MANAGEMENT ‘INTUITION’: AN INTERPRETATIVE ACCOUNT OF STRUCTURE AND CONTENT OF DECISION SCHEMAS USING COGNITIVE MAPS*

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ABSTRACT
In this paper, the structure and content of executive perceptions are considered using cognitive mapping to isolate ‘intuitive’ elements within their individual decision schemas. An inductive approach is used to develop three propositions drawn from the literature. These are explored using the results of interviews with senior executives of two UK retail organizations. Three of the maps represent different levels of seniority and roles and are used to explore potential differences within the organization. Similarities and differences between organizations are examined with reference to an additional map of an individual in a second organization.[1] Propositions are interpreted and developed with reference to the maps and textual extracts from the interviews, to provide additional insight into the concept of intuition prior to larger-scale studies. The study highlights the need to explore differences in schemas both within and between different industry sectors. It emphasizes three important aspects of intuition as a way in which individuals ‘cut through’ a decision situation to make an ‘unexplained’ relationship between input and cognition without really thinking in-depth. First, they appear to trade-off depth for breadth of information. Second, they use personal experiences, surrogate indicators, and typologies to rationalize their decisions. Finally, the study shows there are important overlaps and differences in the content of decision schemas that represent ground for agreement and disagreement and as a basis for negotiating group decisions. These insights are used to redevelop and extend the propositions by way of conclusion.

INTRODUCTION

Intuition is known to be important for effective decision making (Schwenk, 1995). A major study of over 200 executives by Agor (1989, p. 158) showed that ‘left
brain’ intuitive decisions were ‘based on input from facts and experiences gained over the years, combined and integrated with a well-honed sensitivity or openness to other, more unconscious processes’. Agor’s study suggested that intuition is most useful to managers in uncertain situations where they are faced with insufficient facts and complex alternatives. However, despite the fact that many researchers of organizational cognition have since stated that intuition is an important source of ‘sense making’ (e.g. Jenkins and Johnson, 1997a), the structure and content of the concept of intuition is still unrefined and poorly understood. Weick (1995, p. 88) for example, questions whether intuition is merely ‘compressed expertise in which people arrive at an answer without understanding all of the steps that led up to it’, and argues that it is a complex phenomenon. Intuition has, for instance, been variously characterized as an innate problem solving ability (Swink, 1995), a way of managers ‘using their heads’ rather than formulas (Kleinmuntz, 1990), a combination of facts and experiences (Agor, 1989), a means of complex data processing (Payne et al., 1988), a questioning outlook (Blattberg and Hoch, 1990), soft and personal information (Molloy and Schwenk, 1995), and as a way of pulling together and simplifying complex patterns (Showers and Chakrin, 1981). The problem with these definitions is that whilst the effect of judgmental bias and the impact of the functions, roles and backgrounds of individuals on their decision-making effectiveness has been examined, the structure and content of what they perceive has barely been explored (Waller et al., 1995). This absence is surprising, as a number of studies have stressed the value of combining intuitive insight and normative approaches in decision making (Blattberg and Hoch, 1990; Einhorn, 1972; Kleinmuntz, 1990; Papadakis and Barwise, 1998b; Showers and Chakrin, 1981; Spangler, 1991).

Although research in decision-making has been taking place for over 35 years, it is surprising that relatively little can be said of the nature and form of cognitive constructs and their relationship with intuition as a way of ‘cutting through’ to the essence of a situation and their form and role in top management decision-making (Papadakis and Barwise, 1998a). Thus, there is a clear need to begin to examine how managers conceptualize important issues (Ireland et al., 1987). However, it was suggested in a recent study of management cognition that progress can only meaningfully occur once a precise vocabulary of core concepts has been developed (Huff, 1997). Sensitive articulation of concepts like ‘intuition’ are consequently an important precursor to the much-needed large-scale investigation recommended by a number of authors (Huff, 1997; Papadakis and Barwise, 1998a).

The concept of intuition is developed further in this paper by exploring the literature on the cognition of individual managers. Three propositions are then constructed regarding the form which management intuition appears to take. These propositions are examined in the second section of the paper, with reference to individual cognitive maps created from extended interviews with three senior executives of a leading UK retail organization active in the electrical product market, so as to surface inter-functional differences within organizations (Amason, 1996; Bowman and Daniels, 1995). The analysis compares the structure and content of their maps. Insight into potential similarities and differences between organizations is made by a comparison of these findings with the map of an executive from a major UK grocery retailer. The discussion concludes using grounded insights provided by the maps to refine the existing propositions and generate new ones as
a platform for more extensive empirical research. The importance of work of this type has been highlighted by Hodgkinson and Johnson (1994, p. 548):

...we need to develop more sophisticated techniques of analysis, techniques which will enable the researcher to link structural representations of competitors with managers’ causal logics regarding competition...we need to move still further forward to face the complex methodological problems not only of aggregation, but more especially of the comparison of cognitive/causal maps...The task of comparing taxonomies...is embryonic in its development. The ability to compare maps which combine structural and causal elements remains an important and stimulating challenge.

COGNITIVE ASPECTS OF MANAGERIAL DECISIONS

Most strategic decisions involve substantial financial investment and typically relate to changes in the structure and location of the activities of organizations to improve effectiveness (Hickson et al., 1986; Marsh et al., 1988). Longitudinal research (e.g. Butler et al., 1993) has demonstrated decision effectiveness is the outcome of: (1) the interaction between the shape and definition of the problem as seen by participants; (2) how individuals build and develop support for strategic solutions within the group; and (3) the influence particular people have on the nature and timing of the decision process itself. Whilst decisions may be group based, an understanding of the cognitive abilities of individuals is, consequently, critical to the effectiveness of strategic decisions in organizations. Indeed, in environments dealing with large, unstructured decisions of this type (Mintzberg et al., 1976), how individuals judge a particular situation or problem directly affects the effectiveness of the group decision in terms of the attainment of objectives and learning arising from a particular situation, as does the type of conflict present (Butler et al., 1993; Dean and Sharfman, 1996; Hickson et al., 1986; Marsh et al., 1988). Thus, the collective cognition of top management is central to the success of the group in comprehending uncertainty inherent in a decision (Bantel, 1993; Korsgaard et al., 1995; Luce and Winterfeldt, 1994). Understanding the conceptual models used by individuals is, therefore, vital both to the researcher attempting to understand the decision process, as well as the manager trying to evaluate the quality of ideas generated within the group (Eden, 1992b; Massey and Wallace, 1996).

