Decision Analysis Today

Vol. 30, No. 1, April/May 2011

The newsletter of the INFORMS Decision Analysis Society

Inside:

Editor's Comments

Vicki Bier

First, I have some sad news and some good news. Jeff Keisler, our usual newsletter editor, has been dealing with some health issues, but he is recovering. Jun Zhuang and Heather Rosoff favorably stepped in to take charge of the newsletter in his absence. Jeff also graciously took the time to produce a five-page document giving them his pointers on how to produce the newsletter—which probably took almost as much time as producing the newsletter himself! Thanks to all three of them for their support of the newsletter, and best wishes to Jeff for his continuing recovery!!

We are also at a busy time of year for conferences, even though the annual meeting is still half a year away. First, there is the INFORMS Conference on Business Analytics and Operations Research ("Apply Science to the Art of Business"), on April 10-12 in Chicago, which may already have happened as you read this. David Leonhardi, Freeman Marvin, Don Buckshaw, and others have put together an excellent program featuring a number of talks on decision analysis (by speakers including Sam Savage, Ellen Coopersmith, Margery Connor,

Rohit Tandon, and Bill Klimack), as well as a track on "soft skills" for decision analysts. Next up for practitioners is the annual conference of the Decision Analysis Affinity Group, on April 21-22 in Houston.

For those of you in the northeast, the INFORMS Regional Conference will be held on May 6-7 at the University of Massachusetts in Amherst. It should be a beautiful location at that time of year. INFORMS is also having its first-ever thematic conference on healthcare, in Montreal on June 20-22, which those of you interested in medical decision making may find to be of interest.

Andrew Grant is organizing sessions and talks on decision analysis and behavioral decision making for the triennial conference of the International Federation of Operational Research Societies in Melbourne, Australia, on July 10-15, as part of the stream on multiple-criteria decision making. Those of you who haven't yet made your travel plans for the summer may want to consider a trip "Down Under."

Finally, Jim Felli and Canan Ulu are organizing our sponsored cluster on decision analysis for the INFORMS Annual Conference in Charlotte. The conference isn't until November 13-16, but the abstract deadline is coming up much sooner, on May 16. So, please start thinking about which talks or sessions you might be interested in submitting, and be in touch with Jim and/or Canan about your ideas as soon as possible. We especially hope to have great representation from the southeast, including people who might be members of the Decision Analysis Society but do not regularly attend INFORMS meetings. We would also love to know whether you will be speaking on a topic related to decision analysis in a session in another cluster, so that we can explore cross-listing your session to make sure that your colleagues in decision analysis know about your talk.

I greatly appreciate the efforts of all of our officers and volunteers, especially Jun and Heather for producing this issue of the newsletter on such short notice. Looking forward to seeing many of you in beautiful downtown Charlotte in November, to experience a great cluster of sessions on decision analysis, and to enjoy the mix of the historic and the modern in Charlotte!

Finally, I encourage you to check out the new Decision Analysis Society website at http://www.informs.org/Community/DAS that the new site is hosted using INFORMS' new content management system. This new system will help us keep the website up-to-date and make it easy to add new content. If you have suggestions to improve the site, please let us know. **Jason Merrick** remains our webmaster; I am grateful for Jason's efforts in updating our website!

Editor's Comments

Hello from always-sunny Los Angeles and always-cold Buffalo:

Thank you, Vicki, for your nice introduction. First off, we hope Jeff Keisler gets better very soon! Second, we hope everyone is having a great spring and enjoys reading this exciting issue. Alec Morton, in DA Around the World, introduces us to José Rui Figueira, Salvatore Greco, Bernard Roy, and Roman Slowinski, who describe the history and philosophy of the EURO Working Group on Multiple Criteria Decision Aiding. Bill Klimack recounts the 2011 INFORMS Conference and provides insight into future conferences of particular interest. Guest writer to

DA Practice, Terry Bresnick gives valuable insight in "A New Perspective for an Old Decision Analyst: How Things Can Change When a Life or Death Decision Hits Home," an adaptation of a presentation he gave at the INFORMS Conference. In Research, Ron Howard answers the question, "Why Do Humans Need Help in Making Decisions?", and L. Robin Keller and Kelly Kophazi briefly detail the March and June abstracts from the Decision Analysis Journal.

Conference season seems to be upon us – we have a listing of 14, to be exact. We of course want you to pay special attention to the INFORMS Annual Conference in Charlotte, North Carolina scheduled for November 13 – 16. Please contact Jim Felli or Canan Ulu for more information on submitting abstracts or organizing sessions for the Decision Analysis track. Jason Merrick and Refik Soyer call for papers for the Decision Analysis Special Issue on Games and Decisions in Reliability and Risk. Gregory Parnell calls for Publication Award nominations. As well, Detlof von Winterfeldt calls for Ramsey Award nominations; Robert Bordley, Jag Chhatwal, and Chris Dalton call for nominations for the 2011 Practice Award; and Léa Deleris and Jun Zhuang call for Student Paper Award nominations.

The new Executive Director of SDP, Hilda Cherekdjian tells us all about the Society of Decision Professionals. Last, but not least, Frank Koch critically looks at Game Theory for Business- A Primer in Strategic Gaming by Paul Papayoanou in Book Review. Thank you to our readers for your continued comments and support.

-Heather Rosoff, Jun Zhuang, and Elizabeth Newell

Upcoming Conferences

May 6 - 7, 2011
INFORMS 2011 Northeastern Regional Conference
University of Massachusetts, Amherst
http://meetings.informs.org/RegionalNortheastern2011

May 31 – June 3, 2011
Naturalistic Decision Making NDM 2011
Orlando, FL (CFP deadline Jan 15)
http://www.ce.ucf.edu/ndm2011/

June 13 - 17, 2011
Multicriteria Decision Making: The 21st MCDM Conference
University of Jyväskylä, Finland
https://www.jyu.fi/en/congress/mcdm2011

June 20 - 22, 2011
INFORMS Healthcare 2011
Montreal, Canada
http://meetings2.informs.org/healthcare2011/hotel.html

July 10 - 15, 2011
International Federation of Operational Research Societies
Melbourne, Australia
http://www.ifors2011.org/

August 21 - 25, 2011
Subjective Probability, Utility and Decision Making Conference 23rd Biennial meeting (SPUDM)
Kingston University London
http://www.eadm.eu

September 18 - 21, 2011
40th Annual Conference of the Operations Research Society of South Africa (ORSSA)

National University of Science and Technology in Bulawayo, Zimababwe
http://www.orssa.org.za/wiki/pmwiki.php?n=Conf.ORSSA2011

October 23 - 26, 2011
Society for Medical Decision Making
33rd Annual Meeting
"From Evidence to Decision Making: Role of Behavioral Economics in Medicine"
Chicago, IL
http://smdm.org/2011meeting/index.shtml

November 4 - 7, 2011
Society for Judgment and Decision Making Annual Conference
Seattle, Washington
http://www.sjdm.org

November 13 - 16, 2011
INFORMS Annual Meeting 2011
Charlotte, North Carolina
http://meetings2.informs.org/charlotte2011/

December 4 - 7, 2011
Society for Risk Analysis Annual Meeting
Charleston, South Carolina
http://www.sra.org/events_2011_meeting.php

Call for Papers

Decision Analysis Special issue
on Games and Decisions in Reliability and Risk

CALL FOR PAPERS

L. Robin Keller, Editor
Refik Soyer, Guest Editor
Fabrizio Ruggeri, Guest Editor
Jason Merrick, Guest Editor
Deadline: ~~April 25~~ May 31, 2011

The objective of the special issue is to introduce a new theme, the use of game theory and decision theory in reliability analysis and risk analysis. The special issue aims to bring together novel research from disciplines that have the potential to contribute to this theme, including (but not limited to) economics, engineering, finance, mathematics, medical sciences, military sciences, probability, and statistics. Papers must tackle a problem in risk or reliability using the tools of decision theory or game theory (or both).

The issue will not only consider papers presented at the 2nd Symposium on Games and Decisions in Reliability and Risk to be held at the Hotel Villa Carlotta, Belgirate (VB), Lake Maggiore, Italy between May 19-21, 2011 (http://www.mi.imati.cnr.it/conferences/gdrr11.html), but will also be open to the public for submission of papers relevant to the theme.

