

DECISION

ANALYSIS

TODAY

Vol. 40, No. 2, September 2021

The newsletter of the INFORMS Decision Analysis Society

Inside:

President’s Letter -----1	Upcoming Conferences -----12	DA Practice -----21
In Memoriam of Peter Fishburn -----4	Award Announcements -----12	Teaching DA -----23
Peter Fishburn: Ahead of His Time -4	DA Journal Articles in Advance -----14	Editorial Team -----26
Letter from the Editor -----6	Book Announcement -----16	DAS Officers and Council -----27
Nominations for DAS Positions -----7	Research -----17	

President’s Letter



Dear DAS colleagues and friends,

I hope this President’s message finds you well and safe. When writing the January letter, we had hopes that the situation of the pandemic would improve by the summer, allowing us to have more in person rather than virtual meetings. Unfortunately, we are still in an unclear state, but I hope and wish we will be able to come back to an almost normal life in the next months and thus to be able to meet in person soon, if not at the Annual Meeting at the Advances in Decision Analysis conference in June 2022.

I wish to open the newsletter with the DAS homage to **Peter Fishburn**, who sadly passed away on June 10th, 2021. It is difficult to express in a few paragraphs the immense Decision Analysis Society gratitude and affection to Peter. We thank him for his invaluable contributions to decision analysis and the management sciences. Peter has been an icon and a giant of our field. Not only he has been one of the first Ramsey medalists, but a von Neumann prize awardee as well. His scientific interests have been vast, and he was a pioneer in several fields, from multicriteria analysis to mathematical psychology. The Scopus database records 373 of his papers, published in a time series from 1966 to 2015, in journals that range from Management Science, Operations Research, European Journal of Operational Research, Journal of Risk and Uncertainty, Mathematics of Operations Research, Theory and Decision to the SIAM Journal on Discrete Mathematics. His book “Utility theory for decision making” counts over 4500 citations in Google Scholar as of August 2021. He has paved the way for research of several new generations of researchers in Decision Analysis.



To honor and remember Peter, the DAS society is organizing a panel in his memory during the incoming 2021 INFORMS Annual Meeting. The session title is **Peter C. Fishburn Memorial Panel**. It will be a hybrid session, so that you will be able to attend either in presence or virtually. I thank **L. Robin Keller** for her availability and work in organizing the panel, as well as the speakers, **David Bell**, Harvard, **James Dyer**, Univ. of Texas, **Ralph Keeney**, Duke, **Rakesh Sarin**, UCLA and **Peter Wakker**, Erasmus. This panel will allow us to hear from colleagues who have known and worked with Dr. Fishburn, and is an invaluable occasion to get to know more not only about his professional achievements, but also about his great personality and humanity.

Let me also give a warm thank you to David Bell and Jim Dyer for their touching notes on their collaboration with Peter which are to appear in this newsletter - just next to this letter.

Here you find the links to a call in the Journal of Mathematical Psychology for a [Special Issue in Honor of Peter Fishburn](#), and to the [guestbook](#), where also other colleagues have posted memories.

The Peter C. Fishburn Memorial Panel is just one of the events that our society plans for remembering Peter's memory. Also, if you have additional thoughts and proposals, feel free to reach out to the DAS leadership.

As mentioned, the Peter Fishburn Memorial Panel will take place within the annual meeting of INFORMS, on October 24-27, 2021. Let me thank **Jonathan Welburn** and **Eric Specking** for their great work as co-chairs of the DAS tracks for the INFORMS 2021 Annual Meeting. This edition has been particularly challenging from the organizational viewpoint, with sessions that could be in person, hybrid or virtual. Given the present uncertainty and the impossibility of several of our members to travel, the society business meetings as well as the award sessions will be virtual, to allow for a broad participation.

It has been an intense first part of the year for the DAS community and we have a series of items I'd like to talk to you about.

1. Webinars. We have had three wonderful webinars, with **David Bell**, **Manel Baucells** and **Yan Chen**. In the fall, we have two exciting webinars, with **Galit Shmueli** in early October, and **Iliia Tsetlin**, on December 2nd. The recordings and the links to the new webinars are available online at <https://connect.informs.org/das/events/webinars>.

2. Events. In June 2021, we hosted a joint virtual mini-Conference on Emerging Risks with the Society of Risk Analysis. The event has been great success and invaluable occasion to learn about topical subjects for research and practice in decision and risk analysis. Recordings of this mini-conference will also be available soon. We will send you the links via our mailing list. Let me again express my thanks to Kara Morgan for her organizational efforts and hard work on this event. Looking a bit further in the future, our Advances in Decision Analysis Society Conference, ADA 2022, will take place in June 2022. It will be hosted in the Darden School of Business facility in Washington DC. Thanks to **Yael** and **Manel** for chairing the organizing committee of ADA 2022!

3. Awards. As per our tradition, the work on the awards has proceeded steadily. Special thanks go to **Jay Simon** and **Richard John**, for their work on the DAS Best Publication Award. Together with the team of judges they were able to select wonderful winners and runners up. A great work has been done also by **Asa Palley** and **Mehmet Ayvaci** for the DAS Best Student paper award. A big thank also to **Valentina Ferretti**, **Gilberto Montibeller** and **Nadia Papamichail** (DAS), and **Jay Andersen** (Society of Decision Professionals) for bringing forward the DAS-SDP practice award in these not easy pandemic times. Also, a very warm thank you to **Karen Jenni** for her work on the Ramsey Medal award. A warm congratulation to all winners for their outstanding work in Decision Analysis!

4. Elections. It is now time to cast your vote! In September, we will run elections for 2 council positions. Let me welcome all our candidates and thank them for their willingness to participate in these elections. A very special thank you to **Valentina Ferretti** and **Andrea Hupman** for their three-year service in our Council in the period 2018-2021. You will find the candidate bios and more information on the elections in the dedicated section of this newsletter.

Let me also mention that this newsletter will host a novelty, a research column held by a PhD student. This is an innovation introduced by our newsletter editor in chief (thank you Andrea)!

October is just one month away and quite a few occasions are unfolding to interact with the DAS community and nurture our passion for decision analysis. Let us hope to be able to meet virtually at our incoming webinars or in person at the next INFORMS Annual Meeting!

Please feel free to reach the DAS leadership out for any initiative you wish to signal to us. I take the occasion to wish you and your families a safe and serene fall 2021,

Emanuele

Prof. Emanuele Borgonovo (PhD, MIT)
DAS President 2020-2022
Department of Decision Sciences, Bocconi University, Milan, Italy

In Memoriam of Peter Fishburn

By David Bell

In addition to being a really nice person, Peter Fishburn was one of the giants of Decision Analysis. He already had that distinction by the time I was a graduate student in the early 1970's. I referred to his book regularly and with some trepidation, since it was so authoritative and, well, succinct. In the 1990's Peter suggested a topic that we could work together on, and so we did. Peter sent a rough draft (by mail, everything was by mail) and I then spent a few weeks working on it, having my version typed, and finally sending it back to him. A few days later I would receive an extensively reworked manuscript. Then I worked for a few weeks on the next draft.... And so it went. We published three papers together in the next few years –never meeting in person, never talking on the phone – we were working remotely before it was a thing. Peter was so productive I used to claim that it would take me all my time just to read his publications as they came out.

I have described the early days of the Decision Analysis Society when we came up with the idea of the Ramsey Medal, designed to add luster to the field. We decided that each a year a panel of luminaries would select someone for the award. However, we also realized that the choice of the first few winners might be problematic for our field if they proved contentious. As part of the Ramsey Medal launch in 1985 we selected at the outset the first three winners: Howard Raiffa, Ron Howard and Peter Fishburn. My view of the wisdom of our choice is unchanged.

