

HISTORICAL DEVELOPMENT OF SPUDM 1969-1997: Research Conference on Subjective Probability, Utility and Decision Making

Charles Vlek – University of Groningen

The start-up in 1969 and the next 28 years are described of the international research conference on *Subjective Probability, Utility and Decision Making*, whose 23rd biennial manifestation took place in London, August 2011. SPUDM began in Hamburg on April 10-12, 1969, as a *Research Conference on Subjective Probability and Related Fields*. It adopted its current name at the third conference in Uxbridge, UK. As a distinctly European response to the growing literature, SPUDM was just another expression of the big wave of research interests in decision models, methods and processes, which rolled on in the 1950s and 1960s. A description is given of SPUDM's inception around 1969 and its thriving development since then. The important role of Ward Edwards' early decision-theoretic reviews is highlighted, as are the inspiring roles of Bruno De Finetti and Masanao Toda. SPUDM's gradual expansion and differentiation are discussed, and its thematic developments between 1969 and 1997 are surveyed. Typical quotations are given and some pictures of SPUDM inspirators and activists are provided. A postscript anno 2012 gives a more distant look back on later developments, and some suggestions for SPUDM in its fifth decade.

Summer course precursors^{1,2}

Ten years after the first edition of Von Neumann and Morgenstern's *Theory of Games and Economic Behavior* (1944), the *Psychological Bulletin* published Ward Edwards' (1954) review of 'The theory of decision making', altogether 38 solid pages of inspiring information about 'economic man', ordinal versus cardinal utility, riskless versus risky choices, subjective probability, and much about the theory of games and statistical decision functions.

"All these topics represent a new and rich field for psychologists, in which a theoretical structure has already been elaborately worked out and in which many experiments need to be performed" (p. 411).

After another ten years, and shortly after the very first chapter on behavioural decision

theory in the *Annual Review of Psychology* (Edwards, 1961), the author of that chapter gave a series of lectures at a fourteen-day summer course on 'Psychological Applications of Decision Theory'. This extended meeting – quite unusual in Europe at a time still dominated by phenomenological psychology – was organized by professor John Van de Geer of Leiden University, from 2-16 August 1964, at the headquarters of the Netherlands Universities Foundation For International Cooperation (NUFFIC) in The Hague. Van de Geer himself had come across Edwards' field of interest during his own explorations of decision making and Bayesian statistics, the topic of his inaugural lecture (Van de Geer, 1964).

At NUFFIC, some 60 young European psychologists 'needing advanced education' listened curiously to sets of lectures given by Robert Audley (from London, on descriptive theories of choice), Vaclav Břicháček (Prague, reviewing Eastern European research on decision making), Donald Broadbent (Cambridge, on decision models in attention and performance), David Green (Philadelphia, on signal detection theory), Benjamin Matalon (Paris, on empirical studies of decision processes), and Allen Newell (Pittsburgh, on human problem solving).

Ward Edwards (Ann Arbor, Michigan) presented a survey of basic concepts and current issues in decision research. In his own humorous and self-assured way, Edwards taught us about the expected utility of sailing

¹ The body of this chapter was originally written in 1998 as a contribution to the 'Festschrift' for decision theorist Ward Edwards, on the occasion of his 70th birthday and the (his) 35th Bayesian Research Conference in Los Angeles (Shanteau, Mellers & Schum, 1999: 389-397). In late 2011 the original text has been significantly adapted and renewed so as to better fit the broader readership of SPUDM participants and members of EADM, the European Association for Decision Making. A contemporary postscript has been added.

² The author is professor emeritus of environmental psychology and decision research. University of Groningen, Department of Psychology, Grote Kruisstraat 2/1, 9712 TS Groningen, The Netherlands, c.a.j.vlek@rug.nl.

versus golfing, the bookbag-and-pokerchip paradigm, Bayes' theorem and sequential revision of opinion, and probabilistic information processing systems that might as well be computer-automated. One highlight of these lectures was Edwards' personal account of the most convincing statistical test anyone could imagine:

"..the interocular traumatic test; you know what the data mean when the conclusion hits you between the eyes. (It) is simple, commands general agreement, and is often applicable; well-conducted experiments often come out that way. But the enthusiast's interocular trauma may be the skeptic's random error. A little arithmetic to verify the extent of the trauma can yield great peace of mind for little cost" (Edwards, Lindman & Savage, 1963: 217).