The deadline for submission of papers is ~~April 25~~ **May 31, 2011**. Papers limited to ~~12~~ **15** double-spaced pages (including references and figures/tables) should be submitted at http://mc.manuscriptcentral.com/deca following the Decision Analysis author submission guidelines given at http://www.informs.org/Pubs/DA/Submission-Guidelines.

All submissions will go through the standard review process of Decision Analysis. Submitting

authors should indicate their desire to be considered for the special issue in the cover letter to Editor-in-Chief L. Robin Keller completed during the submission process. Technical questions about submissions may be directed to Managing Editor Kelly M. Kophazi (Kelly.Kophazi@INFORMS.org).

For more information about the special issue, please contact:

Refik Soyer, The George Washington University
Tel: +1-202-994 6445
Email: soyer at gwu.edu

Jason R. W. Merrick, Virginia Commonwealth University
Tel: +1-804-828 5865
Email: jrmerric at vcu.edu

Call for Sessions and Abstracts

INFORMS Annual Meeting
in Charlotte, North Carolina
November 13 – 16th

Call for Sessions
Abstract Deadline: May 16, 2011

We would like to invite you to chair a session for the Decision Analysis cluster at this year's INFORMS meeting. The meeting theme is "TransfORmation." This theme offers us the opportunity to reflect on our work and our field in the context of "a thorough or dramatic change," be that change in the area of personal enlightenment, professional development or our local or global external environment.

In the spirit of sharing and transformation, we ask you to further consider chairing a joint session with another INFORMS society to highlight the impact that decision analysis can have in other disciplines (e.g., Transportation, Marketing).

If interested in organizing a session, contact Jim Felli (jcfelli@lilly.com) or Canan Ulu (canan.ulu@mccombs.utexas.edu) to reserve a time slot.

INFORMS Midwestern Conference
at Ohio State University
August 1 -2, 2011
Call for Abstracts

Interested in presenting at a sponsored session on decision analysis for the INFORMS Midwestern Conference?

If so, please contact Dr. Ali E. Abbas by May 16.
Email: aliabbas@illinois.edu

Society for Benefit-Cost Analysis Annual Conference
Expanding the Scope of Benefit-Cost Analysis: Practical Applications and Analytical Frontiers
Washington D.C.
October 21-22, 2011

Call for Sessions and Abstracts
Deadline: June 15, 2011

The Society for Benefit-Cost Analysis promotes the development and appropriate application of benefit-cost analysis to a broad range of public policy issues. This year, our Fourth Annual Conference and Meeting continues the focus of past conferences on the practical use of Benefit Cost Analysis (BCA) in a variety of institutional and national settings, with special attention to the role of BCA in both prospective and retrospective program evaluation; and to broadening and improving measurement of benefits and/or costs.

As always, we welcome abstracts on any topic related to improving the use of benefit-cost analysis, cost-effectiveness analysis, risk-benefit analysis, applied welfare economic analysis, and damage assessments in policy settings, from scholars, practitioners, and others interested in these areas who wish to present research at the conference.

Abstracts should be 200–300 words in length and provide adequate detail on the content of the research. Proposals for panels that include three to four speakers are also welcome, and should include a summary of the overall focus of the panel as well as a 200–300 word abstract for each presentation. Submission of an abstract is viewed as a firm commitment to participate in the conference if accepted.

Abstracts and panel proposals should be submitted as email attachments in Word document (.doc) format to sbcainfo@uw.edu along with complete contact information for all prospective presenters (name, title, affiliation, email, phone, and address), by June 15, 2011. Please write "Abstract: SBCA 2011" in the subject of the email.

Society for Medical Decision Making
October 23 – 26, 2011

Call for Oral and Poster Abstracts
Deadline: May 6, 2011

The Society for Medical Decision Making is soliciting proposals for Oral and Poster Abstracts to be presented at the 2011 Annual Meeting. For submission details, visit: http://www.smdm.org/2011meeting/oral_abstracts.shtml

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George Nicholson Student Paper Competition
Call for Submissions
Deadline: May 31, 2011

The George Nicholson Committee competition is held each year to identify and honor outstanding papers in the field of operations research and the management sciences written by a student.

The following conditions must be satisfied for eligibility:

* The entrant must have been a student on or after December 1, 2010;
* The paper must present original research results (a summary of multiple papers is not eligible);
* The research must have been conducted while the entrant was a student;
* The paper must be written by the entrant with only minor outside editorial assistance;
* An entrant can be a (co-)author in at most one paper submitted to the competition;
* The paper must not have won a prize (1st-2nd) in a previous Nicholson Competition.
* One or more advisors may appear as co-authors of a paper, but the student must be the "first author."

Prizes will be awarded and finalists will be invited to present their papers at the INFORMS Annual Meeting in November 2011.

Please see the following page online for complete details: http://www.informs.org/Recognize-Excellence/INFORMS-Prizes-Awards/George-Nicholson-Student-Paper-Competition/George-Nicholson-Student-Paper-Competition-Application-Process

Publication Awards

2011 Decision Analysis Publication Award
Deadline for nominations: July 1, 2011

The Decision Analysis Publication Award is given annually to the best decision analysis journal article or book published in the second preceding calendar year. For consideration for this year's award, a work should have been published during CALENDAR YEAR 2009. The Decision Analysis Society of INFORMS award is accompanied by a plaque and a $750 honorarium.

The intent of the award is to recognize the best publication in "decision analysis, broadly defined." This includes, but is not limited to, theoretical work on decision analysis methodology (including behavioral decision making and non-expected utility theory), descriptions of applications, and experimental studies.

Nominations are invited at this time. Please send no later than July 1, 2011, to:

Gregory S. Parnell, Ph.D.
Professor of Systems Engineering
Gregory.parnell@usma.edu

Please send the author's name(s) and the full journal citation or book title. Nominators should ensure that the Publication Award Committee has a copy of the publication, preferably in electronic form. SELF-NOMINATIONS ARE ACCEPTABLE AND ARE RECOMMENDED. Historically, most nominations for this award have been self-nominations, so don't rely on your admiring colleagues to nominate your work. However, others who wish to write in support of a publication (in a substantive way regarding impact of the work) are encouraged to do so. Testimonials by those who have benefited from a work will be very helpful to our decision process.

Nominated publications will be judged for significance, relevance, originality, and readability. The award will be presented at the INFORMS Annual Meeting in Charlotte, NC on November 13-16, 2011. This award is sponsored by the Decision Analysis Society of INFORMS. Membership in the Decision Analysis Society is not a condition for being a nominator or a nominee, so please feel free to forward this announcement to other colleagues.

Names of past winners of the Decision Analysis Publication Award are posted on the DAS Awards web page at http://www.informs.org/Recognize-Excellence/Community-Prizes-and-Awards/Decision-Analysis-Society/Decision-Analysis-Publication-Award

Professional News

If you have some news or information you want to share with the DAS, contact the co-editors Drs. Heather Rosoff rosoff@usc.edu and Jun Zhuang jzhuang@buffalo.edu. This could include: promotions or new positions, awards, book announcements, other accomplishments, or whatever rings your bell.

Decision Analysis Journal

The *Decision Analysis* March 2011 issue...

Investment and Defense Strategies, Heuristics, and Games: From the Editor…

L. Robin Keller
http://da.journal.informs.org/cgi/content/abstract/8/1/1

Partial-Kelly Strategies and Expected Utility: Small Edge Asymptotics

Joseph B. Kadane
Kadane (2011) finds that there is no utility function that is independent of the risks it confronts and that has partial-Kelly strategies as the optimal strategy.

Psychological Heuristics for Making Inferences: Definition, Performance, and the Emerging Theory and Practice

Konstantinos V. Katsikopoulos
http://da.journal.informs.org/cgi/content/abstract/deca.1100.0191v1
Katsikopoulos (2011) defines psychological heuristics as models for making inferences that (1) rely heavily on core human capacities, (2) process the information they use by simple computations and may not use all available information and (3) are easy to understand, apply, and explain.

Analysis of National Strategies to Counter a Country's Nuclear Weapons Program

David J. Caswell, Ronald A. Howard, and M. Elisabeth Paté-Cornell
From the perspective of United States policy makers, Caswell et al. (2011) develop a model to decide the best national strategy to prevent or delay another country from acquiring nuclear weapons, with a case study of Iran's nuclear weapons program.