Peter Fishburn: Ahead of His Time

By Jim Dyer

Jim Smith and I recently wrote a paper that summarized the role of *Management Science* in stimulating research and applications in the field of decision analysis. As a part of that effort, I took a trip down memory lane, to use the old cliché, and thought about the papers and the people who had influenced me and my career in decision analysis.

I was fortunate to have entered this field when it was very young. I graduated from the PhD program in management science from The University of Texas at Austin in 1969. My dissertation explored the optimal way to expand the higher education system in Texas based on multiple objectives. Neither my advisor or I were aware of work being done on decision making with multiple criteria almost contemporaneously by several scholars, most notably Peter Fishburn, so I used ad hoc ideas in search of a theory.

As an assistant professor at UCLA I was fortunate have an office two doors down the hall from Jacob Marschak who did foundational work in utility theory published mostly in journals in economics. Other colleagues introduced me to work by Ron Howard and Howard Raiffa, and I heard about a relatively new field that was called “decision analysis”. I also had the good fortune to become involved in some efforts to apply decision analysis to some real problems with multiple objectives.

Searching the literature (by going to the “stacks” in the library and looking up references from other papers), I finally discovered the theory that I had been missing. One key reference was the Rand Memorandum (RM) by Howard Raiffa published in 1969 (see Raiffa (1969) and Dyer (2008)) that contained a very rigorous but accessible discussion of multiattribute utility theory. This RM cited a paper by Fishburn (1965) that appeared in *Operations Research* and that included the key “marginality conditions” that justified the use of an additive utility function for modelling preferences over multiple objectives. In fact, five of Raiffa’s thirteen references in the RM were papers by Fishburn. I soon found other papers by Fishburn that reviewed methods for assessing additive utility functions (Fishburn 1967), a comprehensive review of utility theory (Fishburn 1968) and others.

In the early 1970’s I was asked to assist a project manager at the Jet Propulsion Laboratory (JPL), Ralph Miles, in developing a decision-making scheme for selecting trajectories for the two Voyager spacecraft that were launched in 1977 and continue to stream information about the outer regions of the solar system today. As part of this effort, Ralph asked me to teach a short course on utility theory to engineers at JPL over several weeks. Searching for a book, we settled on Fishburn’s *Mathematics of Decision Making* (1972) which was comprehensive and challenging in terms of its mathematical sophistication. Years later, I was reminded, that when one of my bright PhD students was working on new theories regarding utility theory, I would say to him, “That’s nice, but look in the green book to be sure it wasn’t done years ago.” The “green book,” of course, was Fishburn (1972), and many times we discovered or rediscovered the ideas that were already there.

One of my mentor’s at UCLA once made the comment about another scholar that the gentleman was “too prolific to be profound.” Over time I came to appreciate that adage, but there are a few exceptions and Peter Fishburn was certainly one of them. He was both a prolific scholar and very profound.

Peter Fishburn was a pioneer in utility theory. He laid a foundation for work in utility theory that is still valuable to mine today. He was also a genuinely nice man who was always ready to answer a question or to provide advice to a young faculty member. I was fortunate to know him, and to benefit from his many contributions.

References

- Dyer, J., “Personal Reflections on the Impact of ‘Preferences for Multiattributed Alternatives’ RM-5868”, *Journal of Multi-Criteria Decision Analysis*, Volume 14 Issue 4-6. July - December 2006 (Note: Actually published in 2008) (113-200).
- Fishburn, P.C., “Independence in Utility Theory with Whole Product Sets,” *Operations Research*, 13, 1965, pp. 28-45.
- Fishburn, P.C., *Mathematics of Decision Theory*, De Gruyter Mouton, 1972.
- Fishburn, P.C., “Methods of Estimating Additive Utilities”, *Management Science*, Vol. 13, No.7, 1967.
- Fishburn, P.C., “Utility Theory”, *Management Science*, Vol.14, No. 5, Theory Series: 1968.
- Raiffa, H., *Preferences for Multi-attributed Alternatives*, Memorandum RM-5868-DOT/RC, April 1969.

Letter from the Editor

Dear reader,

I hope this newsletter finds you and your loved ones safe and well as we continue to live in challenging times. The twists and turns of this pandemic seem to be a reminder of the pervasiveness of uncertainty in our lives. As decision analysts, we perhaps are more aware than most that we cannot know with certainty what will happen, yet we do not let that stop us from making the best decisions possible at the time. With that said, I am glad you have made the good decision to read this edition of the newsletter. There are many thoughtful columns and important society notices.

The newsletter has begun with an homage to Peter Fishburn. I wish to thank Emanuele Borgonovo for the nice introduction in the President's Letter and to thank David Bell and Jim Dyer for each writing an homage to Peter with details of their experience with him and with details of Peter's contributions to the field. We are all the beneficiaries of his legacy.

This newsletter also includes candidate statements for upcoming DAS Council elections. The society is fortunate to have five outstanding candidates in this election that will select the next two Council members. The strength of the field is a reflection of the strength of the community.

It is always a pleasure to share good news with you, and this newsletter has several award announcements. I wish to congratulate the winners of the DAS Publication Award, Asa Palley and Jack Soll, for their paper "Extracting the Wisdom of Crowds When Information is Shared." Congratulations are also extended to the runners-up for the award, Y. Fan, D. Budescu, D. Mandel, and M. Himmelstein for their paper, "Improving Accuracy by Coherence Weighting of Direct and Ratio Probability Judgments," and R. Winkler, Y. Grushka-Cockayne, K. Lichtendahl, and V. Richmond Jose for their paper, "Probability Forecasts and Their Combination: A Research Perspective."

I wish to congratulate the winner of the DAS Student Paper Award, Nicolò Bertani, for the paper "Fast and Simple Adaptive Elicitations: Experimental Test for Probability Weighting", co-authored with A. Boukhatem, E. Diecidue, P. Perny and P. Viappiani. Congratulations are also extended to the two runners-up, Zahra Mobini and Asher Lawson.

The newsletter also has the pleasure of sharing the three finalists for the DAS/SDP Practice Award: (i) J.R. Giacon, G. Martins and K. Santos, "Optimum Supply: e-procurement decision analysis platform to maximize the value of strategic sourcing choices," (ii) L. Ekenberg, A. Mihai, N. Komendantova, T. Fasth, M. Danielson, and A. Al-Salaymeh, "Mitigating Cognitive and Behavioural Biases during Pandemic Responses: Evidence-based Methodologies for the Development of Epidemic Combating Policies," and (iii) S. Bansal and G. Gutierrez, "Use of Judgmental Forecasts with Expert Heterogeneity to Support Biofuel Jet Fuels in a Federal Aviation Administration Program."

This issue includes three excellent columns. The Research Column was authored by column guest editor Tim McDonald, a PhD student at the Pardee RAND Graduate School; the column discusses insightful questions about policy analysis. Pat Leach examines the challenge of balancing objectives related to the environment in the DA Practice Column. Johannes Siebert, the Teaching DA guest column editor, summarizes research showing that decision skills improve lives and can be taught.

I thank all contributors to this newsletter. This newsletter would not be possible without their efforts.

Best regards,
Andrea Hupman
University of Missouri-St. Louis

Nominations for DAS Positions

Candidates for DAS Council

Cameron Mackenzie



Position Statement: I am honored to be nominated for the Decision Analysis Society (DAS) council. My main involvement with DAS was as a co-editor with Debarun Bhattacharjya of the *Decision Analysis Today* newsletter from 2016-2020. It was an enjoyable experience reading and editing the different columns in the newsletter. It is fascinating to see all the different touchpoints that the decision analysis community has throughout the world. I am especially proud of the in memoriam columns for Howard Raiffa and Rex Brown that the newsletter produced. I want to thank all the column editors and writers for their excellent contributions to the newsletter.

