DECISION ANALYSIS
Vol. 9, No. 4, December 2012, pp. 297–302
ISSN 1545-8490 (print) | ISSN 1545-8504 (online)

http://dx.doi.org/10.1287/deca.1120.0255

From the Editors

Brainstorming, Multiplicative Utilities, Partial Information on Probabilities or Outcomes, and Regulatory Focus

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This is the final issue under this Editor-in-Chief, so this column is fittingly coauthored with the associate editors, whose terms also end with this issue, to emphasize their major role in the leadership of the journal. We first introduce incoming Editor-in-Chief Rakesh K. Sarin, briefly review this year's operations, and thank our editorial board and referees. Then we move on to this issue's five research articles. In our first article, Ralph L. Keeney presents "Value-Focused Brainstorming." Next, Kenneth C. Lichtendahl Jr. and Samuel E. Bodily develop models for "Multiplicative Utilities for Health and Consumption." Then, Luis V. Montiel and J. Eric Bickel present "A Simulation-Based Approach to Decision Making with Partial Information." Our fourth article, by Kash Barker and Kaycee J. Wilson, is "Decision Trees with Single and Multiple Interval-Valued Objectives." Our final article, by Anton Kühberger and Christian Wiener, is on "Explaining Risk Attitude in Framing Tasks by Regulatory Focus: A Verbal Protocol Analysis and a Simulation Using Fuzzy Logic."

Key words: decision analysis; alternatives: creation of; applications: public policy; copula; correlation aversion; decision trees; dependence; Eagle Airlines; framing; fuzzy logic; gains; health utility analysis; interval arithmetic; life-cycle consumption planning; losses; medical decision making; multiattribute utility theory; objectives: identification of; practice; QALYs; regulatory focus; risk; risk aversion; risk proneness; self-regulation; sensitivity to dependence; simulation; standard gamble; time trade-off; uncertainty; value-focused brainstorming; value-focused thinking; verbal protocols; editorial

Happiness is not proportional to the difference between reality and expectation; rather, the increase in happiness slows as reality moves further from expectation.

(Baucells and Sarin 2012, p. 79)

Our opening quote is the Fourth Law of Happiness from the recent book on *Engineering Happiness* by Manel Baucells and incoming Editor-in-Chief Rakesh Sarin. Key to this law is the observation that we have a reference point of an expected amount of happiness and we see exceeding that level as a gain and failing to meet that level as a loss. This issue's final article examines the effect of framing a situation as a gain or as a loss, accomplished by shifting the perceived reference point.

We are happy to announce that the INFORMS Board of Directors appointed Rakesh K. Sarin, from the University of California, Los Angeles, as the incoming Editor-in-Chief at its summer 2012 board meeting, based on the recommendation of the editor search committee appointed by INFORMS.[1] Editor-in-Chief L. Robin Keller has reached the term limit of two three-year terms. Along with her editorial board,[2] she completes her term on New Year's Eve. Rakesh Sarin assumes office on January 1, 2013, and will appoint a new editorial board. Prof. Sarin is a Ramsey Medalist of the Decision Analysis Society of INFORMS and an INFORMS Fellow, and recently he served as the Department Editor for the Decision Analysis Department of *Management Science*.

Decision Analysis publishes papers on theory, assessment methodologies, experiments, surveys, and applications.[3] *Decision Analysis* is covered by the Social Science Citation Index, and it has an impressive impact factor of 2.143 in the management category, ranking it in the top 25%, at 38th out of 166 journals.[4] We serve readers and authors throughout the world through publications in our archival journal.[5] In the September 2012 issue's editor column, Keller and Kophazi (2012) provided our annual review from the perspective of the journal's editorial office. Most *Decision Analysis* issues contain regularly submitted papers. Recent articles by the editors summarizing the papers in regular issues include Keller (2011), Keller et al. (2011), and Keller (2012). Full text versions of these editorials are available, along with the "About the Authors" section (containing author biographies and photos) from our journal's online site.[6] In the June 2012 issue, we published the special issue on "Games and Decisions in Reliability and Risk," with guest editors Jason Merrick, Fabrizio Ruggeri, and Refik Soyer. See Merrick et al. (2012) for the special issue's editorial column.

As Linus Pauling said, "The best way to get a good idea is to get a lot of ideas." In our first article, Ralph L. Keeney presents a way to get a lot of good ideas via "Value-Focused Brainstorming." Keeney (2012) applies a key idea from his book on *Value-Focused Thinking* (Keeney 1992) to improve brainstorming. He provides guidance to brainstormers by having the objectives (which can be used to determine the overall value of the alternatives) specified before alternatives are generated. He also has individuals generate alternatives alone before meeting for group brainstorming. Following a recommendation of an investigation of the 2001 World Trade Center disaster in New York, this new value-focused brainstorming approach was applied in a public policy workshop to create ideas for improving emergency evacuation from large buildings. I'm sure that Keeney's new approach was not

[1] The search committee included Robert Clemen (chair), Vicki Bier, James S. Dyer, and Frederic H. Murphy (as the liaison from the INFORMS Publications Committee).