Governments' and Terrorists' Defense and Attack in a *T*-period Game

Kjell Hausken and Jun Zhuang
http://da.journal.informs.org/cgi/content/abstract/deca.1100.0194v1
In a two-stage game model with the government moving first and then the terrorist moving, Hausken and Zhuang (2011) examine choices between attacking the enemy and defending against an attack.

Playing Squash Against Ralph Keeney: Should Weaker Players Always Prefer Shorter Games?

Jeryl L. Mumpower
http://da.journal.informs.org/cgi/content/abstract/deca.1100.0196v1
Mumpower (2011) challenges the conventional wisdom that weaker players can maximize their probability of winning by playing as few points as possible against superior opponents.

The *Decision Analysis* June 2011 issue...

(Available in Articles in Advance prior to print)

For more information about Articles in Advance please visit:
http://journals.informs.org/misc/ifora.dtl

Deterring the Smuggling of Nuclear Weapons in Container Freight through Detection and Retaliation
Naraphorn Haphuriwat, Vicki M. Bier, and Henry H. Willis
http://da.journal.informs.org/cgi/content/abstract/deca.1110.0199v1

Decomposing the Cross Derivatives of a Multiattribute Utility Function into Risk Attitude and Value
Ali E. Abbas

Using Bayes' Rule to Update an Event's Probabilities Based on the Outcomes of Partially Similar Events
Robert F. Bordley

Aggregating Large Sets of Probabilistic Forecasts by Weighted Coherent Adjustment
Guanchun Wang, Sanjeev R. Kulkarni, H. Vincent Poor, Daniel N. Osherson

Whether to Retest the Lipids of HIV-Infected Patients: How Much Does Fasting Bias Matter
Xiting Yang, Joseph B. Kadane, Heidi M. Crane, and Mari M. Kitahata

Decision Analysis is now included in the Social Sciences Citation Index.

Decision Analysis is a part of Articles in Advance (AIA),
where accepted manuscripts appear prior to printing:
http://da.journal.informs.org/papbyrecent.dtl

Decision Analysis archives available through Highwire Press:
http://da.journal.informs.org
For *Decision Analysis* subscription information and rates:
http://www.informs.org/Journal/DA

INFORMS Decision Analysis Society Members!

By special arrangement with the Decision Analysis Society Council,
dues-paying regular members of the DAS receive a subscription to the journal as part of their 2011 membership dues.

The DAS is a subdivision of INFORMS.
For information on DAS, go to http://decision-analysis.society.informs.org/ .

Decision Analysis is a quarterly journal dedicated to advancing the theory, application, and teaching of all aspects of decision analysis. The primary focus of the journal is to develop and study operational decision-making methods, drawing on all aspects of decision theory and decision analysis, with the ultimate objective of providing practical guidance for decision makers. As such, the journal aims to bridge the theory and practice of decision analysis, facilitating communication and the exchange of knowledge among decision analysts in academia, business, industry, and government. *Decision Analysis* is published in March, June, September, and December by the Institute for Operations Research and the Management Sciences (INFORMS) at 7240 Parkway Drive, Suite 300, Hanover, Maryland 21076. Please visit our website at http://www.informs.org/Journal/DA.

Calls for Award Nominations

2011 Ramsey Medal Nominations
Submission deadline: May 15, 2011

The Ramsey Award Selection Committee is soliciting nominations for the 2011 Ramsey Medal. The committee values nominations from all members of the decision analysis community. For past Ramsey Medal winners, please see:

http://www.informs.org/Recognize-Excellence/Community-Prizes-and-Awards/Decision-Analysis-Society/Frank-P.-Ramsey-Medal.

The Frank P. Ramsey Medal is the highest award of the Decision Analysis Society. The medal is named in honor of Frank Plumpton Ramsey, a Cambridge University mathematician who was one of the pioneers of decision theory in the 20th century. His 1926 essay "Truth and Probability" (published posthumously in 1931) anticipated many of the developments in mathematical decision theory later made by John von Neumann and Oskar Morgenstern, Leonard J. Savage, and others. The Ramsey Medalists are recognized for having made substantial further contributions to that theory and its application to important classes of real decision problems. The Medal is accompanied by a $1,000 honorarium.

Criteria for the Ramsey Medal

The Ramsey Medal of the Decision Analysis Society (DAS) is awarded for distinguished contributions to the field of decision analysis. Distinguished contributions can be internal, such as theoretical or methodological advances in decision analysis, or external, such as developing or spreading decision analysis in new fields. Thus, the specific criteria for evaluating potential Ramsey Medal recipients are a candidate's:

* Theoretical, methodological, and procedural contributions to decision analysis
* Applications of decision analysis
* Other contributions promoting decision analysis
* Exceptional contributions to the Decision Analysis Society

A potential recipient need not meet all of the criteria, but contributions to each criterion are relevant.

For this award, decision analysis is defined as a prescriptive approach to provide insight for decision-making based on axioms that are logically consistent with the axioms of von Neumann and Morgenstern and of Savage. Key constructs of decision analysis are utility to quantify values and probability to quantify the state of one's knowledge. There are overlapping aspects of decision analysis with other fields, such as behavioral decision research, probabilistic risk analysis, and engineering and economic analyses.

Where and When to Send Nominations

Nominations should be sent via email to the committee chair, Detlof von Winterfeldt: detlof@iiasa.ac.at. The deadline for nominations is May 15, 2010. A nomination should include a brief summary of the nominee's contributions with respect to the award criteria listed above and the nominee's CV or a link to it.

2011 Practice Award Nominations
Submission deadline: July 1, 2011

The Decision Analysis Society invites submissions for the 2011 Decision Analysis Practice Award offered by the one-thousand-member-strong INFORMS Decision Analysis Society.

Submissions should be roughly two pages long.

During the summer,

(1) The Practice Award committee will evaluate all submissions and name three finalists. These finalists will all be recognized at the 2011 INFORMS meeting on November 13-16th in Charlotte, Virginia.

(2) Finalists will give presentations on their submission before an open meeting of INFORMS.

(3) The award committee will determine the winner using six criteria: importance of the problem, impact on the client's decision making, benefits to the client organization, use of decision analysis tools, quality of the analysis, and originality.

(4) The winner receives $750, a plaque from the Decision Analysis Society and considerable publicity (consistent with your proprietary restrictions.)

Submissions based on previously published work are eligible. The deadlines and timeline are:

Submission deadline: ***July 1st***
Announcement of the three finalists: ***August 15th***
Deadline for finalists' abstracts: ***September 15th***
Presentation by the finalists and winner announcement: ***2011 INFORMS meeting***

Please send your submission to any member of the committee:

Robert Bordley, Chair (Robert.bordley@gm.com)
Jag Chhatwal (jagpreet_chhatwal@merck.com)
Chris Dalton (cdalton@syncopation.com)

For more information on the prize, see:
http://www.informs.org/Recognize-Excellence/Community-Prizes-and-Awards/Decision-Analysis-Society/DAS-Practice-Award

2011 Student Paper Award Nominations
Submission deadline: June 17, 2011

The Student Paper Award is given annually to the best decision analysis paper by a student author, as judged by a panel of the Decision Analysis Society of INFORMS. Students who did not complete their Ph.D. prior to May 1, 2010 are eligible for this year's competition.

The award is accompanied by a plaque and a $500 honorarium. The award will be presented and the winner will also be invited to present his or her paper at the DAS Awards Session at the INFORMS Annual Meeting.

All students doing work in or related to decision analysis (e.g., decision methodologies, experimental studies, and applications) are encouraged to submit a paper. The majority of work, including writing, must be that of the student, though faculty members or other mentors can be co-authors if appropriate.

The paper should be 30 pages or less (double spaced and 12 point font) and, in the standard format of Management Science or Operations Research.

If you are a faculty member who is supervising students, please inform them of this opportunity.

If you are a student reading this, please encourage your classmates to submit a paper and to join the Decision Analysis Society (http://www.informs.org/Community/DAS).

While we encourage all applicants to join DAS, it is not necessary for students to be members in order to be eligible for the competition.

To be considered for this year's competition, please email both committee co-chairs, at the address given below with your final submission of:

(i) An electronic version of your paper in PDF format; and
(ii) A letter in PDF format from one faculty co-author (if any) articulating your role in writing this paper.