I have held leadership positions with the Junior Faculty Interest Group at INFORMS, two different specialty groups in the Society for Risk Analysis, and in the Engineering Economy Division of the Institute for Industrial and Systems Engineers. These types of volunteer organizations have taught me that it is best to identify a couple of priorities and work to achieve those priorities.

If elected to the DAS Council, I will work to support the president's goals and current initiatives to ensure that the good work that DAS has been doing continues and progresses. For example, I fully support the recent initiatives to retain and attract mid-career professionals to the society. Excellent work has been undertaken in recent years to identify why some mid-career professionals fall away from DAS and what we could do to keep their interest. Implementing the initiatives that have been discussed at the recent council meetings is one of my top priorities.

Another strong interest of mine is to make sure DAS has an adequate presence on social media. Are we communicating and engaging with our members in the best way? This interest derives from my experience with the newsletter. Understanding how best to push information to DAS members that is useful and interesting to them and how they can be engaged with DAS beyond attending the annual conference is an important undertaking.

Short Bio: Cameron MacKenzie is an assistant professor in the Industrial and Manufacturing Systems Engineering Department at Iowa State University. He teaches graduate courses in Decision Analysis and Engineering Risk Analysis and undergraduate courses in Stochastic Modeling Analysis and Simulation and Engineering Economic Analysis.

Cameron's research focuses on decision and risk analysis, with three main thrusts: (i) homeland security and emergency management, (ii) engineering design and manufacturing, and (iii) supply chain risk management. He worked with Professor Eva Regnier on designing a web-based simulation tool to help the U.S. Marines Reserve Forces practice making decisions in advance of a hurricane. Before coming to Iowa State, he was an assistant professor in the Defense Resources Management Institute at the Naval Postgraduate School, and he previously consulted in the areas of defense and homeland security for former Defense Secretary William Cohen. He received his BS and BA from Indiana-Purdue University at

Fort Wayne, an MA in International Affairs from The George Washington University, an MS in Management Science & Engineering from Stanford University, and a PhD in Industrial Engineering from the University of Oklahoma.

Gilberto Montibeller



Dear DAS colleagues,

It would be an honor and a pleasure to continue supporting our society to thrive in its mission to promote decision analysis research and enhance decision analysis practice.

In recent years I have been deeply involved in many DAS activities and initiative, as Associate Editor of the Decision Analysis journal, as a committee member of DAS awards, and in promoting DAS within the Society of Decision Professionals.

I would strive to bring to the DAS council the strategic aims that I have been pursuing for DAS over the last few years:

- further increase the intellectual diversity and international reach of the society;
- create stronger links between DAS academics and DA practice;
- and help DAS to further extend its impact and outreach for important societal decision problems.

Thank you for considering my name for the DAS council.

Short Bio: Gilberto Montibeller is Professor of Management Science and Director of Executive Education at Loughborough University (England) and a Senior Research Fellow at the University of Southern California (USA).

Gilberto is an expert in behavioral decision analysis and multi-criteria decision analysis. He is Associate Editor of the INFORMS Decision Analysis journal. He has published widely in decision sciences, authoring or co-authoring more than 50 peer reviewed articles and book chapters. The quality of his research has been recognized by best publications awards from the INFORMS Decision Analysis Society, the Society for Risk Analysis, and the International Society on Multi-Criteria Decision Making.

He has been a visiting scholar at the Massachusetts Institute of Technology (MIT), the International Institute for Applied Systems Analysis (IIASA, Austria), and CNRS Lamsade at Paris Dauphine University (France).

His main areas of application are security decision analysis and health risk management, having led projects for the World Health Organization, Pan-American Health Organization, UK Department for Environment, Health and Rural Affairs (DEFRA), UK Department of Health, the Food and Agriculture Organization of the United Nations (FAO), USAID, among others.



Nadia Papamichail

I am delighted and honored to be nominated as a candidate for the Decision Analysis Society Council. Thank you to the nominating committee for the opportunity.

I was first introduced to the discipline after taking a decision analysis course by Prof Simon French, Ramsey Medal Winner. I feel privileged that I went on to complete a PhD under his supervision. Reading Ralph Keeney's decision analysis papers and writing a book on 'Decision Behaviour, Analysis and Support' with Simon French have been significant developmental events in my career.

I first joined DAS as a student, and I have been thoroughly enjoying being part of the DAS family of supportive and engaging members. As decision analysts, educators, professionals and practitioners we help others to frame decision opportunities and problems. In the era of data science and Artificial Intelligence, we are now given an opportunity to re-position ourselves. As members of DAS, we are well-placed to re-frame, articulate and disseminate the valuable contributions that we make to our communities.

I am committed to the development of research students and early-career researchers as well as the establishment of mentoring schemes for the development of decision professionals and decision analysis scholars and teachers. I am engaged in delivering impactful research and I have received several research grants to work with companies in the telecom and legal services sector.

Over the years, I have enthusiastically attended INFORMS meetings and ADA (Advances in Decision Analysis) Conferences. I am always keen on reaching diverse communities and I have recently joined the Society of Decision Professionals (SDP) Learning Exchange Program Committee as DAS representative. I am particularly pleased to co-chair this year's DAS Practice Award committee.

My goals, if elected as a council member, are (1) to promote the discipline of decision analysis by growing awareness and supporting DAS related conference activities and journals, (2) to extend the reach and appeal of DAS to other communities across geographic and discipline boundaries by linking DAS to other professional societies, and (3) to foster the mentoring and career development of decision analysis academics and practitioners by setting up seminars and workshops.

Short Bio: Nadia Papamichail is Associate Professor of Information and Decision Systems at the University of Manchester and a Fellow of the Alan Turing Institute, the leading UK national institute for data science and artificial intelligence. Her research falls broadly under the themes of decision analysis, behaviour and support. Her latest work aims to develop explainable decision analytic tools.

Nadia is committed to providing long-term service to OR and Analytics communities. She is the Chair of DASIG (Decision Analysis Subject Interest Group), that runs under the auspices of the UK Operational Society, and a committee member of WORAN (Women in OR and Analytics), where she leads a brief for setting up a mentoring scheme. She has been elected as Secretary/Treasurer of the INFORMS MCDM (Multi-criteria Decision Making) Section. She has joined the SDP Learning Exchange Program Committee as DAS representative to help shape the prestigious and popular SDP webinar series by offering a DAS perspective. She is co-Chair of this year's DAS Practice Award committee and co-organiser of the DAS Practice Award 2021 session.



Jonathan Welburn

Position statement: I am honored to be nominated as a Decision Analysis Society council member. Over the past decade I have been attending the INFORMS annual conference, first as a student, now as a RAND researcher. From my first annual conference, to my first Advances in Decision Analysis conference, to my first virtual INFORMS, I have enjoyed connecting the names on my favorite papers to faces, attending talks, and getting to know the members of the DAS community. Over the past two years I have found ways to become more involved in the Society. In 2019 I joined the *Decision Analysis* editorial board, in 2020 I served as the DAS cluster co-chair at INFORMS, and 2021 I am chairing the DAS cluster at INFORMS. Each opportunity has been a learning experience, and a blast.

Decision Analysis has an incredible legacy of tackling truly hard problems with implementable solutions. That legacy cuts across disciplines, universities, industry, policy (and organizations like RAND that fit somewhere in between). Given an opportunity to become a council member, I would be excited to help continue and even strengthen this legacy by promoting inclusivity, diversity in membership and in research, academic-practitioner partnerships, and promoting students that represent the next generation of DA scholarship. To do so, I intend to seek out opportunities for engaging students, the broader public, and policy makers about uses of decision analysis through social and traditional media.