James Shanteau & Ward Edwards

Course summaries made on the spot were re-edited afterwards and made available to anyone interested in what had been presented (Van der Kamp & Vlek, 1966). So, although the print quality is meager, you can still reap the fruits of the 1964 NUFFIC summer course, and enjoy the relative simplicity of graduate students' summaries of top scientists' lectures.

The NUFFIC-1964 course also revealed that the *Centre National de la Recherche Scientifique* in Paris had already had its first international seminar on 'Econométrie', with a major contribution by L.J. Savage (1953).



Benjamin Matalon

Years later this was followed by two more seminars, 'La Décision' (1960) and 'La Décision 2' (1967), respectively, where European decision theorists like Bresson, Drèze and Matalon presented their views, not only on individual decision making but also on social choice theory; see CNRS (1961, 1969).

It appeared that a French researcher

named Rouanet (1961) had already conducted an urns-and-balls (or 'bookbag-and-pokerchip') experiment concerning (Bayesian) probability revision that inspired Edwards and Phillips (1964). Around the same time, other European forerunners of behavioural decision research were Van der Meer (1963) in the Netherlands, Schneeweiss (1966) in Germany, and Sjöberg (1968) in Sweden.

Prior to SPUDM's founding year of 1969, the NUFFIC summer course on decision theory was followed up by two more summer schools. One course, in 1966, was devoted to psychological measurement theory, where – among others – Clyde Coombs from Ann Arbor and Lee Cronbach from Stanford came to lecture about unfolding analysis of preferential data, and mental test theory and decision theory, respectively.

The other course, in 1968, was on algebraic models in psychology. There, Robyn Dawes from Eugene (Ore.) and Masanao Toda from Sapporo made contributions on formal models of cognition and on dynamic decision theory, respectively. Following Toda (1968: 108/109):



Masanao Toda

"(..) it is particularly important to keep the distinction clear between (..) the normative decision theory and the descriptive, or behavioral, decision theory (..). As you know, decision theory has been developed primarily as a normative theory (.. which ..) tells to anyone what he should do, if he is willing to accept the axiom system as the correct description of his purpose, and if he does not mind to behave logically. Any such abstract normative theory is a correct theory if it is internally consistent. However, being a correct theory does not necessarily imply that it is also useful. If no one is willing to accept the axiom system as the description of his own purpose, the theory is useless. (..) no theory can be exclusively normative nor descriptive, and actually we have a whole spectrum of theories ranging between (..) those almost purely normative and those almost purely descriptive."

The various NUFFIC summer courses between 1964 and 1972 have greatly stimulated many young European psychologists and brought them in working contact with one another.

Initiators of a low-profile start-up in Hamburg

The NUFFIC 1964 course on psychological applications of decision theory inspired the author to perform a bookbag-and-pokerchip (or rather: boxes-and-beads) experiment of his own (Vlek, 1965). To give you the flavor of this appealing research paradigm, here is an excerpt from this report's abstract (1965: 1):

"Sixty subjects were individually presented with four samples of sizes 9 and 19, containing a varying number of red and white beads, and taken from either of two boxes of different proportional composition. Then they were asked to give an estimate of the posterior probability that the sample was taken from box A, or from box B. (..) In all conditions a consistent suboptimal deviation from the Bayesian normative values was found. Three explanations are suggested: (a) subjects lack sufficient familiarity with the data likelihoods; (b) subjects fail to extract all the information contained in the data; (c) possibly the Bayesian model for the revision of prior opinions is inadequate as a normative optimal rule for this kind of behaviour."

Such 'conservatism in probabilistic inference' was also observed by Phillips and Edwards (1966), and interpreted as reflecting "a general human inability to process information" (p. 354).



Charles Vlek



Dirk Wendt

Meanwhile, another SPUDM-initiator, Dirk Wendt from the University of Hamburg, spent some time at the University of Michigan to find out – under Edwards' keen supervision – whether he could assess 'subjective significance levels'; that is, for which unlikely sample of a certain population are you still willing to – just – believe that the sample was actually drawn from that population? He published about this in the *Zeitschrift für Psychologie* (Wendt, 1966) and continued his work with young German

colleagues among which Helmut Jungermann.

"In a series of experimental studies this approach [of assessing subjective significance levels] was empirically tried out, whereby a number of hypotheses were tested as derived from the theoretical model. It could be shown that the height of the subjective significance level increases with the value that is at stake in the relevant decision, and that it decreases with increasing cost of acquiring the information needed to decide" (Wendt, 1966: 79; my translation).