Léa Deleris
IBM Technology Center, Dublin, Ireland
Email: lea.deleris@ie.ibm.com

Jun Zhuang
University at Buffalo, State University of New York
Email: jzhuang@buffalo.edu

DA Around the World

The EURO Working Group on Multiple Criteria Decision Aiding

Alec Morton, Column Editor

The general aim of this column is to present a view of what is going on in the Decision Analysis community and its various sister communities, broadly conceived, beyond the confines of DAS and INFORMS. In this issue, José Rui Figueira, Salvatore Greco, Bernard Roy, Roman Slowinski describe the history and philosophy of the EURO Working Group on Multiple Criteria Decision Aiding.

The group, its history, its activity

Multiple Criteria Decision Aiding (MCDA) is an important field of Operational Research, which is acknowledged by the fact that, since its foundation at the first EURO conference in Brussels in 1975, the EURO Working Group (EURO-WG) on MCDA was meeting invariably twice a year (in Spring and Autumn), arriving at its 73rd meeting which just held in Corte (Corsica).

Activity of the EURO-WG on MCDA is complementary to the meetings and exchanges which already take place at the level of international conferences and journal publications. Its particular objectives are the following:

1. To contribute to the development, mainly but not exclusively at a European level, of an original way of thinking in the field of multicriteria decision aiding.

2. To allow each member of the group to make known to others methodological, theoretical or applied results, to submit its own works and thoughts to the critical discussion of the group and also to solicit some collaborations.

3. To develop multicriteria aid for decisions by facilitating contacts with people interested in the subject and by stimulating continuity and progress in exchanges and works.

4. To keep the group alive and open by means of bi-annual meetings which must not be mini-conferences but real meetings favorable to exchange and to emergence of new ideas.

The meetings of the group take the form of seminars with no parallel sessions. They are designed so as to foster discussions and exchange of ideas. In 1975, the group consisted of 29 members from 5 different countries. Among the present members, 42 were already members in 1980. Currently, 38 countries are represented.

During recent years, each meeting attracted 5 to 20 new members (with an average of 13). These figures show how lively the group is in terms of meetings and participation. Currently the group has around 350 members, from about 30 countries, and meetings usually gather between 50 and 100 persons. The success of the group is attested by the fact that most texts on MCDM now speak of a "European school of MCDA".

The group was created by Bernard Roy. He has been coordinating the group until the 72nd Meeting of the EURO-WG on MCDA in Paris (October 7-9, 2010). On that occasion, Bernard Roy stepped down from his position of the Group Coordinator and he kindly accepted to continue supporting the group's activity as the Honorary Chairman. The new Board of Group Coordinators, elected at this meeting, is composed of Salvatore Greco, Jose Figueira and Roman Słowiński. The 73rd meeting took place in Corte (Corsica, France) on April 14-16, 2011. The 74th meeting will be held in Yverdone (Switzerland) on October 6-8, 2011.

Among the meetings of the group, the one that deserves a special mention is the 50th Anniversary meeting that was held in 1999 in the prestigious château de Cerisy-La-Salle, and gathered a large number of members (see Figure 1).

The EWG on MCDA also is editing a newsletter, with two issues each year, since Spring 2000. The newsletter is edited by José Rui Figueira and has as permanent collaborators Silvia Angilella, Maria João Alves, Carlos Henggeler Antunes and Juscelino Almeida-Dias. The collection of newsletters can be found at the website of the EWG on MCDA at: http://www.cs.put.poznan.pl/ewgmcda/.

This website, whose web editor is Milosz Kadzinski, is aimed not just at making available the most relevant information contained in the newsletters, but it also intends to become an online discussion forum, where other information and opinion articles could appear in order to create a more lively atmosphere within the group.

Figure 1: 50th meeting of the EURO-EWG on MCDA at Cerisy-La-Salle in 1999

The European conception of MCDA

In the following, we present the basic principles of the so called "European" conception of MCDA that under the original inspiration of Bernard Roy have been developing within the group. In the operational research and decision aiding community, to which we belong, the decision-aiding activity (which is meant to be scientific) is founded on three pillars:

1) The *actions* (formal definition of the possible actions or alternatives),

2) The *consequences* (aspects, attributes, characteristics, ... of the actions, that allow to compare one action to another), and

3) The *modeling of one or several preference systems* (an implicit or explicit process, that for each pair of actions envisioned, assigns one and only one of the three possibilities: indifference, preference, or incomparability).

The last pillar needs further explanation. When given two possible actions, any individual, whoever he/she may be, based on the actions' consequences, and his/her value system, can state: "I prefer the first to the second" or vice-versa, "I am indifferent between the two", or "I am unable to compare these two actions". Modeling a preference system means to specify a process that will provide this type of results based on a pre-established model of the action consequences. These consequences are most often complex and inadequately known. They can be modeled in quantitative or qualitative terms, in a deterministic or stochastic manner, with a part of arbitrariness or ill determination.

According to the "European" conception, the analyst must seek for obtaining a coherent and structured set of results. These results should be sought in order to guide the decision aiding

process and facilitate communication about the decisions. To do so, the analyst must use an approach that aims at producing knowledge from working hypotheses, taking into account the objectives and the value systems involved in a particular decision context. This approach should be based on models that are, at least partially, co-constructed through interaction with the decision maker. This co-construction first concerns the way the considered actions are taken into account, as well as the consequences on which these actions will be judged. Secondly, the co-construction process concerns the way that certain characteristics (notably the values attributed to the different parameters) of the preference model were judged the most appropriate given the specificities of the decision context and the working hypotheses retained. In this conception, it is no longer necessary to assume that there exists, in the mind of the decision maker, a stable procedure capable of defining the decision maker's preference system completely, before even beginning the decision aiding process.

To elaborate results likely to make things more clear to the decision maker (e.g., "if..., then..." results), in the "European" conception, the analyst must propose working hypotheses which will allow the co-construction of the preference model to play an appropriate role in the decision aiding process. The co-constructed model must be a tool for looking more thoroughly into the subject, by exploring, interpreting, debating and even arguing. To guide this process of co-construction, the analyst must also interact with the decision maker assuming that he/she understands the questions that are asked. Nevertheless, in the "European" conception, it is not necessary to assume that the given responses are produced through a stable pre-existing process, but only that these responses are made up through interaction with the decision maker's value system, which is rarely free of ambiguity or even contradiction. In particular, the analyst must make sure that the person who responds to the questions is able to place these questions in the context of the current study. The analyst must also admit that these questions can bring the person thus questioned to revise certain pre-existing preferences momentarily and locally. According to the "European" conception, the knowledge produced does not aim to help the decision maker to discover a good approximation of a decision which would objectively be one of the best, taking into account his/her own value system, but rather more humbly to provide the decision maker with a set of results derived from the reasoning modes and working hypotheses. The decision maker will better understand the results produced and will appropriate them (and potentially share with others) if the analyst makes sure that understanding of the underlying reasoning modes and working hypotheses is integrated into the model co-construction process. In this "European" conception, the analyst does not need to accept either of the following two postulates:

- Postulate of the decision maker's optimum. In the decision context studied, there exists at least one optimal decision, or, in other words, there exists one decision for which it is possible (if sufficient time and means are available) to establish objectively that there are no strictly better decisions with respect to the decision maker's preference system.
- Postulate of the decision context reality. The principal aspects of the reality on which the decision aiding is based (particularly the decision maker's preferences) are related to objects of knowledge that can be seen as

> data (i.e., existing outside of the way they are modeled); these objects can also be seen as sufficiently stable over time and for the questions asked, such that it is possible to refer to the exact state or the exact value (deterministic or stochastic) of given characteristics judged to accurately portray an aspect of that reality.

He/she may find these postulates as totally unrealistic, or may even have good reasons for accepting the existence of incomparabilities in the preference models used.

Some current debates within the EWG on MCDA

We conclude this short presentation of the EWG on MCDA presenting two subjects that are currently debated within the group: robustness concerns in MCDA, and assignment of numerical values to preference parameters.