Short Bio: Jonathan Welburn is an operations researcher at the RAND Corporation. He received his PhD in decision science and operations research and his BSc in Industrial & Systems Engineering and in Economics, each from the University of Wisconsin – Madison. Jonathan is also on the faculty at the Pardee RAND Graduate School where he teaches public policy PhD students and leads the digital gaming group within the school's Tech + Narrative Lab. His research uses methods from decision analysis, risk analysis, game theory, and economics to study systemic risks in economic systems, supply chain risks, cyber risks, and cyber deterrence. In addition to publishing his work in academic journals and in RAND reports, Jonathan has written about his research findings for national media outlets including the Wall Street Journal, CNN Business and, most recently, Defense One. Jonathan has been a session chair at several INFORMS conferences and is the current cluster chair for DAS at the 2021 annual conference



Onesun Steve Yoo

Position statement: I am honored and excited to be nominated for a position in the Decision Analysis Society Council. I have been a member of the DAS for over 10 years. Throughout the years I have benefited a lot by the community, and in particular, from many of its key members through their direct and indirect mentorship and support. The community promotes diverse interests and methodological backgrounds and have been a solid anchor for me to broaden my views and evolve as a researcher. I would be happy and eager to pay back and serve the community.

My goals as a council member are to promote (1) Decision Analysis journal and other high quality publications of our members, (2) conference activities, including the Advances in Decision Analysis conferences and the DA sessions at INFORMS conferences, and (3) practice-based research within DAS.

Short Bio: Onesun Steve Yoo is an Associate Professor in the Operations & Technology and Marketing & Analytics groups at the UCL School of Management, University College London, UK. Steve's research interest lies in examining key decisions of firms pushing innovative products or services to market. His research examines decisions concerning its various stakeholders (e.g., consumers, partners, competitors), and present various operational and marketing insights for firms.

Steve's research has been published in leading academic management journals such as *Decision Analysis*, *Marketing Science*, *Operations Research*, *Manufacturing & Service Operations Management*, and has been featured in key media outlets including the *Wall Street Journal*, and *BBC Capital*.

He received a Ph.D. in Decisions, Operations, and Technology Management from UCLA Anderson School of Management, an MS in Electrical Engineering from UCLA, and BS in Electrical Engineering and Computer Science and BA in Applied Mathematics from UC Berkeley.

Upcoming Conferences & Workshops

September 20-24, 2021

3rd Behavioural OR Summer School,
Association of European OR Societies

Online

<https://euro-online.org/websites/bor/bor-summer-school/>

October 24-27, 2021

INFORMS Annual Meeting
Anaheim, California

<http://meetings2.informs.org/wordpress/anaheim2021/>

November 17-20, 2021

Decision Sciences Institute Annual Meeting
Virtual Conference

<https://decisionsciences.org/annual-conferences/national-dsi>

December 5-9, 2021

Society for Risk Analysis Annual Meeting
Washington, D.C.

<https://www.sra.org/event/2021-sra-annual-meeting/>

December 12-15, 2021

Winter Simulation Conference
Desert Ridge, Arizona

<http://meetings2.informs.org/wordpress/wsc2021/>

April 3-5, 2022

INFORMS Business Analytics Conference
Houston, TX

<http://meetings2.informs.org/wordpress/analytics2022/>

Award Announcements

DAS Publication Award

The Decision Analysis Society Publication Award is a prestigious award given annually to the best decision analysis journal article or book published in the second preceding calendar year, in this case 2019, as judged by an award committee. The award includes an honorarium of \$750 and a plaque. The committee this year included Richard John (Co-Chair), Jay Simon (Co-Chair), Elisa Long, Gilberto Montibeller, and Victor Jose (for the first two rounds of evaluation).

The committee considered an outstanding set of 26 nominated papers on a wide variety of topics. It is our pleasure to congratulate the winner of this year's DAS Publication Award:

Palley, A. B., & Soll, J. B. (2019). Extracting the wisdom of crowds when information is shared. *Management Science*, **65**(5), 2291-2309.

The committee would also like to recognize two finalists for the award:

Fan, Y., Budescu, D. V., Mandel, D., & Himmelstein, M. (2019). Improving accuracy by coherence weighting of direct and ratio probability judgments. *Decision Analysis*, **16**(3), 197-217.

and

Winkler, R. L., Grushka-Cockayne, Y., Lichtendahl Jr, K. C., & Jose, V. R. R. (2019). Probability forecasts and their combination: A research perspective. *Decision Analysis*, **16**(4), 239-260.

Sincerely,
Richard John and Jay Simon

DAS Student Paper Award

The Decision Analysis Society Student Paper Award is given annually to the best decision analysis paper by a student author, as judged by an award selection committee. The award is accompanied by a plaque and a \$500 honorarium. The committee this year included Qiushi Chen, Mavis Wang, Saša Zorc, Xiaojia Guo, Mehmet Ayvaci (Co-Chair, later replaced by Saša Zorc), and Asa Palley (Co-Chair). We received 28 excellent submissions this year, encompassing a diverse set of topics.

It is our pleasure to congratulate the winner of the 2021 award:

Nicolò Bertani, for the paper "*Fast and Simple Adaptive Elicitations: Experimental Test for Probability Weighting*", co-authored with Abdellah Boukhatem, Enrico Diecidue, Patrice Perny and Paolo Viappiani.

The committee would also like to recognize two papers as finalists for the 2021 award:

Zahra Mobini, for "*To Catch A Killer: A Data-Driven Personalized and Compliance-Aware Sepsis Alert System*", co-authored with Mehmet Ayvaci and Özalp Özer.

and

Asher Lawson, for "*Comparing fast thinking and slow thinking: The relative benefits of interventions, individual differences, and inferential rules*", co-authored with Rick Larrick and Jack Soll.

We would also like to extend special thanks to Qiushi Chen, Mavis Wang, Saša Zorc, and Xiaojia Guo for their service on the committee this year.

Sincerely,

Asa Palley
Assistant Professor, Operations & Decision Technologies
Kelley School of Business, Indiana University
Email: apalley@indiana.edu

Mehmet Ayvaci
Associate Professor, Information Systems
Jindal School of Management, University of Texas at Dallas
Email: mehmet.ayvaci@utdallas.edu

DAS Practice Award Finalists

The Decision Analysis Practice Award is sponsored jointly by the Decision Analysis Society and the Society of Decision Professionals. It is given annually to the best decision analysis application, as judged by a panel of members of both Societies. The award includes a cash prize of \$750. The winner of the Practice Award is also invited to present their work at the Decision Analysis Affinity Group conference the following spring. The winner(s) will be announced during the INFORMS conference.

The finalists are:

Joice Ribeiro Giacon, Gustavo Martins and Kislán Santos, “Optimum Supply: e-procurement decision analysis platform to maximize the value of strategic sourcing choices”.

Love Ekenberg, Adriana Mihai, Nadejda Komendantova, Tobias Fasth, Mats Danielson, and Ahmed Al-Salaymeh, “Mitigating Cognitive and Behavioural Biases during Pandemic Responses: Evidence-based Methodologies for the Development of Epidemic Combating Policies”

Saurabh Bansal and Genaro Gutierrez, “Use of Judgmental Forecasts with Expert Heterogeneity to Support Biofuel Jet Fuels in a Federal Aviation Administration Program”

The members of the 2021 DA Practice Award Committee: Jay Andersen, Valentina Ferretti, Jeffrey Keisler, Carol Liffman, Gilberto Montibeller and Nadia Papamichail.

Decision Analysis Articles in Advance

Decision Analysis Journal – Articles in Advance

On (Measurable) Multiattribute Value Functions: An Expository Argument

James E. Smith, James S. Dyer

Published Online: August 6, 2021

In this note, we provide an easy-to-understand introduction to strength-of-preference measures in the context of deterministic multiattribute value assessments, focusing on what they are and why they matter. Though these issues are well understood by some ...

