markov decision tree to model cancer progression and cost-effectiveness analysis for two or more cancer treatments. We propose several problems researchers can encounter in this kind of research and provide possible solutions. The method is used for a clinical study comparing two cervical cancer treatments.

1059. L. Robin Keller, "Risk Aversion" is Mislabeled and Misleading," accepted oral presentation at the Advances in Decision Analysis conference, Georgetown, June 16-18, 2014.

Labeling a concave utility function as risk averse is misleading. Comparing shapes of the value and utility functions, a person is actually relatively risk prone when the concave utility function is below the value function. To improve insight, we should stop telling decision makers "You are risk averse" when their utility function is concave. First, we should determine the shape of the value function, which might be concave, representing decreasing marginal value, and compare it with the shape of the utility function. If the utility function is always above the value function, the person is relatively risk averse. If the utility function is the same function as the value function, the person is relatively risk neutral. If the utility function is below the value function, the person is relatively risk prone.

1058. Yitong Wang (University of Technology, Sydney, Australia), Liangyan Wang (Shanghai Jiaotong University, Shanghai, China), L. Robin Keller, "Discounting over Subjective Time: Towards a Unified Theory of Intertemporal Choice," accepted poster presented at 2014 Boulder Summer Conference on Consumer Financial Decision Making, May 18-20, 2014.

Discounted utility theory is widely used across many fields and is considered the normative theory of decision making over time (Samuelson 1937). It employs a single and context-independent discount rate to model people's preferences over time. And researchers have found that people's behaviors often are inconsistent with the key assumption of the discounted utility theory – the discount rate actually varies across contextual factors (Frederick et al. 2002, Thaler 1981).

From a behavioral perspective, we believe that attributing all variations to the discount rate diminishes the descriptive value of the discounted utility theory, as the discount rate is essentially an economic construct rather than a psychological one. Prior studies have already found some evidence that the variation in perceived temporal distance may contribute to some specific anomalies of discounted utility theory (Zauberman et al. 2009, Bilgin and LeBoeuf 2010). However, to the best of our knowledge, there is little research on the impact of perceived temporal distance on the magnitude effect, nor on bringing multiple anomalies together in one scenario and testing them simultaneously. We investigated the missing components and provided a holistic view via a decision over subjective time model. We tested the proposed model across multiple anomalies and found that subjective time perception is able to explain multiple anomalies simultaneously in a single context.

More specifically, we first show that participants' subjective perceptions of temporal duration are not independent of the outcome magnitudes, where larger monetary outcomes are associated with shorter subjective time perception (experiments 1a and 1b), and our results replicate the magnitude effect when taking only objective time into account but show a constant discount rate when taking subjective time perception into account (experiment 1c). Then we show that subjective time perception was able to explain multiple anomalies of discounted utility theory (i.e., magnitude effect, long term/short term asymmetry, and delay/date asymmetry) simultaneously in a single context (experiment 2).

Our findings can help reconcile the observed inconsistency in preference over time and make a step forward towards a unified theory of intertemporal decision making.

1057. L. Robin Keller, "Recalling Duncan Luce at UC Irvine," in R. Duncan Luce Memorial Session, SJDM Annual Meeting, Toronto, November 2013.

1056. James Leonhardt (New Mexico State University) and L. Robin Keller, both presented poster on "Possibilities and Probabilities in the Bean Game," SJDM Annual Meeting, Toronto, November 2013.

This study was designed to test whether when faced with a possible gain decision makers exhibit a preference for options having less possible outcomes, whereas when faced with a possible loss decision makers exhibit a preference for options having more possible outcomes. Herein an outcome is considered unique when it is qualitatively (rather than quantitatively) different than other possible outcomes. The study found that in the gain condition, there was a greater preference for 2 versus 4 possible outcomes, whereas in the loss condition, this preference was reversed.

Sponsored Session co-chaired by L. Robin Keller and Candice Huynh, "Panel Discussion: Teaching Decision Analysis", INFORMS, Minneapolis, October 2013, in Decision Analysis Society Cluster.

1055. Candice Huynh (presenter) and L. Robin Keller,
"Introduction to Panel Session and Tips for Teaching Decision Analysis Software"

This session will run as a panel discussion. Each panelist will make a short presentation on their perspective on the facets of teaching decision analysis. Then, an open discussion will follow. After introducing the session, I will provide tips on teaching decision analysis software based on MBA teaching experience.

1054. L. Robin Keller, "Quick Decision Analysis for MBAs"

If you only have a few sessions to teach decision analysis to MBAs, what should you do? What are realistic objectives that can be achieved, useful "take aways" for students, the role of experiential learning, and appropriate instructional materials and software?

1053. James M. Leonhardt (poster presenter), L. Robin Keller, and Riana S. Beals, "Parents and Pictographs: Probability Format Affects Parents' Perceived Vaccine Risk," UCI Merage Ph.D. Research Fest, April 18, 2013.

Research Question: When presenting an option (vaccine) that has many possible risks (side-effects) does probability format (1-in-X, N-in-X·N, Pictograph + N-in-X·N) affect perceived (vaccine) risk?

1052. Invited faculty guest attendance at Kauffman Foundation Event Reception for Dissertation Fellows (UCI's Russ Nelson), American Economic Association Meeting, San Diego, Jan. 2013

1051. James M. Leonhardt, L. Robin Keller (poster presenter), "Parents and Pictographs: Probability Format Affects Parents' Perceived Vaccine Risk," Society for Judgment/Decision Making conference, Minneapolis, November 2012.

1050. L. Robin Keller (panelist), October 2012, Women in OR/MS cluster, Panel Discussion on Women in OR/MS: Publishing, Recruitment, and Retention, chaired by Laura McLay, INFORMS, Phoenix.

1049. L. Robin Keller (presenter), Yitong Wang, INFORMS, October 2012, "Ranking FDA Risks: The Medical Devices Case," invited talk in session chaired by L. Robin Keller, INFORMS, Phoenix.

1048. Tianjun Feng (presenter) with Yitong Wang and L. Robin Keller, "Counteracting the Uncertainty Effect Bias." INFORMS Beijing, June 2012.

1047. L. Robin Keller (poster presenter), Yitong Wang, Tianjun Feng. "Shifting Perception of Risks Experienced at Different Times," BDRM Conference, Boulder, CO, June 2012 (held in conjunction with the Boulder Summer Conference on Consumer Financial Decision Making). Peer-reviewed.

1046. Leonhardt, J. (poster presenter), Keller, L. R, Barone, D., & Pechmann, C. (April 2012). "Likelihood Estimates Across Probability Levels With and Without Pictographs." Merage PhD Research Fest. University of California, Irvine. Irvine, CA.

1045. Leonhardt, J. (poster presenter), Keller, R., & Pechmann, C. (Jan. 26, 2012). "Pictographs and probabilities." Judgment and Decision Making Preconference. Society for Personality and Social Psychology. San Diego, CA. Peer Reviewed Conference Presentation (Poster).

1044. Tianjun Feng, L. Robin Keller (presenter), Yitong Wang, "Time Inconsistency of Risk Perception," Society for Risk Analysis, Charleston, SC, Dec. 2011. Peer-reviewed.

> In this paper we investigate inter-temporal changes of risk perceptions in decisions under uncertainty. Time inconsistency of preference has been well documented in the literature, but any possible time inconsistency of risk perception has not received much attention. Two competing theories predict opposite results. The risk-as-feelings hypothesis (Loewenstein et al., 2001) states that payoffs and probabilities have different roles: when more emotional, people are less sensitive to variation in probability and more sensitive to variation in payoffs. Thus it predicts that an increment in time delay before receiving a binary gamble will lead to a higher impact of probability and a lower impact of payoff on risk perception when judged in the present time, assuming larger temporal distance leads to less emotional reactions. However, construal level theory (Liberman at al., 2002) and time-dependent gambling (Sagristano et al., 2002) proposed that probability is subordinate to payoff in preferences for gambles, which means payoffs can be regarded as being at a higher level of construal in gambles while probabilities can be regarded as at a lower level. This predicts temporal distance increases the influence of payoffs and decreases the influence of probability on preferences. In this study, we propose that temporal distance has different influences on attributes of a decision alternative with respect to risk perception as well. Experiments are conducted with hypothetical scenarios to examine this proposition where either probability (payoff) is controlled to estimate the influence of time and the payoff (probability) and provide a detailed discussion of our empirical results. Research results will help in developing a useful framework for evaluating anticipated risk consequences, which can be used by DHS to deliver information on anticipated consequences of future societal or natural risks to the public. Possible implications on risk perception of terrorism risks and natural disasters are discussed.

1043. Leonhardt, J. (poster presenter), Keller, R., Beals, R., & Pechmann, C. (Nov. 2011). "Using Risk Graphics Across Probability Levels." Society for Judgment and Decision Making. Seattle, WA. Peer Reviewed Conference Presentation (Poster).

Invited presentations in session chaired by L. Robin Keller and Tianjun Feng, INFORMS conference, Nov. 2011, Charlotte, NC:

1042. Tianjun Feng, L. Robin Keller (presenter), Yitong Wang, "Time Inconsistency of Risk Perception."

Time inconsistency of preference has been studied by numerous researchers. However, little attention has been paid on time inconsistency of risk perception. In this talk we try to test people's intertemporal changes in their risk perception on abstract gambles. And we found that at different time points, probabilities of losses and potential losses had different roles.

1041. Tianjun Feng (presenter), L. Robin Keller, Yitong Wang, "Counteracting the Uncertainty Effect Bias."

When exhibiting the uncertainty effect, individuals value a binary lottery less than the lottery's worst outcome. Our paper explores how to counteract the uncertainty effect bias by investigating a plausible underlying anchoring-and-adjustment process. Two experiments were conducted to examine if providing an anchor prior to judgments, or introducing additional cognitive load is able to counteract the uncertainty effect bias.

1040. L. Robin Keller, "Behavioral Aspects of Decision Analysis," 10-15-11, presented at the Decision Analysis: Visions for the Future Conference, organized by Ali Abbas, Stanford Park Hotel, Menlo Park, California. (Keller also spoke at the conference on the *Decision Analysis* journal.)

1039. Leonhardt, J. (presenter), Keller, L. R., & Pechmann, C. (Summer 2011). "Does Uncertainty Act as a Causal Buffer?" Summer Institute on Bounded Rationality. The Center for Adaptive Behavior and Cognition. Max Planck Institute. Berlin, Germany. Peer Reviewed Conference Presentation (Oral).

1038. L. Robin Keller, "How to Make Smart Choices," Irvine Presbyterian Church, Primetimers, May 19, 2011.

1037. James M. Leonhardt (presenter, marketing doctoral student), L. Robin Keller and Cornelia Pechmann, Jan. 12-14, 2011, "Avoiding the Risk of Responsibility by Seeking Uncertainty: Responsibility Aversion and Preference for Indirect Agency When Choosing for Others," reworded as "I'd Feel Better if You Were Killed by Chance." Edwards Bayesian Research Conference. Fullerton, CA. Peer Reviewed Conference Presentation (Oral).

1036. Leonhardt, J. (presenter), Keller, L. R., & Pechmann, C. (Nov. 2010). "Avoiding the Risk of Responsibility by Seeking Uncertainty: Responsibility Aversion and Preference for Indirect Agency." Society for Judgment and Decision Making. St. Louis, MO. Peer Reviewed Conference Presentation (Poster).

1035. Jeffery L. Guyse and L. Robin Keller, "Preferences and Subjective Valuation of Sequences of Lives." Invited presentation in session organized by Keller at upcoming INFORMS conference in Austin, TX, Nov. 2010.

