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ISOMORPHISM IN STRATEGIC DECISION-MAKING

By Adrian Bernard Haberberg

A thesis submitted in fulfilment of the requirements for the award of the Degree of Doctor of Philosophy at Cass Business School, City University, London

March 2005

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All remaining errors are, of course my own.

Declaration

The University Librarian of City University, London is hereby granted powers of discretion to allow this thesis to be copied, in whole or in part, without further reference to me.

Abstract

A laboratory study of the factors of that influence the propensity of organisations to copy the strategic decisions of others, based around the BRANDMAPS simulation, investigated the effects of contingencies relating to the environment, the decision and the firm itself, in the absence of binding resource constraints and legal pressures.

The proportion of isomorphic decisions diminished with industry age: isomorphic behaviour did not become institutionalised. It was positively associated with industry dynamism - isomorphism was possibly used for risk reduction. No association with industry concentration was found: field structuration did not affect isomorphic behaviour.

Pressures to imitate their peers, as perceived by participants, appeared unrelated to firms' performance or socio-cultural characteristics other than team diversity. Isomorphic behaviour was unrelated to isomorphic pressures, suggesting that unconscious rationality in managerial behaviour.

Knowledge of opponents' decisions was associated with isomorphic behaviour, indicating that isomorphism was not simply a response to the task environment. However, the association was positive for some decisions and negative for others, inconsistent with common explanations of isomorphism as deriving from a desire for legitimation. Rather, isomorphic behaviour results from managers making efficient use of available information on competitors' practices.

Combinatorially complex bundles of decisions were not isomorphic between firms that had taken similar individual decisions. There was no evidence of an "iron cage" constraining them to become more similar.

Isomorphism between firms is not necessarily linked to institutionalisation or stimulated by causes – notably legitimation – suggested by institutional theory.

A model of isomorphic behaviour in firms is proposed, based on the perceived value of the practice being copied, the nature of the decision, contingent properties of the business environment and of the organisational field and the situation and internal properties of the firm. The implications for managerial praxis are explored.

Chapter 1

Introduction

1.1 Research Question

The research in this thesis focuses upon the question: *"Which factors influence the propensity of organisations to copy the strategic decisions of others?"*.

Isomorphism has been observed in many kinds of decision, both strategic (for example structural and market entry decisions) and operational – see Chapter 3 for a listing. A decision by a firm's[1] managers to emulate the decisions of another firm may come about for a number of reasons. It may be accidental imitation, in which decision-makers, subject to similar environmental stimuli to those experienced by their counterparts at another organisation, independently reach similar conclusions and initiate similar actions. Contingent properties of that environment, such as its degree of turbulence and industry concentration, may thus affect the likelihood that different sets of boundedly rational managers will arrive at similar conclusions. The age of the industry may affect the extent to which firms within it have developed or absorbed common institutions (Scott, 1987; Zucker, 1987) or recipes (Spender, 1989).

Emulation may, on the other hand, be a deliberate decision. It may be a direct, economically rational (or at least boundedly rational) reaction to the firm's competitive position, perhaps an expression of the desire to replicate the benefits a competitor might have obtained from a given course of action. Firms may use emulation in order to learn the value of a strategic move while reducing search costs and delays within the decision-making process. They may also wish to reduce the cost, and improve the availability, of capital and other resources by impressing the stakeholders that control them. The weight given to such factors in the firm's decision-making may depend upon the same contingent properties of the environment mentioned in the previous paragraph. It may also be related to the organisation's situation – for example, firms may copy the decisions of their successful peers (Haveman, 1993; Burns and Wholey, 1993).

Deliberate emulation may not, however, have a true economic rationale. It is widely held to be based upon the desire of those same decision-makers to achieve legitimation (Meyer and Rowan, 1977) within their peer group. Whether the underlying motivation

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[1] In this thesis, I use the words "firm" and "organisation" interchangeably. Distinctions between profit-making and not-for-profit organisations are not germane to the present research.

is economic or social, the degree of isomorphic pressure perceived by those decision-makers will depend, not only upon contingent external variables, but also upon social and cultural factors within the organisation. These will affect the dominant logic (Prahalad and Bettis, 1986) and knowledge structures (Lyles and Schwenk, 1992) which govern the manner in which the environment, and indeed the organisation's own situation, is interpreted by decision-makers (Weick, 1979; Kiesler and Sproull, 1982; Hambrick and Mason, 1984)

Finally, the nature of the decision may itself affect the extent to which isomorphism is to be expected. Complexity or ambiguity in a decision may alter the value that decision-makers derive from emulating the practices of other firms.

As I shall explore in Chapter 3, there are unresolved questions of why and through what mechanism isomorphism occurs. It is unclear which, out of the desire for legitimation, resource dependency, inertia, the desire to replicate economic benefits perceived elsewhere or common reaction to shared environmental stimuli, is the dominant cause of isomorphic decisions, and whether perceived isomorphic pressures actually translate into isomorphic decisions. Through my examination of the influence of environmental, internal and decision-level contingencies on the incidence of isomorphic decisions, I shall attempt to cast some light upon these fundamental theoretical questions.

1.2 Evolution of Research

This thesis is the end point of a picaresque journey through the theory of organisations and strategic management, which began several years ago with a desire to investigate the linkages between an organisation's strategic intent and the resulting core competences. This developed, as I probed further, into a more general desire to understand the processes and stimuli that underlay strategic decisions[2] in organisations and linked them to the resulting outcomes.

It became clear that Gary Hamel was right when, in his introductory address to the 1996 Strategic Management Society Conference, he spoke of "Strategy's dirty little secret... that we lack a deep theory of strategy creation within organisations." More precisely, we do not understand the links between stimuli, from inside and outside an

[2] In this thesis, I use the term "decision" as shorthand for the endpoint of the individual and communal psychological, social and political processes that lead an organisation to a given course of action rather than another (or none). It may or may not be the outcome of a deliberate or logical process.

organisation, and the reactions of decision-makers within it. Neither do we understand the linkages between what decision-makers think, say and do and the way in which strategies change, or fail to change, within organisations (Lyles and Schwenk, 1992). Substantial and, in many cases overlapping, literatures probe strategic decision-making (Mintzberg, Raisinghi and Théorêt, 1976; Quinn, 1980; Shrivastava and Grant, 1985; Eisenhardt and Zbaracki, 1992; March, 1996; Dean and Sharfman, 1993, 1996; Miller, 1997; Hendry, 2000; Nutt, 2001, 2002), strategy formulation (Naryanan and Fahey, 1982; Hart, 1992; Hart and Banbury, 1994; Liedtka, 2001), strategy implementation (Bourgeois and Brodwin, 1984), strategic persistence (Lant, Milliken and Batra, 1992; Audia, Locke and Smith, 2000), strategic change (Johnson, 1987, 1990; Pettigrew and Whipp, 1991; Hellgren and Melin, 1993; Rajagopalan and Spreitzer, 1997; Lindell, Ericson and Melin, 1998) and the management of change (Beer, Eisenstat and Spector, 1990; Kotter, 1995; Hardy, 1996). It is, in my view, unarguable that these are all aspects of a single phenomenon, one that might be termed "strategy development" and that strategic management theory would be by far the richer if they could be linked together.

Such an aim is, most probably, beyond the scope of a single thesis, and perhaps of a single lifetime. When I embarked upon the laboratory study that lies at the heart of the research on which I report here, I intended merely to understand more closely these links between stimulus, decision and action (or inaction). As my research progressed, it became apparent that by far the most interesting patterns related to isomorphism between the decisions of the different players.

I had been introduced to institutional theory at an EDEN Doctoral Seminar in 1998 and had reacted viscerally against the notion that such an "anti-management" (Donaldson, 1995) paradigm might have anything serious to say about strategy development. The momentum in the strategy field was at that stage firmly behind the resource-based view (RBV), which of course focuses on the differences between firms. However, Deephouse (1999) has pointed out the importance of balance between conformity and difference in an organisation's strategy, and in the end I came to share with him, and with DiMaggio and Powell (1983) the feeling that the similarities between organisations were at least as interesting as the differences, and that the study of such similarities and their origin was both important (Chen and Hambrick, 1995) and likely to yield interesting new insights.

There was a well developed body of neo-institutional theory (Meyer and Rowan, 1977; DiMaggio and Powell, 1983; Powell and DiMaggio, 1991; Tolbert and Zucker, 1996) relating to the stimuli for such decisions, notably the desire for legitimation. In my laboratory environment, actions were clearly observable and measurable, although further analysis, detailed in Chapter 2 of this thesis, revealed hidden complications. By generating insights regarding the decision processes involved, hitherto little investigated, I believed I could contribute to the understanding, specifically of isomorphic behaviour in organisations but also more generally of the stimulus-decision-action/inaction linkage.

1.3 Distinctive Contribution

As research associated with the neo-institutional school (Meyer and Rowan, 1977; DiMaggio and Powell, 1983) has gathered momentum, the variety of organisational practices deemed susceptible to capture in DiMaggio and Powell's "iron cage" has expanded. Although, as Oliver (1988: 558) has commented, "isomorphic forces may operate with varying effect on different organizational attributes," the extent to which different types of decision are more or less likely to be emulated has hitherto received little attention, and the incorporation of this dimension represents one of the distinctive contributions of my research.

