# Rejoinder

# Some Viewpoints on Emotion, Consequentialism and Multicriteria Decision Making

FRED WENSTØP*

*Norwegian School of Management, Nydalsveien 37, N-0484 Oslo, Norway*

ABSTRACT

This rejoinder discusses philosophical viewpoints on MCDA, especially concerning the role of emotion. Central issues are: Should MCDA put more emphasis on subjectivity? What is the relation between the decision-maker's mindset and emotions? Can one make the analysis more rational by internalizing emotions associated with virtues through extending the traditional set of decision-criteria? How can belief and values be separated? Finally, what is a suitable definition of rationality? Copyright © 2006 John Wiley & Sons, Ltd.

KEY WORDS: ethics; MCDA; emotion; rationality

## INTRODUCTION

This is a rejoinder to the comments made by Brugha, Daellenbach, Le Menestrel, Tsoukiás and Rauschmayer to the paper 'Mindsets, rationality and emotion in multi-criteria decision analysis', all appearing in this issue of JMCDA.

First of all, let me express my gratitude for the comments, which provide food for further thought and new sources of inspiration. Although the comments are different in outlook and scope, they have a common viewpoint in that they all welcome the attempt to explore some of the philosophical underpinnings of MCDA, where such diverse fields as ethics, psychology and mathematics meet. Not many papers have appeared earlier that address MCDA from this philosophical perspective. A notable exception is Churchman's address from 1972 when he, at one of the first conferences devoted to MCDA issues, questioned the morality of a researcher from the perspectives of Hume and Kant, and asked whether she should be emotionally engaged or detached (Churchman, 1972). I have not found any response to this challenge in the MCDA literature, however. It seems that we had to wait for Damasio's (1994) empirical findings of neurological links between decision and emotion until emotions started to become systematically addressed in the scientific fields of decision-making (Loewenstein and Lerner, 2002).

The commentators also address a number of specific themes, and I shall respond to the most important ones. These are:

1. The call for unabashed emphasis on subjectivity and emotions.
2. Mindsets and emotions.
3. What exactly are emotions?
4. Are emotions elicited, evoked or revealed?
5. Extending the traditional set of decision criteria.
6. Separation of belief and values.
7. Rationality.

## THE CALL FOR UNABASHED EMPHASIS ON SUBJECTIVITY AND EMOTIONS

This issue goes to the heart of MCDA and has to do with its strategy. Should MCDA strive to appear as objective as possible, emphasizing objectivity and solution methods that are technically optimal; or should more emphasis be put on the fact that subjective preferences and emotions

*Correspondence to: Norwegian School of Management, Nydalsveien 37, N-0484 Oslo, Norway.
E-mail: fred.wenstop@bi.no

of the decision maker are paramount factors that should be properly and openly included in the process? In my own experience, I have found it much easier to argue for MCDA by doing the latter, and I am happy to note that all the commentators—by and large—share that opinion.

## MINDSETS AND EMOTIONS

The idea of classifying emotions according to ethical mindset in decision contexts emerged through personal experience with MCDA applications, especially within environmental management and corporate social responsibility (CSR).

On the one hand, I observed that environmentalists would be unwilling to accept any trade-off as long as there was even the slightest probability of severe environmental damage; their language being one of rights and duties and their attitude very emotional (Wenstøp and Carlsen, 1987). Baron and Spranca (1997) have studied this phenomenon and identified a number of so-called *protected values* where people in general are unwilling to engage in trade-offs, including environment and rights.

On the other hand, CSR appears overly concerned with rules and regulations at the expense of focusing on real consequences. The emphasis there is more on commitment to the right standards and filling in the right forms—which does not require passion, than on reducing emissions or worrying about end impacts.

MCDA with its consequentialistic mindset is situated in between these positions. It endeavours to describe, predict and appreciate consequences of decisions—and appreciation of consequences requires tempered emotions.

### Consequentialism and consequential ethics
Le Menestrel finds the classification of mindsets according to virtue ethics, deontology and consequentialism a powerful aspect of my paper. But although he agrees that MCDA is consequentialistic, he does not think MCDA is well equipped to take into consideration consequentialist ethical values. Here, he touches on the distinction between *consequentialism* and *consequential ethics*. The first means that the mind is set on consequences, with no implications of what kind of consequences—they may very well be without ethical content, as they are in most MCDA applications. The latter requires consideration of consequences

that are ethical, and this is what Le Menestrel discusses—an important issue in itself.