Survey results on individuals' preferences and valuation for temporal sequences of survival/mortality outcomes are presented and compared to previous results on monetary outcomes. Results and insights are discussed.

1034. Jay Simon and L. Robin Keller, "Modeling Reference-Dependence Under Uncertainty." Invited presentation in session organized by Keller at INFORMS conference in Austin, TX, Nov. 2010.

Reference-dependent models have become increasingly accepted as descriptive of human behavior, and normative models are now being developed to guide and structure the formation of preferences which induce this behavior. In this paper, we examine the implications of reference-dependence when studying preferences over gambles with intertemporal outcomes. We discuss various (normative) forms of utility functions, and develop the required conditions and assumptions.

1033. Yitong Wang, L. Robin Keller, Tianjun Feng, "Exploration and Extension of the Uncertainty Effect: Probabilistic Ambiguity and Comparison Direction." Invited presentation in session organized by Keller at INFORMS conference in Austin, TX, Nov. 2010.

1032. James Leonhardt (presenter) and L. Robin Keller (with Connie Pechmann), "Accountability-Aversion and a Preference for Uncertainty." Invited presentation in session organized by Keller at INFORMS conference in Austin, TX, Nov. 2010.

1031. Yitong Wang and L. Robin Keller, "Preference over Ambiguous Time," Poster presented at Behavioral Decision Research in Management conference, June 2010, Pittsburgh.

In this paper, we examine the impact of an ambiguous temporal distance on an individual's discounting behavior. Specifically, we find that people generally discount more when facing an ambiguous point in a time span than when facing either boundary of this time span. One potential explanation is found by conducting further experiments. And one way to aid people to make consistent decisions over ambiguous time is also discussed in detail.

1030. Southern California Operations Research/Operations Management Conference at UCI, served as arrangements chair, co-sponsored with Pepperdine. May 2010. Conference rotates annually between UCLA, USC, and UCI.

1029. Yitong Wang and L. R. Keller, "Decision Over Ambiguous Time," Merage Research Fest, with doctoral student posters. April 2010 (Wang presented the poster, Keller was organizer of research fest, as doctoral program director).

1028. James Leonhardt (Merage doctoral student), L. Robin Keller, and Peter H. Ditto (UCI Social Ecology), "Avoiding Risk by Seeking Uncertainty," peer-reviewed poster presented by Leonhardt at Society for Personality and Social Psychology conference, January 2010.

1027. Yitong Wang, Tianjun Feng, L. Robin Keller, "Time Inconsistency of Risk Perception," presented by Wang, San Diego INFORMS conference, October 2009.

> Time inconsistency of preference has been well documented in the literature. In this paper we investigate intertemporal changes of risk perceptions in decisions under uncertainty. We propose that temporal distance has different influence on different attributes of decisions (e.g., loss and probability of loss in a gamble) with respect to risk perceptions. We further conduct experiments to examine the proposition and provide a detailed discussion of our results.

1026. Jay Simon and L. Robin Keller, "Reference-dependent Expected Utility: Possibilities and Challenges," presented by Simon, San Diego INFORMS conference, October 2009.

> Reference-dependent utility has become a popular method for modeling intertemporal preferences. While it does confer advantages as a descriptive model, one significant challenge is that it can make expected utility very difficult to compute a priori, which limits its prescriptive applicability. In this work, we discuss specific utility formulations that can circumvent this issue, and we analyze general properties that will lead to tractability in reference-dependent expected utility modeling.

1025. L. Robin Keller, Jay Simon (assistant professor, Naval Postgraduate School and Merage doctoral alumnus), Yitong Wang (Merage doctoral student), 2009, "Multiple Objective Decision Analysis Involving Multiple Stakeholders," invited 90 minute tutorial at the San Diego INFORMS conference in October 2009.

1024. L. Robin Keller, INFORMS Practice tutorial, Phoenix, April 2009, "Decision Analysis for Multiple Objective Decisions Involving Multiple Stakeholders."

1023. Jay Simon and L. Robin Keller, "Decisions with Health Outcomes," Presented by co-author Jay Simon (not attended by Keller), INFORMS Western Regional Conference, Arizona State University, April 25, 2009.

> Health-related decisions are often based on heuristics and incomplete information, and may not adequately incorporate decision maker preferences. We formulate a reasonably straightforward expected utility model by imposing some conditions on decision maker preferences. We then extend the initial work to a reference-dependent expected utility model, which captures the notion of adaptation and gives a better approximation of the utility actually experienced by the decision maker.

1022. L. Robin Keller, "Effective Decision Making," MBA update, executive education seminar, UC Irvine, February 26, 2009.

1021. L. Robin Keller, Participant in invitation-only conference on "The Irrational Economist" in celebration of Howard Kunreuther's 70th birthday, at Wharton on Dec. 4 and 5, 2008, bringing together researchers in Decision Sciences and Economics of Information and in Catastrophe Risk Management & Insurance.

1020. Tianjun Feng, L. Robin Keller (poster presenter), Liangyan Wang, Yitong Wang, "Biases and Patterns in Consumers' Estimates of Product Health and Safety Risks: The Pet Food and Lead-tainted Toys Cases," Judgment/Decision Making conference, November 15-17, 2008, Chicago.

1019. Participant, 2008 SJDM Preconference, "Using Human Nature to Improve Human Life," University of Chicago Graduate School of Business, Nov. 2008.

INFORMS Annual Meeting, Washington DC, Oct. 12-15, 2008, 3 papers in session chaired by L. Robin Keller on Decisions and Risk Perceptions involving Ambiguity, Health, Safety, and Savings:

1018. Jay Simon (presenter), L. Robin Keller, "Life Decisions with Health Outcomes"

1017. L. Robin Keller (presenter), Tianjun Feng, Liangyan Wang, Yitong Wang, "Product Quality Risk Perceptions and Decisions: Pet Food and Lead-tainted Toys"

1016. Yitong Wang (presenter), Tianjun Feng, L. Robin Keller, "A Behavioral Model of Consumption under Anticipated Health and Income Risks"

Abstract: We study an individual's consumption decisions along an inter-temporal horizon when health, safety and financial risks are involved. Specifically, we propose a behavioral model to analyze individual consumption decisions by linking disparate streams of work on risk perception, time discounting, and consumption vs. savings patterns together. We further conduct a survey on Chinese subjects to test the model and obtain some managerial implications.

1015. Craig Kirkwood (presenter) and L. Robin Keller, "Decision Research," presentation to External Advisory Committee, Decision Center for a Desert City, Arizona State University, Sept. 9, 2008.

1014. L. Robin Keller (based on discussions with doctoral students Yitong Wang and Jay Simon), "Decision Analysis Research Perspective on Opportunities and Challenges in Dealing with Terrorism and Security Issues," talk at Behavioral Economics and Terrorism Risks Workshop, Aug. 15-16, 2008 at Homeland Security Center for Risk and Economic Analysis of Terrorist Events (CREATE), USC.

Decision analysis provides a valuable perspective to address decisions involving terrorist and security issues. First, at the problem structuring phase, we need to refine methods for individuals, groups, and organizations to generate future possible events. We do not yet even have good methods for generating states of nature which occur randomly. While actions of terrorists can be modeled as random states of nature, it is much more complicated to foresee events created by an opponent acting strategically. Second, at the preference and perception assessment stage, we need to understand the objectives of different (and competing) stakeholders in such decisions. We also need to understand how risk perception and risk adaptation changes over time, using discounting models or other temporal models. There will probably be a disparity in assessed valuation of security if people are asked their willingness to accept (WTA) a reduction in safety or if they are asked their willingness to pay (WTP) for an increase in safety. Finally, at the decision making stage, we could examine methods for resource allocation among safety expenditures in a game setting, decisions in contest games between a government and terrorists, and decisions using dynamically changing decision trees.

1013. Dipayan Biswas (presenter), L. Robin Keller, Bidisha Burman, "Predicting Future Product Failures: The Effects of Mental Unpacking and Regulatory Focus," Session on Regulatory Focus and Luxury Consumption in Consumer Behavior Track, American Marketing Association Summer Educator's Conference, San Diego, Sheraton San Diego, August 8-11, 2008.

1012. Dipayan Biswas (presenter, Bentley College), L. Robin Keller, Bidisha Burman (Appalachian State), "Making Probability Judgments of Future Product Failures: The Role of Mental Unpacking," Academy of Marketing Science Annual Conference, Vancouver, May 28-31, 2008.

1011. Jay Simon (presenter), with L. Robin Keller, Craig Kirkwood, "Decisions Using Geographic Information Systems," UCLA/USC/UCI Annual OR/OM Conference, USC, May 20, 2008.

1010. Jay Simon (presenter), working with L. Robin Keller, "Life Decisions with Health Outcomes," Sixth Annual IMBS Graduate Student Conference, May 21, 2008, UCI Institute for Math. Behavioral Sci.

1009. Career night panel member at the UCI Alpha Phi (Sorority) about MBA admissions and MBA careers, UC Irvine, May 12th, 2008.

1008. Panel member for event sponsored by Social Enterprise Institute (www.SE-Institute.org), co-sponsored with Net Impact and Pepperdine alumni, "Profits with Principles- Closing the Responsibility Gap," Newport Beach, April 22, 2008.

Posters presented at Behavioral Decision Research in Management conference, April 25-26, 2008, La Jolla (UC San Diego):

1007. Tianjun Feng (presenter) and L. Robin Keller, "Analyzing Decisions Involving Product Quality Risks in China and the United States: An Example of Pet Food and Lead-tainted Toys."

1006. Jay Simon and L. Robin Keller (presenter), on "Multiple Attribute Utility in Medical Decision Making."

> In medical decision problems, patients are usually concerned with multiple attributes. These decisions are rather unique, because the outcomes are defined over a variable length of time, which is itself one of the attributes being considered. The goal of this work is to develop and analyze a general structure for utility functions to be applied in these situations. One useful concept that has been widely discussed in the literature is quality-adjusted life years (QALYs). This work extends the QALY concept by incorporating the possible occurrence of various conditions as probability curves over time.

1005. L. Robin Keller, "How to Make Smart Choices: Operations and Decision Technologies," Merage School, UC Irvine, Brown Bag Seminar, February 14, 2008.

> Participation in Symposium on "Focus the Nation at UC Irvine: Sustainability and Climate Change Solutions," Jan. 30-31, 2008. Focus the Nation events were held at over 1,400 campuses nationwide to address global climate change, discuss sustainable solutions, and take action to implement collaborative approaches to this intergenerational crisis. Two posters in Sustainability Showcase:

> 1004. Poster presenter: Tianjun Feng, collaborating with L. Robin Keller, Craig Kirkwood, Nancy S. Jones, Jay Simon, and Lowell Kessel, "A Multiple-objective, Multiple-stakeholder Decision Analysis Approach for Water Resources Planning"

> 1003. Poster presenter: Jay Simon, collaborating with L. Robin Keller, Craig Kirkwood, and Tianjun Feng, "Preference Functions for Environmental Decisions with Spatially-Varying Attributes"

Posters presented at the Society for Judgment/Decision Making conference, Long Beach, November 2007:

1002. L. Robin Keller (presenter), Craig Kirkwood, Arizona State Univ., and Jay Simon, "Modeling Decision Situations with Spatially-Varying Attributes"

1001. Tianjun Feng (submitter) and L. Robin Keller (presenter), "Modeling the Effects of Reference Point Dependence and Loss Aversion on Supplier Selection"

1000. Dipayan Biswas (UCI alumnus at Bentley College), L. Robin Keller, Bidisha Burman (Appalachian State)**,** "Making Probability Judgments of Future Product Failures: Packing versus Unpacking the Problem," 2007 Association for Consumer Research Conference, accepted on 7-27-07 for a) presentation by Biswas in competitive paper session at Oct. 25-28, 2007 Memphis conference and b) extended abstract for publication in conference proceedings. ACR: http://www.acrweb.org/acr/assets/program.pdf.