As well as testing the universality of isomorphic forces, this research examines empirically, two other little-researched propositions emanating from neo-institutional theory: the effect of field structuration on isomorphic behaviour and the extent to which such behaviour can be attributed to managers' desire for legitimation, rather than some other cause. It also tests the strength of the link, implicitly assumed by theory, between isomorphic pressures perceived by decision-makers and isomorphic decisions implemented within their organisation. The results of these investigations, although not yet definitive, lend support to the suggestion, which I first raise in my review of the literature in Chapter 3, that institutionalisation and isomorphism, hitherto widely regarded and studied as intrinsically linked, may in fact be largely separate phenomena.

A further distinctive element of this research lies in its approach to two key variables: isomorphic forces/pressures and decision-makers' knowledge of the practices that they are emulating. Researchers hitherto have tended to infer the extent of both pressures and knowledge from the degree of an organisation's or decision-maker's embeddedness (Granovetter, 1985) in organisational fields (DiMaggio and Powell, 1983). In this study,

both are measured directly, the first through the administration of questionnaires and the second by capturing precisely the knowledge that decision-makers command of their competitors' actions.

This latter measurement is made possible by the final distinctive dimension of this research, its employment of laboratory methods, hitherto little used in the study of isomorphism. This has a number of benefits, allowing the researcher to observe directly the links between situation, perception, knowledge and decision, and to discover how isomorphism unfolds in an environment uncontaminated with pre-existing institutions and where resource dependency is not an issue. It also avoids a number of methodological issues relating to the measurement of isomorphism, which I discuss in Chapter 3 of this thesis.

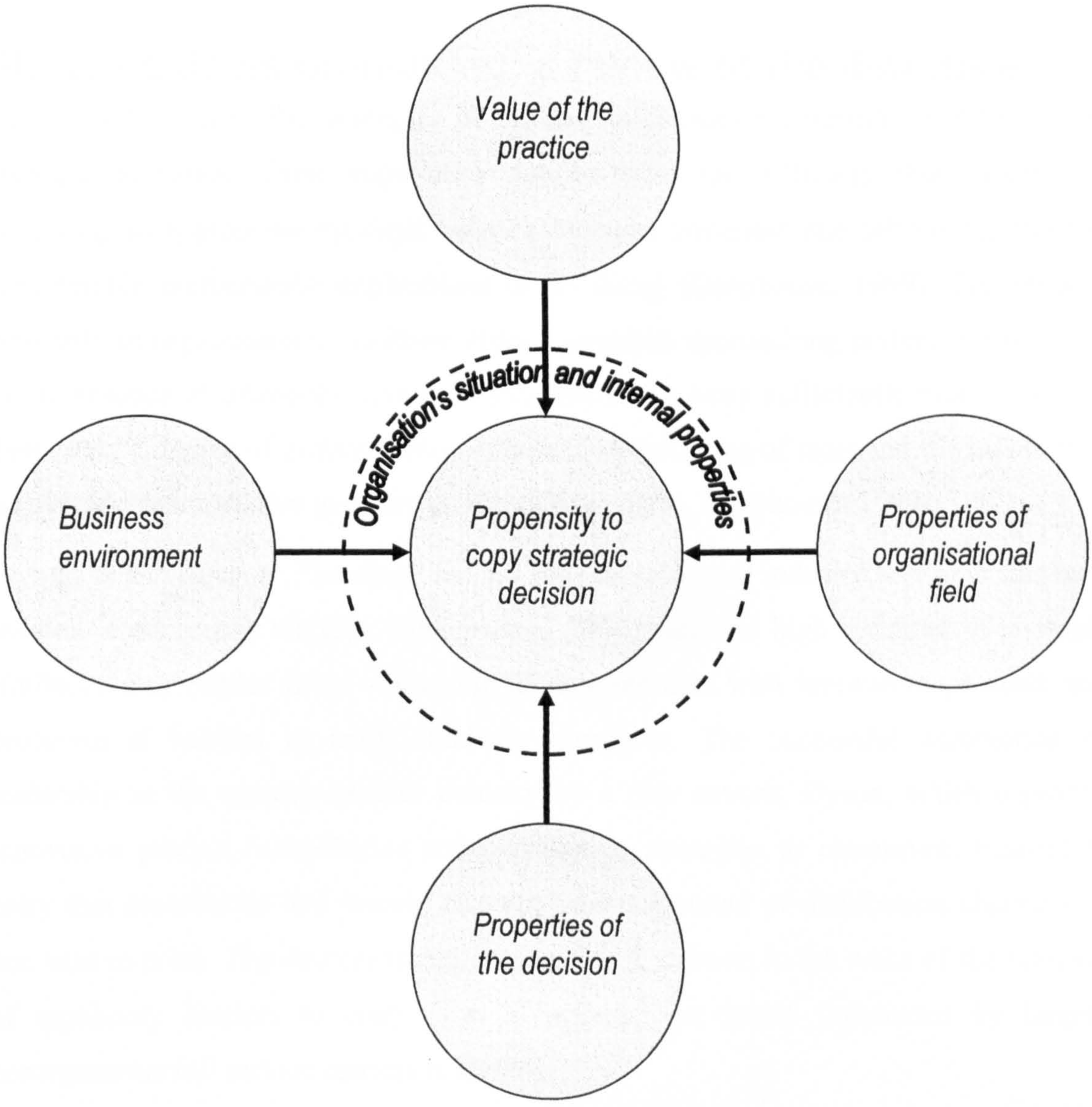
1.4 Structure of the thesis

I start, in Chapter 2, with a review of the literature relating to strategic decision-making and of the likely sources of variation in such decisions.

In Chapter 3, I review the theory and the empirical evidence relating to isomorphism in organisational practices. I develop a model of isomorphism in strategic decision-making, summarised in Figure 1.1 (overleaf), and identify methodological issues and unresolved questions. In Chapter 4 I develop hypotheses and show how, through testing them, I shall throw light upon those unresolved questions. Chapter 5 develops and justifies the laboratory-based methodology that I use to test the hypotheses; the results are set out in Chapter 6.

In Chapter 7, I discuss the implications of these results for the proposed model of the influences on isomorphism in strategic decision-making. I examine the implications for theory, in particular neo-institutional theory and the theory of strategic decision-making, and for management praxis. I discuss the limitations of this study and make recommendations for further research.

Figure 1.1 A model of isomorphic strategic decision-making



Chapter 2

Strategic decision-making: a review of the literature

Decisions to imitate the strategies of another organisation constitute a sub-class of strategic decisions. Their importance derives from the difficulty that attaches to achieving an appropriate strategic balance between sameness and difference, and the considerable performance implications of so doing (Deephouse, 1999). Too great a similarity in organisations' positions risks a situation approaching perfect competition. In the absence of oligopoly structures and barriers to entry sufficiently high to sustain them, only a degree of differentiation allows for the earning of rents and the building of sustainable positions that generate profits (Collis, 1996; Deephouse, 1999).

Even in an oligopoly, "herding" around a set of perceived industry best practices may severely erode profit margins (Nattermann, 2000), and too high a degree of strategic similarity may render firms vulnerable to new entrants with innovative products and processes if barriers to entry suddenly disappear. The successful assumption of leadership in the vacuum cleaner industry by a new entrant, Dyson, which deployed innovative product technologies and distribution strategies to circumvent barriers to entry that incumbents had erected through their command of distribution channels, is one case in point. The successful entry of low-cost airlines, in the wake of the removal of regulatory barriers to entry, into a business previously dominated by largely homogeneous full service carriers is another.

In this chapter, I review the theory of strategic decision-making (SDM), examining the role played in decision-making by decision-makers' cognitive processes, by learning and by politics and bargaining. I identify the main sources of variation in such decisions, as a prelude, in Chapter 3, to identifying the factors that might affect the incidence of isomorphism in them. But I begin with a brief examination of what is understood by a strategic decision.

2.1 Strategic decisions

Strategic decisions are most often characterised in terms of their impact on an organisation. They are decisions that determine the overall direction of the firm (Quinn, 1980) or of some significant portion of it (Haberberg and Rieple, 2001). They commit (Ghemawat, 1991) the organisation's resources to a particular and significant action or inaction, and cannot be easily reversed without some cost in terms of financial

resources, management time or reputation. Internally, some of these commitments take the form of precedents (Mintzberg, Raisinghi and Théorêt, 1976) that will necessitate effort to unwind. They are complex (Hambrick and Mason, 1984; Schwenk, 1988), and this complexity has methodological implications for researchers that I review in section 3.6.3.1.

Although there is a notable lack of uniformity in the scope of the decisions that have featured in studies of strategic decisions (Table 2.1), there seems to be little difficulty in identifying them in practice. Managers can recognize strategic decisions when they encounter them (Dean and Sharfman, 1996: 380), as seems to be the case also for researchers: one study of the airline industry reported total inter-coder agreement in classifying moves as strategic or tactical (Hambrick, Cho and Chen, 1996).