### Taxonomy of mindsets
Rauschmayer uses the notion of mindsets in his paper, but does not think I distinguish well between virtue and duty ethics, pointing out that the union leader, as I described her, 'is not virtue-oriented, but judges herself according to her supposed social role'. This is arguable, I think, and my terminology could have been better. I argued that duty ethics requires only passionless rule-following, while consequentialism requires well-tempered emotions, and virtues connect to strong emotions. This should have been clearer. For instance, while display of classical Aristotelian virtues like 'pride', 'gratitude', 'forgiveness', 'humility', 'loyalty' and 'courage' certainly requires emotion, it is the *failure* of being virtuous that induces strong emotions like guilt and shame. And the same goes for breaking rules, provided rule breaking is experienced as failure of being virtuous. March (1994) uses a simpler taxonomy when he talks about 'a logic of appropriateness' as opposed to 'a logic of consequence'; the former pertaining both to duty and virtue ethics. In this language, the question of whether the union leader lacks virtue or judges herself according to her social role does not come up—she simply feels that her behaviour is inappropriate. March's experience is that most organizational decision-makers say they focus on consequence, while they in fact they make decisions they think are appropriate.

### Should MCDA have a mission?
This question begs itself from the opening part of Tsoukiàs thoughtful paper. I think it is important for the facilitator to understand the mindset of the decision-maker and help sort out reasons for the decision. Different reasons cannot or should not be dealt with in the same way because the emotional correlates are too different. Think of deadlocked political conflicts where reasons like 'right to land' or 'duty to avenge' evoke emotions that are far stronger than rational consideration of the good *consequences* one might achieve if such things were played down. But to shift from the ethical positions of right and duty to a focus on consequence would require a change of ethical mindset, which is hard if one is locked into one. An 'assistant', however, who understands the problem, could facilitate the change. I think it is an important role for the MCDA facilitator to

help the decision-maker understand and apply the consequentialistic perspective. Tsoukiàs asks specifically who my audience is, and my audience is indeed that facilitator. Although—as Rauschmayer correctly observed—I did not intend a moral discussion of MCDA, I do think that many moral dilemmas would benefit from at least exploring the consequentialistic perspective.

Brugha's criticism of the decision of the Norwegian health authorities to stigmatise immigrants in order to contain the HIV epidemic (Wenstøp and Magnus, 2001) is interesting in this connection. He writes: 'The flaw in the Norwegian case was its failure to consider the broader political, ethical and racial implications, indeed the possible consequences, of its chosen alternative. How could this have happened? The trivial possible reason might have been inexperience on the part of the MCDA decision advisors.' Well, I was among the facilitators, and the broader consequences were indeed included in the form of one objective: to avoid stigmatization of population sub-groups. The deputy health minister, who was one of the decision makers, told the facilitators that he found our consequentialistic approach a refreshing change from conventional rule based thinking, which impedes development of new alternatives.

**Neurophysical correlates of emotion**
Recent neurophysical experiments add credence to the notion that mindsets have emotional correlates. In a study by Greene *et al.* (2001) 60 practical dilemmas were classified as moral and non-moral ones; examples of the latter being whether to travel by bus or train given certain time constraints. Moral dilemmas were further classified as moral–personal and moral–impersonal ones. Moral–personal dilemmas included a question of whether to throw people off a sinking lifeboat, and an example of a moral-impersonal question was whether to keep money found in a lost wallet.

Nine participants responded to each of the 60 dilemmas while they were undergoing brain scanning using functional magnetic resonance imaging (fRMI). The results showed distinctly different patterns of activity in different areas of the brain for moral-personal dilemmas on the one hand and moral-impersonal and non-moral ones on the other. The brain areas in question were associated with emotion and with working memory, and the measurements vividly illustrate our preconception of strong activity in the emotional areas for moral–personal dilemmas and else feeble activity. This indicates that emotion is not merely a question of degree, but of kind; the brain appears to operate in different modes, depending on the type of dilemma it struggles with. Although I agree with Tsoukiás that evidence from such experiments may be a bit anecdotal for our purposes, I do think it helps our understanding of what goes on.

## WHAT EXACTLY ARE EMOTIONS?

Rauschmayer registers four different notions of emotions or feelings in my paper and asks for more precision. Brugha disputes some of the ideas of emotions that I have adopted from Damasio (Damasio, 2003; 1994) such as that feelings are 'mental phenomena', and that 'sympathy is an emotion while empathy is a feeling'.