L. Robin Keller, "Panel Comments from Editor-in-Chief of *Decision Analysis*," 2007 Annual Conference, INFORMS, Seattle, in Meet the Editors session, Nov. 2007.

L. Robin Keller (presenter) and Craig Kirkwood, Arizona State Univ., "Preference Functions for Decisions with Geographically-Varying Attributes," 1) Merage School at UCI Brown Bag presentation, April 19, 2007, 2) INFORMS International Conference, Puerto Rico, July 2007, Invited presentation in session organized by Keller.

L. Robin Keller, "How to Make Smart Choices," UCI Mesa Court Community Center, February 1, 2007, to freshmen living in two UCI Mesa Court dorms: Puente (the Leadership Hall) and the Ciudad Freshman Residence Hall.

Craig Kirkwood, Arizona State University (presenter) and L. Robin Keller, "Geographically-Oriented Preference Functions," INFORMS conference, Pittsburgh, November 2006. Invited presentation in session organized by Keller.

Tianjun Feng (presenter), L. Robin Keller, UC Irvine, Lowell Kessel, Craig Kirkwood, Nancy Jones, Jay Simon, "A Multiple-objective, Multiple-stakeholder Decision Analysis Approach for Water Resources Planning," INFORMS International Meeting, Hong Kong, June 2006. Invited presentation in session organized by Keller.

L. Robin Keller, Dipayan Biswas (Bentley College), Tianjun Feng , Xiaona Zheng   (Peking University), "Using a Time-Weighted Approach to Assess Multiple Attribute Utility," presented as a poster at the Behavioral Decision Research in Management Conference, June 2006, Santa Monica.

Tianjun Feng, L. Robin Keller, and Xiaona Zheng, "Home Depot in San Juan Capistrano: A Multi-Objective Multi-Stakeholder Decision Case," presented as a poster at Teaching pre-conference of the Behavioral Decision Research in Management Conference, June 2006, Santa Monica.

L. Robin Keller, Dinner speaker on "How to Make Smart Choices: Value-Focused Decision Making," Life Office Management Association, Orange County, June 7, 2006.

L. Robin Keller, "Medical Decision Analysis," Grand Rounds presentation for the Department of Psychiatry & Human Behavior, UCI Hospital, May 2, 2006.

Craig Kirkwood, ASU (presenter), L. Robin Keller, Nancy Jones, ASU, "Assessing Stakeholder Decision Concerns and Tradeoffs for the DCDC Water Model," With thanks to Bill Edwards, ASU Decision Center for a Desert City (DCDC) and UC Irvine students Tianjun "TJ" Feng, Jay Simon, and Lowell Kessel, Presentation to ASU DCDC External Advisory Committee, April 14, 2006.

Craig W. Kirkwood, L. Robin Keller (presenter), and Nancy Jones, "Water Resource Management Priorities for Central Arizona Water Experts" March 1, 2006, Arizona State University Decision Center for a Desert City Water Briefing.

Craig Kirkwood, L. Robin Keller, and Nancy Jones, "Decision Research in Water Resources Management: A Multiple-Objective, Multiple-Stakeholder Analysis," poster presentation at Central Arizona – Phoenix Long-Term Ecological Research (CAP LTER), Eighth Annual Poster Symposium, January 19, 2006, Arizona State University.

Tianjun Feng, L. Robin Keller (presenter), and Xiaona Zheng, "Home Depot in San Juan Capistrano: Multi-objective Multi-stakeholder Decision Case," Fall 2005, Presentation at INFORMS conference Case Competition sponsored by INFORMS Forum on Education, recipient of Finalist award.

L. Robin Keller, Craig Kirkwood (presenter), W.P Carey School of Business, ASU, Nancy Jones, Decision Center for a Desert City, ASU, "Decision Research in Water Resources Management: A Multiple-objective, Multiple-stakeholder Analysis," invited presentation for New Orleans (moved to San Francisco) INFORMS conference, November 2005.

Tianjun Feng (presenter) and L. Robin Keller, "Modeling the Effects of Reference Point Dependence on Supplier Selection," invited presentation at IFORS conference, July 2005, Honolulu.

L. Robin Keller, "How Decision Analysis Approaches Can Complement Risk Assessments to Improve Environmental Decision Making," Society for Risk Analysis Annual Meeting, December 2004, Palm Springs.

L. Robin Keller, Tianjun "TJ" Feng and Qiang "David" Zeng, "Multiple Objective Decision Analysis for Potassium Iodide Distribution in Nuclear Incidents," Denver, Oct. 2004, INFORMS Conference.

Tianjun Feng and L. Robin Keller, "Modeling the Effects of Reference Point Dependence on Supplier Selection," Denver, Oct. 2004, INFORMS Conference, presented by Feng.

S. David Brazer and L. Robin Keller, "The Multiobjective Multistakeholder Decision Making Model–Revealing Decision Making as it Happens," July 7, 2004, UCSB Center for Educational Leadership Summer Forum.

L. Robin Keller, Dipayan Biswas, Tianjun Feng and Xiaona Zheng, UCI GSM Doctoral Student-Faculty Brown Bag Lunch Series, (February 26, 2004) "The Times of Your Life: Using a Time-weighted Approach To Assess Multiple-Objective Value."

L. Robin Keller co-chaired a session on "Advances in Decision Analysis," October 2003, conference of the Institute for Operations Research and the Management Sciences (INFORMS).

Dipayan Biswas, L. Robin Keller, Xiaona Zheng, and Tianjun Feng. "Time-Weighted Utility for Multiobjective Multistakeholder Perspectives for Environmental Problems." (Subtitle: "How Much Do I Like a Day at the Beach: To Go in for a Dip or Not? The Time-Weighted Utility of a Day at the Beach"), Oct. 2003, INFORMS, Atlanta.

Dipayan Biswas, L. Robin Keller, and Xiaona Zheng, "To Go in for a Dip or Not? The Time-Weighted Utility of a Day at the Beach," presented at Bayesian Research Conference, San Fernando Valley, February 2003.

L. Robin Keller, "Multiple Stakeholders' Perspectives on Huntington Beach Ocean Pollution," presented to Men's Forum, Regents Point (Retirement Home), Irvine, January 23, 2003.

Jeffery L. Guyse and L. Robin Keller, "Valuing Lives Lost Over Time," presented at INFORMS conference, San Jose, Nov. 2002.

Dipayan Biswas and L. Robin Keller, "To Go in for a Dip or Not? Perceived Probabilities of Swimming Despite Beach Risk Warning Signs: Impact of Peer Presence and Frequency of Beach Visits," Presented at the Behavioral Decision Research in Management Conference, University of Chicago, Spring 2002.

L. Robin Keller, Jeffery L. Guyse and Dipayan Biswas, "Multiple Stakeholders' Perspectives on Management of Water Systems and Pollution," presented at 1) the Miami INFORMS conference, November 2001, 2) the Society for Risk Analysis conference, Seattle, December 2001, and 3) International Federation of Operations Research Societies (IFORS) Conference, Edinburgh, July 2002.

L. Robin Keller, "Preferences for Environmental Outcomes: Consistent with Discounting Models or Not?" presented at Stanford University, Decision Analysis Colloquium, Decision and Ethics Center, Department of Management Science and Engineering; April 12, 2001.

L. Robin Keller, "Preferences for Environmental Outcomes: Consistent with Discounting Models or Not?" presented at the EPA conference on "Economic Valuation of Mortality Risk Reduction: Assessing the State of the Art for Policy Applications," Silver Spring, MD, Nov. 6-7, 2001. Proceedings (written by EPA staff) are posted on the National Center for Environmental Economics web site. Follow the link to download the proceedings from Session IV, Risk Characteristics. http://yosemite.epa.gov/ee/epa/eerm.nsf/vwRepNumLookup/EE-0464?OpenDocument

Jeffery L. Guyse and L. Robin Keller, "Valuing Lives Lost Over Time," presented at INFORMS International conference, Maui, June 2001, and Society for Medical Decision Making, San Diego, October 2001.

L. Robin Keller, Rakesh K. Sarin and Jay Sounderpandian, "Shift in Choices and Willingness to Pay when Individuals or Pairs Face Ambiguous and Less Ambiguous Risky Choices," presented at the Research Colloquium in Operations and Decision Technologies, Graduate School of Management, UCI, May 5, 2000; Salt Lake City INFORMS Conference, May 2000, in session co-organized by Keller and Sounderpandian; Behavioral Decision Research in Management conference, May 2000, Tucson; Foundations of Utility and Risk conference X, Turin, Italy, May 2001, presented by Sounderpandian.

L. Robin Keller, "Moving Decision Analysis towards a Naturalistic Modeling Methodology for Multi-Objective Multi-Stakeholder Decision Cases," presented in Naturalistic Decision Making session, Salt Lake City INFORMS conference, May 2000.

Jeffery L. Guyse, L. Robin Keller, and Thomas Eppel, "Assessing Preferences for Environmental Decisions with Long-Term Consequences," Society for Risk Analysis, Scottsdale, December 1998; "Preferences for Sequences of Long-Term Environmental Consequences," Subjective Probability, Utility and Decision Making Conference, Mannheim, Germany, August 1999, Los Angeles Judgment/Decision Making meeting in November 1999. Presented by Guyse at INFORMS Cincinnati, May 1999; Current Research in OR and OM Conference at UCLA, June 1999; INFORMS Philadelphia in November 1999 in session on Decision Analysis involving Outcomes over Time and Environmental Risks organized by Keller; and Atlanta Society for Risk Analysis, December 1999.

Monika I. Winn (presenter) and L. Robin Keller, "Harnessing Complexity, Idiosyncrasy and Time: A Modeling Methodology for Corporate Multi-Stakeholder Decisions," presented at International Association for Business and Society Conference, Paris, France, June 1999.

Joanna L. Ho, L. Robin Keller and Pam Keltyka, "Managers' Variance Investigation Decisions: An Experimental Examination of Probabilistic and Outcome Ambiguity," presented by Ho at American Accounting Association

annual meeting, 1999 and (combined with paper on managers' investment choices) at 1998 Accounting Behavior and Organizations Research Conference.

L. Robin Keller and Craig Kirkwood, Co-chaired panel on founding a decision analysis journal, INFORMS Seattle, October 1998. Also served on "Panel on the Future of Decision Analysis Society Awards".

Young-Hee Cho, L. Robin Keller, and M. Lynne Cooper, "Predicting Health Decisions: The Application of Subjective Expected Utility and Remaining Challenges," at INFORMS, Montreal, April 1998, and "Applying Decision-Making Approaches to Health Issues: Progress and Remaining Challenges," at Mathematical Psychology Conference, August 1997, presented by Cho.

Wen-Qiang Bian and L. Robin Keller, "What's Fair and What's Best: Chinese and North Americans in Decisions Affecting Health and Safety Risks and Decisions in a Market Economy," presented by Bian at Dallas INFORMS National Meeting, October 1997, and "Reductionist Thinking in Chinese Decision Making and a Framework to Add Culture into Decision Making Models: Interviews with Chinese Executives and a Case Study of a Service Quality Program," and "Chinese and Americans Agree on What's Fair, but Disagree on What's Best in Societal Decisions Affecting Health and Safety Risks," presented at the Seventh Behavioral Decision Research in Management Conference, Miami, June 1998.