<https://doi.org/10.1287/deca.2021.0435>

Microfoundations of Discounting

Alexander Adamou, Yonatan Berman, Diomides Mavroyiannis, Ole Peters

Published Online: August 6, 2021

An important question in economics is how people choose between different payments in the future. The classical normative model predicts that a decision maker discounts a later payment relative to an earlier one by an exponential function of the time ...

<https://doi.org/10.1287/deca.2021.0436>

Decision Analysis Journal – September 2021

Scoring Probability Forecasts by a User's Bets Against a Market Consensus

David Johnstone , Stewart Jones , Oliver Jones , Steve Tulig

Published Online: June 14, 2020

The purpose of our paper is to describe a probability scoring rule that reflects the economic performance of a hypothetical investor who acts upon the probability forecasts emanating from a given model or human expert by trading against a market-clearing ...

<https://doi.org/10.1287/deca.2020.0424>

Adversarial Risk Analysis for Auctions Using Mirror Equilibrium and Bayes Nash Equilibrium

Muhammad Ejaz , Stephen Joe , Chaitanya Joshi

Published Online: July 16, 2021

In this paper, we use the adversarial risk analysis (ARA) methodology to model first-price sealed-bid auctions under quite realistic assumptions. We extend prior work to find ARA solutions for mirror equilibrium and Bayes Nash equilibrium solution ...

<https://doi.org/10.1287/deca.2021.0425>

Statistical Process Control for the Number of Defectives with Limited Memory

Barry Cobb

Published Online: June 15, 2021

A limited memory influence diagram model is utilized for statistical process control in a system where qualitative data on the number of defectives in a sample is available in each period of a finite production horizon. Based on the number of defective ...

<https://doi.org/10.1287/deca.2021.0431>

Sequential Shortest Path Interdiction with Incomplete Information and Limited Feedback

Jing Yang, Juan S. Borrero, Oleg A. Prokopyev, Denis Sauré

Published Online: August 19, 2021

We study sequential shortest path interdiction, where in each period an interdictor with incomplete knowledge of the arc costs blocks at most k arcs, and an evader with complete knowledge about the costs traverses a shortest path between two fixed nodes ...

<https://doi.org/10.1287/deca.2021.0426>

Attention 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 membership dues.

The DAS is a subdivision of INFORMS.

For information on DAS: <https://www.informs.org/Community/DAS>

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 5521 Research Park Drive, Suite 200, Catonsville, Maryland 21228. Please visit our website at <http://pubsonline.informs.org/journal/deca>.

Book Announcement

Expert Judgement in Risk and Decision Analysis

Edited by Anca M. Hanea, Gabriela F. Nane, Tim Bedford and Simon French. Vol 293 in International Series in Operations Research & Management Science. 2021. Springer. 6330 Cham, Switzerland. DOI: 10.1007/978-3-030-46474-5

A Festschrift for Roger Cooke.

In the early 1980s, Roger Cooke began to work on how to incorporate often disparate expert judgements of uncertainty into risk analyses. He developed the Classical Method, which has become one of the most used methods of combining such expert judgements. Moreover, over the past four decades he has led many expert judgement studies and complex risk analyses. This book is a festschrift in his honour. It grew from a European Union *Co-operation in Science and Technology* (COST) Network which sought to summarise the state of the art in the use of structured expert judgement within risk and decision analysis, and more importantly, perhaps, to stimulate new applications of expert judgement studies in new domains. Its aimed to create a multidisciplinary network of scientists and policymakers using structured expert judgement to quantify uncertainty for evidence-based decisions, and hence improve effectiveness in the use of science knowledge by policymakers. Roger was part of the network, as were we and many other of Roger's colleagues and past students. The final conference of the network celebrated his career, as well as reported on the success of the network. This book grew from that conference. It is a small token of the esteem in which we hold Roger.

As well as many journal articles, the network published two books. Our sister volume¹, Dias et al (2018), summarised the state of the art at the outset of the network.

Anca Hanea
Gabriela Nane
Tim Bedford
Simon French

¹ Luis C. Dias, Alec Morton, John Quigley (editors) *Elicitation: The Science and Art of Structuring Judgement* Vol 261 in International Series in Operations Research & Management Science. 2018. Springer. 6330 Cham, Switzerland. DOI: 10.1007/978-3-319-65052-4

Research



Policy Analysis for Improving the Performance of Large Social Systems

Guest Column Editor: Tim McDonald, Pardee RAND Graduate School

Since their emergence in the years following World War II, the then-new fields of systems and (later) policy analysis have evolved and matured, helping make the world more stable, secure, and prosperous by informing and improving decision-making in areas of public policy. In this time systems analysis, which had its origins in technical and then operations systems, expanded its scope to include the broader context within which a system is embedded, and encompass large social systems such as the health care system, the education system, and many more.²

More recently, the ongoing disruptions created by the COVID-19 pandemic and our faulty national response have cast in sharp relief the challenges facing policy analysts and leaders when trying to address systemic problems. Together with growing popular unrest around racial and economic justice, political polarization and extremism, the persistent under performance of important social systems like education and healthcare, and concerns about our ability to effectively compete with rising powers, these events are creating an inflection point for those concerned with improving public policy. Our open, democratic systems have historically demonstrated extraordinary capacity for facilitating individual and societal growth and freedom, but they can also become frustrated, and slow and difficult to change when problems become pressing.

How should policy analysis respond to such systemic challenges? Policy analysts commonly understand that problems have deeper causes, but practitioners and scholars have struggled with how to get traction on complex, systemic challenges – particularly how to effect system redesign. For decision makers who are often the audience for analyses, the near-term dominates; events are being thrust at them, and there are problems to solve today. Systemic problems often require long-term solutions, but of all phrases that scare a politician, one surely is “long term.” They need results, today.

Even so, analysts have a remarkable opportunity to have an impact on the most important problems today. In this column I raise three questions and provide some preliminary thoughts for discussion about how the scholarship and practice of policy analysis can contribute to addressing contemporary system challenges.

² From the earliest days scholars of systems and policy analysis argued for beginning analysis with a full view of the systemic context around a problem. Alain Enthoven has stated as a principle, “Always start with the grand totals,” the objectives. See Enthoven, Alain. *Ten Practical Principles for Policy and Program Analysis*. Benefit-Cost and Policy Analysis: An Aldine Annual. Chicago: Aldine. (1975)

Fisher, Walker, and Rich write about a steady expansion over time of the scope of analysis, to include the “context” within a problem is situated, including political, sociological, psychological, organizational, and distributional effects.” See Fisher, Gene, and Warren Walker, Michael Rich. RAND Corporation entry in *Encyclopedia of Operations Research and Management Science*. (2013)

How can an analyst recognize when system redesign needs to occur?

System redesign is necessary when problem-solving strategies are no longer sufficient to achieve policy objectives, and some deeper, more fundamental change to the architecture or functioning of a system is required. There are indicators when this may need to occur. The first is when performance of a system is regularly inconsistent with its ostensible goals. The healthcare system focuses on treating illness (and at high cost), instead improving health (and doing so efficiently). The education system provides universal access for all students, but not universal high achievement. The United States leads the world in incarceration yet still has the highest levels of crime. In each of these situations the performance of the system deviates from, and in too many cases actively opposes, what most consider the policy goals for the system.³

A second, related indicator for the need for system transformation is when a problem keeps recurring despite seemingly best efforts, indicating some persistent underlying cause that is being overlooked and left unaddressed. The rising costs of healthcare and lack of a relationship between cost and quality indicate the healthcare system is very inefficient. Decades of policy efforts have had limited or no effect, indicating that a more fundamental diagnosis of the cause of the system's problems needs to be made.

A third indicator that some redesign of a system may need to occur is when problems defy a singular solution. These often arise from the complexity sciences call *complex adaptive systems (CAS)*. Such systems are complex because they have multiple, often many, interconnected parts, with non-linear and often surprising behaviors. They are adaptive because the individuals or organizations within them are continually changing their behaviors in response to changes occurring within their environment and their own internal makeup. When addressing a problem within a CAS, it's possible that an intervention in one area can lead to adaptation elsewhere in the system (or, commonly and to the frustration of many, no change at all or change for the worse).