The third SPUDM initiator is Carl-Axel Staël von Holstein, then at the Stockholm branch of Stanford Research Institute, who collaborated with Alan Murphy and Robert Winkler about the assessment of subjective probabilities in forecasting tasks (Murphy & Winkler, 1970). From Staël von Holstein we learned that meteorologists may quite aptly handle their uncertainties about tomorrow's weather, and that meteorological practice is supported by a fair amount of fundamental research on the meaning of probability and on methods of expert judgment.

Staël von Holstein actively stimulated the debate on subjective probability assessment and he gave a thorough account of his methodological and empirical work on scoring rules in his doctoral dissertation (see Staël von Holstein, 1970; Spetzler & Staël von Holstein, 1975).



Carl-Axel Staël von Holstein

"The conclusions drawn from the experiments were that the more experience the [probability] assessor has, preferably with statistical concepts, the more consistent different assessments will be (..). .. but (this) will not ensure that these measurements agree with his true beliefs. In other words, his assessments may become more reliable with training but not necessarily more valid as expressions of his true judgment" (Staël von Holstein, 1970: 157).

In a recent memory note about SPUDM-1, Staël von Holstein remembers his own surprise about 'probability matching', so often observed in binary probability learning tasks (e.g., predicting whether a red or a green light would

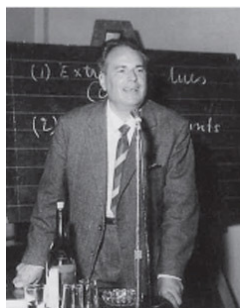
come on next, given a sequence of 80% red and 20% green lights, so far). At the NUFFIC-1964 summer course, Matalon (1966) offered four explanations for this persistent suboptimal finding: (1) stochastic response conditioning, (2) erroneous foresight calculations, (3) avoidance of sure prediction errors, and (4) the boredom of optimal prediction (i.e. always choosing the most probable event).

Launching SPUDM: just getting together

In the course of 1968, Staël von Holstein, Vlek and Wendt visited each other and formed the plan to organize a 'research conference on subjective probability', somewhere halfway between Leiden and Stockholm; no key-notes, no conference fee and no reimbursements. The individual isolation and light despair felt by beginning European decision researchers in the 1960s is reflected in Wendt's preface to the simple volume of brief and sketchy conference proceedings:

"It was, actually, rather hard to get together a list of prospective participants who might be invited to such a conference - and I am afraid that we never managed to complete this list. So, our apologies to everybody we omitted, and our plea to tell us everybody's name who should be on the list, so we can invite him (or her) next time" (Wendt, 1969: 2).

Topics for discussion at SPUDM-1 were: assessment of subjective probabilities, revision of prior probabilities in the light of new information, subjective significance levels, and probability learning. Bruno De Finetti, who had just broken through in the English professional literature (De Finetti, 1964, 1965), would also be invited.



Bruno De Finetti

And he came, together with about 25 others, to attend what later appeared to be the first research conference on subjective probability, utility and decision-making, although it was not yet labeled as such.

During SPUDM-1, applied mathematics and cognitive psychology were joined right away, as they had been before in other conferences marking the start of behavioural decision research (e.g., Thrall, Coombs & Davis, 1954; CNRS, 1961, 1969). The very first SPUDM proceedings gave some nice insights in mostly young people's ideas and viewpoints in the late 1960s. Here are some illustrative quotes from the initial review papers.

In considering European work on subjective probability, Wendt (1969: 7) concluded:

"Two major points of criticism have arisen (...). First, whether it makes sense at all to search for a function relating subjective probability to objective probability. (...) Second, whether the bookbag-and-pokerchip paradigm is not too artificial at all for normal subjects such that it leads to lots of experimental artefacts which have no relevance for actual behavior in daily life. (...) we should 'bury that urn' and abandon the bookbag-and-pokerchip paradigm as a tool of research completely."

After discussing a series of revision-of-opinion studies Vlek (1969: 10-11) recommended:

"The study of subjective probability - because of its preference for objectively specifiable chance situations - is in danger of proceeding along experiments that have a very low external validity (...). Care should be taken to design representative experiments. (...) In complex situations it might be inevitable to treat probability estimates as if they convey only ordinal information."