L. Robin Keller and Craig W. Kirkwood, "The Role of Decision Analysis in Forming INFORMS," presented at International Workshop on Decision Analysis Applications, sponsored by the Instituto de España, Madrid, Spain, July 1997, as one of 12 special invited international speakers.

Wen-Qiang Bian and L. Robin Keller, "Decisions and Fairness Judgments on Risks and Prices by North Americans versus Chinese," presented at EURO XV/INFORMS XXXIV Joint International Conference, Barcelona, Spain, July 1997, and at 8th International Conference on the Foundations and Applications of Utility, Risk and Decision Theory, Mons, Belgium, July 1997.

Wen-Qiang Bian and L. Robin Keller, "Chinese and American Fairness Perceptions and Decisions in Health and Safety Related Situations, " presented by Bian at the 5th Southern California OM/OR Day, Irvine, California, June 1997.

Wen-Qiang Bian and L. Robin Keller, "Chinese and Americans Agree on What's Fair, but Disagree on What's Best in Societal Decisions Affecting Health and Safety Risks," by Bian at San Diego INFORMS Conference, May 1997, by Keller at UCI GSM Brown Bag Seminar, May 1997.

L. Robin Keller, Panel Session Moderator, National Science Foundation Research Opportunities, at San Diego INFORMS Conference, May 1997.

L. Robin Keller and Monika I. Winn, "The Evolution of a Multiple Stakeholder Decision: StarKist's Environmentally Motivated Strategic Decision," presented at the Southern California Conference of Operations Research/Operations Management at UCLA, May 1996.

L. Robin Keller, "Applications of Multi-attribute Utility for Decision Analysis," presented at the Ninth Annual Workshop of the Southern California Society for Risk Analysis on "Current Issues in Risk Management and Human Health," USC, May 1996.

L. Robin Keller, "Decision Sciences Directions," presented to the Department of Decision Sciences, Georgia State University, February 1996.

L. Robin Keller, "Improving Problem Structuring," INFORMS Meeting, New Orleans, Fall 1995; "Toward a Theory of Problem Structuring," ORSA/TIMS Meeting, Phoenix, Fall 1993.

L. Robin Keller and Monika Winn, "Stakeholder Value Tree Analysis in the Case of StarKist's Environmentally Motivated Corporate Decision: Retrospective Analysis and Strategic Implications," Society for Risk Analysis, San Diego, December 1992; TIMS/ORSA Meeting, Boston, Spring 1994; Behavioral Decision Research in Management, MIT, May 1994 (Winn presented); EURO Conference, Glasgow, Scotland, July 1994; Decision Research Colloquium, University of Texas, Austin, March 1995.

L. Robin Keller and Rakesh K. Sarin, "Fair Processes for Societal Decisions Involving Distributional Inequalities," University of Oregon, Feb. 1994; UCI Research Symposium in Operations Research and Operations Management, GSM, May 1994.

L. Robin Keller and Rakesh K. Sarin, "Fair Processes for Siting Hazardous Facilities," presented at Society for Risk Analysis, San Diego, December 1992; Bayesian Research Conference, San Fernando Valley, February 1993; UCI Decision Sciences Colloquium, February 1993; (with different title) TIMS/ORSA Joint National Meeting, Chicago, May 1993.

L. Robin Keller, "How Congress Allocates Research Funds to the National Science Foundation," UCI University Club Forum, January 1993.

Stuart P. Eriksen and L. Robin Keller, "Assessing the Relative Risk Attitude of Physician Decision Makers," Society for Risk Analysis, San Diego, December 1992; TIMS/ORSA Joint National Meeting, Chicago, May 1993.

L. Robin Keller, "Research Support," ORSA Doctoral Colloquium, Stanford University, October 1992.

Joanna L. Ho and L. Robin Keller, "The Effect of Inference Order on Diagnostic Probability Judgments," Behavioral Decision Research in Management Conference, UC Berkeley, May 1992.

L. Robin Keller, "Decision Problem Structuring," presented at Decision Systems Seminar, University of Southern California, December 1991.

Ivy Broder and L. Robin Keller, "Equity Considerations in Managing Risks in Antarctica," presented at UCI conference on "Preference, Risk, and Choice," June 1991; Joint International meeting of the Institute of Management Sciences and the Brazilian Society of Operations Research, Rio de Janeiro, July 1991.

L. Robin Keller, "Descriptive Validity of Assessed Utility Functions and Choice-Based Assessment," talk based on joint work with Richard Daniels, Wharton School, University of Pennsylvania, Decision Sciences Seminar, March 1990; and Carnegie-Mellon University, School of Urban and Public Affairs Seminar, September 1990.

Richard Daniels and L. Robin Keller, "Choice-Based Assessment of Utility Functions," presented at University of Virginia, Darden School, January 1991; Harvard University Decision Sciences Colloquium, December 1990; Renssalaer Polytechnic Institute, Decision Sciences and Engineering Systems, November 1990; FUR V Conference, Duke University, June 1990; ORSA/TIMS Joint National Meeting, New York, Oct. 1989; Bayesian Research Conference, February 1990.

L. Robin Keller and Uzi Segal, "An Experimental Study of Certainty Equivalents Assessed via the Becker-de Groot-Marschak Mechanism," presented at the TIMS/ORSA Joint National Meeting, Las Vegas, May 1990.

L. Robin Keller talks to Social-Personality Psychology Club, University of California, Santa Barbara, June 1989; and the class on "How Society Deals with Technological Hazards" at University of Maryland (Prof. V. Bier), February 1990.

L. Robin Keller, "The Role of Generalized Utility Theories in Descriptive, Prescriptive, and Normative Decision Analysis," invited presentation at the "Utility: Theories, Measurements and Applications" Conference, June 1989, Santa Cruz, CA.

Lauraine G. Chestnut, L. Robin Keller, and William E. Lambert, "Modeling Heart Patients' Preferences over Health States," presented at the ORSA/TIMS Joint National Meeting, Denver, CO, October 1988.

Richard Daniels and L. Robin Keller, "An Experimental Evaluation of the Descriptive Validity of Lottery Dependent Utility Theory," presented at the TIMS/ORSA Joint National Meeting, Washington, D.C., April 25-27, 1988; University of British Columbia, Nov. 1988; Purdue University, Jan. 1989.

L. Robin Keller, "Artful Science or Scientific Art? Towards a Prescriptive Paradigm for Decision Problem Structuring," invited presentation at the ORSA/TIMS Joint National Meeting, St. Louis, October 25-28, 1987. Also presented at the 26th Annual Bayesian Research Conference, Los Angeles, February 1988.

L. Robin Keller and Rakesh K. Sarin, "Equity in Social Risk: Some Empirical Observations," presented at the University of Wisconsin, Department of Industrial Engineering, March 11, 1987; Annual Meeting of Public Choice Society in conjunction with the Economic Science Association, Tucson, AZ, March 1987; Conference on the Health and Behavioral Impacts of Environmental Hazards, UCI, May 1987; Behavioral Decision Research in Management Conference, University of Texas, Austin, June 1987.

L. Robin Keller and William E. Lambert, "Multiattribute Utility Modeling of Cardiac Health Effects from Carbon Monoxide Exposure," Center for Health Policy Research and Education, Duke University, March 19, 1987.

L. Robin Keller and Rakesh K. Sarin, "I'm Fairly Fair About Fairness; or Equity in Social Risk: Some Empirical Observations," 25th Annual Bayesian Research Conference, Los Angeles, CA, February 1987.

L. Robin Keller, "Towards a Prescriptive Paradigm for Problem Structuring," Decision Analysis Workshop, The Fuqua School of Business, Duke University, Jan. 29, 1987.

L. Robin Keller and Rakesh K. Sarin, "Equity in Social Risk: Some Empirical Observations," invited presentation at the Operations Research Society of America - Institute of Management Sciences Joint National Meeting, Miami, Florida, October 27-29, 1986. Also presented to local Orange County Chapter of ORSA/TIMS, September 10, 1986.

L. Robin Keller and William E. Lambert, "Multiattribute Utility Modeling of Cardiac Health Effects," invited presentation at the VIIth International Conference on Multiple Criteria Decision Making," August 18-22, 1986, Kyoto, Japan.

L. Robin Keller, "It's Risky to Speak About Perceived Risk," presented at the 24th Annual Bayesian Research Conference, Los Angeles, California, February 1986.

L. Robin Keller, Rakesh K. Sarin, Martin Weber, "Evaluation of Some Properties of Perceived Risk Measures," invited presentation at the Institute of Management Sciences - Operations Research Society of America Joint National Meeting, Boston, Massachusetts, April 29 - May 1, 1985.

L. Robin Keller, Decision Problem Representation," invited presentation at the Lehrstuhl fur Unternehmensforschung (Operations Research), Rheinisch-Westfalische-Technische-Hochschule, Aachen, Federal Republic of Germany, June 1984.

L. Robin Keller, "Trends in Utility Conformance with Variations in Decision Problem Parameters," presented at the Twenty-sixth International Conference of the Institute of Management Sciences, Copenhagen, Denmark, June 1984.

L. Robin Keller and Peter H. Farquhar, "Decisions Under Certainty: Assessment Methods for Value Functions," invited presentation at the Institute of Management Sciences-Operations Research Society of America Joint National Meeting, San Francisco, California, May 1984.

L. Robin Keller, "I Differ with Gamblers About Comparing Differences: Measurable Value Function Assessment," presented at the 22nd Annual Bayesian Research Conference, Los Angeles, California, February 1984.

L. Robin Keller, "Measurable Value Function Assessment," presented at the Operations Research Society of America/Institute of Management Sciences Joint National Meeting, Orlando, Florida, November 1983.

L. Robin Keller, "The Effects of Decision Problem Representation on Utility Conformance," presented at the Operations Research Society of America/Institute of Management Sciences Joint National Meeting, San Diego, California, October 1982.

L. Robin Keller, "Inducing Rational Decision-Making Behavior," presented at the Operations Research Society of America/The Institute of Management Sciences Joint National Meeting, Houston, Texas, October 1981.

L. Robin Keller, "An Empirical Investigation of Relative Risk Aversion," presented at the Institute of Management Sciences/Operations Research Society of America Joint National Meeting, Washington, D.C., May 1980.

AWARDS, GRANTS AND HONORS

Fellow of Society for Risk Analysis, special recognition for substantial achievement in science or public policy relating to risk analysis and substantial service to the Society. Fellows include up to one percent of the Society members per year. Conferred at the Annual Meeting in Washington DC in Dec. 2023.

Winner of the 2020 Clemen-Kleinmuntz Decision Analysis Best Paper Award, formerly called the Decision Analysis Special Recognition Award. This award, with a $2000 prize, is given annually for the paper most worthy of recognition published in the Decision Analysis journal (published by INFORMS) for that year. For the paper: Jeffery L. Guyse (Merage PhD alumnus, Professor, Technology and Operations Management, College of Business Administration, California State Polytechnic University, Pomona), L. Robin Keller, Candice H. Huynh (Merage PhD alumna, Assistant Prof., Cal Poly, Pomona), "Valuing Sequences of Lives Lost or Saved Over Time: Preference for Uniform Sequences", Decision Analysis, 17(1):24-38, March 2020

Finalist for the 2020 Decision Analysis Special Recognition Award. For the paper: Jay Simon (Merage PhD alumnus, Associate Professor, American University), Donald Saari (Professor Emeritus, UCI Social Science), L. Robin Keller, "Interdependent Altruistic Preference Models", Decision Analysis, 17(3), Sept. 2020, pp. 189-207.