[2] See the journal site at http://www.informs.org/Journal/DA/Editorial-Office for contact information and photos of the editorial office team, including outgoing Production Editor Kimberly Anoweck. Editorial board member photos are at http://www.informs.org/Pubs/DA/Promo-Folder/PHOTOS.

[3] Those honored with the DAS (Decision Analysis Society) Practice Award are encouraged to prepare papers for the journal. See http://www.informs.org/Recognize-Excellence/Community-Prizes-and-Awards/Decision-Analysis-Society/DAS-Practice-Award.

[4] See http://thomsonreuters.com/products_services/science/science_products/a-z/journal_citation_reports/. Coverage began with Volume 6, Issue 1 (March 2009), so our first impact factor (counting the average number of citations of each paper published in the journal in a specific time period) appeared in the summer 2012 *Journal Citation Report*.

[5] Since we began using the ScholarOne Manuscripts online submission system (formerly called Manuscript Central) in January 2008, we have had corresponding authors from 48 countries.

[6] *Decision Analysis* website: http://www.informs.org/Journal/DA. Past issues are archived by HighWire Press®, http://da.journal.informs.org/, which also offers the option to request free *Decision Analysis* eTOCs (emailed Table of Contents) alerts.

motivated by this quote from Cher, but it does capture the benefit of value-focused brainstorming: "If you really want something you can figure out how to make it happen."

Keeney (2012) adds to the growing body of literature on how to improve decision analysis practice, including many papers published in *Decision Analysis*. For example, Keefer et al. (2004) contains a survey of decision analysis applications, and Keisler and Noonan (2012) present standard communication practices in decision analysis consulting and describe how communication can be improved. Other papers related to practice include Sevillano et al. (2012) on avoiding Somali pirates, Bana e Costa et al. (2008) on the transmission of electricity, Brothers et al. (2009) on managing radioactive liquid process waste, Brown (2009) and Gregory et al. (2005) on public policy, Cantor (2004) on medical decisions, Ewing and Baker (2009) on green buildings, Ewing et al. (2006) on military base decisions, McCardle et al. (2009) on fund raising, and Mild and Salo (2009) on infrastructure maintenance.

Prior papers in *Decision Analysis* by Ralph Keeney, who is also a member of the editorial board, include Bond et al. (2010) on improving the generation of objectives, Keeney (2004a) on communicating about decisions, Keeney (2004b) on making better decision makers, and Keeney and Vernik (2007) on a woman's childbearing plans in light of her biological clock and her three objectives for professional, social, and family life.

As Ralph Waldo Emerson said, "The first wealth is health," suggesting the idea that we should pay attention to our decisions affecting our health and our wealth. Our next paper looks at preference models for making decisions about health and consumption over time. Kenneth C. Lichtendahl Jr. and Samuel E. Bodily develop models for "Multiplicative Utilities for Health and Consumption." Lichtendahl and Bodily (2012) present two multiplicative utility forms, one of which incorporates the possibility of a person being correlation averse in consumption streams, which cannot be modeled with an additive form. Consider the context of choosing a lottery with two possible states leading to different streams of financial consumption and health over time. A person exhibiting correlation aversion for financial consumption would prefer a lottery with states having a varying sequence of financial outcomes over time (exhibiting low correlation over time) over a lottery with states having corresponding constant sequences of financial outcomes over time (exhibiting high correlation), assuming health is held constant. When the person has constant health and consumption streams over a lifetime, their model forms reduce to a double exponential utility in life duration. As we think about our own streams of health and (food) consumption, let's try to follow Benjamin Franklin's advice: "To lengthen thy life, lessen thy meals."

Casey Lichtendahl is an associate editor for *Decision Analysis*. Sam Bodily's prior paper in *Decision Analysis*, by Bodily and Pfeifer (2010), is on a class exercise to examine students' choices when facing high stakes lotteries.

Prior papers in *Decision Analysis* on decision models for health outcomes include Erkin et al. (2010) on determining patients preferences from observed decisions and applied to the timing of a living-donor liver transplant, Harvey and Østerdal (2010) on cardinal scales for health evaluation, Hazen (2004, 2007) on modifications of quality-adjusted life years (QALY) models, Cantor (2004) on clinical decision analysis, Müller et al. (2006) on dose selection, and Pauker and Wong (2005) on influence diagrams' use in medicine. A prior paper on multiattribute utility is Abbas (2011).

The next two articles deal with uncertainty about probabilistic dependence or about the consequences of a decision. First, Luis V. Montiel and J. Eric Bickel present "A Simulation-Based Approach to Decision Making with Partial Information." The Eagle Airlines example (from Clemen 1996 and Clemen and Reilly 1999) is used by Montiel and Bickel (2012) to illustrate a simulation procedure that can create a collection of possible joint probability distributions to match known probabilistic information. Then, as a new kind of sensitivity analysis, the decision problem is analyzed with the set of possible distributions.