Summarising a draft chapter on 'Some problems in the application of Bayesian decision theory', Staël von Holstein (1969: 23) focused on the assessment of subjective probabilities:

"An assessor can be good in essentially two respects. He may have some knowledge of probability concepts and he makes assessments that are consistent with the theory of probability. (...) The second respect concerns the assessor's knowledge of the practical problem at hand. (...) To summarize, the normative standard of 'goodness' concerns expertise in probability assessment, while the substantive standard (...) concerns expertise in the domain in which assessments are made."

And De Finetti (1969: 33-37) fervently defended the 'one and only' personalistic interpretation of probability, as follows.

"The true subjective probability problem consists in

the investigations concerning the ways in which probabilities are assessed by more or less educated people, and the way in which such abilities may be improved. This seems to me the field in which the cooperation between all specialists concerned is most wanted (...). I was surprised to see that some psychologists call *subjective* probability any 'wrong' evaluation of the 'correct' probability that is called *objective*. (...) *Even in the cases where one accepts the so-called objective probabilities (e.g., ratio of white balls or observed frequencies of their occurrence by drawings) it is the subjective decision to admit such information and nothing else as relevant, and to make use of it in the ordinary ways, that transforms objective data (...) into a probability, which is therefore subjective, just as well as in every other case. (...).*"

At SPUDM-2, Amsterdam, Larry Phillips (1970: 254) emphatically elaborated on De Finetti:

"As scientists and as technologists we should discard the idea of a 'true' or 'objective' probability."



Jozef Koziellecki



Larry Phillips

Can the reader imagine the great desire for more, and our firm intention to get more colleagues involved and to do a better job of preparing and organizing such meetings?

Conference expansion and format development

During the 1970s SPUDM took off forcefully, as if there was something to make up for. The attendance of 26 people in 1969 grew to about 60 in Amsterdam-1970, 80 in Uxbridge-1971, and 100 in Rome-1973.



Amnon Rapoport



Patrick Humphreys

From then on SPUDM attendance increased more moderately, but steadily. After ten years, Groningen-1983 attracted 175 participants.

Moscow-1989 (just before it all changed) saw as many as 250 participants, many of whom – unrestrained by East-West customs regulations – came from the Soviet Union and Eastern-European countries. In 1995, around 200 decision researchers convened in Jerusalem, many from Israel itself. About the same number of people participated in the Leeds-1997 conference.

In the very beginning, SPUDM had the simple format of conference papers being delivered by active researchers. Rather soon, however, the organizers realized that something had to be done to both survey major parts of the field and introduce newcomers to it. Hence a distinction was made between invited major review papers and specific research papers, with an occasional tutorial on decision analysis added. The 'major papers' proved to be an effective means to keep the conference on track and to give it new impulses.

As the conference grew, a need was felt for accommodating informal workshops on new or controversial themes. In these, an invited workshop coordinator set out the course for debate, thereby supported by several invited discussants. Parallel workshops were introduced in SPUDM around 1975 and they first provided SPUDM participants with a problem of choice among various conference options, some of which were (simultaneously) 'not to be missed'.



Pieter Koele, Maya Bar-Hillel, Helmut Jungermann

In 1981 the phenomenon of parallel specific-paper sessions was added. In the beginning, this was painful for many and somewhat troubling for the conference's identity. But it seemed to be a fair representation of what was happening throughout the field of behavioural decision making: expansion, differentiation and increasing multidisciplinary, particularly with respect to practical applications, such as in the areas of management decision analysis, technological risk assessment and medical decision making.

Themes of common interest were treated in the major papers and in expert panel debates for plenary meetings, such as on the validity of

judgmental heuristics and biases (1981), the concept of a 'good decision' (1983), and organizational intervention (1987). In 1984, a regular SPUDM Bulletin was set up to facilitate between-conference communication among SPUDMists and potential conference attendants. Selected conference proceedings were published right from the start. Except for Hamburg-1969 (yielding a stenciled report) and Uxbridge-1971 (a conference preparation book), published conference proceedings have come out of every SPUDM meeting until 2000.

Thematic developments in SPUDM 1969-1997

A child's growth curve is steepest between its first and tenth years of age. Similarly, SPUDM development between 1969 (Hamburg) and 1979 (Göteborg) was energetic, eager and rapid. Guided by tutorials on decision analysis and 'honest' probability estimation, participants soon got involved in other key problems of decision analysis and human decision-making. Amsterdam-1970 was still dominated by probability measurement and (Bayesian) probabilistic information processing. At Uxbridge-1971, however, doors were opened for utility assessment, medical decision-making, and the logic of social inference. In Rome-1973 major attention was given to multi-attribute utility theory and measurement, and to research paradigms for dynamic decision-making.