What is the role of incrementalism in changing large systems?

When confronted with a large-scale systemic challenge, it can be tempting to call for comprehensive change, or a total overhaul – looking for a big bang, like the New Deal or Affordable Care Act. But these openings, important as they are, are very rare. They are also, despite their broad and impressive scope, usually the culmination of many more incremental and less visible efforts.

Despite its negative connotation, there are many important roles for incrementalism. It may occur as part of *continuous system improvement*, the challenging and often critical work of improving the function of a system. It may be used to *address problems*, as part of “treating the symptoms” of underlying systemic issues. It may be used to *perfect a piece of the system*, by isolating and focusing on one piece – what one analyst has affectionately called “tail strut analysis.”⁴ It could also be used for the less productive task of *work avoidance*, whether intentionally or otherwise working away from the heart of the problem. Or, it could be used to *survive another day*, taking a smaller step that is feasible in the moment, practically or politically.

These are the more common types of incrementalism. Their drawbacks are that they do not necessarily lead to – and may even work against – system change, and if they do not address the underlying causes of

³ A discussion of the relationships between education and crime can be found in Autry, Fayola. "Education, Medication and Incarceration; No Child Left Behind and the School to Prison Pipeline. CreateSpace Independent Publishing Platform. 2015.

⁴ An interesting discussion of this concept, and a broader theory of “Large System Architecture” can be found, in McClure, Walter, “Architecting Large Social Systems.” *Center for Policy Design Press*. 2016.

problems, they may be inefficient interventions. Three more forms of incrementalism are more favorable for system redesign:

The first is *incrementalism to work toward a larger aggregate change*, for example the creation of quality measurement for healthcare services. Beginning in the 1980's streams of efforts over decades, aided by researchers, practitioners, industry, foundations, and government developed the science, technology, and culture of quality measurement in healthcare services. This extraordinary feat – a continual work in progress – has enabled improvements to care management and opened new avenues for incenting better care. The process of developing rigorous measures is incremental, challenging, and often unglamorous but taken in aggregate has created a new critical component to the healthcare system.

A second form of incrementalism for system change is *targeting a leverage point* that changes how a system evolves. For example, in the 1990's a series of reforms introduced school choice to the American public education system. Until that point school districts had little or no incentive to be responsive to the needs of students, as their enrollment was geographically assured. As students gained the ability to choose among surrounding school districts through open enrollment, or among independently chartered public schools, or to take higher education courses for high school credit, the dynamics in the system changed.

A third form of incremental intervention is *purposeful destabilizing*, anticipating, shaping, or otherwise initiating a societal tipping point to destabilize a system and shake loose established norms to facilitate change.⁵ Destabilizing a system may create openings for action on a leverage point. For example, Congress or the President build upon progress in electric vehicle technology to create strong consumer incentives and industry mandates for vehicle emissions, thus setting off a new urgency in the market. Or a municipality changes zoning policies in a neighborhood that precipitates transformation of the residential and business composition. Modeling can help provide insight for when tipping points may occur but have limits in the face system complexity and deep uncertainty.⁶

There are merits to these types of incrementalism. Often it is more politically viable than a comprehensive overhaul. Incrementalism may connect a change in a system to what came before, like how DNA evolves through a marginal change to existing structure. It may be rooted in important aspects of a group's culture, history, and legacy which can help secure sustainable change in politically palatable ways. For these reasons incrementalism is, as Alain Enthoven has observed, “one of the first laws of our democracy.”

The key is for the incrementalism to be pursuing a vision – specifically, a viable system redesign with structure and incentives that enable and reward the system for the performance society wants and selects against the current malperformance it does not want – so you aren't just drifting or responding to the nearest problem without a guiding diagnosis of its malperformance and guiding theory of action.

How do mindsets and skills of analysts need to change to work on systemic challenges?

To work on large-scale systemic challenges, the analyst may need to adopt both near-term and long-term mindsets. In the near-term, there are problems to solve, sponsors to be responsive to, and collaborators to

⁵ Robert Lempert has originated this concept.

⁶ The term *deep uncertainty* refers to “when parties to a decision do not know, or cannot agree on, the system model that relates action to consequences, the probability distributions to place over the inputs to these models, which consequences to consider and their relative importance.” See the Society for Decision Making Under Deep Uncertainty, at <https://www.deepuncertainty.org/>.

work with. The mindset and skills of analysts need to be re-imagined so they simultaneously solve near-term problems and lay the foundations for longer-term systemic effects.

The analyst's task is to adopt a longer-term, strategic, and more entrepreneurial mindset with respect to project scoping, clients and collaborators, data, funding, and dissemination. To do this, analysts will need to approach the fundamental steps of policy analysis differently. Rather than a discrete project, the analyst will need to scope for system redesign, which may be more of a campaign or series of projects and include helping broaden the vision of stakeholders and sponsors. The analyst will become more pro-active than re-active, and enterprising in first developing strategy for engaging collaborators, partners, and sponsors; finding or generating the necessary data; and disseminating findings to those in the best position to use them, in formats that are accessible and digestible.

This approach to policy analysis requires a more entrepreneurial temperament, a skill for building projects and initiatives, and a broader and deeper understanding of what works and what doesn't in effecting positive change in large social systems. The analyst is both conducting the analyses, and taking a role of "system pusher," helping to nudge a system by working with stakeholders to change its components. It can be supported by the interdisciplinary nature of policy analysis, with visioning and entrepreneurship becoming a new set of core competencies brought to a team. This work will require re-imagining education and training for analysts, drawing on the foundational skills that have brought us to this point but expanding mindsets and skills to take on challenges of complex systems.⁷

The Path Forward

There are many challenging problems and systems to address. Racial justice, the changing nature of the economy and social and economic inequality, health, education, and welfare, global competitiveness and security, and climate change – all these policy areas are systemic, complex, and require new approaches to have an impact. What would an applied, systems-oriented research agenda look like?⁸

It should be rigorous, objective, and non-partisan, though that doesn't mean it can't be savvy about implementation (it must be!). Analysts are often reluctant to say what "should" be done, instead presenting the decision maker with a range of options. One way to think about a more design-oriented approach could be like an architect presenting designs to a client: "If you desire to achieve A, B, and C, then, using the best available science and evidence, we believe this design and implementation strategy pose the most likely chance of success."⁹ In this case the "clients" are all those stakeholders involved in moving redesign forward – stakeholders, sponsors, and public officials.

For analysts, such a pro-active approach to systemic challenges is a necessity and an exciting opportunity.

Acknowledgements: The author gratefully acknowledges and thanks Robert Lempert, Walter McClure, Paul Davis, Anita Chandra, Rhianna Rogers, Alain Enthoven, and Jeffrey Johnson for their insights and thoughtful comments in preparation this column.

⁷ The Pardee RAND Graduate School has been redesigning its PhD program to train analysts to grapple with challenges presented by Complex Adaptive Systems. A paper describing the approach is Davis, Paul, Tim McDonald, Ann Pendleton-Jullian, Angela O'Mahony, and Osonde Osoba. "A Complex-Systems Agenda for Influencing Policy Studies," *Proceedings of the Society of Computational Social Science*, 2020.

⁸ For discussion of "Building a System of Health," see McDonald, Tim, Christopher Nelson, Laurie T. Martin, Anita Chandra. "Don't Waste This Crisis: How America Can Begin Building a System of Health," *The RAND Blog*. May 2020. <https://www.rand.org/blog/2020/05/dont-waste-this-crisis-how-america-can-begin-building.html>

⁹ This characterization is described under methods for "change strategy," included in McClure (2016).