Robustness concerns

In the field of Multi-Criteria Decision Aiding (MCDA), the subject of robustness is increasingly present in scientific journals. This subject is also present more and more in much of the less formal works done by companies applying operational research tools about concrete decision-aiding problems. In MCDA, the multiple meanings accorded to the term "robust" are open to debate. This subject is discussed in detail in the Newsletter of the European Working Group "Multiple Criteria Decision Aiding" in a series of contributions originated from a first contribution of Bernard Roy in 2002. This series of perspectives highlights the polysemic character of the notion of robustness. This polysemic character is primarily due to the fact that, depending on the situation, this notion can be similar to, and sometimes compared to, the notion of flexibility, stability, sensitivity and even equity.

According to the proposal of Bernard Roy the term robust has to be understood as a qualifier meaning a capacity for withstanding "vague approximations" and/or "zones of ignorance" in order to prevent undesirable impacts, notably the degradation of the properties that must be maintained. The research on robustness seeks to insure this capacity to the greatest degree possible. Consequently, robustness stems from a process that responds to a concern: a need for resistance or self-protection.

For this reason, it is preferable to use the expression robustness concern, rather than robustness analysis because the latter can give the impression of a work done a posteriori, as is the case with sensitivity analysis, for example. Robustness more often involves a concern that must be taken into account a priori, when formulating the problem. (Of course, this does not exclude the use of sensitivity analysis to respond to such a concern, if necessary.)

In decision aiding, the desire to take our own ignorance into account as much as possible explains why the robustness concern exists. From this perspective, it is important to remember that the decisions for which decision aiding is performed will be:

1) executed in a real-life context that may not correspond exactly to the model on which the decision aiding is based;

2) judged in terms of a system of values that will appear to be pertinent (and not necessarily stable) for a future that may not be well-defined; as a result, this system of values may not correspond

exactly to the one used to create and exploit the model.

These are two of the possible reasons for a non-perfect conformity, and thus a gap between: on the one hand, the formal representation (FR), including the model and the processing procedures that are applied to it; and on the other hand, the real-life context (RLC) in which decisions will be made, executed and judged. In decision aiding, it is important to try to take into account the vague approximations and zones of ignorance responsible for the formal representation's non-perfect conformity to the real-life context: FR ≠ RLC.

Assignment of numerical values to preference parameters

Every comprehensive preference model based on a family of criteria has to somehow take into account a way of differentiating the role of particular criteria in the construction of this preference model. To represent this differentiation, the majority of models involve a set of parameters which hold various names, depending on the nature of the model: weights, scale coefficients, substitution rates, importance coefficients, sometimes even veto.

After the analyst has chosen a model which (s)he finds the most appropriate for decision aiding, (s)he has to assign a numerical value to each of the parameters of the chosen model, which would characterize the relative role played by each criterion. To do this, (s)he has to interact with the decision maker in order to obtain relevant information which (s)he will further exploit. Various procedures (direct and indirect) have been proposed to this aim. They may be better or worse when adapted to the chosen preference model. All of them have some weak points. Some of them should maybe even be banned. Whatever they are, **their goal is not to best assess the true value**, which would be supposed to exist in the head of the decision maker, but rather help the participants to the decision to understand better the problem.

On the basis of the above statements, the debate within the group addressed the following goals:

a) To review the main ways of interaction with decision makers (or their representatives) who are supposed to be able to elicit information to be exploited further so as to assign one or more sets of values to importance parameters adequate to the preference model used. The objective is to make precise an underlying semantic content of the concept of importance used in the considered model.

b) To show weak points of each of the main ways of interaction, so as to understand:

   i) what they imply in practice, to be properly used;

   ii) what are the conditions in which the model using the sets of values, that these ways of interaction permit to work out, is convenient to serve in decision aiding.

The debate on this topic was held during the 71st Meeting of the EURO-WG on MCDA in Torino on March 25-27, 2010. The introduction to the debate was given by four invited speakers: Bernard Roy, Roman Slowinski, Marc Pirlot and Thierry Marchant. A video of this debate and slides of the invited speakers are displayed at: http://www.cs.put.poznan.pl/ewgmcda/index.php/web-links/38-debate-turin.

DA Practice

Bill Klimack, Column Editor

As I write this, the 2011 INFORMS Conference on Business Analytics and Operations Research has just concluded. The conference included a DA track, and a soft skills track that dealt with interpersonal skills of analysts. This is important for all technical professionals, of course, but is key to DA with our use of subjective probabilities and representation of attitudes regarding preference and risk. For the fourth year the DA-inspired Soft Skills Workshop was well attended with over 50 participants.

This conference was rebranded to include analytics. This term is said to be "hot" in the business world. INFORMS' results support this. The attendance was up by about 30 percent from the conference last year before the analytics focus. I see more schools have added or are working to add analytics programs to their offerings. INFORMS has recently stood up an analytics section. How analytics evolves with respect to DA remains to be seen, but certainly practitioners should be aware.

The Decision Analysis Affinity Group (DAAG) conference is about to get underway. The Society of Decision Professionals will hold a business meeting in conjunction with DAAG.

For those working in healthcare-related fields, INFORMS is organizing a conference on the topic in Montreal, June 20-22, 2011. See www.informs.org/Attend-a-Conference/Thematic-Conferences for more information.

Planning is well underway for the INFORMS fall meeting in Charlotte, North Carolina.

This issue's guest columnist has had a distinguished career both in the military and in the private sector. Terry Bresnick is the Executive Principal Analyst and CEO of Innovative Decisions, Inc. He is the author of a number of journal papers and a frequent presenter at INFORMS conferences. He has been an Assistant Professor of Systems and Decision Analysis and is a registered Professional Engineer in the State of Virginia. He is a recipient of the David Rist Prize, Military Operations Research Society, for outstanding achievement. Thanks to Terry for sharing his professional thoughts and insights that grew out of such a significant personal situation.

Please send your comments, suggestions, and, especially, offers to be a guest columnist to me at bklimack@kromite.com. You can help improve the practice of decision analysis!

A New Perspective for an Old Decision Analyst: How Things Can Change When a Life or Death Decision Hits Home.

This article is adapted from a presentation at the INFORMS Practice Conference in April 2010

What I am going to talk about today is an "aha" moment I recently had that really made me look hard at what I do as a decision analyst. Unfortunately, it involved a family member's life and death situation, but strangely enough, that is what it sometimes takes to trigger major changes in our lives. But lest this come across as a depressing talk, I'll give you one of the bottom lines up front. As of today, things look very good for the family medical situation.

Let me set the stage so you can understand where I am coming from. I consider myself to be a decision analyst by profession. I've been at it for more than 35 years. I was trained at Stanford and I worked at decision analysis firms such as Decisions and Designs, Inc (DDI) and Decision Science Consortium (DSC). In 2001, Dennis Buede and I formed Innovative Decisions, Inc. In my mind, I consider my perspective to be that of a "traditional" decision analyst, whatever that means. What has been a somewhat non-traditional is the degree to which I facilitate many knowledge elicitation sessions using the format of the Decision Conference that was started at DDI by Cam Peterson. I personally have facilitated more than 1000 decision conferences or somewhat shorter decision workshops, so knowledge elicitation is a routine part of my repertoire.

Now, we all know that decision analysts and operations research practitioners are supposed to be objective, content neutral, and unbiased elicitors of information. Facilitation means many different things to different people. I have seen facilitators range from totally non-interventional "traffic cops" who refuse to do anything other than pure process measures, to those who don't hesitate to contribute to the process by providing important substantive knowledge to the group that may not otherwise be available and that may correct incorrect information. Personally, I lean towards the latter. But regardless of our modeling styles or our facilitation styles, we should be driven by ethical principles. We can look at the codes of ethics or organizations such as INFORMS, MORS, or the ethical guidelines that Ron Howard lays out in his book, and the things that are common to all include words such as the following from the Military Operations Research Society for its members:

- **Objective, constructive, and responsive in all work performed**
- **Honest open, and trustworthy in all their relationships**
- **Truthful, complete, and accurate in what they say and write**
- **Always doing what is right rather than expedient**

In our modeling efforts, decision analysts are supposed to elicit in an unbiased fashion, analyze according to sound theoretical principles, and report findings clearly and accurately. It's a no-brainer – my perspective was very clear for many, many years. At least it was until I was confronted with a very personal, family-related life and death situation that I'll address shortly. All of a sudden, I found that the line that I couldn't cross was a bit blurry; the role I needed to play went beyond analyzing and reporting accurately. What I thought was a very clear perspective changed for me overnight.