The link between the composition and outlook of upper echelon teams of executives and organizational outcomes is important, and has formed a key area of research over the last ten to fifteen years (e.g. Daniels et al., 1995; Hambrick and Mason, 1984; Miller et al., 1998; Thomas and Venkatraman, 1988). Arguably, this connection has not been explored systematically, a weakness to which attention was drawn by Hambrick and Mason (1984). Specifically, they emphasized the interaction between a given decision situation and the cognitive biases and values of participating individuals, who have limited fields of vision, and who select and interpret information in the process of making strategic choice with important implications for team composition. They proposed that homogeneous teams will make decisions more quickly and effectively than heterogeneous teams, especially in stable environments, and that this will tend to lead to greater profit-
ability. However, whilst the idea of understanding the schemas of individuals as a starting point for more effective group decision-making is appealing, a recent study has highlighted that the evidence for cognitive diversity helping ‘upper echelon’ executives – defined in terms of differences in beliefs and preferences – is actually inconsistent (Miller et al., 1998). The reason for this appears to be that, whilst groups can exert a positive effect on outcomes, with disagreement acting as a basic ‘resource’ affecting group cohesion and preventing ideas from going unchallenged; they can also produce negative effects on decision-making by leading to polarization in discussion. Miller et al.’s survey of decision-making in three different sectors found that the reasons for the inconsistent findings relate to the mediating role that is played by organizational size and environmental differences. As a result, they concluded that the value of understanding cognitive diversity is dependent on the context of the decision. Exploring this, however, requires researchers to ‘... search for or develop methods to overcome the problems and more effectively utilise the advantages of cognitive diversity’ (Miller et al., 1998, p. 51). More importantly, these findings on strategic decision-making underline the importance for researchers to be sensitive to the differences in the domains of decisions and the nature and form of major decisions between industrial sectors (see Laukkanen, 1998), rather than simply making abstract comparisons. Thus, for the purposes of this paper, the study concentrates largely on exploring intuitive elements of decision schemas within a single company. However, to better contextualize these findings an attempt is made to compare the structure and content of the maps with those of an executive operating in a second company, the scope and content of whose job is broadly similar to one of those interviewed in the first organization.

COGNITIVE ASPECTS OF INDIVIDUAL DECISION SCHEMAS

Such individual differences in perception occur principally because: (1) managers take ‘bounded’ views of problems (March and Simon, 1958); (2) search for and select information in different ways; and (3) have contrasting ‘cognitive styles’ (Allison and Hayes, 1996; McDougal, 1995; Payne et al., 1988). This view is central to Schwenk’s (1984) perspective of strategic decision making, which integrated previous models developed from cognitive, organizational and political perspectives. The organizational view implies that structures and processes influence information flows; the political perspective highlights the interplay between external influences and internal political manoeuvring and power struggles within the group; and the cognitive perspective emphasizes the effect of how problems are comprehended. Central to all three models, however, is the way in which individuals within the group perceive the decision environment and exert their cognitive biases and assumptions. A growing area of work is demonstrating how this can be affected by demographic, personality and psychological characteristics (Langer, 1975; McDougal, 1995; Nahavandi and Malezad, 1993). Understanding the group perspective through individual schemas is thus central to an improved critique of group decision-making. In this paper, we focus on the structure of schemas and their content, as a precursor to exploring the effect of personality and other factors that underlie them in future work.
It has also been suggested that the perceptions of a decision situation vary between managers from contrasting backgrounds and levels within the same organization, although again, results are inconclusive. An early exploratory study of three managers in a single company found some association between the functional positions of managers and their diagnoses of situations (Dearborn and Simon, 1958). Subsequently, a study of 40 managers in six companies across different organizational levels and areas of expertise found no association between functional specialization and their ability to scan the operating environment (Kefalas and Schoderbek, 1973). A large study of the belief structures of 121 middle managers also found there was no significant relationship between perception and work histories (Walsh, 1988). Nevertheless, research on 56 top, middle and lower-level managers within three South American companies demonstrated significant differences in perceptions of environmental uncertainty amongst individuals at different levels (Ireland et al., 1987). Reasons for these inconclusive results may be the variety of levels at which fieldwork has been undertaken, the relative lack of top executives taking part, and a tendency to use experimental approaches rather than examining live decisions in the field (Ireland et al., 1987; Waller et al., 1995). Although a distinction has been drawn between the cognitive abilities of senior executives and middle functional managers, others have argued that promoted executives tend to overcome any parochial views picked up from experience of working in functional sub-areas (Waller et al., 1995). From such a relatively small number of studies of managerial judgement, it is not possible to ascertain with any certainty the nature of, and complex interactions between, influences which occur within individual decision makers’ personal knowledge systems.

Insight into the effects of individual judgmental bias or ‘heuristics’ is provided by psychological research on uncertainty. Inferential rules used by decision-makers to simplify difficult tasks (Simon, 1957) have been attributed to five principal sources (Tversky and Kahneman, 1974). These are the ability of an individual to recall or make information available; bias brought about by over-attribution to certain factors with the benefit of hindsight (Fischhoff, 1975); taking a particular case out of context; illusory expectations of relationships; and accepting judgements which are not ‘representative’ of the group as a whole. Heuristic bias can result in decision-makers being overconfident in their judgements (Fischhoff et al., 1977), because of a misguided illusion of control and search for certainty (Langer, 1975). It is not surprising given the potential influences of bias involved in the interactions of individuals in group decisions, that writers have called for the assumptions of group members to be examined more critically than has been the case to date (Barnes, 1984; Schwenk, 1984, 1995).

