Heuristics, biases and strategic

STRATEGIC decisions concern the general direction taken by organisations over the medium- to long-term and are often the critical factor differentiating success from failure. Take the case of Rolls Royce. For the majority of the last century this organisation was considered to be the epitome of excellence in British engineering. Yet by the early 1970s, following the failure of a crucial strategic decision concerning the development of a new aeroplane engine, the aircraft division of this giant was sold for just one pound sterling! In contrast to this, Shell has been credited with well-managed strategic decision making. The effectiveness of their strategic processes meant that, relative to their competitors, they were considerably better placed to weather the financial crisis caused by soaring crude oil prices in 1973 (Wack, 1985a, 1985b).

The aim of this article is to demonstrate how one area of behavioural decision research (BDR), concerned with judgemental heuristics and biases, can contribute to an understanding of strategic decision making, and in doing so has the potential to improve this important aspect of organisational activity.

Why do some organisations make effective strategic decisions while others do not? Why do organisations have difficulty making these decisions? What are the factors that differentiate successful and unsuccessful strategic decision making and how can we use this knowledge to improve this activity? These are important questions that require a broad range of economic, political, technical and financial perspectives. A detailed consideration of these perspectives, however, lies outside the scope of this article – the interested reader should consult Mintzberg *et al*. (1998). Instead, we focus on a psychological perspective: the contribution that BDR can make to answering these questions.

To illustrate, reconsider the situation at Rolls Royce described above. The primary problem can be traced back to a strategic decision committing the organisation to developing what was believed to be a 'winning' aero-engine. When this decision ran into problems, the level of commitment was so great that the organisation continued spending large amounts of money in an attempt to find a solution, bankrupting themselves in the process. This activity maps well on to one body of theory and research in behavioural decision making concerned with escalation of commitment. In particular, research has shown that individuals and organisations often demonstrate a strong commitment to an action, despite feedback suggesting failure (see Staw, 1997). BDR is concerned with identifying and explaining these types of activities.

Heuristic modes of thinking in decision and judgement

An important starting point for theories of human judgement and decision making has been the suggestion that people have limited capacity for mental work, and that in order to deal with a complex and fast-changing world they have developed a number of simple modes of reasoning. These 'heuristic' modes of thinking can lead to error and bias. This view from BDR contrasts with discussion of risk and uncertainty within the general area of strategy, mostly underpinned by an economic perspective, which has been developed from the premise that decision makers and implementers of strategy are inherently rational actors.

Rational theories of decision making would propose that we choose the best option from all the alternatives that are on offer. But Simon (1957) argued that people in choice situations 'satisfice' – a decision heuristic that involves choosing the first alternative that meets their minimum requirements. Satisficing is much simpler in terms of its cognitive operations, so it makes fewer demands on scarce mental resources. However, it may lead to suboptimal behaviour given that once an 'acceptable' option is found the search for and evaluation of further, potentially better, alternatives ceases. Subsequent research has identified other decision heuristics that, in common with satisficing, involve less mental effort (see Payne *et al*., 1993; Svenson, 1979). There is strong evidence suggesting that heuristic modes of reasoning also underpin judgement, particularly when people assess risk and uncertainty (Gigerenzer *et al*., 1999; Kahneman *et al*., 1982; see also Hardman & Harries, this issue).

Initially, three judgemental heuristics were identified: 'representativeness', 'availability' and 'anchoring-and-adjustment'. The representativeness

FRAMING BIAS

(taken from Bazerman, 1998, pp.47–48)

A large car manufacturer has recently been hit with a number of economic difficulties, and it appears as if three plants need to be closed and 6000 employees laid off. The vice-president of production has been exploring alternative ways to avoid this crisis, and has developed two alternative plans:

Plan A *This plan will save one of three plants and 2000 jobs.*

Plan B *This plan has a 1/3 probability of saving all three plants and all 6000 jobs, but has a 2/3 probability of saving no plants and no jobs.*

A second pair of alternative plans is:

Plan C *This plan will result in the loss of two of the three plants and 4000 jobs.*

Plan D *This plan has a 2/3 probability of resulting in the loss of all three plants and all 6000 jobs, but has a 1/3 probability of losing no plants and no jobs.*

decision making

A. JOHN MAULE *and* **GERARD P. HODGKINSON** *discuss cognitive shortcuts in business.*

heuristic involves judging the likelihood of an event based on the similarity between that event and existing knowledge about similar occurrences. Availability refers to the way in which probability or frequency judgements are influenced by the ease with which past examples are recalled. Anchoring-and-adjustment refers to a tendency for judgements to be biased towards an initial value arrived at from partial or no computation. A large body of research indicates that people use heuristics such as these, often overlooking other important information that correct solutions (based on statistics and probability theory) prescribe should be taken into account (see Baron, 1994; Bazerman, 1998).

Cognitive biases

In addition to problems associated with the dependence on heuristic modes of thinking, BDR has identified a number of more general biases in human judgement and decision making. One relatively well-established bias is illustrated in the box (left). All participants read the problem and then half are asked to choose between Plans A and B and the other half between Plans C and D.