L. Robin Keller one of 10 women interviewed and spotlighted for longtime contributions to operations research: Kara Tucker, "Powerful, pragmatic pioneers: Personal profiles of 10 pillars of the O.R. profession who blazed trails, broke barriers and busted down doors for others to follow (plus one 'Rising Star')", https://pubsonline.informs.org/do/10.1287/orms.2019.01.14/full/, OR/MS Today, 46(1) February 2019. Magazine editorial explains selection process; more than 30 candidates were first considered and 10 were selected (Peter Horner, "Pioneer Women of O.R.", https://pubsonline.informs.org/do/10.1287/orms.2019.01.10/full/).
(also listed above under media interviews)

Ramsey Medal, for distinguished contributions to decision analysis, highest award of the Decision Analysis Society of INFORMS, 2015, https://www.informs.org/Recognizing-Excellence/Award-Recipients/L.-Robin-Keller

Best Reviewer for *Risk Analysis*, 2010

UCI Merage School of Business **Faculty Service Award**, June 2008

Recognized in Who's Who in Science and Engineering

Kimball Medal Recipient for 2006, presented at Pittsburgh INFORMS conference, for distinguished service contributions to Operations Research and the Management Sciences. https://www.informs.org/Recognize-Excellence/INFORMS-Prizes-Awards/George-E.-Kimball-Medal https://www.informs.org/Recognize-Excellence/Award-Recipients/L.-Robin-Keller

Tianjun Feng, L. Robin Keller, and Xiaona Zheng, "Home Depot in San Juan Capistrano: Multi-objective Multi-stakeholder Decision Case," Fall 2005, Presentation at INFORMS conference Case Competition sponsored by INFORMS Forum on Education, recipient of Finalist award.

INFORMS Fellow, awarded Oct. 25, 2004, for contributions to Operations Research and the Management Sciences, https://www.informs.org/Recognize-Excellence/Fellows

Winner of the "**Breaking the Frame Award**" at Western Academy of Management meeting in March 2002 by the Journal of Management Inquiry for best paper of 2001, co-authored with GSM doctoral alumna Prof. Monika I. Winn of University of Victoria.

UCI Graduate School of Management **Faculty Service Award**, May 1993.

UCI Graduate School of Management **Excellence in Teaching** Award, to the best teacher of the year, upon vote by students, 1982-83, 1985-86.

UCLA Graduate School of Management Outstanding Graduate, 1982-83. Recognition of academic distinction upon vote by faculty and sponsored by UCLA Alumni Association.

UCLA Academic Senate's Special Commendation as a Teaching Assistant, 1975-76.

Member of Beta Gamma Sigma, the national business honorary society.

Listed in Who's Who in the West, Who's Who of Emerging Leaders in America, Who's Who in American Education, Who's Who in California, International Directory of Distinguished Leadership Dictionary of International Biography, 2000 Notable American Women, and International Who's Who of Professional and Business Women.

Awards to students based on research collaborations:

Dispayan Biswas, dissertation proposal awards:
> Winner, Association for Consumer Research–Sheth Foundation dissertation Proposal Award, $2,000 check and plaque awarded at October 2002 conference
> Runner-up, Academy of Marketing Sciences Mary Kay Dissertation competition, presented at May 2003 conference.

Xiaona Zheng, awarded a Decision Analysis Society student travel grant ($200) on 8/13/03 to attend October 2003 INFORMS Conference and present EPA funded work on "Time Weighted Utility for Multiobjective Multistakeholder Perspectives for Environmental Problems," with L. Robin Keller, Dipayan Biswas and Tianjun Feng.

Jay Simon, Sanli Pastore & Hill Excellence in Economics Writing Award. UCI Institute for Mathematical Behavioral Sciences, Third Place, based on his paper on prostate cancer decision making in <u>Interfaces</u>. June 2009 press coverage of his paper:
> http://www.sciencedaily.com/releases/2009/06/090615144429.htm

James M. Leonhardt, Finalist in 2013 Decision Analysis Society of INFORMS Student Paper competition for his paper with L. Robin Keller and Cornelia Pechmann. October 2011. "Avoiding the Risk of Responsibility by Seeking Uncertainty: Responsibility Aversion and Preference for Indirect Agency When Choosing for Others," in <u>Journal of Consumer Psychology</u>, http://ssrn.com/abstract=2015956. (He was a Marketing doctoral student at the time the paper was published, and is now an Assistant Professor, New Mexico State.)

Jeffery L. Guyse, Decision Analysis Society of INFORMS, finalist in 1999 student paper competition (for papers with student as lead author) for Guyse, Keller, and Eppel's "Valuing Environmental Outcomes: Preferences for Constant or Improving Sequences."

<u>Grants and Fellowships</u>

> USC CREATE Center (subcontract from Department of Homeland Security funds), "The Effects of Time on Anticipated Consequences of Risks," Keller (PI), Yitong Wang (student investigator), March 2011-Sept. 2011, $19,982; Oct. 2011-Sept. 2012, $15,000 (Candice Huynh and Yuhong He, student investigators)
>
> The John S. and Marilyn Long Institute for U.S.-China Business and Law, $5000 grant on 7-2-2011 to Tianjun Feng (Fudan University), L. Robin Keller, and Yitong Wang (Tsinghua University), "A Cross-national Study of Food Safety Management: Comparisons between the United States and China"
>
> National Science Foundation Dissertation Grant, 2010-2011, "Doctoral Dissertation Research in DRMS: Decision Research on Time, Risk, and Ambiguity." Keller (PI), Yitong Wang (Co-PI). $6,270
>
> UCI Environment Institute Grant, Winter 2009-, Principal Investigators: Bill Tomlinson (Informatics), Brett Sanders (Civil & Environmental Engineering), and Robin Keller (Merage School), "*Using IT to Compress Perceived Time and Space in How People Think About Global Change: A Step Towards Behavioral Change.*" $12,051 to Keller and RAs, total $48,000= $38,000 from Institute + $10,000 from UCI UWRC
>> Many people find it difficult to engage with environmental issues, in part because global change occurs on scales of time and space that are relatively large compared to the usual scope of human decision making. People respond enthusiastically to fast-acting disasters such as fires and earthquakes, but less so to issues that occur more gradually over many years, even when the consequences are far greater. To date, there has been little research on how to connect long-term global environmental change to human scales of time and space in a systematic way, thereby enabling behavioral change. Our efforts will focus on the science and public perception of sea level rise.
>
> National Science Foundation, L R. Keller (PI) and Jay Simon (co-PI), to University of California, Irvine, Proposal ID SES-0823458, "Doctoral Dissertation Research in DRMS: Cross-Disciplinary Analyses Using Multi-Attribute Utility Theory," submitted Feb. 7, 2008, notified of recommended funding 5-28-2008, $5,200. To support Jay Simon's dissertation expenses. (Start date 8-1-08, 12 months.) The e-Synopsis for the project: http://apps.research.uci.edu/awardsynop/. At the prompts, enter the following information: Award Number: SES-0823458 , Synopsis Cycle: 1.
>
> National Science Foundation, Research Center to Arizona State University, "Decision Center for a Desert City" for a 5 year Center grant, $6.9 million, 2004-2009, subsequently extended for another 5 year

term, Keller served on decision research team with Craig Kirkwood of ASU, Supported former doctoral students Tianjun Feng (non-salary research) and Jay Simon (RA support) and partial faculty summer salary in summer 2009

U.S. Environmental Protection Agency, "Identification and Control of Non-Point Sources of Microbial Pollution in a Coastal Wetland," Co-Principal Investigator with PI Brett Sanders, UCI Dept. of Civil and Environmental Research, grant R-82801101-0, 8/1/00-7/31/04, $895,234, with $145,020, under Keller's supervision on stakeholders' perspectives (Supporting Dipayan Biswas, Xiaona Zheng, & Tianjun Feng)

U.S. Environmental Protection Agency, "Assessing Preferences for Environmental Decisions with Long-Term Consequences," Principal Investigator L. Robin Keller, $181,851, 8/1/98 - 7/31/2001, under EPA/NSF STAR Partnership for Environmental Research EPA grant R826611-01-0, and a subcontract to Decision Insights, Inc., Dr. Thomas Eppel (Supported Jeff Guyse's doctoral dissertation work)

National Science Foundation Grant #SBR-9605826, "The Chinese vs. North American Perceptions and Decision Making Concerning Fairness and a Framework to Incorporate Culture into Decision Making," Principal Investigator L. Robin Keller and Co-Principal Investigator Wen-Qiang Bian, $9,030, 1997-98 (Supported Bian's doctoral dissertation work)

National Science Foundation Grant, "Foundations of Risk Analysis: Theoretical and Empirical Investigation," Faculty Associate (with Co-Principal Investigators Rakesh K. Sarin and Robert L. Winkler), 1988-90, $119,000

U.S. Environmental Protection Agency, Office of Policy Analysis grant, "Economic Analysis of Risk to Heart Disease Patients from Exposure to Carbon Monoxide," Co-Principal Investigator, 1985 (with Steven D. Colome)

National Science Foundation Grant, "Foundations of Risk Analysis," Senior Associate, 1984-86 (with Rakesh Sarin), $82,000

UCI Committee on Research Faculty Research Grant:
        1986-87 - "Foundations for a Normative Theory of Decision Problem Structuring"
    FHP Research awards:
        1986-87 - "Risk Analysis and Equity"
        1986-87 - "The Management of Emergency Medical Services," with Bruce Lamar

UCI Faculty Fellowships administered through GSM:
    1983-84 - "Modeling Preferences: Theoretical and Empirical Investigation"
    1984-85 - "Foundations of Risk Analysis"
    1985-86 - "Biases in the Modeling of Preferences"
    1986-87 - "Risk Analysis and Equity"

UCI Instructional Improvement Grant, 1983-84, with Carlton Scott

GSM Instructional Improvement Grant, 1986, with Bruce Lamar

University of California Intercampus Activities Award, "Determinants of Risk Perception," 1985-86

UCI Career Development Awards:
    "Foundations for a Normative Theory of Decision Problem Structuring," W 1987, sabbatical supplement
    "Modeling of Perceived Risk," June 1984, research travel
    "Modeling Preferences: Theoretical and Empirical Investigations," Spring 1984, course release

PROFESSIONAL SOCIETIES

Decision Analysis Society of INFORMS
Advances in Decision Analysis conference at Darden in Northern Virginia, June 22-24, 2022, sponsored by the Decision Analysis Society of INFORMS
    Scientific committee member
Advances in Decision Analysis conference at Bocconi University, Milan, Italy, June 19-21, 2019, sponsored by the Decision Analysis Society of INFORMS
    Scientific committee member
    Chair, Ramsey Medalist Panel
2017 Decision Analysis journal Publications Award Committee Member
2017, 2018, 2019, 2021, 2022, 2023, 2024 Ramsey Medal Selection Committee Member

Advances in Decision Analysis conference at Georgetown, June 2014,
sponsored by the Decision Analysis Society of INFORMS
Steering committee member (high level advice)
Appointed session chair for Research Incubator session
DA 50-Year Celebration Program Committee- 2014
Past-Chair (renamed Past-President), 2002-04
Chair, Spring 2000-2002
Chair-Elect, Spring 1998-2000
Publications Award Competition in 2012, for a 2010 paper, member of committee
Chair, Practice Award Competition, 2002 and 2003
Session chair activity is listed above under conference talks.