A study by Schwenk examined the influence of bias at three main stages in the decision making process: the identification of the problem; the generation of alternatives; and the evaluation and selection stage (Schwenk, 1984). In the first stage, it was suggested that individuals seek information which confirms their initial beliefs; that these beliefs ‘anchor’ or restrain their judgements; that feelings of personal responsibility lead to group convergence; and that the effectiveness of initial judgement is affected by the representativeness of analogies they draw with other similar situations (Steinbrunner, 1974). The result is that some alternatives tend to be preferred from the outset, with other alternatives being discussed in negative
rather than positive terms. Preferred alternatives therefore tend to be justified on
the basis that they do not involve cost trade-offs. Consequently, the group commits
to a set of assumptions from the outset. In the final evaluation stage of the group
decision, the use of analogies by managers to justify a point of view, frequently
brings about an overestimation of the extent to which past experiences are applicable
and, in the search for control over an uncertain situation, strategic alternatives
only partially described or ineffectually put forward, can lead to them being
devalued and dismissed by the group.

PROPOSITIONAL DEVELOPMENT

From the preceding discussion, it is clear there is a need to investigate the bases
for individual perceptions in order to more fully understand their influence on
the effectiveness of group decisions (Kosko, 1993). A series of propositions can
be developed from the literature which articulate the conclusions of previous
research, and which can then be developed further with reference to the cognitive
maps drawn from the interviews undertaken for this paper.

Previous research suggests that intuition emerges from experience and that
it represents something over-and-above explanation provided by basic ‘facts’.
Managers commonly refer to this as ‘gut feel’, researcher by terms such as ‘soft
personal information’ (Molloy and Schwenk, 1995). From this standpoint, Swink
(1995) has argued that intuition is about ‘visualizing’ causes of a situation. Drawing
from the work of others cited in the introduction to this paper, however, intuition
tends to involve something of a ‘jump’ between inputs to a decision and the deci-
sion itself, without, necessarily, involving a conscious process of cognition. Implicit
ly, therefore, previous research indicates that this is a relationship which goes
unexplained, with (conscious) cognitive elements of decision schemas frequently
being confused with the more intuitive dimensions. Previous work tends to indi-
cate that intuitive managers can ‘cut through’ to the essence of a situation and are
likely to utilize a greater proportion of non-factual information in their decisions,
reflecting their personal backgrounds and experiences. In the corporate setting,
because of their relative remoteness from the day-to-day business, one might
expect the causal maps of chief executives to be less factually based and thus more
intuitive than those of functional managers.

A second dimension to intuition is the degree of understanding an individual
brings to their observation of a situation. Intuition reflects an ability to appraise
a situation holistically and ‘pull patterns together’ (Showers and Chakrin, 1981).
In a company context, it would be expected that the cognitive maps of chief
executives would be structurally more complex than those of other managers,
demonstrating a greater integrated understanding and explanation of a decision
situation.

A third dimension to intuition is the ‘questioning outlook’ on certain types
of data and situations which has been observed of some senior managers (e.g.
Blattberg and Hoch, 1990). This observation relates to managers using their
intuitive insight to judge when normative analyses break down. It might be
expected that chief executives will ‘see’ some things in situations that their
functional counterparts will not. By implication, it is hypothesized that they will
demonstrate substantially different patterns of cognitive constructs than their

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functional counterparts. It is proposed that chief executives are more intuitive decision-makers because they have had greater exposure and experience, which leads them to perceive things which others do not.

METHOD

Cognitive mapping is a technique which has been used widely by management researchers in a variety of different contexts to explore individual perceptual schema (Bougon, 1992; Calori et al., 1994; Carlsson, 1995; Eden, 1992a, 1994; Eden et al., 1993; Hart, 1977; Klein and Cooper, 1982; Langfield-Smith and Wirth, 1992; Smith et al., 1995; Tolman, 1948; Wang, 1996). The popularity of the technique stems from its simplicity relative to other techniques, such as repertory grids (Brown, 1992), coupled with the inherent attraction of using ‘maps’ to work interactively with managers. Cognitive maps provide a holistic picture of an individuals’ overall perspective, without any loss of detail, enabling the researcher to move beyond the assumption of internal consistency to the detailed assessment of specific concepts within the map (Jenkins and Johnson, 1997b). They also allow the researcher to undertake inductive analyses to distil and clarify emergent issues. The technique is inherently interpretative, and involves the judgement of the researcher to develop themes from the data, allowing these to be stated as propositions to be developed further. Cognitive maps can be used to reflect managerial perceptions of ‘real world’ problems which they face, and is a technique that owes much to pioneering work by Eden (Eden, 1988, 1990, 1992a, 1992b, 1993, 1995; Eden and Ackerman, 1993). The technique acknowledges differences in management views and encourages discussion, suggesting alternative courses of action (Eden, 1992a). It is based on Kelly’s theory of personal constructs, which suggests that individuals interpret data differently, and present contrasting perceptions of problems (Ackermann et al., 1990; Kelly, 1955).

In cognitive mapping, self-defined constructs represent the ‘causal knowledge’ of a decision-maker in the form of a map of his/her own subjective world (Park and Kim, 1995). The technique does not imply that one person is ‘right’ and another is ‘wrong’ – since ‘truth’ itself is related to context and relevance in problem solving. Cognitive maps can be seen as a model of ‘action-oriented thinking’ about a situation in which arrows signify influences in a line of argument linking cause and effect (Eden, 1994). Such mapping makes comprehension transparent. The mapping process involves respondents identifying factors affecting a particular decision-making ‘goal’. In the case of strategic decisions, this can be some measure of the effectiveness or quality of the decision itself.