The terms 'emotion' and 'feeling' are of Latin and Germanic roots, respectively, and are often used synonymously in English, as I do in this paper. It is a question of purpose, I think, if one wants to distinguish between them, and I find Damasio's definitions of *emotion* as a somatic phenomenon and *feeling* as a mental process quite useful. It implies that people in general can observe other peoples emotions, while feelings are private. It intrigued me that Damasio's discovery of emotions as the decisive factor in decision-making so closely mirrors Hume's contention that 'reason is the slave of passion'. According to Damasio, one cannot but act to feel better. This is a key point: emotion—not reasoning—prompts action. Therefore, in any decision-making process, emotions must be evoked whenever choices are made, otherwise the results will be unreliable. (To answer Daellenbach's question: *unreliable* is meant in a statistical sense. Damasio (1994) describes vividly how people who lack emotions sometimes have great difficulties making up their mind at all, and when they finally do, the choices tend to be random.)

*Affect* is another word for emotion, and *affective science* is a recent interdisciplinary field dedicated to the scientific study of emotion (Davidson, 2002), which include psychology, psychiatry, neurology, zoology, anthropology, sociology, economics and decision-making (Loewenstein and Lerner, 2002). Empirical studies apply two basic concepts of emotion: emotion as global affect and discrete emotions. Global affect is general emotion

measured on a high level—either positive or negative (Frijda, 1993), while discrete emotions are more specific, such as happiness, love, anger, fear, and sadness (Connelly *et al.*, 2004).

This indicates that that the kind of emotions that need to be elicited in MCDA are of the global affect type that can induce a degree of inclination towards- or aversion against specific outcomes or scenarios. This needs to be further explored within the MCDA context.

### Are emotions elicited, evoked or revealed?

Some commentators question whether emotions are 'elicited'—which is the term I used in the original paper—or whether some other term is better. Rauschmayer suggests 'evoked', and Brugha 'revealed'. 'Revealed' is probably the correct word when one observes emotions that are already there, for instance through measurement apparatus. 'Evoke' and 'elicit' mean nearly the same thing, but maybe 'evoke' is closer to calling forward something latent, while eliciting requires more effort and is therefore closer to what one would do in an MCDA process that aims at constructing preference models, or reasons for decisions as Tsoukiàs puts it. An example is Gregory *et al.* (1993) who look at valuation of environmental resources as a *constructive process*, considering that the values are not there at the outset, but need to be constructed. Perhaps '*evoke* emotions in order to *elicit* values to *construct* preference models' is suitable language.

### EXTENDING THE TRADITIONAL SET OF DECISION CRITERIA

The most interesting comments—in the sense that they point at ways MCDA practice can improve—deal with extending the traditional set of decision criteria to take emotions and ethical values into account.

Daellenbach requests emphasis on 'boundary critique' and careful judgement of what facts and values to include in the analysis. Tsoukiàs points out that 'A decision aiding methodology cannot limit itself in considering a certain type of reasoning (deontic, value based, heuristic or normative). It has to be able to consider any reason.' Brugha distinguishes between attributes and criteria, seeing attributes of the alternatives as something tangible and measurable in the tradition inspired by Keeney and Raiffa (1976). The result according to Brugha has been that MCDA has tended to focus on somatic issues according to his hierarchy of development activities and levels of subjective thinking. By stepping up his ladder it should be possible to include emotions and ethical values such as virtues. Le Menestrel is even more specific. He asks in the same vein: 'Is the sense of virtue reducible to standard rationality?' Le Menestrel considers two alternatives that are identical, except that one of them also incurs shame, and concludes that since shame is not really a property of the alternative—or attribute if you will, but an associated feeling, it cannot properly be treated within the MCDA framework. Rauschmayer proposes a solution to make it possible to retain a consequentialistic mindset: to defuse strong emotions by internalizing them with needs-based criteria.

Thus, all commentators seem to point in the same direction: that of extending the traditional set of decision criteria. Let me try to put these issues into a framework that highlights the different roles of consequential criteria and strong emotions.