Table 2.1 – Strategic decisions studied by researchers

Mintzberg, Raisinghi and Théorêt, 1976	*Dean and Sharfman, 1996 (examples from sample of 52 decisions)*	*Miller, 1997*
Change of retirement age policy in small electronics firm	Shut down major part of steel business	Building a water treatment works for water utility
Acquisition of distribution agency by marketing board	Close overseas electronics manufacturing plant	Installation of CADD system for water utility
Institution of new form of treatment in hospital	Adopt steel-toed athletic shoe in footwear company	Installation of new computer systems for two mail order firms
Purchase of seat on stock exchange	Adopt manufacturing cell controller in electronics company	Building of new warehouse for mail order firm
Firing of radio announcer	Create divisional structure in lighting company	Development of new transport and distribution system for chemicals firm
Merger of consulting firm	Adopt state-of-the-art scanning equipment in publishing company	Installation of a new computer system for chemicals firm
Acquisition of jet aircraft for regional airline	Adopt advanced information system in chemical company	Building of university and campus

Table 2.1 (contd).

Mintzberg, Raisinghi and Théorêt, 1976	*Dean and Sharfman, 1996*	*Miller, 1997*
Purchase of new radiology equipment for hospital	Establish private-label business in clothing company	Installation of heating and energy management system for university
Purchase of new switching equipment for telecomms company	Emphasise new market segment in publishing company	Formation of private chemicals company
Purchase of new DP system for municipality	Paint company moves into Latin American market	Merger of two divisions of chemicals firm
Purchase of new DP system for firm	Lighting company creates European office	
Development of new TV programme	Electronics company moves into photolithography	
Development of new beer for brewery	Chemical company constructs new plant	
Development of bid in new industrial market	Lighting company constructs Caribbean plant	
Development of promotional programme for racetrack	Adopt new compensation system in electronics company	
Development of new supper club in hotel	Company-wide worker involvement programme in paint company	
Development of new container terminal in port	Develop total quality effort in chemicals company	
Development of new market for deodorant		
Development of urban renewal programme		
Development of new runway for airport		
Development of new building for college		
Development of new laboratory for university		
Development of new plant for small firm		
Development of new HQ building for bank		

2.2 Strategic decision-making processes – an overview

Our understanding of the making of strategic decisions is informed by a number of literatures relating to strategy processes (e.g. Hart, 1992; Hart and Banbury, 1994; Bailey and Johnson, 1995), strategic decision making (Eisenhardt and Zbaracki, 1992), strategic change (Rajagopolan and Spreitzer, 1997) and strategic persistence (Lant, Milliken and Batra, 1992; Audia, Locke and Smith, 2000). As I argued in my Introduction (Chapter 1), these are essentially different aspects of a single phenomenon. Changes to a strategy are the outcomes of strategic decisions, and are shaped by managerial routines and by the cognitive processes of participants (Hellgren and Melin, 1993; Rajagopalan and Spreitzer, 1997; Lindell, Ericson and Melin, 1998). Persisting with a strategy, whether by calculation or by default, is equally a strategic decision – it embodies commitments (Ghemawat, 1991) and has long-term consequences. The literature on strategy processes investigates the generic organisational processes undergone when arriving at strategic decisions and, in some cases, integrating different sub-decisions into a coherent whole.

All of these literatures draw upon a common base of concepts relating to how decisions are reached: rationality and bounded rationality in decision-making, managerial cognition, managerial learning and political bargaining. These are the concepts that form the main substance of this chapter.

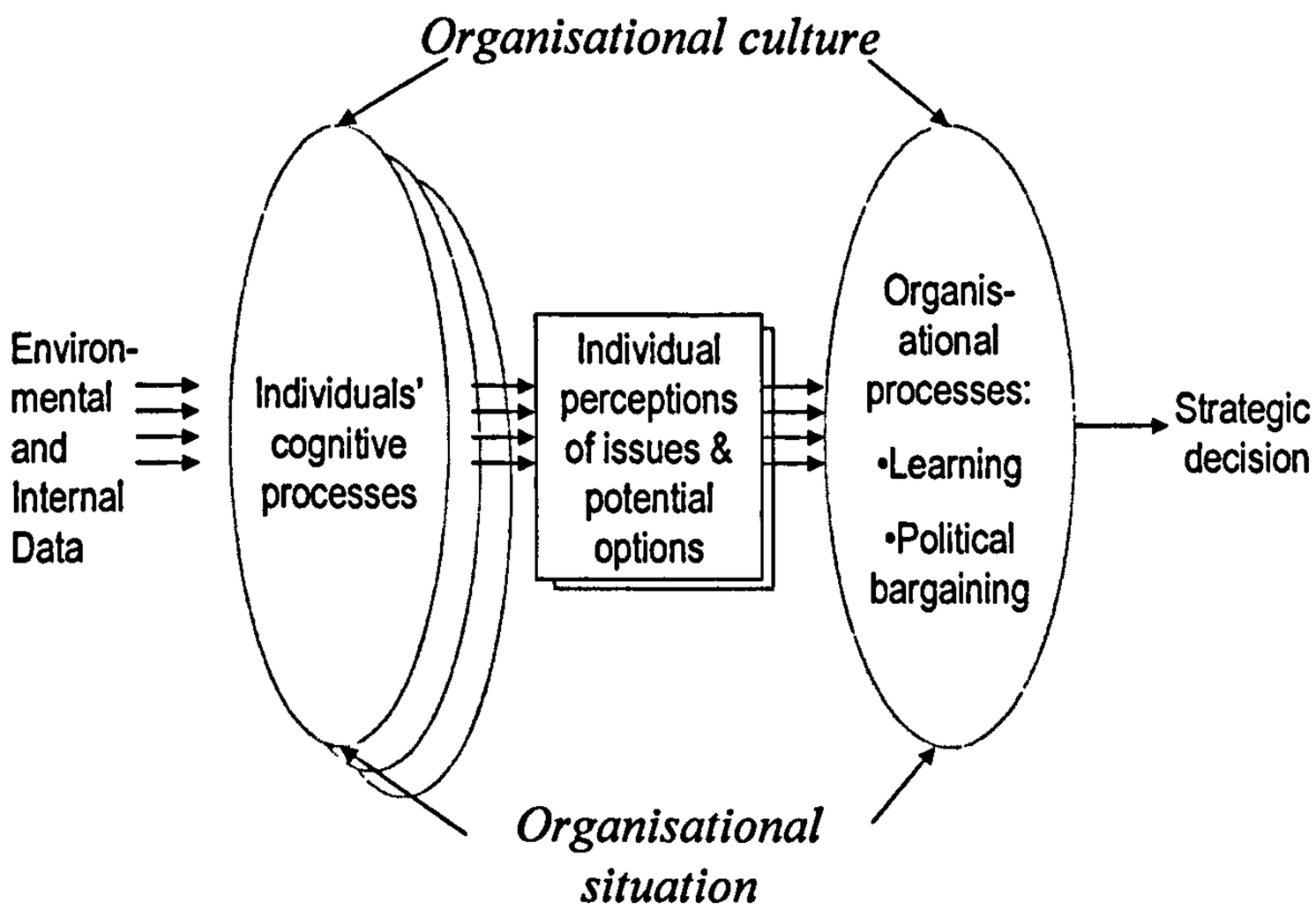
Strategic decisions are a collective response, on the part of an organisation's members, to the firm's environment and to its perceived situation within that environment, requiring participants in the decision-making process to make sense of conditions inside and outside the organisation, of changes in those conditions and of the results of past decisions (Rajagopalan and Spreitzer, 1997).

In some strategy processes, participation is largely limited to dominant chief executives or top management teams, whereas others involve a broader degree of participation within the organisation, be it through formal planning systems, less formalised internal learning processes, political bargaining or individual initiatives (Bourgeois and Brodwin, 1984; Shrivastava and Grant, 1985; Hart, 1992; Hart and Banbury, 1994; Bailey and Johnson, 1995). Different varieties of these processes may co-exist within a given organisation (Hart and Banbury, 1994; Bailey and Johnson, 1995; Brews and Hunt, 1999). In the discussion that follows, I therefore refer generally to "decision-makers" who may hold any position within the organisation, rather than

limiting my discussion to "managers" or "executives", as is common in the field (e.g. Hambrick and Mason, 1984).

The starting point for most models of strategic decision making is the accumulation of information regarding the organisation and its environment through a process of scanning (Hambrick, 1981; Hambrick and Mason, 1984; Thomas, Clark and Gioia, 1993). Such activities may account for a substantial part of top managers' time (Mintzberg, 1973a; El-Sawy, 1984). However, cognitive biases and other human imperfections on the part of participants serve to limit the scope of this scanning, cause certain observations to be downplayed while others are given undue weight, and place bounds upon the number and types of options that are considered (Cyert and March, 1963; Kiesler and Sproull, 1982; Hambrick and Mason, 1984; Ocasio, 1997; Hodgkinson and Sparrow, 2002). I review these cognitive phenomena, together with their considerable implications for SDM in general and isomorphic strategic decisions in particular, at greater length in section 2.2.1.