Operationalization of Constructs

Three propositions were identified in the previous section regarding management intuition. The first proposition is that chief executives will be more intuitive in their decision-making than functional managers, a proposition that can be operationalized as the proportion of the ‘non-factual’ concepts used by managers. It is appreciated that even the idea of a ‘fact’ is contentious in terms of cognitive perception, so in order to overcome this problem, the maps produced from the interviews were developed separately by two researchers dual-coding to ensure consistency of approach. There was broad agreement between these two
researchers in this process – approximately 90 per cent of constructs were similarly interpreted. On the few occasions where the interpretative coding proved problematic, discussion between the researchers about their own interpretations enabled these isolated problems to be resolved. In addition, further clarification was made possible through the second stage of the interview process, where the individual maps were re-discussed with respondents.

Cognitive maps can also be analysed in terms of their content (the meaning which they embody) and complexity of configuration. The second proposition addressed this issue, emphasizing that the maps of chief executives will demonstrate a higher level of cognitive complexity, because of the strategic role which they perform (Calori et al., 1994). Several authors have used three measures to summarize the structure of causal maps (Eden et al., 1992, 1993; Jenkins and Johnson, 1997b): the link to node ratio; the cluster index; and the average chain length. Chief executives should have a more coherent view of the business than functional managers at other levels, and be able to articulate their view more lucidly. Their maps should be more coherent, with a lower ratio of links to nodes, a measure which some researchers believe provides some evidence of cognitive complexity (Eden, 1992a; Jenkins and Johnson, 1997b). A second measure is the cluster index, describing the degree of ‘grouping’ of nodes on a map. Maps where the ratio of clusters to nodes is close to zero suggest a highly fragmented conception of a situation and, hence, a lower level of coherence in train of thought. By contrast, a map with a cluster-to-node ratio close to one is indicative of a manager with a more coherent view of an issue. The third measure of understanding is the degree of explanation a map offers, as defined by the average length of chains of concepts, with a greater amount of explanation being offered through longer causal chains. This measure is suggestive of the degree of detail an individual uses to explain a given event.

The third proposition concerned intuition as an ability to see things which others do not, and is operationalized by measuring the degree of similarity/dissimilarity of mental constructs between the cognitive maps of different managers. Three surrogate measures are used to implement this proposition. Map concepts are compared individually to define which constructs the three managers have in common, expressing similarities as the proportion of common constructs (i.e. those which all managers articulated), partially common constructs (i.e. which two managers had in common), and individual constructs (i.e. those particular to a manager).

**Data Source**
The propositions were used as a basis for exploring the structure and the content of decision-making constructs through the maps. The research required simultaneous assimilation of the overviews of individual managers as well as the details of their cognitive understanding. It was felt, therefore, that a qualitative study focusing, in the first instance, on a small number of managers within a single organization would be most appropriate at this stage, in order to develop the approach for more extensive research. The three senior managers of a major UK electrical retailer who are jointly responsible for the strategic decisions relating to the investment in, and construction of, new superstores were interviewed in-depth. The study applied the cognitive-mapping method to focus on the way in which managers ‘think’ causally as outlined above, spending about two hours...
with each manager individually. In addition, once the maps had been drawn up more formally, they were briefly re-discussed with each respondent for clarification and elaboration. The technique captured the holistic perception of managers, and provided insight into the degree of similarity between them. However, discussing only similar concepts would have missed the point of the exercise, which was also to highlight potential differences in cognitive structure and content. Whilst the authors recognize the potential to explore differences in intuition between industrial sectors, a decision was made not to do this for two reasons. First, the significant research on strategic investment decisions (such as the opening of new superstores in this research) has emphasized fundamental differences in the nature of the decisions and their operating environment, which make comparative work theoretically and practically problematic (Butler et al., 1993; Marsh et al., 1988). Second, the aim of this research project was to use qualitative work to begin to construct a definition of intuition as core decision-making element (see Huff, 1997). Given the nature of the work, therefore, the number of interviews is less relevant to the aims of the research. However, to begin to address potential differences in intuition within the industry sector under investigation (retailing), a fourth interview was conducted with an executive at a similar level of seniority to one of those in the first company. This enabled the research to begin to explore intra-sector differences in intuition – in this case between the electrical retail sector and the grocery retail sector.

Data Collection

In analysing cognitive constructs, the approach described elsewhere of initially generating concepts from individual or group interviews as a basis for subsequent individual discussion (Jenkins and Johnson, 1997b) was not deemed appropriate in this case. Rather, before the individual interviews, the researchers employed a collective group interview with all senior directors and managers involved in the process of making new store investment decisions in the first company. The aim of this meeting was to define and agree the common ‘goal’ of the decision process, and to identify particular ‘prototype’ stores that could form the basis for subsequent discussions with the individual managers. The group defined the desirable ‘decision-goal’ of this type of strategic decision as the opening of ‘high performing superstores’, with measures of performance being agreed as a combination of high sales turnover from each outlet, and a high return on capital employed in the investment. The group’s rationale for these measures was that the turnover of the superstore reflects the competitiveness of the environment, whereas the return on capital links this to the specific costs associated with the development.

The cognitive mapping process was facilitated in this instance by the application of a method used in artificial intelligence known as ‘prototyping’, a method requiring the respondent to identify and talk about particular selected examples. The selection of appropriate prototypes by the group (particular stores in this instance) provided a controlled basis for discussion. Prototypes were selected from the respondent’s own organization to provide a framework to reflect their integrated knowledge base about a particular situation (Aikens, 1993). Prototyping provides a transparent means for discussion and reasoning, which helps to overcome the inherent problem embedded in the use of most decision systems – the use of language itself – since this can have profound implications for patterns of human reasoning and interpretation (Frank and Mark, 1991). The benefit of using
prototypes in cognitive mapping is that it provides a common agreed starting point for discussion by individuals, enabling their different perceptions of a situation to emerge. The role of the interviewer in this situation is to repeatedly ask probing questions as to ‘how’ a particular causal concept is affected and ‘why’ it is important, an interviewing protocol known as ‘laddering-down’ and ‘laddering-up’ respectively (Eden, 1988; Elliott, 1996; Jenkins and Johnson, 1997b). From the point of view of the individual, prototypical reasoning is an effective vehicle for acquiring intuitive knowledge, since it enables the insights of individuals to be elicited with reference to a common set of objects which exemplify ideal decision ‘goals’.