Rome-1973 also enjoyed the first European presentation of Tversky and Kahneman's (1974/1975) ground-breaking research on heuristics and biases in probability estimation.



Daniel Kahneman



Amos Tversky

In Darmstadt-1975 societal risk perception first came to the fore, along with the calibration of probability assessors and the use of think-aloud protocols for decision-process tracing. Warsaw-1977 offered the first full-blown opportunity for Eastern- and Western-European researchers to meet, e.g., over the

psychological development of decision-making, the function of hierarchical goal structures, and whether decision analysis should be called an art or a science. One highlight in Warsaw was Masanao Toda's (1981a) intriguing reflection on 'What happens at the moment of decision?'

Concluding the first seven conferences was Göteborg-1979, where participants could enjoy papers on volitional problems in stopping an addiction, the role of emotions in decision-making, and the relative attractiveness of different decision rules, the latter somehow linking up to a Lewinian perspective on 'decision emergence' (Beach & Wise, 1980).



Berndt Brehmer, Peter Lourens, Sarah Lichtenstein

A sample of later conference highlights is: dominance-search theory (Budapest-1981), requisite decision modelling (Groningen-1983), risk homeostasis theory (Helsinki-1985), social dilemmas and cooperative conflict (Cambridge-1987), influence diagrams and fault trees (Moscow-1989), differentiation / consolidation theory (Fribourg-1991), cumulative prospect theory (Aix-en-Provence-1993), anomalies in intertemporal choice (Jerusalem-1995), and the 'dead end of lottery paradigm' (Leeds-1997). Over these years, regular conference attention was also given to problem-framing effects on decision-making, and to the mutual relationship between verbal and numerical expressions of probability. Considering the various contributions listed above we may observe that SPUDM has fairly well succeeded in keeping its train going. It did so while consolidating already explored tracks on the one hand, and setting out courses for new tracks on the other.



Katrin Borcharding



Lola Lopes

The liveliness of this effort may be explained by the importance of the subject matter (multidisciplinary, and basic as well as applied), the need for international communication on a continent (and beyond) harbouring different language communities, and participants' gradually increased pride in a 'SPUDM movement' that proved to be productive, inspiring and radiant for behavioural decision theorists in many countries.

Meanwhile there was as proliferation of relevant journals. From 1970 on, *Acta Psychologica* became an important publication channel for selected SPUDM proceedings and independent research papers. Also in 1970, the more philosophical *Theory and Decision* came to life. *Medical Decision Making* and its supporting society began in 1980 (cf. Ledley & Lusted's inspiring paper in *Science*, 1959, 3360). *Management Science* and *Operations Research* were increasingly receptive to decision-analysis papers (e.g. Spetzler & Staël von Holstein, 1975; Keeney, 1982). *Organizational Behavior and Human Performance* (OBHP) changed its 'Performance' into 'Decision Processes' (OBHDP) in 1985.

The American Society for Judgment and Decision Making (JDM) was founded in 1986. Both the *Journal of Behavioral Decision Making* and the *Journal of Risk and Uncertainty* got started in 1988. Neighbouring *Risk Analysis* and the *Journal of Risk Research* came to life in 1980 and 1998, respectively. As a juridical offspring, *Law, Probability and Risk* began in 2002 (cf. Lindley, 1975). And in 2006, the North-American JDM and the European EADM started their open-access E-journal *Judgment and Decision Making*.

Early SPUDM inspirators

As one may infer from the overview above and from the underlying proceedings volumes, Bruno De Finetti, Ward Edwards and Masanao Toda have played important stimulating roles. De Finetti's unforgettable inputs are, of course, concerned with the meaning of probability and with proper ways to express it. Edwards regularly made smart (and smarter)³ remarks about utility assessment, optimal decision rules, probability revision and the coming 'century of Bayes'. Toda impressed his audience – often amusingly – with sharp

analyses of dynamic decision making, the intriguing 'moment of decision', and the crucial relationship between emotion ('programmed utility') and decision making. For Toda, the classical theory of decision making was too much of a straightjacket to accommodate his visionary ideas and speculations (see Toda, 1981b).