Institute for Operations Research and the Management Sciences (INFORMS)
INFORMS Meeting, Anaheim, Fall 2021, Mentored an unrepresented student from Puerto Rico
President, 2015; President-Elect, 2014; Past-President, 2016 (Executive Board Member)
https://www.informs.org/About-INFORMS/History-and-Traditions/Miser-Harris-Presidential-Portrait-Gallery
Board Liaison to INFORMS Roundtable (heads of OR groups in companies)- 2014
Board Liaison to INFORMS History and Traditions Committee, 2016 (as Past President)
INFORMS Strategic Planning Committee, Co-chair, 2016
President's Award Committee Chair, 2015; Member 2016 and 2017.
Nominations Committee Member for 2015 election- 2014, Chair for 2017 election- 2016
Committee on the Board Member, 2016
Ad Hoc Committee on Diversity Member, 2016
Master INFORMS Judge for Posters (walk through posters with attendees & moderate discussion
with presenters, judge posters), INFORMS Annual Meeting, Nov. 2016
Conference Board of the Mathematical Sciences, Investments Committee Member,
www.cbmsweb.org (as INFORMS President, 2015)
Ad Hoc Board Committee on Open Access Chair, 2014
Kimball Medal Committee Member 2011 and 2012, Chair, 2013
Special Ad Hoc Committee on Publication Strategy Member, appointed 9-07
INFORMS Board of Directors: Founding Director-at-Large, '95, '96, Liaison for Education Cluster
Finance Committee Member, 1995
NSF Liaison Committee Member, 1995-98
The Institute of Management Sciences
Elected Vice President-Finance, Sept. 1993 - Dec. 1994, served simultaneously as chair of TIMS
Investment Committee
TIMS Nominations Committee, Spring 1993
Chair, Cost-Benefit Subcommittee to Evaluate TIMS/ORSA Merger, Fall 1993
Council Member, 1991-93
Chair, Editorial review committee for Organization Science, 1992
OR/MS Board Finance Committee member, 1992-94
Operations Research Society of America, Elected to Full Member, 1985
Nominations Committee Member, 1990
Employment Opportunities Chair, TIMS-ORSA Joint National Meeting, Los Angeles, April 1986
Orange County ORSA-TIMS Joint Chapter, Founder, Member through 1989
ORSA Special Interest Group on Decision Analysis
Elected Council Member, 1986-89
Student Paper Competition: Judge (1986), Chair (1987)

Society for Risk Analysis
Society for Judgment and Decision Making, Charter Member
European Association for Decision Making (prior member)
International Federation of Operations Research Societies (IFORS) member of Program Committee for
2002 Conference in Edinburgh; 2005 conference in Hawaii
Invited Nominator of Candidates for Bank of Sweden Prize in Economic Sciences in Memory of Alfred
Nobel, most recently 1/2024

Member in 6/2009 of the International Programme Committee of the International Conference on "Uncertainty and Robustness in Planning and Decision Making." INESC Coimbra, an R&D unit of the University of Coimbra, conference organized in the framework of the COST Action IC0602 on Algorithmic Decision Theory (www.algodec.org), held April 15-17, 2010.

Program committee, 13th International Conference (2018)/Workshop (2019) on Operations Research, Havana, https://rev-inv-ope.univ-paris1.fr/icor-2018-havana-cuba/, https://rev-inv-ope.univ-paris1.fr/iwor-2019-havana-cuba/ (I did not attend these years' conferences; the program committee shows my continuing support.)

First Annual ComplianceNet Conference, UCI Law School, June 1-2, 2018, session chair on "Good and Bad Apples in Compliance: An Ethics Approach"

EDITORIAL SERVICE

Editorial Appointments

Decision Analysis	Editor-in-Chief, Term 1:1/2007-12/2009
	Term 2 and final term: 1/2010-12/2012
	Founding Member of Editorial Board (2004-2022)
	Advisory Board (2023-on)
	Acting Editor-in-Chief and Acting Associate Editor for selected papers, 2013-on
Management Science Decision Analysis department	Departmental Editor, 4/1994-4/1998
	Associate Editor, 1989-March 1994
EURO Journal on Decision Processes	Founding Member, Editorial Board 2012-2023
Investigación Operacional (Cuban OR journal)	Editorial Board, 2017-
https://rev-inv-ope.pantheonsorbonne.fr/en https://rev-inv-ope.pantheonsorbonne.fr/journal#Board	
Management and Business Review (Winter 2021 vol 1 issue 1)	Advisor (2021-)
https://mbrjournal.com/winter-2021-reader/	
Journal of Risk and Uncertainty	Editorial board, 1995-February 2011
Journal of Behavioral Decision Making	Editorial board, Winter 1994-Fall 2010
Organizational Behavior and Human Decision Processes	Editorial board, Jan. 2000–June 30, 2004
Information and Decision Technologies (formerly Large Scale Systems), Associate Editor, 1989-93	

Reviewer Activity

In addition to journals above: Journal of Behavioral Decision Making, Operations Research, Risk Analysis, Theory and Decision, IEEE Trans. on Systems, Man, and Cybernetics, OMEGA, Medical Decision Making, Naval Logistics Research Quarterly, European Journal of Operations Research, Decision Sciences, Information Systems and Operational Research, Psychological Science, Journal of Mathematical Psychology, Environmental Management, American Economic Review, Geneva Risk and Insurance Review, Wiley Encyclopedia of OR/MS, Medical Education Online

National Academies/National Research Council
External Reviewer
(Summer 2011- "Improving Metrics for the Department of Defense Cooperative Threat Reduction Program")

National Science Foundation (U.S.A.)
Panelist: Decision, Risk, & Management Science Program Advisory Panel, Fall 2000-Spring 2002
        Integrative Graduate Education and Research Training Program
        Human Dimensions of Global Change Centers and Teams
        National Center for Environmental Decision Making
Reviewer: Decision, Risk, and Management Science Program
        Law and Social Sciences Program (Dissertation proposal- 2011)
        Economics Program, Geography and Regional Science Program
Research Grants Council (Hong Kong)
        Reviewer: Decision Analysis Proposals and Center Proposals
Decision Sciences Institute (formerly American Institute for Decision Sciences)
        National Meeting paper reviewer
American University (Washington, DC)
        Reviewer: Faculty Sabbatical Research Proposals

Spearheaded effort to found Decision Analysis journal.

Organized planning meeting in San Francisco, February 1999, and conference panel discussion.

Chair, <u>Decision Analysis</u> Journal Founding Editor Search Committee, Dec. 2000-April 2001.

TEACHING

Doctoral Student
Development

Amy Williams, ODT PhD student, co-chair with Prof. Shuya Yin, Summer 2021-on. Advancement to candidacy on Sept. 7, 2022, "Retail Returns and Environmental Consciousness: The Paradox of Intentions and Actions", Co-chairs L. Robin Keller and Shuya Yin, members Luyi Gui, John Turner, & Nícola Ulibarrí. Expected graduation 6-2024.

Qi Yan, ODT PhD student, "Essays on Impacts of Online Interactions on Customer Behavior in Live Streaming Sessions", advisor from Summer 2020-graduation in Fall 2023, chair of advancement committee, 8-24-21 (with S. Yin, C. Pechmann, C. del Campo, M. Choi on committee) and dissertation chair. Position at McKinsey, January 2024.

Alexander Robinson, ODT PhD student, advisor, Fall 2017-Summer 2020. Advancement committee member (John Turner, Chair, other members L. Gui, A. Regan, S. Yin), "Estimating Hotel Demand with Expectation Maximization", June 10, 2021, final defense member, "Demand Forecasting with Time-Varying Arrival Rates: Modeling and Evaluation with Hotel Data," on November 2, 2022, graduation Fall 2022. Position at CSX (railroad company), beginning Spring 2022.

Carrie Wang, O&M PhD student, advancement committee member, "Sea Turtles: The Return of Highly Skilled Professionals to China from Abroad", June 15, 2020. (Will also be on final defense committee.) Clinical Assistant Professor, ASU W. P. Carey School, Fall 2023.

Diana Xiuyao Yang, Economics PhD student, advancement committee member, "Adaptive Learning and Cryptocurrencies' Price Volatility", 8/20/2019.

Ali Hassanzadeh Kalshani, ODT PhD student, advancement committee member, "Analysis of Pricing Mechanisms in a Resource Exchange Economy", 6/5/19, final defense 7/6/2021 (I was not on final committee). Alliance Manchester Business School, UK, lecturer (US equivalent is assistant professor), August 2021.

Kyle Kole, Economics PhD student, advancement committee member, "Effects of Socializing on Efforts in Team Production", 2/12/2019.

Alexander Ruiz, O&M PhD student, advancement committee member, "Unpacking benevolent sexism through an investigation of the effects of helping behaviors", 8/20/18. (Final defense 4/22/19, Keller not on final committee)

Yiwei "Derek" Wang, ODT PhD Student, dissertation committee member, "Essays on Technology and Data Analytics in Operations Management", final defense May 24, 2021 (member with Chair Shuya Yin, other member is Lauren Lu at Dartmouth), advancement committee member, "Essays in Operations Management for Innovations", 6/13/18, graduation 6/2021.

Pele Schramm, Social Science PhD student, advancement committee member, "Examining Transitivity Violations in Probabilistic and Temporal Discounting", 6/5/18.

Alexander Bock, hosted visiting PhD student, October 2017, Information Systems, University of Duisburg-Essen, Germany.

Ali Esmaeeli, ODT PhD student, "Improving Efficacy of Support groups in Online Environments", advisor, June 2015-Summer 2020. Advancement to candidacy Sept. 1, 2017. Co-chair for dissertation with Connie Pechmann. Placed at Google, Irvine. Graduation Summer 2020 (final defense 7-22-20).

Vahid Nourbakhsh, ODT PhD student, advancement committee member, Sept. 2016, "A Global Optimization Algorithm for Routing Heterogeneous Jobs to Heterogeneous Servers." Final defense committee member, "Routing Dynamics: Optimization, Measurement, and Applications", 11/1/2018. Senior Operations Research Scientist, Wayfair, Nov. 2018-.

Jiaru Bai, Operations and Decision Technologies (ODT) PhD student (Decision Analysis, Markov Models), advisor, Sept. 2012-March 2014. Continuing advice on Markov decision tree modeling for cervical and ovarian cancer cost-effectiveness analysis, April 2014-May 2015. Co-chair of dissertation committee with Prof. Shuya Yin, June 2015-June 2017. Advancement proposal, "Markov cost-effectiveness analysis for cancer treatment," advanced in June 2015, graduation June 2017, Thesis title: "Interdisciplinary research in operations management: Applications in healthcare,

retailing and on-demand service platforms", assistant professor, Binghamton University (SUNY), Fall 2017-Dec. 2018, assistant professor Wake Forest, Jan. 2019-2022, Assistant professor, SUNY Stony Brook, Fall 2022-. First place, POMS 2017 Supply Chain Management College student paper competition (May 2017), POMS conference, Seattle, based on her joint work with Rick So and Chris Tang at UCLA. 6 papers were in the finalist list including papers from (http://poms.org/2017/04/2017_college_of_supply_chain_m_1.html) CMU, MIT, UT Dallas and University of Toronto.

Percy Mistry, Cognitive Science, advancement committee member, 7-27-15, "Perspectives on Cognitive Modeling of Adaptive Behavior". (Final defense was May 29, 2018; I was not on the final committee.) August 2018, postdoc at the Stanford Cognitive & Systems Neuroscience Laboratory.

Bart Knijnenburg, ICS, proposal defense, 6-9-14, "A user-tailored approach to privacy decision support", dissertation defense 7-27-2015, Clemson University Assistant Prof. in Human-Centered Computing, Fall 2015.

Rico Bumbaca, Marketing doctoral student, independent study on decision theory, Summer-Fall 2013.