While both pairs of alternatives are objectively the same, people consistently prefer Plan A over plan B and Plan D over Plan C. This inconsistency, known as the 'framing bias', maps on to a large body of literature showing that people tend to be risk-averse when outcomes are considered in terms of gains, and risk-seeking when outcomes are considered in terms of losses (see Kuhberger, 1998). While an explanation of the framing bias lies outside the scope of this article (interested readers are referred to Hodgkinson & Maule, 2002), this phenomenon demonstrates that choice behaviour may be crucially affected by the form in which decision alternatives are presented, rather than being the product of a systematic analysis of the expected outcomes of these alternatives.

While these and similar findings appear to have important implications for strategic decision making, they are largely based on laboratory experiments using simple pencil-and-paper problems given to inexperienced undergraduates. In the next section we review research investigating whether judgemental heuristics are used in complex strategic contexts, by experienced and knowledgeable individuals.

Judgemental heuristics in strategic decision making.

The implications of research on heuristics and biases for strategic decision making have been recognised for some time. Schwenk (1984), for example, identified three different phases of the strategic decision-making process ('goal formulation and problem identification', 'alternative generation and evaluation' and 'selection') and considered the potential use of heuristics (and the possibility that these might lead to biased judgement) during each phase. He identified and defined a set of heuristics and biases, then presented supporting evidence for their use in strategic situations by analysing various written accounts of how actual strategic decisions had been taken in practice.

Schwenk argued that the processes outlined in these descriptions indicated that particular heuristics had been deployed and provided evidence of a number of attendant biases. In addition, he discussed how these heuristics and biases may have led to important errors of judgement, reducing the quality of strategic decision making. For example, he described a situation in which the head of an American retail organisation held a very strong belief that there would be a depression at the end of the Second World War. This belief was based on the knowledge that a similar depression had occurred at the end of the First World War. So strongly held was this belief that the individual concerned decided not to expand his business following increased competition induced by a major rival, a decision that led to a permanent loss of market share. Schwenk argued that this executive's erroneous belief about an impending depression, the primary reason for his poor decision, could be explained in terms of representativeness.

Two trends have developed within subsequent research. The first has continued the line of enquiry established by Schwenk using documentary sources and anecdotal evidence to identify the occurrence of particular heuristics and biases; the second has used experimental techniques in an attempt to replicate and extend BDR findings, using relatively complex strategic scenarios and, in some studies, experienced research participants.

Evidence for heuristics from documentary sources Within this body of work (for recent reviews see Das & Teng, 1999; Schwenk, 1995) there are many examples of strategic action that can be readily interpreted as having involved heuristic modes of thinking, which in turn have led to error and bias, as illustrated by the American retailer example highlighted above.

Despite many compelling examples, there are some important methodological limitations associated with this research. For example, documentary sources are usually prepared for particular audiences (often to influence the perceptions of other key stakeholders) and may not truly reflect

the executives' thinking. In addition, the heuristics and biases identified by BDR may not be directly relevant in this context, given that they are based on studies that have involved much simpler problems and less experienced participants than would normally be characteristic of strategic situations.

Evidence for heuristics from experimental research Schwenk (1984, 1995) has advocated the use of suitably adapted experimental methods as a means of overcoming the difficulties with documentary research. The use of complex strategic problems and experienced research participants provides a useful means for ensuring that research is both rigorous and relevant. However, despite the obvious advantages, the experimental method has been greatly under-utilised in this context (Hodgkinson & Maule, 2002; Schwenk, 1995).

Nevertheless, sufficient evidence has accumulated to demonstrate the value of this approach. Bateman and Zeithaml (1989) reported two laboratory studies, one using undergraduate students, the other experienced MBA students, which tested the validity of a psychological model of the escalation of commitment phenomenon. Three key variables were investigated: positive vs. negative decision frame (as illustrated in the box on p.68), perceived organisational slack (i.e. spare resources that can be utilised in the event of problems arising) and failure feedback (i.e. feedback indicating that the expected benefits are not forthcoming). The overall pattern of findings indicated that a positive decision frame combined with failure feedback and low perceived organisational slack were predictive of the highest levels of escalation of commitment in a financial reinvestment decision.

Our own experimental studies (Hodgkinson *et al*., 1999; Hodgkinson & Maule, 2002), also using a combination of inexperienced (undergraduates) and experienced participants (senior managers within a financial services organisation), have uncovered evidence for the framing bias. Left unchecked, this particular bias is likely to undermine the quality of strategic decision making in organisational settings.

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In addition we have investigated whether the framing bias could be eliminated using structured decision aids. One technique in particular, causal cognitive mapping (Axelrod, 1976; Huff, 1990), was examined, on the basis of a growing body of evidence suggesting that more effortful thought prior to making decision choices can eliminate this particular bias (e.g. Maule, 1995). In both student and managerial samples, the application of causal mapping prior to choice eliminated the framing bias, providing supporting evidence for its efficacy as an intervention technique for use in practical settings.