Figure 2.1 A model of strategic decision-making in organisations



The internal cultural characteristics of the firm influence decision-making in two ways: by affecting the cognitive structures, and hence biases, of decision-making participants, and by shaping the interactions between those participants – for example, the degree of learning or political bargaining that occurs within the decision process. Learning interactions determine the extent to which individual views become shared

within an organisation, so that decisions are based upon consensus. Political bargaining may be an alternative mechanism for forging a consensus between parties with divergent views or, alternatively, a mechanism whereby one set of views comes to prevail in the absence of consensus. The underlying model of decision making is shown in Figure 2.1.

In the sections that follow, therefore, I review three key elements of SDM: managerial cognition, learning and political bargaining, and then elaborate the principal sources of influence on each of these factors, which in the following chapter are elaborated into a model of isomorphic decision-making.

2.2.1 Rationality, bounded rationality and individual cognition

Early theories of strategic management (e.g. Ansoff, 1965) either prescribed or assumed that strategic decisions, and indeed decisions in general, would lend themselves to a sequential process of rational analysis: goals would be set, the situation of the organisation be subjected to comprehensive analysis, appropriate strategies developed and then the performance of the organisation monitored, furnishing inputs to the next round of analysis (Bourgeois, 1980). Rational models of this kind still inform the behaviour of many decision-makers (Mintzberg, 1973b; Mintzberg and Westley, 2001) and planning processes based upon them remain as inputs to strategy formulation in a substantial number of organisations (Hart and Banbury, 1994; Bailey and Johnson, 1995).

However, not all strategic choices lend themselves to rational analysis, which is best suited (Nutt, 2001, 2002) to non-developmental decisions (i.e. those that do not require a radical change in the arenas in which an organisation does business, or in its business practices), where both goals and the means for achieving them are known or easily discoverable. Strategic decisions, since they are complex and imply radical change in both the scope and the mode of operation of a business, do not always fit these criteria. Decision participants therefore supplement analysis with judgement and intuition (Thompson, 1967; Khatri and Ng, 2000; Nutt, 2002).

After a review of 21 field and laboratory studies of strategic decision-making over the period 1963-1992, Eisenhardt and Zbaracki (1992) concluded that, in fact, it was now almost universally accepted that decision-makers act in a fashion that is boundedly (Cyert and March, 1963) rather than fully rational. This is reinforced by findings that that models of innovation diffusion based on bounded rationality in decision-making

lead to more realistic results than those which assume full rationality; the latter contain a greater bias in favour of innovation than is observed in real life (Abrahamson and Rosenkopf, 1993).

Bounded rationality results from constraints on decision-makers' time and attention, so that they are unable to absorb and fully process all relevant information, leading them to simplify the decision problem in a number of ways (Cyert and March, 1992). They satisfice against what they regard as achievable targets, rather than seeking optimal solutions. They use decision rules – heuristics and standard procedures – rather than attempting to treat each problem individually. Such heuristics may be substantially flawed: experimental research (Sterman, 1987, 1989a, 1989b; Paich and Sterman, 1993; Diehl and Sterman, 1995) has shown how even highly educated decision makers, fully briefed and informed regarding the internal dynamics of a system, rely upon heuristics that embody misperceptions of feedback effects, with potentially costly results.

Further departures from rational decision-making occur because decision makers operate on mental representations of the world – "schemata" or (Hellgren and Melin, 1993) "ways of seeing" – which they "enact", using them as the basis for classifying phenomena, assessing their salience and formulating solutions (Weick, 1979; Kiesler and Sproull, 1982). These schemata may not incorporate the latest information regarding the environment.

Moreover, decision-makers are liable to discount information that conflicts with a course of action to which they are heavily committed, choosing to notice more ambiguous information or information that presents them or their past decisions in a favourable light. Errors are also likely in the attribution of causes to effects: managers may overestimate the strength of a cause if strong inhibitory factors have been present, discount the importance of other factors if one plausible cause is present, mistakenly conclude that unrelated events are correlated if they appear similar or are encountered in the same context, and falsely believe that phenomena which have captured their attention have a causal relationship with events that occur at approximately the same time (Kiesler and Sproull, 1982).

When it comes to formulating the solutions to problems, managers have been shown to be prone to framing bias: managerial attitudes and the consequent decisions are affected by the manner in which a situation is framed as favourable or unfavourable (Kahneman and Tversky, 1984, Bateman and Zeithaml, 1989; Greve, 1998b;

Hodgkinson et al, 1999). Prospect theory (Kahneman and Tversky, 1979; Kahneman and Lovallo, 1993) holds that, in situations perceived as favourable, people favour less risky solutions than those adopted in situations portrayed as unfavourable, where they may take greater risks in order to retrieve the position. There is some evidence that this behavioural pattern translates from individual to corporate attitudes to risk (Greve, 1998b).

All of the above, in summary, conspire to limit the degree of rationality that informs decisions in organisations. Decision processes in some contexts have even been modelled as a garbage can in which ideas, issues and individuals combine in random fashion (Cohen, March and Olsen, 1972), although the garbage-can model appears to lack explanatory power in real-life situations (Eisenhardt and Zbaracki, 1992).

The implications of the above for isomorphism in SDM are as follows. Firstly, the strategies observed in competitors or suggested by key stakeholders are likely, in many organisations, to be considered salient information, and the emulation of such strategies is clearly a candidate heuristic to be used in certain situations. For example, for much of the 1980s, the merchandising strategy of Tesco, a UK supermarket chain, explicitly mimicked that of the market leader of the time, Sainsbury (Bell, 2003). Imitation of another organisation may also be a rational strategy for economising on search costs and minimising potential risks associated with delay. Any contingent factors internal and external to the organisation, or contingent properties of the decision, which might affect the adoption of such heuristics or the weight given to search costs or risk, are thus likely to affect the incidence of isomorphic decision-making.

Decision-makers may also assess the advantages of adopting a practice in terms of their personal utility, alongside or instead of the benefits to the organisation. If it saves them effort, or frees up time for some more attractive or important activity, they may be tempted to adopt a practice even if it offers no overall benefit to their firm. Any factor, such as corporate culture, that affects the manner in which individuals weigh their personal utility in relation to that of their employer may also therefore impinge on the frequency of isomorphic decisions.

Secondly, any contingencies that affect the salience of the information received regarding the practices of competitors or other potential role models are likely to influence the extent to which such information is absorbed and hence the likelihood of the practices being adopted. Similarly, any factors that affect the degree to which the

practice is likely to be perceived as a cause of success or failure will influence the likelihood of its adoption.

Such factors may include elements of the organisation's situation, such as good or poor past performance. These, together with the extent to which it is committed to strategies that are compatible or incompatible with the practice observed elsewhere, may affect the likelihood of isomorphic practices being adopted.

2.2.2 SDM and learning

Organisational learning and strategic management are strongly complementary activities (Leavy, 1998; Hodgkinson and Sparrow, 2002). On the one hand, strategies are seen as having a pivotal role in the process of organisational learning, being the means whereby theories of action are tested against reality (Hedberg, 1981). On the other, learning is increasingly seen as a desirable outcome of strategy. Particularly since the advent of the knowledge-based theory of the firm (Nonaka and Takeuchi, 1995; Grant, 1996; Spender, 1996) organisational learning has become identified as a source of competitive success and core capability (Senge, 1990; Schein, 1993; Nevis, DiBella and Gould, 1995; DiBella, Nevis and Gould, 1996) and a means whereby organisations acquire and enhance their competences (Sanchez and Heene, 1997).

Strategy processes where incremental learning activities are a principal element have been observed (Hart and Banbury; 1994; Rajagopolan and Spreitzer, 1997) as both an alternative (Quinn, 1989, Mintzberg, 1994) and a complement (de Geus, 1988; Brews and Hunt, 1999) to traditional rational planning. In such processes, "strategy is crafted based upon an ongoing dialogue with key stakeholders – employees, suppliers, customers, governments and regulators" (Hart, 1992: 338). Learning processes thus furnish a conduit whereby pressures for isomorphic decisions may be introduced into the strategy process. They may either stimulate isomorphism or, since the challenging of received assumptions is inherent to organisational learning (Senge, 1990), may play a part to its eventual rejection.

The relationship between learning and isomorphism is bidirectional with isomorphic decisions potentially playing a part in the strategic learning process. If the decision-makers believe that they can derive predictable and acceptable results from the emulation of practices observed elsewhere, then they may decide to adopt a number of isomorphic practices to avoid uncertainty in some areas, thus obtaining leeway to experiment with other elements of the strategy. Alternatively, they may adopt

isomorphic practices with a view to searching for incremental improvements in them. Such behaviour would accord with the principles of uncertainty avoidance and simple-minded search in the neighbourhood of existing alternatives, which have been identified (Cyert and March, 1963) as guiding managerial decisions.

2.2.3 Politics and bargaining

Organisations exist as coalitions of individuals whose goals may well conflict. Such conflicts may remain latent but, when they surface, some means for their resolution of must be found (Cyert and March, 1963). Political manoeuvring and bargaining between individuals and groups is one such means, and politics and power have long (Pettigrew, 1973; Narayanan and Fahey, 1982; Prahalad and Bettis, 1986; Schwenk, 1989, Pfeffer 1992; Dean and Sharfman, 1993) been identified as factors that shape the manner in which strategic decisions occur in organisations. In fact politics are "common in strategic choice" (Eisenhardt and Zbaracki, 1992:26); and prevalent in the strategy processes of some organisations (Bailey and Johnson, 1995), with the views of those stakeholders that control key resources being likely to prevail (Pfeffer and Salancik, 1974; Christensen, 1997).