James Leonhardt, Marketing, advancement committee (Spring 2012) and dissertation committee (May 7, 2013), "The Name-Control Effect in Consumer Judgment and Decision Making", Assistant Professor, New Mexico State Univ., Fall 2013-June 2016, University of Nevada, Reno, Fall 2016-. Associate professor, 4-2020, Phil and Jennifer Satre Professor of Marketing.

Kim McCarthy, Organization and Management (O&M), "Is E-Rudeness At Work Contagious? The Impact of Rude Email on Employee Performance", June 14, 2013.

Greg Autry, Policy, "In New Space, No One Can Hear Them Scream: Government Roles in Community Emergence," advancement committee, July 2012.

Yuhong He, ODT PhD student, working committee member, March 2011-, advancement and dissertation committee member, advanced in August 2011, graduated June 2014, "Joint Selling of Complementary Suppliers under Competition and Alliance Formation among Complementary Suppliers for Durable Products", Assistant Professor, Clemson University, Fall 2014. Assistant Professor, Cal State Fullerton, Fall 2015.

Hannah Oh, Marketing, 3-person working committee member, Spring 2011-graduated July 2014. Assistant Professor, UT Rio Grande Valley (former Univ. of Texas- Brownville). As of 9-16, at Univ. of Nebraska, Omaha.

Brent Miller, Cognitive Science, dissertation committee member, "The Wisdom of Crowds and Rank Ordering Problems Can We Aggregate Where We Cannot Average?" Sept. 2011.

Patricia Wellmeyer, Accounting, visiting doctoral student from NHH Norway, dissertation advice, 2011, Decisions under ambiguity and group choice (June 2016 final defense, lecturer with potential security of employment at UCI).

Laura Huang, Organization and Management, dissertation committee member, "A Test of the Impact of Gut Feel on Entrepreneurial Investment Decisions," March 15, 2011 advancement, Assistant Professor at Wharton as of Fall 2012-2017. (Graduated Winter 2013). Associate professor, Harvard Business School, 2018-.

Yeong Seon Kang, Marketing, dissertation advancement committee, "Essays on Marketing Strategy: Quality Competition, Distribution Channel Structure, and Downsizing," committee formed in Sept. 2010, official advancement in Spring 2011. Final defense on Dec. 5, 2012.

Yitong Wang, ODT PhD student, advisor and dissertation chair, ODT doctoral student, beginning September 2007-Sept. 2011, advanced to candidacy in Winter 2010, "Decision Research on Time, Risk, and Ambiguity", Assistant Professor, Tsinghua University, Beijing, Industrial Engineering, from Fall 2011-summer 2013; Lecturer in marketing (i.e., assistant professor) University of Technology Sydney, Fall 2013-, Senior Lecturer 8-2018- June 2019 (i.e., associate professor), with continuing affiliation 7/2019-on while in China. July 2019- to Alibaba, Behavioral Economics Mechanism Design area, China.

Candice Huynh, ODT PhD student, advisor, Summer 2010-June 2014, passed Phase I exam 10-2011. Advancement to candidacy, chair, "Risk Attitudes in the Supply Chain, Proxy Attributes and Personal Consumption", May 14, 2013. Assistant Professor, Cal Poly Pomona, Fall 2014, Associate Professor, Summer 2020.

Heidi Tucholski, IMBS Doctoral student independent study of decision theory, Winter/Spring 2010, "Incentivized Decisions in the U.S. Air Force: Stepping Back to Look at the Big Picture", March 4, 2013, Advancement committee. Graduated Winter 2014.

Matthew Feldmann, IMBS Doctoral student independent study of decision theory, Winter 2010.

Jay Simon, 9/2005-6/2009, ODT PhD student, advisor and dissertation chair, "Cross-Disciplinary Studies in Multiattribute Utility." Advanced to candidacy 3/20/08. Assistant Professor, Naval Postgraduate School, Monterey, CA, as of 8-1-09. Moved to American University in Washington DC, summer 2015. Tenured Associate Professor as of Fall 2018.

Wenting Pan, ODT PhD student, advancement committee member, May 2009-2012, Three Essays in Inventory Management, dissertation title: "Optimal Operational Strategies for an Assembly System Under Supply Uncertainty," final defense 5-21-2012. St. Mary's, CA, Assistant Prof., Fall 2012.

Dante Pirouz, Marketing, advancement to candidacy committee, "The Dark Side of Product Attachment: Reactivity of Addicted Users to Ad Cues" on neuroscience and tobacco smoking ads, Dec. 2008, graduated 6/2010. Assistant Professor, Ivey School, University of Western Ontario, starting Fall 2010.

Anitza Ross Grubb, Organization and Management, Dissertation Committee, "The Effect of Mood on Escalation of Commitment," 2008-10, advanced 2/12/2010, final defense July 2011.

David Tannenbaum, Social Ecology, Psychology and Social Behavior, 2/24/10, advancement to candidacy committee member, "A Reasons-based Framework for Policy Defaults", post doc at UCLA in 2011-14 and U. of Chicago 2014-16, University of Utah assistant prof., Fall 2016.

Ofer Mintz, Marketing, advancement to candidacy committee, "What Drives Managerial Use of Metrics and Does it Matter to Performance?", 4-29-10, final defense, 11-28-11, Visiting Professor, Interdisciplinary Center (IDC) Herzyila in Israel in Spring 2012, Assistant Professor, marketing, LSU, Fall 2012, Lecturer (i.e., assistant professor), University of Technology, Sydney, July 2017-.

Smith Williams. Department of Economics, Advancement to candidacy committee, 5-2009.

Tianjun Feng, ODT PhD student, 2002-June 2008, advisor, dissertation chair, advanced to candidacy on 3-15-06, graduated June 2008, "Three Essays in Supplier Management". Assistant Professor, Fudan University, Shanghai, as of Sept. 1, 2008. Promoted to Associate Professor, Jan. 2012; Full professor, Dec. 2016.

Burçak Ertimur, Marketing, advancement to candidacy committee, "The Impact of Customer Generated Advertising on Corporate and Brand Images: The Issue of Source Effects," September 2007. Assistant Professor of marketing, Fairleigh Dickinson University, as of Fall 2009.

Jiana-Fu (Jeff) Wang, Transportation Studies, UCI, advancement to candidacy committee, "Operational Strategies for Single-Stage Crossdocks," March 2007, final dissertation defense, 10-27-08. Assistant professor, Department of Industrial and Systems Engineering, Chung Yuan University, as of February 2009. Department of Marketing at National Chung Hsing University (Taiwan) since August 2009.

Liangyan Wang, Marketing, advancement to candidacy committee, "Toward a Hierarchy of Reference Group Messages: Distinguishing the Effects of Informational, Value-expressive, and Utilitarian Reference Groups," September 2006. Assistant Professor, Shanghai Jiao Tong University, beginning Fall 2008, Associate Professor as of 2010.

Shaoxuan Liu, ODT PhD student, doctoral dissertation committee, "The Impact of Uncertain Supply on Marketing and Inventory Decisions," September 2006. Assistant professor, Shanghai Jiao Tong University, beginning Fall 2008. Assoc. Prof. 2013-2016. Summer 2016 went to become founding Executive Director, Ningbo Supply Chain Innovation Institute China (NSIIC), established in a partnership of the Center for Transportation & Logistics (CTL) at MIT with the government of Ningbo; the NSIIC is part of the MIT Global Supply Chain and Logistics Excellence (or SCALE) Network.

Merlyn Griffiths, Marketing, advancement to candidacy committee, Consumer territoriality behavior, 7-06, graduated 2007. Assistant Professor, University of North Carolina, Greensboro, Fall 2007. Professor as of 2013.

Qiang "David" Zeng, ODT PhD student, 2004-05, advisor.

Xiaona Zheng, ODT PhD student, research assistant, summer 2002-summer 2003, co-author 2004-05, moved to Duke University to complete degree with Prof. Jeannette Song, named Assistant Professor at Peking University in summer 2005, Associate Professor from 2010.

Daniela Balkanska, advancement to candidacy committee member, August 2005, "Disposition effect and heterogeneous beliefs." Assistant Professor, San Francisco State.

Tom Moliterno, dissertation committee member, graduated 6/05, "Behavioral Antecedent to Firm-Level Resource Replacement and Acquisition, "Assistant Professor of Management, Moore School of Business, Univ. of So. Carolina, appointed summer 2005. Associate Professor, U. Mass Amherst, as of 2013.

Guangzhi "Terry" Zhao, Marketing, Spring 2002, dissertation committee member, advanced 9/03, graduated 2005, "Regulatory Focus, Message Framing, and the Persuasiveness of Antismoking Ads

Targeted at Youths." Received dissertation award of $60,000 from Tobacco Related Disease Research Program. Assistant Professor of Marketing, School of Business, University of Kansas, summer 2005. Assistant Professor, Loyola U., Maryland as of 2013.

Dipayan Biswas, Marketing, Fall 2001-04, dissertation committee member, advanced in summer 2002. Graduated 6/04, "Information Formats for Presenting Negative Product Information: Managerial and Regulatory Perspectives," Assistant Professor. Bentley College, Fall 2004. Associate Professor, U. South Florida, as of 2013.

Zhu Liu, 8/04, Advancement to Candidacy Committee, "Forecast Properties and Impact of Belief Updating."

Gary Henderson, Organizational Behavior, Summer 2003, advancement to candidacy committee.

Kevin Shang, ODT PhD student, dissertation committee, June 2001-June 2002 (Assistant Professor, Fuqua School of Business, Duke University, beginning 7/02). Associate Prof. with tenure, 7/10-.

Jeffery Guyse, ODT PhD student, 9/96-12/2000, doctoral committee chair. Dissertation title: An Empirical Investigation into Preferences over Sequences of Monetary and Environmental Outcomes: A Decision Analysis Approach (Professor, Calif. State Polytechnic University, Pomona.)

Ping Lin, Fall 2002-03, dissertation committee member (Assistant Professor of Accounting, University of Texas, Pan American, beginning 7/02).

Steve Mattingly, 1999 and 2000, Civil Engineering, dissertation committee. (Asst. Prof., Univ. of Alaska).

Jiongjiong Song, Engineering, advancement to candidacy, Sept. 2000, dissertation defense, Spring 2003.

Rod Smith, Accounting, advancement to candidacy, May 2000 (Asst. Prof., Univ. of Arkansas).

Kuntara Pukthuanthong, Finance, advancement to candidacy, June 2000.

Yanbo Jin, Finance, advancement to candidacy, June 2000.

Alan Meister, Economics, 1998, advancement committee.

Annaliese Franz, Chemistry, 1998, advancement committee.

Gerald Fisher, Social Science, 1997-99, advancement and dissertation committee.

Robert Sneddon, Social Science, 1997-99, advancement and dissertation committee (Cal Tech).

Niramol Jindanuwat, 1993-99, Phase II committee, research assistant, dissertation committee. (Price WaterhouseCoopers, Bangkok).

Yung Jae Lee, ODT PhD student, 1992-93, phase II committee, 1994, advancement committee. "A Framework for Understanding the Impacts of Every Day Pricing". Assistant Professor, St. Mary's. Full professor and Dept. Chair as of 2013 (Business analytics). In 2018-19, Interim Dean of St. Mary's School of Economics and Business Administration; Dean, Barowsky School of Business, Dominican University of California, Fall 2019-on.

Wen-Qiang Bian, ODT PhD student, phase II committee, phase II advisor, dissertation chair, 1994-9/1998. Dissertation title: "Fairness Perception in China (vs. North America) and Cultural Elements in Decision Making". (With start-up company in 2002, previously with InCubeNet).