The group selected six prototype superstores for discussion, viewed as representative of high and low performing stores, as judged by the decision goal criteria. The respondents knew the stores used in the interviews since they had been involved in the original investment decisions. The performance of these six superstores was used as the focus for separate interviews with the three individuals: the Managing Director or Chief Executive, the Operations Manager, and the Estates Manager, in order of descending seniority. Illustrative materials were used as prompts for the discussions on each store, including location maps, site layout plans, and aerial photographs. Respondents were asked to identify the factors most influential in producing high performing superstores with reference to these examples as a starting point. Detailed discussions with each respondent were transcribed verbatim to provide a record of the discourse. Transcripts were then blind-coded by the interviewer and another researcher separately, in order to ensure the process was consistent and unambiguous. The mapping process involved concentrating on the causal connections between the concepts, representing the concepts and links as they emerged within the interview on paper, as separate cognitive maps. Links between concepts were ascribed one of three status levels, as used by other authors: ‘causal’ links in which one concept influences another directly; ‘connotative’ links which imply indirect or associated influences; and ‘temporal’ links, which change over time and can have either positive or negative dimensions. As a final stage in the process, the maps were discussed and adjusted with the respondents themselves. The resulting maps are shown in figures 1–3.

DATA ANALYSIS AND FINDINGS

In the final part of this paper, the propositions developed from findings of previous research are explored through inductive interpretation of the constructs of the cognitive maps. This process is naturally interpretative, requiring the active engagement of the researcher in developing emergent themes from the data, allowing broad structural features to be compared, and enabling themes to be amplified by illustrations from the body of the research text. It is possible to examine the propositions already developed by using the operational measures of intuition to examine both the structure and content of the cognitive maps of the three respondents. Proposition 1 inferred that the chief executives will be more intuitive than functional managers, judged by virtue of their use of a higher proportion of non-factual information. The analysis shown in table I compares the measures of these propositions for all three respondents. It shows that 53 per cent of information used by the Managing Director was ‘non-factual’. This contrasted sharply
Figure 1.

Fig. 1

Figure 2.

Fig. 2
with the much lower proportion of non-factual information used by the Retail Estates Manager (40 per cent), thus providing some support for Proposition 1. However, whilst the Managing Director on these results would appear to be more ‘intuitive’, the Operations Manager (51 per cent) used only slightly less non-factual information. This finding to some degree supports Proposition 1 (i.e. that more senior executives utilize a higher proportion of non-factual information). Although there is clearly a need for more extensive fieldwork to test this proposition, it suggests that the proportion of non-factual information used might relate to depth of experience rather than simply seniority as suggested by the initial proposition. The MD and the Operations Manager both had longer and more varied careers in the company and the electrical retail sector than the younger Retail Estates Manager.

Proposition 2 stated that chief executives will demonstrate a greater understanding of decision situations, as indicated by the coherence, complexity and explanation displayed in their cognitive maps. In the maps of the three respondents, the ratio of links to nodes shows no clear pattern, with apparently little difference in their coherence of understanding. This suggests that there may be some difference in cognitive complexity, but that a MD does not, necessarily, have a more coherent view than a functional manager. This first measure of Proposition 2 would need to be tested more extensively, but the findings here suggest that decision-maker insight is not measured simply by the number of elements (in this case ‘nodes’ and ‘links’) involved in an individual’s train of thought. The measure
thus begins to address the way in which cognitive concepts are juxtaposed in new and creative ways in context as discussed by psychologists (Daniels and Henry, 1998).

The second measure of Proposition 2 was derived by identifying broad areas or clusters within each map, reflecting this as a cluster index. It appears to show that there is little difference in the degree of perception of a situation between respondents. The MD and Operations Manager had cluster indices closer to one (0.87) than the Retail Estates Manager (0.81), indicating that they have a slightly more holistic view of the situation. Average chain length is the third operational measure of Proposition 2, and is a surrogate for the degree of explanation offered in each map, in the way nodes and links are connected to each other to provide depth along a particular train of thought. These measures were derived using a statistical algorithm to measure the length of all possible routes through each map, acknowledging the fact that there were multiple destinations and origins possible. The data appear to highlight a clear relationship between this measure and level of seniority, with the MD displaying a substantially shorter average chain length (2.41) than the Operations Manager (3.74) and Retail Estates Manager (4.42).

Taking the findings for the three measures for Proposition 2 together, the key to gauging executive understanding would appear to lie less in the complexity (measure a) and the coherence (measure b) put forward by each individual map, and more by the depth or degree of explanation in the overall picture of a
situation (measure c). Insight from these three case studies indicates the senior executives, and especially the MD, approach problems through their own mental schemas by attempting to simplify rather than use complex frames of reference. However, whilst this tentative finding underlines the conclusions of others (e.g. Horgan et al., 1989), it is acknowledged that such research suggests that experts have more complex mental models (e.g. Murphy and Wright, 1984). Consequently, this finding would need to be tested through more extensive research. The qualitative findings here would appear to suggest that the maps of such executives are not, necessarily, more integrated or coherent. Indeed, since on the one hand there is little apparent relationship in the maps between seniority/role in terms of these measures, but on the other hand they do display much ‘shorter’ explanations (judged by chain length), this is a finding which is worth further investigation. What it suggests is that more senior personnel utilize a higher proportion of non-factual information in association with simpler overall conceptions in order to appraise a situation. The limited evidence in this analysis appears to lend support to a further proposition, that they delicately balance key factors which give them insight into the whole picture, ‘trading-off’ depth for the benefits of breadth using more non-factual information than other managers. For example, figure 4 compares two extracts from the maps of the MD and the Operations Manager in terms of their thinking about in-town or town centre store sites. The Managing Director’s conception appears to be more integrated with lateral connections rather than just additional detail. An alternative explanation of variations in map complexity with seniority may well be that managers’ mental models increase in

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complexity as complexity in the business environment increases, as indicated by Calori et al. (1994).