Eisenhardt and Zbaracki (1992) review 14 studies and isolate two, conflicting views of politics in organisations. The first view holds that political behaviour is an essential "system requirement" for the creation of effective organisational change and adaptation (Quinn, 1980; Pfeffer, 1981, 1992). Certain types of strategic decision, in which the alternative means of moving forward are known but the eventual goals have yet to be agreed between stakeholders, lend themselves to resolution by bargaining of this kind (Nutt, 2002).

The second view is that political behaviour represents a dysfunctional and time-wasting activity that people adopt only as a last resort (Eisenhardt and Bourgeois, 1988), using established networks of allies (Pettigrew, 1973; Eisenhardt and Bourgeois, 1988), and that it diminishes the effectiveness of strategic decisions (Dean and Sharfman, 1996).

Isomorphic decisions may represent a means of furthering the goals of some stakeholders or of placating powerful resource holders, a topic which is discussed in greater depth in Chapter 3. Equally, they may represent a means of abbreviating dysfunctional conflict by offering a plausible solution that has been legitimated by

adoption elsewhere. The degree of political behaviour observed in an organisation may plausibly affect the extent to isomorphic decisions are contemplated and adopted.

2.3 Five sources of variation in strategic decision content

Within the preceding discussions of the role of rationality, cognition, learning, politics and bargaining in strategic-decision making, a number of possible sources of influence on each factor have emerged. Each of these constitutes potential sources of variation in the content of strategic decisions. I review them in turn, along with the empirical evidence, where it exists, regarding their influence on SDM.

The organisation's **business environment** furnishes stimuli, some or all of which may elicit strategic responses or varying degrees of rationality (Rajagopalan and Spreitzer, 1997). Decision-makers respond to their organisation's enactment of that environment, which is only an imperfect representation of the real world, but is nonetheless influenced by it and may contain some of its salient elements, which will then influence strategic decisions. The munificence of the environment may regulate the influence of political processes on SDM – where resources are abundant, individual resource holders exercise less power, and political bargaining may hold less sway.

The environment is, in fact, frequently cited as a major influence on an organisation's performance (Porter, 1980) and behaviour (Burns and Stalker, 1961; Lawrence and Lorsch, 1967). Estimates for the proportion of variation in US company profits explained by industry factors range from 8% (Rumelt, 1991) to 18.7% (McGahan and Porter, 1997). Theoretical insights into the link between environment and an organisation's strategy come from the well-known structure-conduct-performance model from industrial economics, and from life-cycle models, which postulate links between the age and degree of maturity of the industry and its members' strategies (Hofer, 1975; Porter, 1980) prevailing mode of operations (Hayes and Wheelwright, 1979; St John, Pouder and Cannon, 2003) and structure (Greiner, 1972; Van de Ven and Poole, 1995).

A particular subset of the firm's environment, the **organisational field**, (DiMaggio and Powell, 1983) plays a special role in decision making. It constitutes the social network (Abrahamson and Rosenkopf, 1997) of peers within which decision makers are embedded and from which they draw information. Information deriving from these sources may be regarded as more salient than that from elsewhere, so that the properties of the field may influence the cognitive processes whereby decisions are reached. The density or cultural characteristics of the field may influence the flow if information into

the organisation, and hence the learning processes with SDM. The members of the field may wield political power within the organisation by virtue of their influence over its resources. They may confer power disproportionately upon particular individuals by giving them privileged access to information or influence over resources (Pfeffer, 1982).

In some cases, an organisation's entire strategy may be largely dictated by pressures from within the organisation's field (Mintzberg and Waters, 1982; Bailey and Johnson, 1995). There is a substantial literature on the effect of the organisational field on isomorphic decision-making, which I review in Chapter 3.

The salience of the information relating to a particular decision will also be influenced by the **perceived value of the practice** to which the decision relates. Politically, association with a valuable practice may be expected confer power or influence upon a decision-maker. Cognitively, the plausibility of a practice as a source of benefits has been shown, as I have already (2.2.1) mentioned, to influence the importance attributed to it (Kiesler and Sproull, 1982). Rationally, the more valuable a practice appears to be, the more attractive its adoption, whether the value resides in expected economic returns or in the extent to which adoption is likely to win favour with influential or resource-rich members of the organisation's field. Variations in the strength, but also in the type of value (e.g. economic or political) attributed to a practice may plausibly influence the outcome of a strategic decision. There is a considerable literature on, in particular, the manner in which expectations of legitimacy (Meyer and Rowan, 1977, DiMaggio and Powell, 1983; Suchman, 1995) affect decision-making; I review this in chapter 3.

It is quite plausible that perceptions of the value of that practice may be moderated by certain **properties of the decision** itself, such as complexity or ambiguity. The more complex a decision or the greater the degree of ambiguity as to cause-effect relationships, the more likely it appears that decision-makers will fall back on established heuristics where available, or on incremental decision, which permit of learning, where they are not.

However, potential differences in the nature of the decision receive little attention in either the theory or in empirical studies of strategic decision making (Nutt, 2001). SDM studies tend to be at pains to emphasise the complexity of all types of strategic decision rather than to differentiate between them. It has been argued that different types of

decision call for different decision processes (Nutt, 2001, 2002; Sagie and Aycan, 2003) and require different decision support systems (Wijnberg, Van den Ende and de Wit, 2002). Kahneman and Lovallo (1993) have discussed how managers' attitudes to risk may differ for small and large decisions. But neither Mintzberg et al (1976) nor Dean and Sharfman (1996) controlled for the attributes of the decision in their studies, although, as I remarked in section 2.1, those studies embraced a wide range of different types of decision. An investigation of these issues therefore is a potential distinctive feature of the present research.

The final source of variation in strategic decisions comes from **internal factors** with an organisation. Organisations are idiosyncratic cultures at whose heart lies their paradigm (Johnson, 1987) or dominant logic (Prahalad and Bettis, 1986; Bettis and Prahalad, 1995), a set of shared, mental models that shape the cognitive processes of most of their members. The history of the organisation, the national culture that plays host to the firm, the recipes (Spender, 1989) prevalent within the industries in which it operates and the personal backgrounds of top managers and leaders will shape these mental models (Hambrick and Mason, 1984; Drennan, 1992).

The rituals, routines and power structures to be observed in a firm are expressions of the paradigm (Johnson, 1987). The degree to which decision making routines feature learning behaviours, politics or bargaining can thus be traced back to the paradigm and is therefore a cultural phenomenon. Only a small proportion of firms, for example, develop mental models and routines of a kind that enable them to be characterised as "learning organisations" (Senge, 1990; Garvin, 1993). Entrepreneurial organisations similarly feature unusual, informal working practices that are manifestations of the personalities of their founders and employees (Rieple, Gander and Haberberg 2002).

Thus an organisation's idiosyncratic culture determines the cognitive, learning and political processes to be found within it, and these in turn moderate the effects on SDM of the environment, the organisational field and the value of the practice and the type of the decision. For example, the extent to which schemata have been developed for handling radical or rapid change will influence the likelihood that major environmental changes will be ignored (Kiesler and Sproull, 1982). The strength of the linkages between the mental models to be found in different parts of a firm will govern the ease with which that firm adapts to environmental change and the extent to which it favours stability over innovation and diversity over focus (Lyles and Schwenk, 1992).