### Immediate and expected and emotions

Figure 1 is adapted from a more complex structure proposed by Loewenstein and Lerner (2002), illustrating how emotions influence decisions:

(a) Our immediate emotions always determine the decision. We have—according to the basic tenet—no choice but to do whatever makes us feel better at the moment.
(b) We have expectations—or beliefs—about consequences of our decisions.
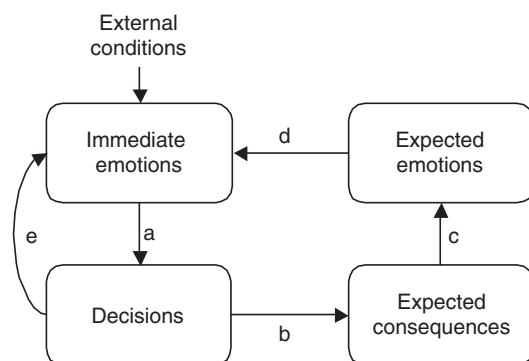(c) We envisage future emotions evoked by experiencing those consequences.



Figure 1. The role of emotions in decision-making.

(d) Our immediate emotions when we contemplate what decision to make are influenced by the future emotions we think the decision will produce.
(e) The choosing itself may strongly influence the immediate emotions if emotions caused by fear, guilt, shame, etc. overshadow the expected emotions from the intended consequences.

Seen in the light of Figure 1, MCDA has two emotion-related challenges. First, how do we evoke expected emotions that are strong enough to influence the immediate emotions? Second, how do we temper the strong emotions evoked through loop (e). It is like the problem of diving into water to have a swim. I can easily envisage the good consequences (global affect)—once I am in the water, but simple fear prevents me from doing the dive (discrete emotion)—and this emotion is so strong that no trade-off with the expected emotions seems possible. How can it be overcome?

**Internalizing needs**
The loop a–b–c–d of Figure 1 portrays consequentialism, where a degree of global affect—positive or negative—is required to tilt the decision maker one way or another. The loop (e) is characterised by strong (discrete) emotions and does not belong in the consequentialistic picture. It seems that the commentators generally recommend that we should try and reinforce the consequentialist perspective by *internalising* the reasons for loop (e) by extending the set of expected consequences. And this is precisely what Rauschmayer more specifically proposes by introducing need-based criteria that he argues would not normally come up in an ordinary MCDA with its focus on attributes.

Would this approach work in the diving example? Normal consequential attributes of the swim would be 'exercise', 'fun', 'company of others', 'pleasant feeling afterwards', etc. But I would also like other people's appreciation for overcoming my fear of diving into cold water, so perhaps 'appreciation' is a criterion that could be set against the discrete emotion, fear?

Actually, maybe the diving example is a bit unfair, since we have hitherto focused exclusively on *moral reasons* for strong emotions, not emotions like fear. However, *perception of risk* is another important factor in decision-making and a determinant of emotion as well. Slovic *et al*. (2004)

discuss this in a paper that has several parallels to our discussion. They suggest that rationality requires emotion, but are concerned that strong affect—especially caused by fear—may create misleading bias in decision-making under risk. Damasio's (1994) empirical work on decision-making and emotion is a central source of inspiration for their work, and they consider elicitation of well-tempered emotions an important challenge in decision-aid. In their words:

> On the one hand, how do we apply reason to temper the strong emotions engendered by some risk events? On the other hand, how do we infuse needed 'doses of feeling' into circumstances where lack of experience may otherwise leave us too 'coldly' rational?

## SEPARATION OF BELIEF AND VALUES

Keeney and Raiffa's (1976) seminal work has inspired what is now commonly called Multi Attribute Utility Theory (MAUT), with a parallel tradition (MAVT) that uses value functions instead of utility functions (Belton and Stewart, 2002). Value functions generally look like

$$V(a_i) = \sum_j w_j v_j(x_{ij})$$

The total value the decision-maker derives from alternative $i$ is $V(a_j)$, and the $x_{ij}$ are actual or anticipated 'measurements' of the performance of alternative $i$ on criterion $j$—what I called scores, or beliefs about facts. The value the decision-maker derives from the performance of criterion $j$ is $v_j \times (x_{ij})$, where the value functions are subjective and can be elicited from the decision-maker. The relative importance of the criteria is represented by $w_j$, which is also subjective and can be elicited as well, provided sufficient emotions can be evoked. The formula thus gives a compelling model of how of values and beliefs can be separated, with $w$ and $v$ representing subjective items and $x$ beliefs about facts. (Behind the scene, there are some assumptions about decomposability, but in this context, it is the principle that counts). Now, the beliefs $x$ may very well also be subjective, but the difference between values and beliefs is that other people cannot question your values as easily as they can question your beliefs.