The Operations Manager views the two location types relatively independently, separating in-town locations into ‘precincts’ – the success of which is dependent on the size of the store and trading pitch, and ‘traditional high streets’ – affected by the strength of location, pedestrianization and good parking provision. By contrast, the section of the map of the Managing Director is considerably more coherent, suggesting a deeper understanding of the interrelationship between town-centre and out-of-town retail park locations. In explaining the vitality of town centre locations the MD provided an extended evaluation with reference to additional constructs – such as the overall impression of the precinct and the percentage of unlet shop units. He also demonstrated an appreciation of the dynamics of this type of location, particularly in terms of the changes over time of the relative success of out-of-town retail parks to town centre stores, the growth or decline of weekly markets in the city centres, and road developments and improvements. He perceived road improvements as having a negative effect over time on town centres, whilst working to improve the position of out-of-town locations in the road network. These subtle interrelationships are demonstrated by an extract from this respondents’ transcript when he was referring to one of the Company’s developments in Norfolk:

...using my experience, I would say that the town was at one time a good shopping centre, but since then, the road network has improved drastically... what keeps it alive is things like the market on a Tuesday. Markets, if they are open, are a major attraction to people in this area. I find these visits fascinating... I covered that area for years, and I would always try to organise them for market days – I would say ‘now, today is market day at such-and-such a place’, and so on...

Proposition 3 inferred, by contrast, that the demands of their position, coupled with their own experiences, leads MDs to perceive influences on strategic decisions which others in lower level functional jobs, and with less experience, do not. The measures of the degree of similarity and difference between the three respondents in terms of common, partially common, and individual constructs were derived from a detailed classification of the content of each respondent’s causal map (table II). The results of the comparison show that the respondents had over one third of their constructs in common, indicating a substantial ‘common ground’ between the respondents in this particular organisation. It would be interesting to speculate what factors affect this level of commonality and, indeed, the extent to which it varies both within and between organizations. Two of the respondents also had a relatively high proportion of constructs in common – the MD (37 per cent) and the Operations Manager (32 per cent) – contrasting with the substantially lower figure for the Retail Estates Manager (5 per cent). This measure reinforces the earlier conclusion that relative lack of experience may account for the variation in the level of common understanding generated between executives. Those working together for a considerable period are more likely to have developed constructs in common, whereas new or less experienced executives are more likely of have a significantly higher level of individual constructs. In fact the least experienced of the respondents in this exercise, the Retail Estates Manager, had

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a significantly higher level (52 per cent) compared to the MD (26 per cent) and Operations Manager (32 per cent). This pattern may be explained by the fact that new and less experienced executives will take time to corroborate the effectiveness of their own constructs and understanding with that of their colleagues, during which time their reliance on individual constructs will decline as shared understanding emerges. It can be conceived that the ‘residual’ individual constructs are the genuinely intuitive dimensions perceived by each individual which are not ‘seen’ by the others in the group. Being aware of, and tapping into these individual common constructs, whilst at the same time understanding areas of common ground, may be the key to balanced and effective group decision-making. The fact that, for example, the MD and Operations Manager had proportionately fewer intuitive (individual) constructs than the Estates Manager does not mean that they are unimportant. What it might indicate is that the individual view gradually converges with that of the rest of the group through discussion and trial-and-error.

Table II demonstrates that many of these common and partially common constructs were rooted in some of the ‘facts’ measured in Proposition 1. Previous work has suggested that senior managers are less likely to use ‘factual information’ as they have middle managers to check out hunches for them, and that their career success has given them a sense of invulnerability and power (Hayward and Hambrick, 1997). These qualitative cases appear to indicate that in addition, managers may gradually ‘tune in’ to key variables that prove discriminating. For example, there was a common understanding that site rental level, linked to influences on
store turnover (such as population, affluence, quality of the approach roads and size of the store), were the main influences on return on capital. Respondents also demonstrated some understanding of the dynamic aspects of the decision situation. For example, causal relationships are complicated for the Managing Director by presence of out-of-town competitors, and, for the Retail Estates Manager, by growth of competition over time. Two of the respondents also mentioned the importance of the position of the store on out-of-town retail parks as being important, both in terms of geographical position, and in terms of temporal position within the phasing of the development. These perspectives were effectively ‘qualifiers’ or control variables on decisions, and are illustrated with reference to the words of the Retail Estates Manager, who implicitly noted what he had learned from a particular decision:

Everything is stated to a point in time. I wasn’t to know what was to happen in this particular situation [i.e. a new out of town competitor opening] . . . I suppose that gave you a frightener, that is the cautionary tale.

A third construct common to all of the respondents was the importance of the strength of the retail brand relative to the competition. Such a construct illustrates the importance of a ‘non-factual’ or difficult-to-measure influence, which the respondents all felt was critical to take into account, even if it was hard to express themselves precisely in this regard. One of the respondents, for example, referred to this issue, stating that:

The retail gut feel is difficult to get at . . . it can be something as simples as how easy it is to get into the site, how accessible it is.

For the Managing Director, however, brand strength had both positive and negative dimensions. In certain situations where it was weak, he noted that:

I think it was a flyer, because the brand [of the Company] is not that well known in this part of England, but the town was so obviously right for what we wanted to do.

Whereas, in another situation the brand was stronger:

It’s not that different from anywhere else, but it’s gone like a train . . . it is just the fact that the brand is better in that part of the world.

In both these two situations, the MD was sensitive to the strength of the company brand, which served to reinforce the logic of his decision. In his view it was about the town being of the ‘right’ type, with a rich population of ‘traditional shoppers’ who like to shop at the store they have always known in shopping precincts. These same constructs were common to the other respondents, but in the case of the MD other individual ‘intuitive’ constructs were used to get a ‘feel’ for each situation. These case studies of individual managers cognitive maps therefore represents further qualitative insight into the commonality in management perceptions within and between organisations stressed by other researchers in this area (Bowman and Daniels, 1995; Hodgkinson and Johnson, 1994).
Indeed, the cognitive maps generally provide significant anecdotal evidence of executives bringing a substantial proportion of these individual constructs to bare on given decisions. A key example of this is the way in which they appear to draw on their own experiences, which over time proved discerning for them. For the Retail Estates Manager, this came through in two different ways. First, when he was trying to assess the likely spending power of a local population, he inferred this was influenced by their propensity to spend on certain product types. Thus, when the Company opened a new Scottish store, he concluded that, whilst:

... the disposable income here is not huge ... it is that type of area for brown goods\(^2\) – you know, they want a large telly to watch.