So what was the circumstance that shook my world? In October of 2008, my 39 year old daughter, Michele, had been suffering from a very bad sinus infection for a few weeks, and her doctor had put her on a very strong antibiotic with side effects that required her red blood cell count to be monitored weekly. During one visit, he told her that there was something unusual and that he wanted her to see a specialist at Johns Hopkins Medical Center; he had made her an appointment for three weeks in the future. She went back to her internist later that week for another checkup, and he told her not to wait three weeks, but had set up an appointment for the next day. She asked her mother and me to go with her, and of course we did. We had a 7:00 AM appointment with a doctor who we, upon arriving at the hospital, discovered was an oncologist – not a good sign.

After looking at her blood work, he told us that she had a form of Leukemia, but couldn't be sure of the nature or the specific form until after a bone marrow biopsy. He told us that some forms of Leukemia are relatively easily treated, but before he'd commit to a treatment regimen, he needed to see preliminary results of the biopsy. An hour later, after a biopsy, he gave us some very bad news. Her white blood cell count had gone from 11,000, which is high, to 42,000 in just 3 days. She had acute myeloid leukemia (AML) which usually responds well to chemotherapy and radiation therapy. Unfortunately, she had a relatively rare and very nasty strain known as an FLT3 mutation which was much harder to deal with. Here are some of the basics of AML:

- **AML** is a cancer of the myeloid line of blood cells characterized by rapid growth of abnormal white blood cells that accumulate in bone marrow and interfere with production of normal blood cells
- The specific cause of the disease remains unclear
- AML progresses rapidly and is typically fatal within weeks or months if left untreated
- Five-year survival varies from 15–70%; relapse rate varies from 33–78%, depending on subtype
- FLT3 mutations occur in 5-10% of adult AML patients and are strongly associated with a poor prognosis and a high white cell count

After the shock had set in, we peppered the doctor with many questions, the most obvious of which was the nature of her treatment and more importantly, her prognosis. He told us that she would need an initial course of chemotherapy, followed by a bone marrow donation, followed by more chemotherapy.

Fortunately, Johns Hopkins is one of the best centers in the world for treating this form of Leukemia, and they had developed their own unique protocols that had "done well" for patients with this disease. I talked to the doctor about getting a second opinion; the doctor responded that he was admitting her immediately, would have a bed ready for her by 9:00AM and that she would have been finished with her first chemo treatment by 5:00 that afternoon. The white blood cell count was rising so quickly that if her internist had not sent her to Hopkins when he did, she had days, or at most weeks to live. As to the prognosis, he told us that he believed Michele had a ***"good possibility"*** of making it through this.

As a decision analyst, I understand the importance of precise language in explaining probabilities to clients. I take great pains to use techniques such as reference processes and common understandable events to help clients relate to the numbers, particularly when dealing with rare events. While encouraged by the words "good possibility" that the doctor used, I wasn't satisfied that I really understood what my daughter was facing. So reverting from my role as highly distressed parent to clear-headed decision analyst, I pressed the doctor for what his words meant in probability terms. As many of us have come to find, doctors generally don't like to talk in terms of probabilities. But I was persistent, and he finally said that survival probabilities for this disease were around 20%, perhaps as high as 30% - not exactly what I had calibrated to the words "good possibility"! I pressed further – was the 20% a population statistic, or was it conditional for 39-year old, otherwise strong and healthy females? What was the probability of getting her into remission to even get to the point of bone

marrow transplant? What were the odds of finding a donor? The questions just kept coming. And the more I asked, the more he tried to put me off. After all, my daughter and her family needed to know exactly what she was facing so we could properly evaluate courses of action. I assured the doctor that this type of decision making was I did for a living, and that I could best be of help by understanding the probabilities and consequences. Although I was hardly unbiased and neutral in this case, I still believed I could help her make any decisions she had to make by "eliciting" the required information. At this point, the doctor could sense my frustration, and he took me aside, out of earshot of my daughter. He then explained to me his reasons for avoiding my questions, and when he was done, a light bulb came on. And it was a light bulb that shed a new perspective not only on the effects that my role in trying to play decision analyst for my daughter could have, but on the effects that my role as a decision analyst could have on all of my clients. So what was it exactly that the doctor said to me?

The doctor told me that he had dealt with many patients in similar circumstances. Both his experience and several other studies clearly showed that for patients with the same apriori survival base rates for patients with AML FLT3, the ultimate survival rates are higher for patients who have a positive, optimistic attitude about their circumstance, who believe that the hellish treatments they are about to go through will do the trick, and who believe that they will survive, than for those who go into a funk of depression, who start to plan for their death, and who don't believe they will make it. The psychological attitude can affect the probability of survival. Now, you may or may not believe this, and it is not believed by all in the medical profession. I am not going to debate the merits of the hypothesis, but will accept the hypothesis and show its implications for the decision. I am going to focus on the light bulb – the one that illuminates the fact that the very act of eliciting and reporting on probabilities accurately can actually change the probabilities of survival in a case such as this! As Michele's father, I clearly want to increase the chances of her survival. As her decision analyst, I want to play my ethical role in helping her to have all of the information needed to determine the right course. Yet these two fundamental objectives were clearly in conflict.

Let's take a step backwards now, and look at the situation purely from the perspective of the objective decision analyst trying to model the decision for the client. Let's first focus on this revelation that the act of elicitation can actually change the probabilities of the outcomes. When you think about it, this isn't a revelation at all. I was taught that probability is a state of information or state of mind; it includes all relevant information that we have, to include information on the physical state of things. Any time we do a diagnostic test or other data gathering, we change the state of information and thus have the potential to change the probability along a path in our decision tree.

Let's assume that a patient appears at a critical care facility with serious symptoms that could be indicative of a serious Disease A, a critical Disease B, or some very minor condition. The physician can choose to not treat, treat for A, or treat for B. Depending upon what the patient really has and what treatment regimen the doctor selects will result in a patient outcome that is either of low consequence, serious consequence, or death-resulting.

But the doctor can probably do better by choosing to conduct a non-invasive diagnostic test that may

make it clearer whether the patient is suffering from A, B, or something else. Of course, the test is not perfect, so we must incorporate various misdiagnosis probabilities and consequences into the model as well as the cost of the test. As we gain more information, we can expect the probabilities of patient impact states to change as a result of the diagnostic test.

Now, this is very basic decision analysis, and there should be no surprise that by changing the state of information, probabilities on the consequences change. But let's take it one step further. What if the diagnostic test is invasive rather than non-invasive? For example, when a patient presents at an emergency room with chest pain, doctors sometimes perform an angiogram to look into the heart and gather information to determine the probability that the patient has had or will have a heart attack. But there is something different about an angiogram than a non-invasive test such as an MRI. The procedure itself can initiate the heart attack. Not only can the probability change because the state of information has changed, but because the physical condition has changed as well as a result of the test.

In this context, what if we think of the routine probability elicitation process by a facilitator in a different way? The characteristics of the elicitation process are very similar to those of a diagnostic test in medicine – probe the situation for additional data to change the state of information. The interesting question is whether we are more like a non-invasive diagnostic test or an invasive diagnostic test? Are we more like an MRI that reports the situation or more like an angiogram that can alter the physical properties of the situation as well?

When I try to answer this question in the context of the admonition given to me by my daughter's doctor, the revelation occurs. By eliciting more information from the doctor and reporting accurately on it to my daughter, I was clearly having an invasive effect, and could actually be having a negative impact on her survival.

So now we come to the heart of the dilemma – do I report the probabilities accurately and take the risk that she will take on a pessimistic attitude and decrease the probability of survival further, or do I use vague words like "good possibility" to bias her towards a more optimistic outlook that can increase the chance of survival? As a father, this was an easy choice; like the doctor, I would do everything in my power to give my daughter a survival edge. If I am going to have an "invasive" effect, let me bias it in a way that works in her favor. I can live with that and still believe I am an "ethical" decision analyst.