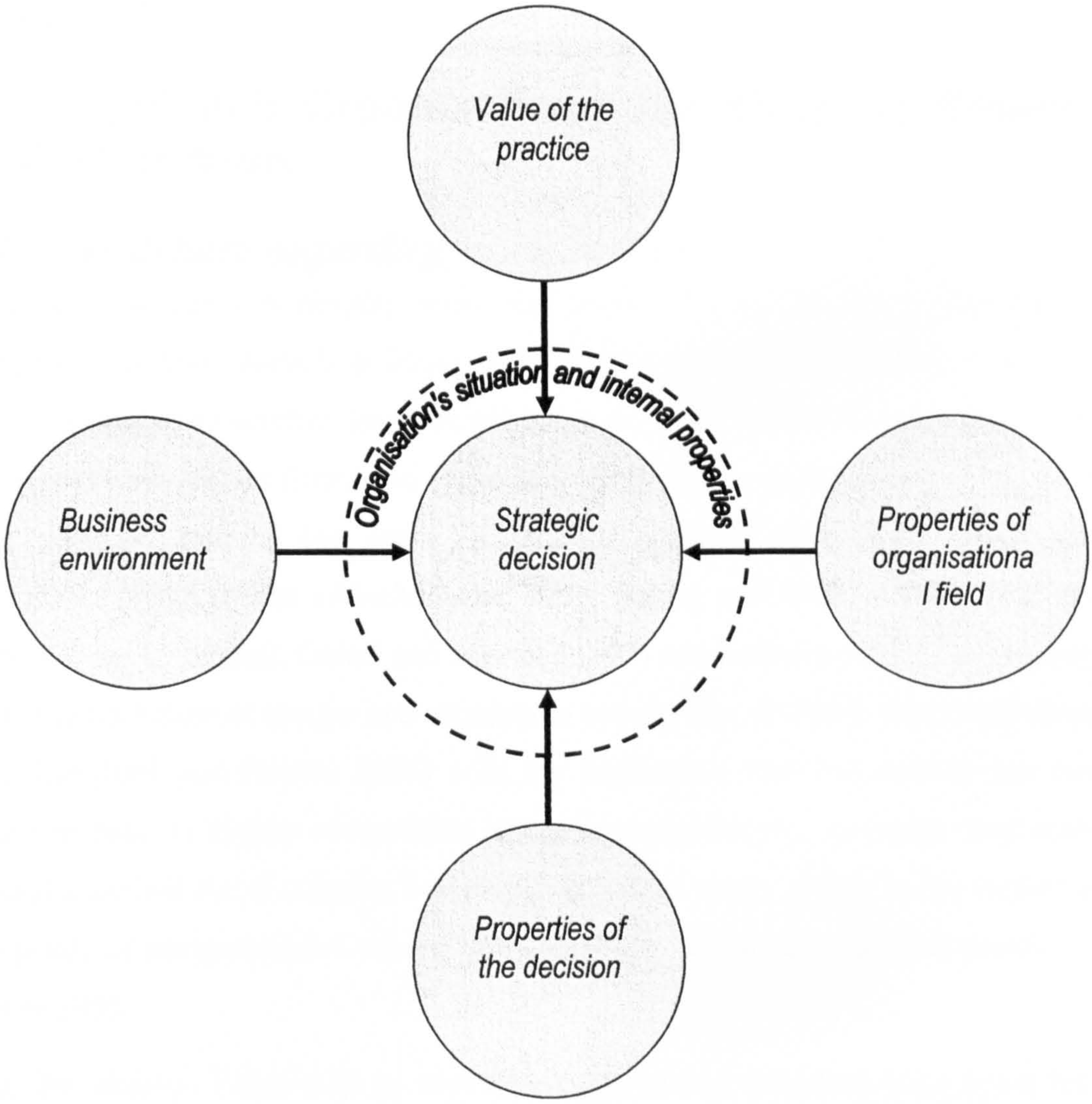
The effects of these culturally based factors will be further attenuated by the firm's situation, as mentioned in section 2.2.1: decision makers' reactions to environmental and decision/practice-specific contingencies: decisions are affected by the manner in which the decision context is framed as favourable or unfavourable, and by the extent to which the organisation is already committed to courses of action that are similar or dissimilar to those implied by the decision.

2.4 Conclusions – a model of decision-making

In this chapter, I have reviewed the theory of strategic decision-making and examined the key underlying factors: managerial cognition – and its implications for the rationality or bounded rationality of decisions – learning, and politics. I have identified five possible causes of variation in the incidence of isomorphism in organisations' strategic decisions, showing how each of these might affect managerial cognition and the extent to which learning and politics feature in decision processes.

These five factors are summarised in the model shown in Figure 2.2 (overleaf). In the following chapter (section 3.6), I use these same five headings as the basis for a model of isomorphism in strategic decision-making.

Figure 2.2 Influences on strategic decision-making



Chapter 3

Isomorphism in Organisational Decisions – A Review of the Literature

3.1 The debate regarding isomorphism

That organisations periodically copy one another is not in doubt. The innovation diffusion literature charts how innovations in both products and practices spread from one organisation to another. Institutional theorists, from a different perspective, analyse the spread of structural forms and organisational practices between organisations. Some such practices assume the status of fads or fashions, commonly cited examples including quality circles (Abrahamson, 1996; Strang and Macy, 2001), total quality management (Westphal, Gulati and Shortell, 1997) and business process re-engineering. The cyclical nature of merger and acquisition activity has also been frequently remarked (e.g. Langford and Brown, 2004) with the implication that this activity too may be prone to fads. In highly competitive business environments, strategies may converge around a limited set of industry best practices (Nattermann, 2000). In the market place, the prices of computers and other consumer goods cluster around price points such as £99 or £999.

In this chapter, I start with an overview of the strong empirical links found between the properties of the organisational field and isomorphism in organisational decisions and practices. I then examine the theoretical explanations that have been advanced for such isomorphism, commencing with those under the umbrella of neo-institutional theory, and showing the extent to which each is supported by empirical findings. I proceed with a review of the state of knowledge relating to each of the five possible influences on isomorphic strategic decisions that were introduced at the conclusion to Chapter 2. I identify several unresolved theoretical and empirical questions that form the basis of the research agenda that I pursue in this thesis. I also draw attention to two important underlying theoretical questions on which I intend to throw light in this research: how pervasive a phenomenon is isomorphism, and what are the links between isomorphism and institutionalisation.

3.2 Isomorphism – the influence of field properties

Table 3.1 (see page 70, at the end of this chapter) summarises the substantial body of empirical work on the spread of isomorphic practices between organisations. I omit

some well-known studies (e.g Covaleski and Dirsmith, 1988; Kostova and Roth, 2002) which focus upon the spread of practices within a single organisation, since these do not address the research question.

One clear conclusion that can be drawn from this research is that the spread of a decision or practice is influenced by properties of the field through which it is disseminated. Professionalisation of a field promotes the spread of practices approved of within the relevant profession (Baron, Dobbin and Jennings, 1986; Dobbin, Sutton, Meyer and Scott, 1993; Greenwood, Suddaby and Hinings, 2002). Researchers have repeatedly validated the importance of embeddedness (Granovetter, 1985) within an organisational field as a factor encouraging the dissemination of practices between organisations. This factor has been studied alongside theories relating to economics (Fligstein, 1985; Mezias, 1990; Palmer, Jennings and Zhou, 1993), population ecology (Fligstein, 1985; Oliver, 1988; Haveman, 1993), CEO background (Fligstein, 1985; Palmer et al, 1993) and politics and power (Palmer et al, 1993).

Almost without exception, these studies show that the incorporation of measures of embeddedness increases the explanatory power of models based on economic and other theories. Higher densities of local ties (Greve, 1998a), social ties (Galaskiewicz and Wasserman, 1989; Westphal et al, 1997), board-level contacts and the numbers of shared directors between organisations (Haunschild, 1993; Davis and Greve, 1997) have all been found to be associated with an increased degree of isomorphism in organisational practices.

However, Oliver (1988) found little support for embeddedness as a factor in explaining isomorphism in the strategies of voluntary organisations in Toronto. She concluded that any similarities were the result of strategic choice (Child, 1972). The importance of this result has, I believe, been underplayed in the literature; I hypothesise that it provides evidence for the influence of the properties of the decision type on the degree of isomorphism to be expected between firms, a point to which I return in section 3.6.5 below. Nonetheless, it cannot be held to undermine the validity of the link between field properties and isomorphism.

There is, however, no firm theoretical consensus, however, on *why* embeddedness promotes isomorphism. The most influential theories relate to the properties of the practice, such as the extent to which its adoption might bring economic benefits or legitimacy, or avoid resource penalties or legal sanctions. I now review these different

explanations, commencing with the most influential, those advanced by institutional theory.

3.3 Institutional theory and isomorphism

3.3.1 Institutional theory

Institutional theory (Scott, 1987; Zucker, 1987; Powell and DiMaggio, 1991; Tolbert and Zucker, 1996; Dacin, Goodstein and Scott, 2002) is an increasingly influential body of theories relating to institutions and of the processes, known as 'institutionalisation', whereby they become embedded within organisations and shared between them. Institutions are generally regarded as sets of behaviours or activities – "organisational forms and practices" (DiMaggio and Powell, 1983: 148) - that are "stable, repetitive and enduring" (Oliver, 1992: 563). Institutional theory, however, encompasses a variety of strands and there is a lack of consensus as to what does and does not qualify as an institution (Scott, 1987; Donaldson, 1995; Powell and DiMaggio, 1991).

This is partly because notions of institution have changed considerably since the term's early coinage by sociologists (Hughes, 1936, 1939; Parsons, 1951; Selznick, 1949, 1957) who have been retrospectively (Scott, 1987; Powell and DiMaggio, 1991) termed the 'old institutionalists.' These early theorists viewed institutions as symbolic manifestations of an organisation's culture, grounded in its 'values, norms, rules, beliefs and taken for granted assumptions' (Barley and Tolbert, 1997). They were held to be adopted for their symbolic value, either through an emergent process, as described by Selznick in his earlier writings, or as a deliberate attempt to disseminate and perpetuate the organisation's mission and values, as advocated in his later works. Under this view, institutions were shaped by managers who, even in highly political environments, functioned as rational actors, building coalitions in order to circumvent barriers to achieving their chosen goals (Powell and DiMaggio, 1991).

More recently, the so-called new institutionalism has gained increasing prominence amongst organisation theorists (Powell and DiMaggio, 1991; Tolbert and Zucker, 1996; Dacin, Goodstein and Scott, 2002) and kindred ideas have been adopted (see Powell and DiMaggio, 1991 for a review) by economists (e.g. Nelson and Winter, 1982; North, 1987, 1991, 1992) and political scientists. It embodies a view of institutions as consisting of "taken-for-granted scripts, rules and classifications" (Powell and DiMaggio, 1991: 15). Scripts (Barley, 1986; Barley and Tolbert, 1997; Johnson, Smith

and Codling, 2000) are "observable, recurrent activities and patterns of interaction characteristic of a particular setting" (Barley and Tolbert, 1997: 98).