DA Practice

Balancing Competing Objectives

Column Editor: Pat Leach



At the strategic level, decision making is often a matter of striking a balance between competing objectives. I'd like to relate some thoughts on this matter – specifically, on finding a balance between long-term sustainability and short-term rewards.

I recently gave a talk at the International Conference on Resource Sustainability entitled, “Overthrowing the Tyranny of Economics.” The title is a bit of hyperbole to pique people’s curiosity, but the talk does make a case that we have become overly dependent on economic metrics in our decision making when it comes to our relationship with the natural world. The natural world is governed by the laws of physics, chemistry, and biology; it couldn’t care less about economics. Using economic metrics to make decisions about how to interact with the natural world is like having the Fed use Bernoulli’s equation to decide about the money supply – it makes no sense. I contend that decisions regarding *what* we should do should be based on the applicable sciences (physics, etc.), and on our values, not on economic metrics. Once we have decided what we are trying to accomplish, economics can be used to decide *how* to do it efficiently.

On this subject, I am merely aligning myself with the Nobel-Prize-winning economist, William D. Nordhaus. In an essay on the subject (which I have quoted in a previous column) he says, “...conventional benefit-cost analyses are rules of thumb for decision making [sic].... But they cannot substitute for judgment. When the implications of the calculations are ethically unacceptable, or where the underlying assumptions are questionable, we must step back and ask whether there are implicit assumptions in the decision criterion that are flawed.... Sometimes, a society may decide that...activities are intrinsically important in a way that cannot be captured by market valuations.” Nordhaus goes on to add, “The best approach will generally be to identify the long-term objectives and to take specific steps to override market decisions or conventional benefit-cost tests so as to achieve these long-term goals.” (pp. 149 & 158, *Discounting and Intergenerational Equity*, Paul R. Portney & John P. Weyant, eds., 1999).

In the Q&A after my talk, the chair of the session suggested that this isn’t really a case of economics vs. values, but rather how to meet the needs of the current population without compromising the ability of future generations to meet their needs (which is the fundamental balancing act of sustainability efforts). In a classic case of my senior brain not working as quickly as it used to, it wasn’t until after the Q&A had ended that I realized that we were both right: it is a matter of short-term vs. long-term objectives, but it is also a matter of economics vs. values. Her framing of the issue added clarity and a new dimension to the problem.

To put it simply, every economic metric I know of is maximized by bringing as many benefits, rewards, and goodies as far forward in time as possible, and by pushing as many costs and liabilities as far into the future as possible. The very way economic metrics are calculated biases them in favor of short-termism. NPV, GDP, benefit-cost analyses – they’re all going to tilt heavily in favor of doing what makes us happiest now, and leaving the mess for our children and grandchildren to deal with. So not only are we using economics to make decisions in an arena governed by physics, chemistry, and biology, we are using

inherently biased metrics. Why then do we think that those metrics are appropriate criteria to use when we are trying to balance present-day needs (which, let's be honest, are often just present-day desires) with the needs of future generations?

This was the point I made in my talk. Economics encourages us to use the cheapest labor possible, even if that means shipping things back and forth across the ocean, burning up non-renewable resources in the process and generating pollutants. It encourages corn farmers to use pesticides to fight against certain pests when simply rotating one's crops will accomplish the same thing far more effectively. How often have you heard that recycling "doesn't make economics" in certain places, when an eight-year-old could tell you that in the long run, you're better off re-using stuff than constantly consuming new stuff. We consider the cost of producing oil or mining iron to be solely the cost of extraction, transportation, refinement, etc., never taking into account that we are leaving behind a depleted resource base and toxic pollutants for future generations.

Sustainability is indeed all about striking a balance between meeting our needs and providing future generations with a human-friendly biosphere and the resources to meet their needs. But by any objective measure, we have been doing a terrible job of striking that balance fairly. I contend that part of the reason is that we are using inappropriate criteria – economic metrics – to make our decisions.

But that's only part of the reason. On July 15th, Ezra Klein wrote an interesting article in the New York Times entitled, "It Seems Odd That We Would Just Let the World Burn." In it, Klein quotes Andreas Malm, quoting John Lanchester: "...even the people who feel most strongly about climate change on some level can't quite bring themselves to believe in it." A part of us just can't believe that our highly intelligent, innovative species could screw things up this badly. Coming to grips with that requires dealing with enormous cognitive dissonance in our brains because we desperately want to believe that not only are we clever and creative, we are good. Good people don't cause mass extinctions or leave vastly degraded biospheres for their descendants to deal with (intentionally or unintentionally). And we're good, so we must not be doing those things. More than any other psychological trait, this one fuels denialism on major environmental issues – especially global warming. (For further reading on this subject, check out *Mistakes Were Made But Not By Me*, by Carol Tavris and Elliot Aronson).

Klein goes on to say, "We are inconsistent creatures who routinely court the catastrophes we most fear. We do so because we don't feel the pain of others as our own, because there are social constraints on our actions and imaginations, because the future is an abstraction and the pleasures of this instant are a siren." He closes with, "Humanity has spent thousands of years building the social organizations and technological mastery to insulate itself from the whims of nature. We are spending down that inheritance, turning back the clock. I don't believe this reveals our true preference for the world our descendants will inhabit. I believe it reveals our deeply human inability to take the future as seriously as we take the present."

In other words, when it comes to balancing our own needs and desires with those of future generations, not only must we stop using inappropriate metrics – metrics that have nothing to do with the underlying science and tilt strongly toward present enjoyment rather than a sustainable future – we are also fighting some of our most ingrained weaknesses as humans.

Is it any wonder that, despite being aware of the dangers of climate change for more than thirty years now, we have made almost no real progress toward combating the problem?

Teaching DA

Proactive Decision-Making Skills Enhance Life Satisfaction and Can Be Trained

Guest Column Editor: Johannes Siebert

There is good news, especially for those who teach or participate in decision-making courses and those who want to have a better life. We have gathered empirical evidence suggesting that, firstly, good, proactive decision-making skills can be trained and, secondly, these skills explain a substantial share of the variance of life satisfaction. Taken together, **by participating in decision-making courses actively, you can learn how to make better decisions, and as a consequence, you are more satisfied with your life.** (If it increases your satisfaction, you can watch this [video](#) instead of reading ;-)

Most individuals and organizations can be characterized as reactive in their decision-making. Decision situations are seen as decision problems that have to be solved. The most apparent alternatives or alternatives that have proven suitable in similar decision situations are often identified with little effort. Most of the effort is spent in evaluating these alternatives. In doing so, it is by no means ensured that the best possible alternatives are available for selection.



Figure 1: Video summary ([link](#))

In contrast, Ralph Keeney (1992) suggests spending more effort to identify attractive alternatives since only alternatives that have been identified before can later be chosen. Individuals or organizations should identify their values, in other words, what they care about, and translate them into objectives. These objectives should be used for identifying more and better alternatives systematically. Instead of solving decision problems, decisions should be seen as opportunities that can be proactively developed. Keeney assumes that value-focused thinking is beneficial for decision-makers.

In the last decades, several studies produced empirical evidence suggesting the usefulness of value-focused thinking. Keeney recommends identifying objectives and using them to create alternatives systematically. For that, you need to be aware of your objectives. However, [Bond, Carlson, and Keeney \(2008\)](#) found empirical evidence suggesting that individuals and organizations are not aware of their objectives. If you do not know your objectives, how can you make good decisions?

In a paper in which I had the great pleasure of sharing the authorship with Ralph Keeney, we found empirical evidence suggesting that individuals and organizations are not aware of their alternatives ([Siebert and Keeney 2015](#)). More than fifty percent of the participants were not able to identify their best alternative without any help. How can you make good decisions if you are not aware of your potentially best alternatives? However, there is good news. Prompting with objectives helps to identify more and better alternatives. These and other research are essential pieces of the puzzle of investigating the benefits

of methods suggested in value-focused thinking. However, there was still the need to capture the essence of decision-makers' value-focused skills and personality traits to analyze the consequences on a broader level.