In the bigger picture, what I learned from my daughter's situation has carryover implications for what I do in my work where I don't carry the same biases towards pushing the decision in favor of the "client". As hard as I try to be neutral and not impact a decision as a decision analyst, that may not be possible. The very act of elicitation, as we have seen, can impact the decision. And this isn't a phenomenon that only occurs in medical decisions. Prior to the last Presidential election, many media outlets were accused of "making the news" rather than reporting on the news. When I go into a client firm to help with strategic planning, I am now more aware that the very act of my eliciting information from workers may cause them to behave differently. What if my very presence in the company leads some to believe incorrectly that there is something negative going on in the company and causes some key performers to put their resumes on the

streets or "abandon ship" to get ahead of a perceived bad outcome? Like the media in the above example, I am now intervening in the decision and affecting it, rather than analyzing and reporting on it - clearly troublesome in the context of a decision analysis code of ethics.

So what happened in my daughter's case? As I said, I listened to the doctor and did everything I could to help her have a positive attitude. She was successfully put into remission after a nasty course of chemotherapy, an anonymous donor was found, she had a bone marrow transplant on 4 March 2009, she was married in August of 2009, and in March 2010, her one year post-transplant bone marrow biopsy was free of any traces of Leukemia. She is about to undergo her 2-year biopsy, and when this is found to be free of Leukemia, she will have passed the critical threshold for AML and will be considered "cured".

Terry Bresnick with his daughter Michele

Society of Decision Professionals

By Hilda Cherekdjian

The Society of Decision Professionals (SDP) held its first annual in-person meeting on Thursday, April 21, 2011 at the Norris Conference Center in Houston following the DAAG conference. SDP's board introduced the new Executive Director of SDP Hilda Cherekdjian who just took office. With the board and councils, she will lead the society of decision professionals into becoming a well recognized and vibrant community.

The SDP membership, now nearly two hundred, continues to grow. Members are from around the world, the public and private sector, and include students as well as seasoned professionals. The initial sponsoring organizations playing a key role in the Society's direction and effectiveness are Chevron, Unilever, SmartOrg, Kromite, Palisade, Strategic Decisions Group, Syncopation, and Decision Frameworks.

The SDP has sponsored successful Learning Exchanges that are archived at: http://www.decisionprofessionals.com/news_events.html. You can access the PDF slides and audio files of these events from this web-link. Three of SDP's most recent learning exchanges are:

1. The Value of DA/DQ: Building a Compelling Case for Decision Makers
By: Michael Menke, SPD Fellow

2. Implementation of Decision Analysis: 20 Years of Building Chevron's DA Culture
By Larry Neal and Brian Putt, Chevron

3. Aligning Decisions with our Values,
By Somik Raha, PhD

SDP supports decision professionals to become the trusted advisors of choice for decision makers facing important and complex decisions. The Society upholds professional standards of practice and certifies professionals. The Society also fosters collaboration, continual learning, and networking among its members and collaborates with INFORMS and other professional societies and organizations to bring clarity and insight to Decision-Makers.

For more information on SDP, including the professional career ladder, news, governance and SDP's professional code, and how to join, please go to the Society's website: www.decisionprofessionals.com.

Research: Ron Howard

Why Do Humans Need Help in Making Decisions?

Ronald A. Howard
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Consider the Let's Make a Deal (Monty Hall) Problem: In Parade Magazine on September 9, 1990 Marilyn Vos Savant challenged her readers as follows:

This problem derives from a popular television show in the 1970's. In the show, a contestant had a choice of three doors behind one of which was a prize like a new automobile. The other two doors concealed a joke gift like a goat. After the contestant chose an initial door, the host of the show revealed a goat behind one of the two unchosen doors, and asked the contestant if he or she would like to switch to the other unchosen door. The question is: should the contestant switch?

Do the odds of winning increase by switching to the remaining door?

If you have not encountered the problem, you will enjoy solving it. When Marilyn presented her solution, she immediately received much correspondence telling her that her solution was incorrect and even questioning whether, given her great incompetence in the subject, she should continue to write columns like this. Some of the correspondence questioning her solution was from mathematics professors. (see her website[1]) Later when she wrote a book about her column[2], she

[1] http://www.marilynvossavant.com/
[2] "Ask Marilyn" , Marilyn Vos Savant, St Martins Pr, ISBN 0-312-95181-7

provided fascinating detail of the correspondence and of how she resolved the controversy. She asked the schoolchildren of America to simulate the problem and then report to her how well they did by switching or not switching. As you might have expected, the schoolchildren demonstrated that the disparaging critics were wrong.

While the controversy was raging, one of my newly minted doctoral students who had not yet heard the problem entered the office of a client to begin work on a decision analysis consulting project. Upon his arrival, the client said that he had been trying to figure out the right answer for some time and that he was sure that my student, being an expert on decision-making, would be able to show him the solution. Happily, my student had the capability expected and work on the project could begin.

We have discussed this problem in my classes with solutions and variants at increasing levels of sophistication. For the last several years, students in the advanced class, who are thoroughly familiar with all methods of solution, have been receiving a new assignment. They are to find people in their personal or professional lives that have not heard the problem and then ask them to solve it. The students should help if help is needed, using the simplest methods that allow their associates to become confident in their answer. This exercise often provoked heated personal and professional discussion. More than one student reported that the most technical, professional, and highly reputed people in the organization had the greatest difficulty in becoming reconciled with the solution.

My experience with the problem in special professional courses has been the same. Even after instruction and drilling in solving probability problems more complicated than this one, a majority of the class often selects the wrong answer until finally presented with an argument that makes the solution irrefutable to each dissenter.

When I ask new students how many have had a class in decision making at any point in their education from grade school to high school to college, virtually none has had the experience. Rarely do we see in media discussions of a decision in any area of life susceptible to decision analysis that the decision makers have used any of the concepts and methods that we know are so helpful in making important decisions.

The cause cannot be a lack of knowledge of what to teach. The technology for reasoning to achieve clarity of thought and clarity of action has been advancing for centuries. Daniel Bernoulli[3] in 1738 resolved the St. Petersburg paradox problem posed in 1713 by introducing wealth-dependent

[3] "Specimen Theoriae Novae de Mensura Sortis" Commentarii Academiae Scientiarum Imperialis Petropolitanae, Tomus V [Papers of the Imperial Academyof Sciences in Petersburg, Vol. V], 1738, pp. 175–192. Translated as "Exposition of a New Theory on the Measurement of Risk", Econometrica, Vol. 22, No. 1 (Jan., 1954), 23-36

risk aversion. Laplace[4] in 1812 wrote of the usefulness of applying probability to many important issues. He even used the term "certain equivalent" as "espérance morale". Yet even in the 1950s when I was a student, Feller[5] criticized his correct reasoning rather than marveling at it.

Compare this with progress in other areas of science and technology. When my father was born, no one had flown, but more than 40 years ago, he experienced the moon landing. How could we explain to Laplace why we have not built grandly upon his legacy now that we each possess computational power that would be miraculous to him?

Some recognize the promise of decision analysis, which is really just the engineering of decisions like the engineering of any other human artifact. Recent studies by the Society of Decision Professionals[6] indicate that a business investment in decision analysis often pays off at a rate of 1000 to 1, especially in industries like pharmaceuticals or energy that are characterized by large investments, high uncertainty, and substantial time to fruition. The companies that have invested in decision analysis report that not only does it allow them to make specific decisions, but that even more important is how it changes for the better how they communicate within the decision-making process. (I can report that my best investments have been in companies started by former students and managed using the principles of decision analysis.)

How can we explain why we have not seen the advantages of decision analysis become more widely appreciated and exploited?

One possible explanation is that we are living in the modern world with bodies and minds designed by evolutionary processes only about 100,000 years ago.

This is easy to demonstrate. If at this moment, you heard close by a full-throated roar of a lion, you would be immediately alarmed and ready to fight or flee before your mind even appreciated what you had heard. An equally loud nearby car crash would be startling but would not evoke the same response.

The evidence of our eon-long design shows up throughout our lives. 100,000 years ago, there was no agriculture. People had to be hunter-gatherers; their diet was what they could catch, like meat or fish, and what they could pick and dig up – fruits, nuts, and tubers. And these were not the kind that we find today in our supermarkets. The only true sweets would be something like honey, very attractive but also very difficult to obtain. Today we, in the developed world, live where cereals abound and sugar can be found in most processed food. The modern all-you-can-eat buffet line is one of the hazards we face without the warning of the lion's roar. The natural response can be ultimately deadly.