Such institutions arise as a response to limitations (see section 2.2.1) in managers' attention structures and the consequent need for routines and heuristics as means of reducing uncertainty within decision-making processes (Cyert and March, 1963; Nelson and Winter, 1982; Powell and DiMaggio, 1991). This, cognitive, explanation of the formation of institutions is the major factor distinguishing the new institutionalism from the old (Powell and DiMaggio, 1991).

3.3.2 Institutionalisation

There is a further strand within institutional theory that has been less concerned with the nature of institutions than the process of institutionalisation. Institutions are defined – by inference, since no concrete definition of the noun is offered – as, in essence, any practice that can be institutionalised. Such a notion of institution can be observed in the early work of Zucker (1977, 1987) and her associates (Tolbert and Zucker, 1983). They see the process of institutionalisation as a pathway along which reality becomes socially constructed within an organisation and, more strongly, as a mechanism whereby accepted patterns of behaviour are laid down so that participants learn to conform to them. Such properties as recurrence, endurance and symbolic resonance are not necessary.

For example, in an early experiment, Zucker (1977) looked at her subjects' ability to judge the distance that a beam of light had moved in a given time. The emphasis was on demonstrating that these judgments became more entrenched within individuals if they were imparted in what the participants were told was a teamworking context, and even more so in an organisational one. Institutionalisation occurred as new subjects used the judgments of those whom they believed to be more experienced to calibrate their own notions of how far the light beam had travelled. There was no suggestion that subjects were exchanging any techniques for improving their judgement, that the activity was embedded in any deeper structures, that it had any symbolic importance to the "organisation" in question or that it would ever be repeated, although for some subjects it eventually was.

Tolbert and Zucker have recently (1996) espoused a more conventional view of institutions as recurrent processes, and have identified three stages in their emergence: habitualization, objectification and sedimentation. The pre-institutional stage of

habitualization involves the generation of practices, at the level of the individual organization, to deal with a given problem. The semi-institutional stage of objectification is the stage at which a practice acquires sufficient perceived value, whether symbolic or economic, for it to spread between organisations through a process of conscious imitation. An older view of institutions, deriving from Selznick's early writing, sees precisely this objectification as both their distinguishing feature and raison d'être. At the final stage, sedimentation, practices have spread almost universally "within the group of actors theorized as potential adopters" (Tolbert and Zucker, 1996: 184), have been sustained for a substantial period and can thus be regarded as fully institutionalised.

3.3.3 Institutional theories of isomorphism

Tolbert and Zucker's exposition of "sedimentation" implies that some measure of isomorphism between organisations is intrinsic to institutionalisation – indeed, that a practice cannot be deemed institutionalised without it. However, the most commonly cited institutional predictions regarding isomorphism are somewhat stronger than this. They date from the publication of DiMaggio and Powell's seminal (1983) neo-institutional paper in which the authors, proceeding from an observation that the degree of institutional similarity between organisations was notable, postulated that such similarities were bound to increase, using Weber's metaphor of the "iron cage" to describe the inexorability of the process.

Drawing upon earlier pioneering work by Meyer and Rowan (1977), they postulated that the search by organisations' members for legitimacy, within their peer group and in the eyes of the bodies that controlled an organisation's access to valuable resources, was the fundamental force driving organisations to become isomorphic with others in their organisational field. Three mechanisms were identified for the spread of isomorphic practices: response to the demands of powerful external stakeholders such as regulators and corporate parents (coercive isomorphism), the imitation of successful peers (mimetic isomorphism), whether directly or through intermediaries such as consultants, and the establishment of norms of managerial behaviour (normative isomorphism) through common professional training and professional networks.

Although the determinism inherent in their view has been criticised (Whittington, 1992), and idiosyncrasies have in fact been found to persist in firms' practices, even in such highly structured environments as the Taiwanese PC industry, (Hung and

Whittington, 1997), the impact of DiMaggio and Powell's (1983) neo-institutional manifesto has been enormous. It has, until recently, dominated both the study of isomorphism and the study of institutional theory: it is a rare paper relating to isomorphism that does not refer to it, and the majority of empirical papers published regarding isomorphic behaviour in organisations have been conceived as tests of the theories set out within it.

Institutional researchers, for their part, have largely focused their efforts on large-sample statistical studies of "the persistence and homogeneity of phenomena," (Dacin, Goodstein and Scott, 2002; 45). There has, however, been a recent trend towards studies which, as advocated by Barley and Tolbert (1997), utilise a more ethnographic approach to study processes of institutionalisation and deinstitutionalisation. This trend culminated in a special issue of the Academy of Management Journal in which little allusion was made to isomorphism (Dacin et al, 2002). This may indicate a decoupling of the concepts of isomorphism and institutionalisation, an issue to which I shall return later in this chapter and thesis.

3.4 Causes of isomorphism – the institutional and resource dependency views

In this section, I shall examine in more detail the causes for isomorphic behaviour advanced by institutional theorists, and appraise the extent to which they are supported by empirical evidence.

Institutional theorists hold that, if an organisation is to survive and thrive, it must achieve legitimacy through conforming to the rules and expectations from its 'institutional environment' – a broad term embracing any body that has the power to confer such legitimacy, but typically including governments, regulators and pressure groups (Oliver, 1997a). The demands of the institutional environment may conflict with, and take priority over, those of the 'task environment', which embraces the industries and markets in which firms operate and from which pressures emanate to optimise economic performance (Scott, 1987).

Historical analyses show that national level macro-institutions have a major influence upon the manner in which organisations and individuals are able to organise transactions, and thus upon their economic behaviour (North, 1991, 1992). Lam (2000) goes further, positing that certain elements of the institutional macro-environment, namely labour markets and systems of education and training, by shaping the manner in

which organisation members think and act, influence firm-level institutions. In particular, she holds that the prevalent form of labour market and of education/training systems within a given society or industry will together combine to dictate which organisational form a firm is likely to adopt and hence the manner – tacit or explicit, individual or collective – in which it holds and manages knowledge. Firms, in their turn, may be the source of institutions which, as they spread across interorganisational networks, may exert a substantial influence on national macro-cultures (Abrahamson and Fombrun, 1992).

These generic linkages between macro- and micro-level institutions have, however, yet to be substantiated by empirical researchers, who have preferred to examine cases where specific and more easily identifiable factors within the institutional environment exert a clear influence, through rewards and sanctions, upon organisational behaviour. There is thus empirical evidence of organisations' practices' being influenced by a variety of elements of that environment: unions and governments (Baron et al, 1986); professional associations (Baron et al, 1986; Dobbin et al, 1993; Greenwood et al, 2002); local government agencies and local bodies such as schools and churches (Baum and Oliver 1991, 1992, 1996; and elite families (Tolbert and Zucker, 1983). Although these empirical studies have tended to focus disproportionately on mimetic isomorphism (Mizruchi and Fein, 1999), they together support the existence of all three of the types of isomorphism identified by DiMaggio and Powell (1983): mimetic, coercive and normative.

The rewards and sanctions for adoption or non-adoption of a given practice can be placed in three categories: legal and regulatory pressures; resource penalties and incentives; and legitimacy. I examine the empirical evidence regarding the impact of each of these on organisations' propensity to adopt isomorphic practices. It should be noted that the borders between the task and institutional environments are not clear-cut, so that some of these rewards and sanctions may be within the gift of organisations other than those mentioned in the previous paragraph. For example, suppliers, customers and even competitors may confer legitimacy (Tushman and Romanelli, 1985; Christensen, 1997; Sherer and Lee, 2002) and influence the availability of resources, as well as determining the factors needed for economic success in a given industry or task environment.

I also examine the evidence for a further institutional explanation of isomorphism, inertia, which derives from a property of the environment rather than of the practice.

3.4.1 Legal and State Pressures

Studies of the dissemination of personnel practices (Baron et al, 1986; Dobbin et al, 1993) have clearly demonstrated that the state, through its ability to promulgate and enforce legislation regarding a practice, and the courts, through their willingness to respond to suits from unions and other pressure groups, can be a powerful forces for the adoption of isomorphic practices within a field.

3.4.2 Resource penalties and incentives

Resource dependency theorists (Pfeffer and Salancik, 1978; Christensen, 1997; Toms and Filatotchev, 2004) hold that the twin needs, on the one hand to conform to the requirements of stakeholders that control access to key resources and on the other hand to reduce such dependency, are major determinants of an organisation's strategy. Such resource dependency may be one of the levers whereby the state (section 3.4.1) promotes acceptance of its desired institutions, and the threat of withdrawal of resources is also one of the reasons why organisations may favour policies that they believe will legitimate them in the eyes of such stakeholders (Meyer and Rowan, 1977; DiMaggio and Powell, 1983).

Resource dependency arguments are thus frequently intertwined with neo-institutional explanations of the emergence and persistence of phenomena (Powell and DiMaggio, 1991) since they clearly have a role in coercive isomorphism. I thus consider them here alongside institutional explanations, although they are conceptually distinct (Tolbert and Zucker, 1996): true institutional theories focus on the capacity of entities such as states to shape rule systems and institutions, and on the symbolic value of those institutions, rather than on the more economically rational calculations of resource availability, cost and benefit.