Prior papers in *Decision Analysis* by Bickel, who also serves as an associate editor, include Bickel (2010) on using probability scoring rules, Bickel (2009) on using baseball examples in teaching, Bickel and Smith (2006) on optimal sequential exploration, Bickel (2008) on the value of information, Bickel (2007) on various scoring rules, and Bickel (2006) on corporate risk aversion.

Copulae are one way to construct joint probability distributions consistent with known one-dimensional margins. Prior copula papers in *Decision Analysis* include Kurowicka (2012) on a new type of conditionalization of copula based models and Kotz and van Dorp (2010) on generalized diagonal band copulae with two-sided generating densities. Prior *Decision Analysis* papers on probabilities in general include Abbas et al. (2008) on two probability assessment methods; Baillon (2008) on eliciting probabilities using exchangeable events; Bordley (2011) on updating probabilities knowing outcomes of partially similar events; Bordley (2009) on combining experts' opinions when they partition events differently; and Johnstone (2007), Kilgour and Gerchak (2004), and Schervish et al. (2009) on probability scoring rules.

Our next article, by Kash Barker and Kaycee J. Wilson, is on "Decision Trees with Single and Multiple Interval-Valued Objectives." Barker and Wilson (2012) look at decisions with single or multiple objectives, where the resulting performance on an objective might only be known to be within an upper and lower bound. For example, a company might know that the return on an investment (ROI) at the end of a decision tree branch, following a specific path with a chosen alternative and a state of nature, will range between 4% and 10%, but the company might not be able to provide a probability distribution over those ROI levels. To preserve the information on ranges of final outcomes when rolling back the tree, interval arithmetic is used. The process is illustrated on a maintenance, repair, and overhaul decision.

Before we turn to our final article, which is on how people make choices when framed as a gain or a loss, it is time for our *Trivia question*:

Match the following quotes on happiness to the person who said them. Hint: These quotes begin some of the chapters in Baucells and Sarin (2012).

A. Shall we be merry?
B. Happiness is intended pleasure and the absence of pain; unhappiness is pain and privation of pleasure.
C. The dread of evil is a much more forcible principle of human actions than the prospect of good.
D. The man is the richest whose pleasures are the cheapest.
E. We must cultivate our own garden.
F. The constitution only gives people the right to pursue happiness. You have to catch it yourself.

Match to the person:

1. John Stuart Mill
2. Shakespeare
3. Henry David Thoreau
4. Voltaire
5. Benjamin Franklin
6. John Locke

Once you have made your guess, see the footnote for the trivia answer.[7]

Our ending article examines risk attitude. Even though they practiced in the disparate domains of leading a country and playing hockey, both Winston Churchill and Wayne Gretzky expressed risk prone sentiments. As Winston Churchill said, "Better to dare mighty things and fail, than to live in a grey twilight where there is neither victory nor defeat." And Wayne Gretzky advised that "You'll always miss 100% of the shots you don't take."

Anton Kühberger and Christian Wiener conducted a pair of experiments in "Explaining Risk Attitude in Framing Tasks by Regulatory Focus: A Verbal Protocol Analysis and a Simulation Using Fuzzy Logic." Kühberger and Wiener (2012) build upon the idea from regulatory focus theory (Higgins 1997, 1998) that a person can have a promotion focus or a prevention focus when making decisions, and that can lead to different choices. They measured regulatory focus by coding verbal statements by participants (or by measuring it with a questionnaire) and found people avoided risk under a prevention focus, and preferred risk under a promotion focus for a monetary stock investment scenario similar to the classic Asian disease decision problem of Tversky and Kahneman (1981), which is framed as leading to either lives saved or lives lost. Then, the data from the questionnaire were input into a simulation of the participants' choices using a fuzzy-logic decision generator (Reyna and Brainerd 1991, 2011; Reyna et al. 2003, 2011). They found that risk attitude in framing tasks can be modeled as a form of fuzzy processing.

Related articles on risk attitudes in *Decision Analysis* include Nosić and Weber (2010), Weber and Zuchel (2005) and Vrecko et al. (2009) on monetary decisions,

[7] *Trivia answer*: A–2, B–1, C–6, D–3, E–4, and F–5.

Smith (2004) and Bickel (2006) on corporate risk attitudes, Baucells and Rata (2006) on real-world risk taking, Delquié (2008) on risk tolerance as maximum acceptable loss, and Kirkwood (2004) on approximating risk aversion in applications.

To end our column, we remind all authors and readers that we use the Ithenticate Professional Plagiarism Prevention software to check how much each submitted manuscript overlaps with other published works. When submitting a paper, each corresponding author confirms the following:

"I acknowledge that in submitting this paper I am aware of INFORMS policy on plagiarism and copyright (http://authors.pubs.informs.org). Further I acknowledge that I will report to the editor(s) of the journal all of my manuscripts (e.g., prior publications, conference proceedings, book chapters, papers submitted to other journals) that have substantial overlap with the submitted paper. I also certify that the copyright for all portions of this paper can and will be transferred to INFORMS upon acceptance."[8]

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[8] See http://www.informs.org/Find-Research-Publications/INFORMS-Journals/Author-Portal/Publications-Policies/Guidelines-for-Copyright-Plagiarism.

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