Consider other examples. Scuba diving has allowed many to explore the underwater world with great edification and enjoyment. If you are diving at a depth of 30 m and suddenly find that you cannot breathe using your apparatus, the natural response is to hold onto the precious air in your lungs and head for the surface as quickly as possible. This response can kill you since the expanding air in your lungs may cause pulmonary embolism. To survive you must continually

[4] Théorie Analytique des Probabilités, Mme Ve Courcier, Paris, 1812

[5] "An Introduction to Probability Theory and its Applications", William Feller, Vol.1, Second Edition, Wiley, New York, 1957, pp. 113-114

[6] www.decisionprofessionals.com

exhale air as you slowly ascend. You must perform the most unnatural action you could imagine. Free divers never have to face this problem.

Airplane pilots, no matter whether beginning or highly experienced, will crash if they fly when they cannot determine their position by visual reference, such as when they are completely enveloped by clouds. Notice that birds do not have this difficulty. If a flight of ducks enters a cloud, duck hunters would have to wait a long time to bag their limit by catching ducks falling from the sky.

Finally, at this moment, you and I could be exposed to a substance on the bottom of our chairs that would kill us by radiation overdose by tomorrow. Yet we would notice nothing amiss until symptoms developed.

In all these examples, the common feature is that humans had no evolutionary pressure to acquire the missing capabilities. We are operating in an environment with which we were not naturally designed to deal. Nevertheless, by using the proper knowledge and instruments, people can scuba dive, fly airplanes in bad weather, and determine whether they face a radiological hazard.

The implications of our design in the area of decision-making are quite clear. If we are hunting, attempting to outsmart our potential prey, or dealing with the small community of people with whom we have direct experience, our evolutionary training serves us quite well. However, if we are signing up for a subprime adjustable-rate mortgage with a balloon payment, choosing an advanced medical treatment with serious mortality and side effects, or investing in a highly uncertain, long time to payoff venture, our evolved capabilities may be inadequate if not augmented by appropriate instruments.

Almost coincident with the development of decision analysis has been the growth of knowledge on cognitive decision-making among behavioral scientists, inspired by the work of Tversky and Kahneman. This knowledge has been extremely important to the development of decision analysis, since every decision analysis must confront human behavior at the two critical interfaces with the formal process. The first interface is helping the decision-maker to frame the decision, and then to provide the critical elements of the decision basis: the alternatives, information, and preferences to be used in the analysis. When the results of the analysis are available, the second interface begins: the analyst must undertake the ultimately most important step of reporting them to the decision-maker. The key is to present the insights of the analysis in a way that will allow the decision-maker to convince himself or herself that the way forward is clear. Lessons from cognitive science have been very helpful in the effective design of these interfaces.

Concomitant consequences of the development of behavioral decision-making have been challenges to decision analysis. The recognition of many biases that affect both judgment and decision-making has raised questions about the effectiveness of decision analysis. At my last count, there were listings of 72 cognitive biases in Wikipedia, although there seems to be considerable duplication. We know that our perceptions bias our judgments: recall the familiar demonstration of how one of two lines of equal length with reversed arrowheads appears longer. Once you have seen it, you are seldom fooled. One of my colleagues takes advantage of this in her teaching by actually drawing the lines such that the one that appears to be longer actually is longer. Yet almost all of the participants, knowing of the illusion, say they are of the same length.

The existence of biases shows that we must not be naïve at either of the interfaces with the decision-maker, but also that we must be judicious in any attempt to compensate for them.

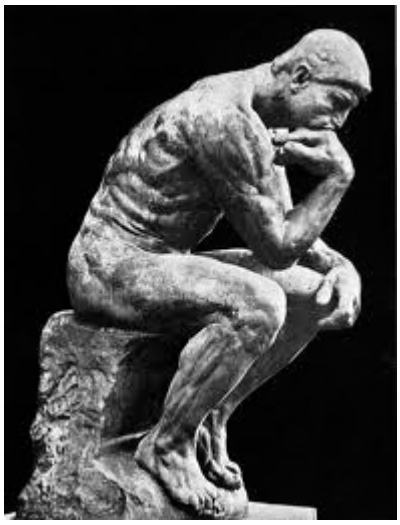
I find nothing in the developments of behavioral decision theory showing that intuitive processes for judgment and decision-making are reliable for any important decision. Phenomena like anchoring, wishful thinking, incorporating sunk costs, spending too much on information gathering, etc. are only too common. Human beings can only balance two or three factors in their minds in arriving at consistent judgments. Yet many of the decisions we face today, in business, health, technology, are multifarious in a way that our caveman brain is ill-prepared to handle. We are fortunate that we have developed in decision analysis the instrument we need.

When Amos Tversky taught his course in behavioral decision-making at Stanford, usually my teaching assistants in decision analysis would take it, and his teaching assistants would take mine. His teaching assistants would often tell me that Prof. Tversky advocated making decisions by using prospect theory, one of his descriptive models of decision-making. Whenever I mentioned this to him, he found it very amusing, since they had completely misconstrued his views.

As you know, the roll call of those who have made mistakes in probability looks like the roll call of great scientists. Once, at the end of a class on probability, a student asked me whether his probabilistic intuition had so improved that he would have an advantage in probabilistic reasoning even without using his new tools. My reply was that he would be just as equipped to solve probability problems using intuition, as would be an experienced pilot flying in zero visibility without using instruments.

Instead of trying to avoid our instruments when we need them, we should rejoice that we have them. Since decisions involve alternatives and preferences as well as probability, important decision problems are even poorer places to try out your intuition - yet we do.

The word “important” in that last sentence is very significant. I can use the concepts of decision analysis almost every time I make a decision. I separate the quality of the decision from the quality of the outcome. I think about the frame of the decision, seek alternatives, make sure I am using all my relevant knowledge, and acting in the light of my preferences. Every year I may personally face only two or three decisions worthy of the formal methods I teach in my classes on professional decision analysis. These decisions may be financial or medical, but the tools are the same. By using my instruments, I know that I will have clarity of action and that no matter what the future brings I will have no notion of regret.



Book Review

Game Theory for Business –
A Primer in Strategic Gaming
By Paul Papayoanou

Book Review by Frank Koch

There are many excellent books describing business strategy development. Some of them focus on decision analysis techniques to deal with decision making in the face of uncertainty. Others cover game theory and the interaction of players as they compete, collaborate and cooperate. Game theory and decision analysis are usually treated as two independent disciplines. However in my experience during the past 20 years in the oil and gas business, many strategic business decisions must be made in the face of both significant uncertainty and complex player interactions. Game Theory for Business fills that void in decision analysis literature, providing a practical guide to the incorporation of gaming elements into business decision making.

The book starts with a short review of game theory's development as a strategic tool, referring to the work of Nash, Schelling and others, to provide a background; but Papayoanou does not distract the reader with a mathematical exposition on the theory. He refers the reader to several fine texts where they can absorb all the theory and math they desire. The book provides a framework for thinking about simple games by considering three "end members": competitive games, collaboration games, and coordination games. These basic games are illustrated using 2X2 matrices and simple game trees. Papayoanou then describes a strategic gaming process that includes three steps: dynamic framing, strategy evaluation and execution planning. This process closely corresponds to the "stage-gate" processes (e.g. opportunity identification, alternative selection, project engineering and execution) that many businesses have adopted for their strategic and major project decision making.

The middle third of the book explores each step in the strategic gaming process in detail using game trees that incorporate uncertainties and private information as well as 2X2 game matrices, tornado diagrams and other tools. Examples include sequential and simultaneous decisions, signaling games, mixed strategies and repeated games. The discussion of execution planning covers both the development of tactics to change the game and the construction of a dynamic roadmap that illustrates the interaction of the players during the execution of their strategies.

The final third of the book contains a series of specific examples, case studies of coordination, collaboration and competitive games that illustrate the benefit strategic gaming can bring to decision making.

I have read many books on game theory. They have been fascinating and informative; but after reading them I have been left with an unfilled gap on how to apply these concepts to business decisions. Game Theory for Business was written with the practitioner in mind. It is clear, readable and prepares the reader to apply basic game theory concepts to his or her decisions. If you are involved in analyzing or making strategic decisions where others' decisions and actions can have a critical impact on your success, I highly recommend you read this book. Read it today and improve your decisions tomorrow.

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