Jiachu Song, TA, Spring 1993 (In IT firm).

Jeanne Pickering, Computer Science, advancement to candidacy committee, summer 1994.

Maria Lourdes Roldan, AGSM UCLA, research assistant, 1993-95 (Assistant Professor, San Jose State, Associate Dean as of 8-2016)

Brenda Nordenstam, Social Ecology, 1992, advancement to candidacy committee (Assistant Professor, SUNY)

Young Hee Cho, Social Science, 1992-96, supervisor of research assistant, advancement committee. (Assistant Professor, Cal State Long Beach; Professor as of 2013)

Monika Winn, Strategy, 1992-, supervisor of research assistant; 1993, advancement to candidacy committee, 1994 (Tenured Associate Professor as of 7/02, Professor as of 2013, University of Victoria, BC Canada)

Pam Keltyka, Accounting, 1992, phase II committee, dissertation committee, 1995-99 (Assistant Professor, University of Akron, Associate Professor as of 2013)

Stuart Eriksen, ODT PhD student, 1987-90, phase II comm. chair, dissertation comm. chair, "Decision Making with Information from Apparently Non-Comparable Studies" (USC adjunct professor)

Alan Brothers, Social Science, 1989-90, dissertation committee (Battelle Pacific Northwest National Lab)

Diane Roberts, Accounting, 1991-1994, dissertation comm. (Assistant Prof., Univ. of San Francisco)

Ed Schumann, Social Ecology, 1988, advancement to candidacy committee.

William Lambert, Social Ecology, 1987, examination committee (Assistant Professor at University of New Mexico School of Medicine)

Ali Peiravi, Engineering, 1983, dissertation committee

Soheila Jorjani, ODT PhD student, 1983-86, phase II comm. (Professor, Cal State San Marcos)

Ken Poertner, ODT PhD student, 1984-86, phase II committee

Masoud Tehrani, Engineering, 1984, examination committee

Tom Sabol, UCLA, Engineering, 1984-85, dissertation committee

Mahmood Noii, Engineering, 1985-86, dissertation committee

Maria Hozbor, Chemistry, 1986, advancement to candidacy committee

Faculty Mentor (Recent)

Maritza Salazar Campos	Fall 2021-Winter 2022
Luyi Gui	Fall 2015-Spring 2021

Courses Taught

Undergraduate

University Studies 3	Make Smart Choices (Winter '06), freshman seminar; http://eee.uci.edu/06w/87582/
Mgt. 183	Quantitative Methods Undergraduate Minor (Fall 1994)
Mgt. 196	Decision Analysis (Spring '20, Winter '21)

PhD

Mgt. PhD 297A	Doctoral Proseminar
	(Fall '91, '92, '95, F/W 99/00, Fall '00, '03, '09, '10, '11, '12)
Mgt. PhD. 299	Behavioral Decision Theory indep. studies Win. & Spr. 2005, Fall 2013
Mgt. PhD 297T-SWT	Decision Theory PhD Research Seminar, Spring '11,'13,'17, '19, '20, Fall '14, '21
Mgt. PhD 291	Decision Theory Doctoral Research Seminar (Falls '04, '06, '08)
Mgt. 290	Decision Theory Doctoral Research Seminar (Sp '88, Sp '99, W '01, W '03)
Mgt. 290	Advanced Topics in Operations & Decision Technologies (co-taught doctoral seminar) (Spring 1995, 1997, Winter 1998)

Full-time MBA

Mgt. 201A	Statistics for Management (Fall 1984, 1985, 1986, 1987, 1988, 1996, 1997)
Mgt. 201A	Quantitative Methods for Management (Fall 1982)
Mgt. 201B	Quantitative Methods for Management (Winter and Spring 1983)
Mgt. 201B	Operations Research for Management (Winter 1984; Winter 1992)
Mgt. 201B	Management Science (Winter 1995, 1996)
Mgt. 289	Field Studies in Operations Management (Winters 1997, 1998, 2006)
Mgt. 290	Decision Analysis (Spring and Fall 1983; Spring 1986; Winter 1988)
Mgt. 290	Decision Analysis and Creative Problem Solving (Spring 1992, Winter 1993)
Mgt. FT 283	Decision Analysis
	(Sp. 2000, Fall 2003, Fall '05, Fall '07, Spr. '10, '12, '13, '16, Winter '14)

Fully Employed MBA

Mgt. FE 201B	Operations Research for Fully Employed MBA Students (Spr. 1992, 1993, 1994)
Mgt. FE 290	Decision Analysis for Fully Employed MBA (Fall 1999, Winter 2001)
Mgt. FE 283	Decision Analysis for FEMBA
	(Spring '02, '03, '04, '18, Fall '04, '05, '06, Sp.'18, Winter '21)

Executive MBA

Mgt. E 283	Decision Analysis for EMBA (Spring 2003, Spring 2006)

Health Care Executive MBA

Mgt. HC201B	Operations Analytics for Healthcare Executives (new title, Fall 2016, '17, '18)
Mgt. HC201B	Management Science for HCEMBA (Fall '13, '14, '15, Co-taught W '97 & '98)
Mgt. HC 283	Decision Analysis for HCEMBA
	(Sum. '03, Sp '04, Sum.'05, Sum. '08, Spr. '09,'10, '11, '12)
Mgt. 290	Medical Decision Analysis for Health Care Executive MBA (Fall 1999, 2000)

Economics

Econ. 219A	Advances in Utility Theory (with Duncan Luce) (Winter 1995)

<u>Field Studies</u>
<u>and Independent Studies</u>

Fall 2022   Technical advisor- Mgt. 298 Experiential Learning class- FTMBA Field Study team, Johnson & Johnson/Cerenovus. Create a searchable database featuring J&J medical device attributes for future regulatory submissions & product development.

Fall 2018   Technical advisor- Mgt. 298 Experiential Learning class- FTMBA Field Study team, Mazda. Identify ways to reach millennials in the Takata airbag recall campaign.

Winter 2018   Technical advisor- Mgt. 298 Experiential Learning class- FTMBA Field Study team, SunPower. In 2011, Total SA and SunPower partnered to create a new global leader in the solar industry. The focus of the project is to conduct an assessment of the US solar market, and explore new market segments for SunPower in the United States, as well as conduct competitive analysis and generate competitive intelligence profiles. https://us.sunpower.com/company/https://us.sunpower.com/why-sunpower/

Fall 2017   Technical advisor- Mgt. 298 Experiential Learning class- FTMBA Field Study team, Microvention Terumo, Aliso Viejo medical device company (pioneered the development of catheter-based technologies for the treatment of diseases of the brain, http://www.microvention.com/). Develop analytical/evaluation tools and frameworks to quantify growth opportunities via acquisitions, licensing, distribution, partnerships/alliances.

Fall 2016   Technical advisor- Mgt. 298 Experiential Learning class- FTMBA Field Study team, Edison Water Resources, analyze business models to deliver water efficiency and conservation services.

Spring 2016   Francisco Ugalde, FTMBA- Renewable energy industry analysis.

Fall 2015   Technical advisor- Mgt. 298 Experiential Learning class- FTMBA Field Study team, RAJ Manufacturing's (Tustin) SwimSpot retail division's strategic evaluation of alternative retail channels

Fall 2013   Technical advisor- Mgt. 298 Experiential Learning class- FTMBA Field Study team, Parker Aerospace supply chain benchmarking and recommendations

Spring 2013   Sanket Mehta, FTMBA- Think Tank intern

F 2012-W 2013   Sri Jaya Sankar Malladi, FTMBA- HireRight intern

F 2012-W 2013   Kyung "Justin" Chai, FTMBA- Emerson Process Management-Rosemount Analytical intern

Fall 2012   Nitin Joshi, FTMBA- HireRight intern

Spring 2012   Anna Gawlicka, HCEMBA, Independent study on "Decision model for cost-effectiveness analysis of probe-based confocal laser endomicroscopy for diagnosis of indeterminate pancreaticobiliary stricture"

Spring 2012   Dotty Wang, FTMBA, Independent study for Johnson & Johnson on sourcing and procurement. Supervisor: Tiffany Shaw, Category Manager, Advanced Sterilization Products, Johnson and Johnson, 33 Technology Drive, Irvine, CA 92618

Fall 2011   Technical advisor- Mgt. 298 Experiential Learning class- FTMBA Field Study team.   Hyundai Motor America on a brand awareness program for Hyundai's Hydrogen Fuel Cell technology and environmental friendliness

F 2011-S 2012   Serge Sidorov, FTMBA, NEi Software (finite element analysis)

Fall 2010   Technical advisor- Mgt. 298 Experiential Learning class- FTMBA Field Study team. Ev3, Irvine, http://www.ev3.net/about/ on improving the product launch process, sponsored by Tom Whalen, VP Operations, Tamanna Karnani, Director Materials & Planning

Summer 2010   Undergraduate summer research fellowship (also worked with him in 2010- Dec. 2011) Raymond Wan, undergrad. business major, project on prospect theory, Summer Undergrad. Research Program (SURP)/Undergrad. Research Opportunities Program (UROP) appointment as a SURP Fellow at UCI for Summer 2010. $1700 award, "Does Prospect Theory Provide Empirically Verifiable Evidence for Understanding How Students at UCI Resolve Decisions under Risk?"

W 2010- S 2010 Saurabh Tyagi, B/S/H Logistics Intern BSH Home Appliances Corporation, Huntington Beach CA, MBA Independent study internship

Spring 2010   Geetanjali Singh, FTMBA- Social Enterprise: International Princess Project http://www.intlprincess.org/

Fall 2009   Technical advisor- Mgt. 298 Experiential Learning class- FTMBA Field Study team. Sponsored by Ed Fuller of Marriott, International: Identifying potential corporate partners to preserve Amazon Rain Forest in Brazil in the JUMA Reserve, Group members: Geetanjali Singh, Sudhish Subhash, Gaurav Bahal, Eric Higgins, Sandy Lou

Fall 2008	Technical Advisor- Mgt. 298 Experiential Learning class- FTMBA field study team with Hoag Hospital for Business Plan for Mary and Dick Allen Diabetes Center (MD/MBA students with regular Full-time MBAs on team)
F2008-W 2009	Kristen Parrinello, independent study for Social Enterprise Institute, Betsy Densmore, www.se-institute.org/SEI
Spring 2007	UCI Avian flu planning for undergraduate business program
	Independent studies (199's) by undergraduate minors Kyle Addiss and Brian Cho
Winter 2006	Medtronics (pig heart valve supplier management)
	Panda (restaurant operations improvement)
	Erin Gruwell Education Project (improving Freedom Writers educational program)
	Decision Center for a Desert City-ASU (water planning stakeholders analysis)
Spring 2004	John Matelis, decision analysis use at Booz, Allen, Hamilton
Winter 2000	Rong "Elaine" Zhang, WFS Financial Inc., Subsidiary of West Corp.
	(Data Warehouse Project Management)
Winter 1998	Disneyland Business Planning (Improving Throughput on Major Attractions)
	Decision Insights, Inc. (Software prototype for decision analysis on web)
Winter 1997	Disneyland Business Planning. (Replacement Parts Procurement Procedures)
	U.S. Bureau of Export Administration. (Process Evaluation)
Spring 1996	Kelly Hamerlinck, Disneyland (Labor Force Scheduling)

Predoctoral
Teaching

	UCLA Engr. 11	Patterns of Problem Solving (1975-81)
	UCLA Engr. 12	Applied Patterns of Problem Solving (1976-81)

(Revised 1/1/24)