From a consequential ethics point of view, your values are yours. They are internal and cannot be right or wrong, although they can be more or less well-founded. Your beliefs, however, are about expected consequences—whether they are measurements or perceptions—of the outer world and can be both ill-founded and wrong. Things may simply turn out differently than you thought.

This picture works particularly well as long as the criteria are objectively measurable attributes. But many MCDA methods use subjective scores, and this becomes even more necessary when subjective needs-based criteria are introduced to defuse strong emotions. I fully accept that scores may be subjective, but I still feel that the more objective a consequence analysis is, the better. Objectivity relieves the decision maker from some of the cognitive burden and may increase rationality. To use indicators instead of subjective criteria is one way to avoid the problem. This was done in the HIV case mentioned above (Wenstøp and Magnus, 2001), where a human-rights issue (do not stigmatise subgroups) was internalised as a consequential indicator criterion (the size of the group that was stigmatised) and traded off against containment of HIV (cases). This provided the decision-makers with objective background information to make it easier for them to evoke emotions concerning the stigmatisation problem.

Daellenbach addresses the issue of objectivity, questioning my assumption that beliefs can be right or wrong. He asks: 'How can a perception by an individual be wrong? If I experience the weather as cold and you find it warm, this does not imply that one of us is wrong. Our perceptions are simply different.' Yes, but while perception is mental organization of sensory input, belief about facts relates to the outer world and can be true or false. I can *perceive* the weather to be cold, but *believe* it to be −10°C. It all depends on the kind of criteria, whether they are objective or subjective. But you may be wrong even with subjective criteria. You may believe that you will perceive the weather to be cold when you get out, while in fact it turns out that you find it quite comfortable.

### Problem structuring methods
Daellenbach wants a discussion of the overriding questions of problem structuring and *boundary critique*, which is a systematic method to define the boundaries of the decision-problem by 'boundary judgments as to what 'facts' (observations) and

'norms' (valuation standards) are to be considered relevant and what others are to be left out or considered less important' (Ulrich, 2000). This involves a choice of separation of facts and values, which I fully agree is far from self-evident. Keeney (1992) has made an important contribution on how to identify values in his seminal book value focused thinking. However, my paper took a more narrow perspective by assuming that facts already have been separated from values, and then asked what kind of values MCDA can deal with. But it would be quite interesting to consider the role of emotion in this context. When trying to separate facts and values, good candidates for values would probably be things that the decision-maker feels emotional about.

### Implications for emotion
It is well known that emotions may affect our ability to predict future consequences. For instance, positive emotions make us optimistic; and there is no obvious reason why this should be different in the case of subjective criteria. Therefore, while emotions are required to engage values, they are a potential source of bias when it comes to making predictions. This is consistent with Damasio's theory, which describes predictions as being made through reasoning processes in neocortex and the prefrontal lobes, while emotions are subsequently evoked by the amygdala.

Therefore: (1) stay cool when making predictions of consequences, (2) imagine what it would be like to live with them, and (3) choose on the basis of the emotions that the images evoke.

## RATIONALITY

Researchers tend to be emotional about the concept of rationality, and Le Menestrel, Rauschmayer, Brugha and Tsoukiàs all make comments on the proposed definition. There exist indeed many notions and definitions, and the question is to find one that is suitable. I wanted a normative definition of rationality that clearly distinguishes between beliefs and values, and Føllesdal's (1982) emphasis on well-foundedness of values was especially appealing, since it made it possible to argue for emotions as a necessary requirement for rationality, emotions being necessary for engagement of values in decision-making. In fact, decision-makers appreciate being told that they are rational when they use gut feeling, although

this is contrary to most layperson's concept of rationality, being as it is—strongly connected to reason and even to self-interest. Another nice feature of Føllesdal's definition is that it clearly communicates that rationality is not a question of what your values are, the important point is that they are well-founded; thus altruism, for instance, is fully compatible with rationality.

Le Menestrel supports this, arguing standard models of rationality 'focus on the choice of the action that leads to the best consequence for the individual who acts. As such, these standard models of rationality may inhibit our ability to act rationally.' Rauschmayer supports the emphasis on rationality and consequentialism, but not expected utility maximization as a part of it. I only used that as an example, however. I could just as well have said value maximization or something else. Anyway, I did not intend to touch on utilitarianism and welfare distribution.

Brugha finds the discussion of rationality as a foundation for values one of the most interesting aspects of the paper, pointing out strong parallels with his own concept of adjusting activities: proposition, perception, pull and push (Brugha, 1998).