Other, more remote inspirators of the SPUDM movement are econom(etr)ists, statisticians and decision analysts like Knight (1921; risk vs uncertainty), Simon (1957; bounded rationality, satisficing), Allais (1953; the famous paradox), Savage (1954; Bayesian statistics), Luce and Raiffa (1957; games and decisions), and Schlaifer (1959; business decisions; followed by Raiffa's *Decision Analysis*, 1968). The much longer and more European history of the probability concept is thoroughly described by Hacking (1975/2006), who reminds us that the Dutch mathematician and clockmaker Christiaan Huygens (1657) was one of the first to propose a method for calculating the fairness of betting in games of chance. Perhaps with a few exceptions (see list), the references must be well known to regular SPUDM participants.

What makes for a good decision?

One question which SPUDMists have often confronted in one way or another concerns the assessment of decision quality: how could one tell good decisions from bad ones; which model or method would promote better decision making; how might one assess the effectiveness of well-intended decision aids; wasn't normative decision theory demanding an 'irrational rationality' (Van Praag at SPUDM-1971; see Van Praag, 1975)?

To tackle the question of 'What constitutes a good decision?' head-on, a panel debate was organized at SPUDM-1983 in Groningen, among Ward Edwards, István Kiss, Giandomenico Majone and Masanao Toda – representing four different nationalities and rather different research interests. The following excerpts from a report of this event give the reader a taste of what was said and what could be concluded (all quotes from Edwards, Kiss, Majone & Toda, 1984: 5-27).

[Edwards:] "A good decision cannot guarantee a good outcome. (...) .. evaluating (a decision) as good or not must depend on the stakes and the odds, not on the outcome. (...) Traditional decision theory takes options as given; this is unrealistic. (...) Options grow out of values, in the light of situational constraints

³ SMART(ER) = Simple Multi-Attribute Rating Technique (Extended to Ranking); Edwards (1977).

and opportunities. (..) Generally, elicitation of numbers is easy (..), provided that structuring has been skillfully done. (..) The validation of decision-analytic numbers is an important research topic. (..) No one has figured out how to formulate the problem of validating decision-analytic structures .. (..) .. decision analysis is a technology in which practice has sped far beyond the theory on which it is nominally based."

[Kiss:] "... I try to prove that something for which we are all working is impossible, namely to make (..) good decisions. (..) .. we can find strong similarities (of decision making) with the process of control. (..) In 1958 Ashby formulated the law of requisite variety. (..) .. 'every good regulator of a system must be a model of that system'. (Thus) .. our decision is as good as is our model of the process we want to manage (..) to accomplish the desired aim. (..) .. to the extent that there is not a perfect model of reality, our ability to control (..) a process is limited, so there exists no good decision!"

[Majone:] "A decision (..) can be evaluated according to three different sets of criteria: input, process, or outcome criteria. (..) to evaluate an activity by the outcomes it produces, two basic conditions have to be satisfied: (a) the existence of unambiguous criteria by which outcomes can be identified and ranked; (b) a well-defined functional relation (or 'production function') connecting certain inputs (..) with certain outputs. In many (..) situations these conditions cannot be satisfied. (..) This is the basic justification for the existence of elaborate judicial, legislative and administrative procedures. .. they *legitimate* decisions that are substantively still undetermined .. (..) In most cases of practical interest the substantive rationality of a decision cannot be judged independently of its procedural rationality."



István Kiss, Giandomenico Majone, Gerard de Zeeuw

[Toda:] "The evaluation of a decision may vary from person to person, from moment to moment, from situation to situation. (..) So the goodness of a decision is undoubtedly a .. conditional measure. (..) .. still we can hardly live without the notion of goodness (or badness ..) .. (..) Perhaps the intensity

of a *regret* emotion would come as the closest candidate for the badness feeling. (It) is aroused by a certain cognition. (..) .. if happiness is somehow comparable to the lack of regret, someone who entertains only one alternative all the time (..) is also a very happy person indeed .. On the other hand (..) a meticulous person who always considers a large number of alternatives is bound to feel lots of regret. (..) .. the expected utility maximization rule has nothing at all to say about .. the number of alternative actions."

In Leeds-1997, Edwards further clarified his position on proper decision making. In response to a major paper given by Oswald Huber ('The lottery paradigm: a dead end for psychological decision theory?'), Edwards said:

"You could think of decision analysis as some kind of striptease in which you gradually uncover the various things that are important for your decision."