In 2013, I started this endeavor with my friend and colleague Reinhard Kunz. Later, our Ph.D. student Philipp Rolf has joined and energized the team. We have conducted several studies with more than 7,000 participants and have published our results in three papers in the European Journal of Operational Research.

In the first paper, we developed and validated the scale of Proactive Decision-Making ([Siebert and Kunz 2016](#)). This scale describes the degree of proactivity of individuals in decision situations with six dimensions. Four dimensions concern cognitive skills integrate the ideas and concepts of value-focused thinking and decision quality into the Scale of Proactive Decision Making: systematical identification of objectives, systematical identification of information, systematical identification of alternatives, and using a decision radar. Two dimensions cover proactive personality traits: striving for improvement and showing initiative. We explained 50% of the variance of decision satisfaction with proactive decision-making.

In the second paper, using a structural equation model, we showed that proactive decision-making explains a substantial share of the variance in life satisfaction ([Siebert, Kunz, and Rolf 2020](#)). In other words, if you are more proactive in your decision-making, you are more satisfied in your life.

In the third paper, we applied the proactive decision-making scale a priori and ex-post to analyze the impact of three different types of decision-making courses: A massive online course by Carl Spetzler (NovoEd's online courses, *DQ 101: Introduction to Decision Quality*), a massive onsite course by Rüdiger von Nitzsch at the RWTH Aachen University, and several of my small onsite courses at the Management Center Innsbruck in Austria ([Siebert, Kunz, and Rolf 2021](#)). In line with the hypotheses, the degree of the proactive personality traits remained stable, while the degree of the proactive cognitive skills improved significantly through the training.

Our results substantiate the assumption that decision training is of practical relevance. The decision-making courses increased participants' (tacit) knowledge about effective decision-making, self and peer-reported proactive decision-making behavior, and general satisfaction with their decision-making. We argue that it would be beneficial both for potential participants and for training providers to deplore the dwindling number of decision-making courses being offered publicly. Hence, OR scholars, in particular, should be encouraged to advocate for incorporating such general decision-making courses into OR-related degree programs or similar professional development initiatives. But, of course, even the most sophisticated OR methods cannot entirely compensate for underdeveloped individual decision-making skills.

Decision-making courses are also missing outside our field. For example, there are business schools that do not offer any courses on decision-making to their students. Yet, what is one of the core tasks of managers? Making decisions! Therefore, we recommend universities, colleges, and schools to include decision-making courses in their curriculum. At the Management Center Innsbruck, I have already successfully created such courses in five study programs. My students enjoy them very much, knowing that actively participating in the course and reflecting on the material has the potential to make their life better.

In addition, I have created the initiative [KLUGentscheiden](#) (smart deciding) in Germany, which educates high school students in decision-making. Preliminary results indicate that they enhance their proactive cognitive skills and feel empowered. This is very motivating. Decision education is a key for our future. The research results I have shared with you are just the beginning. There is a lot to do. If you are interested in joint work, please contact me to discuss perspectives.



Finally, I like to thank the research community for many precious inputs. The discussions with colleagues during the meetings of the Decision Analysis Society and the EURO working group on Behavioral Operations Research were very fruitful and energized our research. Mainly, I like to thank the anonymous reviewers who have provided many useful suggestions to substantially improve the quality of our papers. In the end, I like to cite Ralph Keeney: *The only way to exert control over your life is through your decision-making. Take advantage of this opportunity.*

Johannes Siebert

MCI | THE ENTREPRENEURIAL UNIVERSITY®
Johannes.Siebert@mci.edu

- Bond, SD; Carlson KA; Keeney RL 2008. Generating Objectives: Can Decision Makers Articulate What They Want? *Management Science*, 54(1), 56-70, <https://doi.org/10.1287/mnsc.1070.0754>
- Keeney, RL 1996. *Value-focused thinking*. Harvard University Press.
- Siebert, JU; Keeney RL 2015. Creating More and Better Alternatives for Decisions Using Objectives. *Operations Research*, 63(5), 1144-1158, <http://dx.doi.org/10.1287/opre.2015.1411>
- Siebert JU; Kunz R 2015. Developing and Validating the Multidimensional Proactive Decision-Making Scale. Special Issue "Behavioral Operations Research", *European Journal of Operational Research*, 249(3) 2016, 864-877, <https://doi.org/10.1016/j.ejor.2015.06.066>
- Siebert, JU; Kunz, R; Rolf P 2020. Effects of Proactive Decision Making on Life Satisfaction. *European Journal of Operational Research*, 280(1) 2020, 1171-1187, <https://doi.org/10.1016/j.ejor.2019.08.011>
- Siebert, JU; Kunz R, Rolf P 2021. Effects of decision training on individuals' decision-making proactivity. *European Journal of Operational Research*, 294 (1), 264-282, <https://doi.org/10.1016/j.ejor.2021.01.010>

Editorial Team



Editor
Dr. Andrea C. Hupman
University of Missouri -
St. Louis
hupmana@umsl.edu



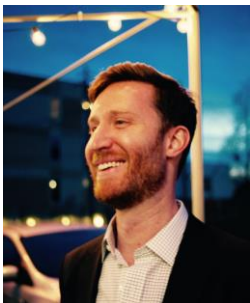
DA Practice
Pat Leach
Independent Consultant
leach.sullivan@gmail.com



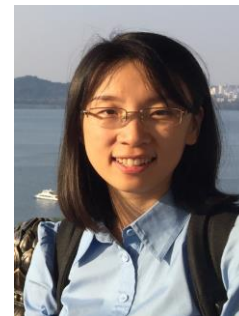
Ask DAS
Dr. Florian Federspiel
INCAE Business School
florian.federspiel@incae.edu



DA Around the World
Dr. Shijith Kumar
SolBridge International School
of Business,
Woosong University,
shijith.pm@solbridge.ac.kr



Ask DAS
Dr. Michael D. Gerst
Earth System Science
Interdisciplinary Center
University of Maryland,
College Park
mgerst@umd.edu



DA Around the World
Dr. Chen (Mavis) Wang
Tsinghua University
chenwang@mail.tsinghua.edu.cn



Research, Guest Column Editor
Tim McDonald
PhD Student
Pardee RAND Graduate
School
tmcdonal@prgs.eedu



Teaching DA, Guest Column Editor
Dr. Johannes Siebert
Supply Chain Management
Management Center Innsbruck
Johannes.Siebert@mci.edu

DAS Officers

President

Emanuele Borgonovo

Department of Decision Sciences

Bocconi University

emanuele.borgonovo@unibocconi.it

VP/President-Elect

Yael Grushka-Cockayne

Darden School of Business

University of Virginia

GrushkaY@arden.virginia.edu

Past President and Webmaster

Karen Jenni

U.S. Geological Survey

kjenni@usgs.gov

Secretary-Treasurer

Dharma Kwon

Gies College of Business

University of Illinois at Urbana-Champaign

dhkwon@illinois.edu

DAS Council

Asa Palley

The Kelley School of Business

Indiana University

apalley@indiana.edu

Ying He

Department of Business and Economics

University of Southern Denmark

yinghe@sam.sdu.dk

Allison C. Reilly

Center for Disaster Resilience

Department of Civil and Environmental

Engineering

University of Maryland

areilly2@umd.edu

Valentina Ferretti

Department of Management

London School of Economics

v.ferretti@lse.ac.uk

Andrea Hupman

College of Business Administration

University of Missouri-St. Louis

hupmana@umsl.edu

Kara Morgan

Center for Foodborne Illness Research and

Prevention, Department of Food Science and

Technology

Ohio State University

morgan.1353@osu.edu