Second, other tried-and-tested surrogate indicators (in his mind) were also present, which made the decision the right one:

It is a good centre, you have a good Marks [& Spencer], you have got a good Littlewoods.

In the case of the Operations Manager, however, these experiential benchmarks took the form of a categorization of towns, into which he could ‘fit’ and classify new examples. Two illustrations show how the subtle classification of ‘traditional high street’ versus ‘precinct’ town centre locations which he had developed, proved discerning for him in two contrasting towns. At one of them, for instance:

... it’s done well, first of all because it is high street. It’s a small town, and does not have a lot of out-of-town competition. This is really a high street type of town. This is not a back street type of location. It is pedestrianised, the old high street, there is a good multi-storey car park there, a high street like we used to know them years ago. There is a good mix of retailers ... you have got Next, you have got Superdrug, you’ve got things like banks that people need to go to ... there is Burtons, Granada, Specsavers, Early Learning Centre ... and its an old fashioned mixed high street basically, and as a consequence it works.

His understanding of the precinct location type in Scotland, however, led to a very different conclusion:

Here it is different in as much as it is not traditional high street, it is more of a modern precinct area ... they bolted it on to the old shopping centre, which was up here .. it is a very different type of town ... it is the type of community that spends on that type of product. You will do well as you have adequate space, and a good pitch. You do not need a whole pile of statistics to tell you that, if you known the town.

Use of their own classifications as a means of a making sense of given decisions also emerged in other deeply ingrained ways. Rather than just classifying a town as a certain type, analogies were drawn with other Company stores, where the investment decision had been regarded as a good one, in that it had led to the goal of a high performing superstore. The Operations Manager, for instance, referred to one of the prototype stores as being ‘another York’. When asked what he meant...
by this, he said that the prototype was likely to be successful in the longer-term because of its position in the road network which (like York) was well known and a ‘gateway’ to the city.

In the first part of this paper, the problematic nature of comparing strategic decisions in different industry sectors was noted, because of the differences in their operational domains and the nature of decisions themselves. This conclusion is supported by previous research (Butler et al., 1993; Marsh et al., 1988). Whilst the objective of this paper was to isolate propositions drawn from the literature in order to define ‘intuition’ as a key decision-making construct by analysis of one industry sector, it was felt necessary to gauge the findings drawn from the three interviews within one company against those of another organization. To do this, a fourth interview with a Site Location Executive in a second retail organization was undertaken. Company B operated in the grocery sub-sector of retailing rather than the electrical sector of Company A, allowing limited comparison across the spectrum of activities of the sector overall. Whilst it was not possible to compare the commonality of constructs (see table I) with those executives in Company A (since many of the factors influencing location decisions are different, and would result in a meaningless comparison), the other measures of map content and structure are comparable. The respondent was of similar level of seniority to the Retail Estates Manager in Company A, albeit from a different function. The cognitive map resulting from the interview is shown in figure 5. Interestingly, the results fall in line with those of Company A, showing more factual information was used, and with longer ‘chains’ of explanation, indicating a greater emphasis on detail.
A higher complexity ratio and cluster index compared to the respondents in Company A may relate to the analytical role performed by the executive interviewed, who had a specialist knowledge of normative factors influencing the outcome of decisions of this type. Although this insight would need to be rigorously explored, it reinforces the insights from Company A.

CONCLUSIONS

The aim of this paper was to develop and test propositions about the structure and content of management intuition from the literature, using qualitative in-depth case studies to construct cognitive maps of their decision schemas. Whilst the work of Agor (1989) and others cited in the first part of the paper proposed that managers use intuition when they are faced with insufficient facts and complex alternatives, and to simplify a given decision situation, this exploratory study suggests that senior managers do not appear to use more complex and more coherent decision schemas compared to less senior executives. Rather, there is some suggestion that it is the content, not the structure of their cognitive maps that are different. Senior managers seem to opt to use simpler cognitive explanations, putting greater reliance on key constructs and a higher proportion of non-factual information. Illustrations drawn from the text of the interviews showed that there are many instances where this trade-off is informed by ‘benchmarking’ their thoughts against their own experiences and outcomes of previous corporate decisions. Analogues, or comparable exemplars, play an important part in this process. This finding might explain, for example, why the more senior respondents in this study displayed a lower proportion of individual constructs in their maps, preferring instead to rely on cognitive elements common to the other managers in their organization. Intuition seems, therefore, to come more into play as a means of ‘going beyond’ the rational data and information, by using experiences to ‘cut through’ to the essence of a situation, helping to make sense of it, and as a test of its validity. Viewed in this way, we begin to see how cognitive and intuitive constructs might interplay within the decision schema of an individual manager and the potential implications for group decision-making. We also begin to understand why quantitative analysis may not be integral to the decision-making in the way that one might presuppose.

As a way forward for research in this area, it is possible to reflect on, and extend, the propositions developed in the first part of this paper. The first proposition regarding the tendency for more intuitive senior managers to use a greater proportion of non-factual information has been supported, but this appears to be affected by the depth of experience rather than just by role. In redeveloping this proposition, therefore, more extensive future work should aim to test the proposition that the causal maps of chief executives are less factually based and thus more intuitive than those of functional managers. This may be because of the demands of their positions, or as a result of the depth of their previous experiences. It would also be useful to conduct longitudinal research with individual managers, getting them to repeat the mapping process at certain times in order to examine if and how their insight changes under different environmental conditions (Reger and Palmer, 1996). Of course, a further explanation for the differences between the maps of executives exhibited in this paper might be their contrasting cognitive

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styles, as discussed earlier in the paper (Allison and Hayes, 1996; McDougal, 1995; Payne et al., 1988). This is clearly another area that deserves exploration through qualitative case studies to explore how the demographic, personality and psychological characteristics of individual managers affect the structure and content of their cognitive maps (Langer, 1975; McDougal, 1995; Nahavandi and Malekzadeh, 1993).