Tsoukiàs makes the interesting comment that I could have used Simon's (1976) distinction between procedural and substantive rationality to distinguish between rule based behavior and consequentialism. This distinction is akin to March's distinction between a logic of appropriateness and a logic of consequence, except that appropriateness also pertains to virtues. Not disagreeing with Føllesdal's definition of rationality, Tsoukiàs feels that several different rationality concepts are relevant as well, particularly those characterizing the decision aiding process; for instance normative rationality, descriptive rationality, prescriptive rationality, and constructive rationality.

## CONCLUSION

The initiative to discuss some of the philosophical underpinnings of MCDA is welcomed; and there is general agreement that emotion and subjectivity deserve more focus. It is in particular appropriate to consider emotion a necessary ingredient in rational decision processes.

There are different viewpoints on rationality, but there is no strong opposition to Føllesdal's

four-dimensional concept of rationality, which includes well-foundedness of values. However, there is an obvious need for further discussion of how to separate belief and values. This is accentuated by the proposed distinction between virtue values and consequentialistic values.

The need for evoking sufficient emotions when considering expected consequences, and for tempering strong emotions linked to virtues, is generally accepted, and some promising ideas for doing the latter have emerged; in particular internalizing virtues with the help of needs-based criteria. None of the commentators have addressed the question of how to evoke sufficient emotions to evaluate expected consequences, however. So this important challenge remains.

## ACKNOWLEDGEMENTS

## REFERENCES

Baron J, Spranca M. 1997. Protected values. *Organizational Behavior and Human Decision Processes* **70**: 1–16.

Belton V, Stewart TJ. 2002. *Multiple Criteria Decision Analysis*. Kluwer: Dordrecht.

Brugha CM. 1998. The structure of qualitative decision making. *European Journal of Operational Research* **104**(1): 46–62.

Churchman CW. 1972. *Morality as a Value Criterion*. Multiple Criteria Decision Making. University of South Carolina Press: University of South Carolina.

Connelly S, Helton-Fauth W, Mumford MD. 2004. A managerial in-basket study of the impact of trait emotions on ethical choice. *Journal of Business Ethics* **51**: 245–267.

Damasio A. 2003. *Looking for Spinoza. Joy, Sorrow, and the Feeling Brain*. Harcourt: Orlando.

Damasio AR. 1994. *Descartes' error. Emotion, Reason and the Human Brain*. G. P. Putnam's Sons: New York.

Davidson Rj (ed.). 2002. *Handbook of Affective Sciences*. Oxford University Press: Cary, NC, USA.

Frijda NH. 1993. Moods, emotions episodes, and emotions. In *Handbook of Emotions*, Lewis M, Haviland JM (eds). The Guilford Press: New York.

Føllesdal D. 1982. The status of rationality assumptions in interpretation and in the explanation of action. *Dialectica* **36**(4): 301–316.

Greene JD, Sommerville RB, Nystrom LE, Darley JM, Cohen JD. 2001. An fMRI investigation of emotional engagement in moral judgment. *Science* **293**: 2105–2108.

Gregory R, Lichtenstein S, Slovic P. 1993. Valuing environmental resources: a constructive approach. *Journal of Risk and Uncertainty* **7**: 177–197.

Keeney R. 1992. *Value-Focused Thinking*. Harvard University Press: London.

Keeney R, Raiffa H. 1976. *Decision with Multiple Objectives*. Wiley: New York.

Loewenstein G, Lerner JS. 2002. The role of affect in decision making. In *Handbook of Affective Sciences*, Davidson Rj (ed.). Oxford University Press: Cary, NC, USA, 619.

March JG. 1994. *A Primer on Decision Making*. The Free Press: New York.

Simon HA. 1976. From substantial to procedural rationality. In *Method and Appraisal in Economics*, Latsis SJ (ed.). Cambridge University Press: Cambridge; 129–148.

Slovic P, Finucane ML, Peters E, MacGregor DG. 2004. Risk analysis and risk as feelings: some thoughts about affect, reason, risk, and rationality. *Risk Analysis* **2**: 311–321.

Ulrich W. 2000. Reflective practice in the civil society. *Reflective Practice* **1**(2): 247–268.

Wenstøp F, Carlsen AJ. 1987. Ranking hydroelectric power projects with multi criteria decision analysis. *Interfaces* **18**: 36–48.

Wenstøp F, Magnus P. 2001. Value focused rationality in AIDS policy. *Health Policy* **57**: 57–72.