This informal statement nicely contrasts with a key conclusion by Huber (1995: 209) himself:

"The concentration of experimental research on tasks where relevant background knowledge and perceived control is excluded systematically, seriously restricts the generalizability of results and hinders the development of decision theories (..)."



Anna Vari, Baruch Fischhoff

The implication here seems to be that a person's (partial) control over the set of choice alternatives, the probability of uncertain events, and the nature of possible consequences may make any 'striptease' going for the clearest representation of one's decision problem to be a rather elastic affair. This point also clearly appears from Wilde's (1982, 1994) Risk Homeostasis Theory: without a fair amount of personal control no risk compensation could manifest itself in response to external safety measures.

Meanwhile, perceived control indeed has proven to be an important variable in classifying uncertain evidence, weighing utility attributes and discounting long-term consequences. Thus variations in perceived control have significant

implications for risk judgment and risk-taking decisions, as John Cohen (1960) had already argued.

European Association for Decision Making (EADM)

In the mid-1980s an increasing need was felt to institutionalize SPUDM as a formal society. This, however, proved to be a controversial topic. On the one hand, a minimal structure seemed necessary to safeguard conference-organizational expertise and financial security over the years. On the other hand, many colleagues said they were only interested in a high-quality conference every two years and in carefully edited proceedings every non-conference year. Eventually it turned out that a modest majority of SPUDM attendants voted in favor of founding a society. The latter was actually instituted at SPUDM-14 in Aix-en-Provence 1993, with Willem Wagenaar as its first president.



Willem A. Wagenaar

From then on SPUDM is organized under the auspices of the European Association for Decision Making. Participants' arguments expressed in favor of EADM were, among other:

".. founding a formal society .. is inherent in the dynamics of SPUDM, growing size necessitates formal organization, visibility to outsiders and newcomers will be greater, will guarantee more continuity and uniformity, yields better communication among researchers, improve the quality of conferences, allow for clearer presence in science and politics, reflects an idea whose time has come."

Such arguments rested upon various 'statements of purpose' serving the function of explicating SPUDM's flexible identity, and they greatly help newcomers as well as next-conference organizers to orient themselves quickly and clearly.

Conclusions and suggestions for the future (1997-..)

For a historical account we may note that, around 1950, Ward Edwards himself started off

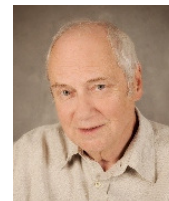
on two different experiences. One was a chapter by Lewin, Dembo, Festinger and Sears (1944), who wrote about the concept of aspiration level and discussed this against the background of game theory. The other root is a colloquium attended by Edwards and given by Frederick Mosteller (cf. Mosteller & Nogee, 1951) of Harvard's Laboratory of Social Relations. Mosteller talked about a method for inferring utilities from choices among bets with specified outcome values and probabilities. Edwards asked the speaker why he had not (also) assumed a subjective transformation on the probability variable, as Preston and Baratta (1948) had done. Mosteller's somewhat open answer led Edwards (1953) to his study of probability preferences in gambling.

Evidently, thus far the research conference on SP, U and DM has matured into a professional international forum for behavioural decision research. It has many strong points of attraction for older and newer decision theorists alike. Once engaged, one tends to become faithful to SPUDM, and many believe that the long conference movement so deserves.

But SPUDM obviously has its shortcomings as well. It is oriented towards theory and methodology rather than practical application. Its focus is on individual cognitive processes rather than on social-deliberative interaction. It represents a special mixture of interests in prescription, cognition and preference about relatively simple, static and single-actor judgment and decision situations. As such, it would seem to be a merger of rational-economic and cognitive-psychological perspectives on decision making. Organizational and political decision processes largely remain outside SPUDM's intellectual coverage.



Oleg Larichev



Lennart Sjöberg

A certain functional fixedness to established research paradigms may have kept SPUDM a little inner-directed. Why, for example, has SPUDM not paid more attention to risk homeostasis theory and its societal implications (Wilde, 1982, 1994), to addictive behaviours and decisions to quit these

(Sjöberg, 1980), to decision-making under varying perceived control (Kuhl, 1985; Huber, 1995), to variants of uncertainty (Kahneman & Tversky, 1982) in relation to different types of risk, to decision aiding in terms of information provision (problem structuring and option evaluation did get a fair amount of attention), and to component choices underlying complex strategic decisions (Bresson & Matalon, 1969; Toda, 1976)? Naturally, these and other things were addressed later on.