The second proposition concerned the expectation that the maps of chief executives would be structurally more complex, coherent and demonstrate a greater degree of explanation than those of other functional managers. Contrary to the proposition, however, this study has suggested that the cognitive maps of chief executives and more senior managers display a tendency to be simpler than those of their functional counterparts, and with a comparable level of coherence. Importantly, rather than displaying additional depth to their explanations, the study shows that more intuitive managers might seek to focus on the key elements of a decision. The second proposition can, therefore, be restated. This restatement should seek to test the apparent tendency for the causal maps of chief executives to be less complex than those of functional managers, and more concise forms of explanation in terms of the average length of causal chains, which reflect conceptual decomposition. In this context, it is useful to stress the fact that this paper has utilized cognitive mapping as a single technique and that, in future, it would be useful to undertake more extensive research of this type employing multiple methods to unearth different aspects of intuition and cognition as no technique free from methodological constraints (Daniels et al., 1995). Other techniques might be used, for example to ascertain the effects of personality, psychological influences, the effects of demographic characteristics and so on. This paper has alluded to the influence of all of these factors on map structure and content but they need to be explored specifically.

The third proposition of this paper concerned the questioning outlook of more senior managers – for instance, chief executives ‘seeing’ things in situations that their functional counterparts do not – suggested that such insight will be reflected in the composition of the constructs in their cognitive maps. The measures used in this study showed little reasonable difference in the overlap or uniqueness of constructs. There might be a number of reasons for this, not least of which might be the adequacy of the surrogate measures used in this exploratory work. It could also be that it is the connections that more experienced executives make between different constructs, rather than the constructs themselves, that enables them to ‘see’ things that others do not, which is the basis for their intuitive insight. Precisely how they do this and how it is reflected through the form and structure of their cognitive maps should be considered in further research as part of this extended proposition.

Issues raised in the study also suggest two additional propositions. The first concerns the way in which these above tendencies interact with each other. In particular, it is proposed that chief executives may have a preference for less complex decision schemas because they have less time to devote to detail and are able to compare and rationalize their understanding with those of other functional managers. Senior managers are also able to compensate for their less detailed understanding by balancing-up or ‘trading-off’ the inputs to their decision with reference to their own experiential benchmarks. A word of caution is necessary here, however, since it could also be that such map detail is ‘lost’ by virtue of it becom-
ing taken for granted or tacitly important to individual managers. It is easy to assume that the mapping process fully captures their ‘intuitive’ insight, whereas in actual fact what is captured is that which can be teased out – i.e. revealed rather than actual knowledge. The second additional proposition concerns going beyond the boundaries of this particular study, the objective of which was to focus on the structure and content of individual decision schemas. It will be important in future work, therefore, to explore the composition of individual schemas in the way that is proposed here, but then to move on to explore how they are brought to bare in live group decision-making contexts (Langfield-Smith, 1992; Weick and Roberts, 1993). How, for example, do individual schemas exert influence on the group? How does the group ‘make sense’ of a situation using these cognitive starting points? Are individual schemas adjusted as a result of such interactions? This additional proposition would contend that chief executives exert a greater influence on group decisions than their functional counterparts because of their ability to articulate their understanding of a situation simply, justifying this with reference to their experiences and previous decisions. In this context, research that undertakes comparisons between firms in individual industries is likely to be particularly beneficial.

Moving from an exploration of individual decision schemas, such as that conducted in this study, involves what is, essentially, a reflective process, in that it attempts to reconstruct rationales for typical decision types. Such a methodology is suitable for the purpose of addressing the objectives of this paper as a necessary first stage in research on management intuition. We hope to be able to report more fully on these same aspects in the near future, utilizing substantially more interviews from the research project from which these initial findings are drawn. Arguably, however, the more exciting second stage will then be to explore how these decision schemas and outlooks are used to influence and affect decisions in a group context and, indeed, whether this process leads to more or less effective decisions as a result. Clearly, this research will require a methodological approach which involves more ethnographic ‘in-the-boardroom’ observation, as a way of exploring not only how managers begin to make sense of their own intuitive judgement, but also in fact, to ascertain whether the decisions they reach make sense to the group as a whole.

NOTES

*We gratefully acknowledge funding from the Engineering & Physical Sciences Research Council (EPSRC) for the three year programme of research on which this work is in part based (Grant Reference No. MO7694, ‘Modelling Group Intuitive Spatial Reasoning in Retail Site Assessment’). Thanks to Kevin Daniels (University of Sheffield) and Keith D. Brouthers (East London Business School) for comments on earlier drafts of the paper, and to three anonymous JMS referees for their constructive comments.

[1] Whilst the authors acknowledge the limitations of a study of decision schemas within a single company, this approach is justified on two grounds. First, the objective of the paper is exploratory, aimed at developing propositions for further and more extensive research as a response to calls for detailed comparisons of cognitive maps of individual managers within particular organizations (Bowman and Daniels, 1995; Hodgkinson and Johnson, 1994). Second, it reflects the need to be sensitive to differences in the domains of decisions and their nature and form in contrasting industry sectors in cog-
nitive mapping research (see Laukkanen, 1988). More widely, the approach is justified by research on strategic investment decisions (such as investments in the opening of new superstores that is the subject of this paper) which emphasizes the fundamental differences in the nature of strategic decisions and their operating environment that makes comparative work theoretically and practically problematic (Barwise et al., 1993; Marsh et al., 1988).

[2] In UK electrical retailing, and distinction is made between so-called ‘brown’ goods (such as televisions, videos, cameras and hi-fi); and ‘white’ goods (such as freezers, refrigerators, microwaves and food processors).

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