Evaluation of field and experimental research

Heuristics and their attendant biases are confirmed by the research findings reviewed above as likely to be important in strategic decision making. There are, however, three aspects of this research that are worthy of further comment. The first concerns the relevance of the perspective adopted, focusing as it does on the individual decision maker and neglecting key organisational factors (e.g. past performance and decision history, politics and power, organisation rules and procedures) known to be important in the strategic context. However, as we have argued elsewhere (Hodgkinson & Maule, 2002) although strategic decision processes typically involve group, organisational and political factors, the initial judgements and preferences of the individual decision maker are a vital component of these wider social and organisational processes. Hence a research perspective focusing on individual judgements and preferences has an important role to play in understanding strategic choice.

The second aspect is methodological and concerns the relative merits of the two approaches adopted. While field research has the advantage of relevance in that it is based on documentary evidence associated with actual strategic decisions, it lacks rigour, given that the matching of the documented cases to heuristics and biases is not always undertaken systematically and the interpretation is *post hoc*. Experimental research, by contrast, is rigorous but lacks ecological validity. No matter how experienced the participants and realistic the case material, the situation is always artificial. However, it is important to note that both approaches have yielded rather similar findings. Following Fischhoff (1996), we suggest that the high degree of consistency in the effects observed between the laboratory and field settings greatly strengthens the confidence that can be placed in these effects and the accompanying body of theory. In short, this convergence of findings provides considerable support for the conclusion that heuristics and biases are indeed important in strategic contexts.

Finally, both approaches described above have contributed much to our understanding of the deleterious effects of heuristics and their consequent implications for improving strategic choice. However, there has been little consideration of the possible *benefits* of using heuristics in the context of strategic decision making, despite the fact that one of the earliest and most influential articles on the topic of heuristics unequivocally stated that '[t]hese heuristics are highly economical and *usually effective*, but they lead to systematic and predictable errors' (Tversky & Kahneman, 1974, pp.1130, emphasis added).

One of the advantages of using heuristics is that they take less time to implement compared with conventional processing and so are particularly appropriate in time-pressured situations (Svenson & Maule, 1993). While, by definition, strategic decisions involve the medium- to longer-term and so are less likely to be time pressured overall, arguably such decisions in reality comprise

a series of smaller, relatively discrete decision episodes accumulating over extended periods and defining the ultimate decision. It is highly likely, we contend, that these 'micro-episodes' are time pressured and, therefore, might ordinarily benefit from the use of heuristic modes of thinking and reasoning. In this connection, Hogarth's (1981) work is highly relevant, drawing attention to the fact that studies demonstrating bias have been dominated by tasks involving one-off, discrete judgements of an unchanging situation or object. Hogarth has suggested that often, as in the present context, people have to judge situations or objects that change over time, making it inappropriate to expend a good deal of effort to make a precise judgement at any particular point in time. Under these circumstances, an approximate judgement based on a simpler, less effortful heuristic may be much more appropriate (see Hardman and Harries in this issue for further criticisms of the heuristics and biases approach).

Some positive aspects of using heuristics have been strongly demonstrated in a series of articles by Gigerenzer and his colleagues (see Gigerenzer *et al*, 1999), but further work is urgently needed to investigate whether heuristics of this kind perform similarly well in more complex strategic situations. If so, then identifying these simple but effective modes of reasoning could provide a very powerful way of improving strategic choice.

Conclusions and implications

Overall, the current evidence supports the view that heuristic modes of thinking, and their attendant biases, are important features of strategic decision making. The findings we have reviewed demonstrate that BDR can make an important contribution to our understanding of strategic management by identifying and explaining fundamental limitations of strategic thinking and reasoning, thereby adding to a growing body of psychological research concerned with the nature and impact of cognition and emotion in strategic management (for details see Daniels, 1999; Hodgkinson, 2001a, 2001b; Huff, 1990). These findings also demonstrate potential sources of error and bias that can lead to catastrophic outcomes, as exemplified by the situation at Rolls Royce described earlier.

Fortunately, however, BDR has implications not only for the development of descriptive theory and research on strategic decision making, but also suggests useful ways in which strategic decisions might be improved. For instance, Kahneman and Tversky (1982) present a relatively simple set of procedures to follow in order to overcome bias associated with over-dependence on the representativeness heuristic, and Russo and Schoemaker (1989) have devoted an entire book to identifying and improving the thinking and reasoning underlying decision making, based on an understanding of the heuristics and biases literature in general. Our own research, described earlier, has provided evidence for the importance of the framing bias in the context of strategic decision making and the use of cognitive mapping as a means for overcoming this bias. In summary, the adoption of a BDR perspective has led to the development of a number of theoretically sound interventions to help overcome error and bias, thus contributing to the improvement of strategic decision making.

Finally, the research reviewed in this article has also advanced BDR by addressing directly a legitimate concern voiced by a growing number of critics over recent years – that an over-dependence on simple laboratory studies limits its usefulness for understanding more complex decision making in the real world.

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