Postscript anno 2012

Thirteen years and seven SPUDM conferences after 1997 the previous remarks can and must be significantly updated. Behavioural decision research has matured and emancipated itself from the 'rational' theories and models of the 1950s and 1960s. Following Mellers, Schwarz and Cooke's (1998: 469):

"The message of decisions errors and biases has had widespread effects. Confronted with real world violations of rational choice theory, many economists and other social scientists now recognize the need for behavioral assumptions in the marketplace."

Concluding their chapter on decision technology, Edwards and Fasolo (2001: 605) write:

".. on-line decision aids and personal computer programs are making inexpensive, yet sophisticated, decision technology available to everyone. However, much work remains to be done to make these tools more theoretically sound and more responsive to decision makers' needs."

Weber and Johnson (2009) propose that psychological ideas and findings about cognitive, affective and emotional processes have greatly helped integrate judgment and decision research in the behavioural sciences.



Elke Weber



Gerd Gigerenzer

They attractively show how many limitations, heuristics and biases revealed in the past are now understood much better in terms of context-dependence and goal orientation, efficient time-quality management, utility

reference points, allocation of attention, and the need for personal justification and self-presentation.

In the long line of *Annual Review of Psychology* chapters, Gigerenzer and Gaissmaier's (2011) contribution serves as an important advance, surveying widespread heuristics research, and showing – as a teasing conclusion for rationalists – that your judgments and decisions may turn out better if you neglect part of the relevant information.

On the non-psychological side, an enlightened econometrician like Wakker (2010) has come to treat expected utility theory as a special case of Prospect Theory (Kahneman & Tversky, 1979; Tversky & Kahneman, 1992), which may best be applied with a keen eye on situational factors and decision-maker characteristics (e.g., gain/loss-dependent ambiguity attitudes). Wakker's masterful overview offers young researchers an excellent basis for their own advanced education and the design of innovative research projects.

In a more general behavioural-science connection, Gilboa (2010: 16) provides an illustrative quote about 20th-century developments in decision theory:

"It is quite amazing that a few thinkers in the early and mid-twentieth century could come up with simple principles that summarized a large body of philosophical thinking through the ages and charted the way for applications in decades to come. Their contributions are elegant and general, philosophically profound and mathematically brilliant. (..) However, it should come as no surprise that such an elegant theory may need to be fine-tuned to accommodate specific applications. We cannot be sure that the same notion of rationality would meaningfully apply to all decision makers, individuals, or organizations, independently of culture, education, and context."

Apparently, such a statement by an economist may be 'normal' today, but it would have been quite remarkable 30 years ago (but see Schoemaker, 1982). Evidently, much cognitive-behavioural research on probability judgment, utility assessment, decision framing and risk perception has significantly contributed to this. Thus modern '*homo psychologicus*' seems to be gradually merging with classical '*homo economicus*'. This certainly holds major promises for a world offering many complex decision problems for

boundedly-rational human beings.

Let me conclude on a more recent challenge. The controversial Precautionary Principle (PP) in environmental and health policy-making is generally considered to apply in cases of greatly uncertain, presumably low-probability, high-consequence risks: “*in dubio abstine*” or “better safe than sorry” (e.g., Graham, 2001; Majone, 2002; Resnik, 2003). Thus decision-theoretic ideas and findings about ambiguity, ignorance, pessimism, and loss aversion are highly relevant.

An illustrative survey of formal decision models (Vlek, 2010) reveals that precautionary decision-making – balancing false positives vs false negatives – may follow various strategies, ranging from classical maximin and probability pessimism to over-depreciation of potential losses and maximizing expected utility-minus-regret. Persistent international scepticism about the PP may diminish when case-relevant theoretical and experimental results are advanced as a basis for more convincing policy-making.

Since the 1950s, probabilistic-inferential and decision-theoretic thinking has been broadened and deepened both in theory and in various practice. Given that much good work has already been done, one aspiration of SPUDM in its fifth decade (!) could be the integrative application of the many valid ideas and solid findings so well-documented in the professional literature. This would prevent the reinvention (elsewhere) of well-proven wheels. And it would demonstrate the flexible applicability of a rich body of knowledge, to which SPUDM has significantly contributed.

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