Resource dependency theory has itself been characterised, along with institutional theory, as being deterministic and anti-managerial (Donaldson, 1995), on the basis that both theories suggest that managers will necessarily be drawn towards "irrational" decisions that diminish their organisation's efficiency, and hence its economic welfare. However behaviour driven by resource dependency may have a clear economic rationale. If an organisation's goal is to maximise the return upon its invested capital,

then behaviour that reduces the cost of such capital, or that makes available resources controlled by external stakeholders that can be combined with valuable internal resources in order to facilitate expansion (Penrose, 1959) is no less rational than behaviours aimed at increasing economic efficiency (Powell and DiMaggio, 1991).

Resource dependency considerations may affect not only managers' willingness to mimic another firm's decision, but also the haste with which they do so in order to avoid any possible penalties from delay. The last corporate boards to adopt poison pills or other takeover defences find themselves disproportionately likely to suffer a hostile bid (Davis and Greve, 1997). The last company to find a strategic alliance partner in an emerging market may find that all the attractive firms are spoken for, and the option of entering that market has effectively gone. Such delays may also damage the firm's or the manager's reputation (Scharfstein and Stein, 1990) and hence their legitimacy.

Resource dependency has been shown to be a factor in the pre-institutional adoption of practices by firms, including the setting up of structures to ensure access to funding (Pfeffer and Salancik, 1978) and to access new product technology (White, 2000). It has also been shown to influence the persistence of strategies in firms and organisational fields (Christensen, 1997; Toms and Filatotchev, 2004), and the rejection of practices disliked by dominant sources of funding (Covaleski and Dirsmith, 1988).

There have been few explicit studies of how resource penalties and incentives influence isomorphic firm behaviour. Union threats of labour withdrawals were highlighted as a factor in the spread of bureaucratised personnel management practices in the US (Baron et al, 1986). Firms were shown to be more likely to adopt M-form structures if they were dependent for financial resources on firms that had done so (Palmer et al, 1993). Resource linkages, evidenced by federal contractor status, were found by Pfeffer and Salancik (1978) to be significantly associated with the spread of equal opportunities in internal labour market practices, although Dobbin et al (1993) found that such effects were not significant in multi-variate models that also incorporated the effects of legal changes. On balance, however, there appears to be sufficient evidence to conclude that the presence of resource incentives or penalties for the adoption or non-adoption of a practice is significant in explaining isomorphism in firm practices.

3.4.3 Legitimacy

Legitimacy is "a generalized perception or assumption that the actions of an entity are desirable, proper or appropriate within some socially constructed system of norms, values, beliefs and definitions" (Suchman, 1995: 574). It is given or sought in three main forms (Suchman, 1995): pragmatic, moral and cognitive. Pragmatic legitimacy derives from calculated assessments of the benefits – resources or influence – to be accrued from a relationship with an entity, and thus overlaps with the resource dependency considerations reviewed in the previous sub-section. Moral legitimacy comes from doing, or appearing to do, the "right thing" to enhance social welfare in the context of the social system in which that entity is located. To achieve cognitive legitimacy, an entity must act in accordance with the belief systems and taken-for granted assumptions of that social system.

The neo-institutional pioneers (Meyer and Rowan, 1977; DiMaggio and Powell, 1983) believed that early adopters of a practice would do so in a calculated fashion, in order to enhance the efficiency or effectiveness of their organisation, and perhaps also its influence and command of resources, and thus its pragmatic legitimacy. This corresponds to Tolbert and Zucker's (1996) pre-institutionalisation phase in a practice's adoption. Later adopters of a practice that has been institutionalised would be influenced mainly by the desire to avoid the erosion of pragmatic legitimacy and achieve, in particular, cognitive legitimacy. They would thus reap the personal and organisational rewards of legitimation: improved survival prospects for the organisation (Singh, Tucker and House, 1986; Baum and Oliver, 1991, 1992); enhanced status for its members; and enhanced access to resources for both (Meyer and Rowan, 1977).

It should be noted that perceptions as the degree to which adoption of a particular practice might confer, in particular, moral and cognitive legitimacy will be subject to personal interpretation by the organisation's members. The extent to which a given member or group within an organisation will perceive what I term "isomorphic pressures" – constraints to imitate others within their organisational field – is thus likely to vary, for reasons discussed in section 2.2.1, according to the experiences and professional and social backgrounds of the persons concerned. It is not self-evident that persons in different countries or regions, or different functional areas, will perceive the same, or any, isomorphic pressures. Although institutional theory tacitly assumes that such pressures will translate unambiguously into organisational action, it is quite possible that, after political bargaining between interest groups, some or all of them may

be ignored as determinants of organisational action. I return to this point in section 3.6.5.

Although a large number of empirical studies have set out to test DiMaggio and Powell's theories regarding isomorphic behaviour, none has clearly established that legitimation is in fact a driver of it. In fact, of the statistical studies in Table 3.1, only those by Deephouse (1996) and Westphal et al (1997) have operationalised a direct measure of legitimation – I review their findings below.

Most scholars have chosen as their independent variable the extent of an organisation's embeddedness in a field of adopters of similar practices; I have summarised the empirical findings of these studies in section 3.2 above. Typically, having found an association between embeddedness and isomorphism, researchers have concluded that neo-institutional theory's predictions with respect to mimetic isomorphism are supported. However, embeddedness within a field does not necessarily imply that a desire for legitimation from its members is the main, or indeed an active, motive for an organisation's action – the main alternative explanation is discussed in section 3.5.2.

Westphal et al (1997) did find a trade-off for late adopters of TQM between efficiency and legitimacy, as predicted by neo-institutional theory. However, their measure of legitimacy for US hospitals was also the measure used by the authorities to allocate Medicare funding, and hospitals that sought a high score on it may well have done so as much to avoid resource penalties as to seek legitimacy. This highlights the problems for empirical researchers in separating legitimation from resource dependency effects. Baum and Oliver (1991) did examine how resource dependency differed in its effects from legitimacy, and concluded that the difference was insubstantial, but their research related to the effects of legitimation on survival, not on isomorphism. Davis and Greve (1997) ascribed the variation between the adoption rates of different forms of takeover defence to the fact that poison pills, in order to be adopted, required only cognitive legitimacy, whereas golden parachutes had to await moral legitimacy in the eyes of the media and general public. However, this was a post hoc rationalisation of the findings – legitimation variables were not actually tested during the study.

There are some empirical findings that clearly link legitimation and isomorphism. Deephouse (1996) has demonstrated that legitimation may result from isomorphism, but did not examine the reverse causality. Ethnographic and historical studies have

demonstrated that strategic and personnel practices may be adopted more widely once they have been legitimised by professional bodies or prestigious competitors (Baron et al, 1986; Greenwood et al, 2002; Sherer and Lee, 2002). The size and profitability of a firm, and thus by inference its prestige, are positively associated with the likelihood that its strategies will be copied (Haveman, 1993; Greve, 2000).

However, there are also contrary findings. The absence of legitimation did not inhibit a large number of US liberal arts colleges from offering professional courses spurned by their more prestigious peers (Kraatz and Zajac, 1996; Kraatz and Moore, 2002). The imitators of large firms may be other large firms (Haveman, 1993), and such imitation may be as much motivated by a desire to replicate their economic success as by a wish for cognitive legitimacy.

The "hard-line" neo-institutional idea that legitimation effects will dominate others is thus seen less often in recent writings (e.g. Powell and DiMaggio, 1991). It is not inherent to institutional theories (Whittington, 1992) and entails a highly prescriptive view of individuals, of the kind criticised by Granovetter (1985), as creatures whose actions are constrained by their social environment and who are unable to exert free will. There are contexts in which this idea is inherently paradoxical: in creative industries, legitimation comes from asserting one's differences from one's peers (Rieple, Gander and Haberberg, 2002), whilst in other cases, legitimation may come from success within the task environment, which invariably implies a degree of difference in either market positions or working practices (Deephouse, 1999).

3.4.4 Inertia

Organisations display inertia (Hannan and Freeman, 1977; Tushman and Romanelli, 1985; Hardy 1996), which leads to the persistence of strategies (Lant el al, 1992), institutions and structures (Oliver, 1992; Orton, 1996). Solutions developed for individual problems become enshrined as heuristics for the addressing of similar problems (Cyert and March, 1963) leading to the development of sticky routines (Nelson and Winter, 1982) and persistent causal maps (Barr, Stimpert and Huff, 1992; Orton, 1996). The resulting taken-for-granted assumptions may become shared at the level of the industry (Spender, 1989), strategic group (Porac, Thomas and Baden-Fuller, 1989) or national culture[3] (Hofstede, 1980, 1991; Hampden-Turner and Trompenaars,

[3] Scott (1987) refers to these national cultural communities as "societal spheres".

1993; Albert, 1993), and also within networks of buyers, suppliers and other external constituencies (Tushman and Romanelli, 1985).

This results in behavioural convergence between organisations over time, particularly as deviant organisations are culled from the population (Hannan and Freeman, 1977) through a process of competitive isomorphism (DiMaggio and Powell, 1983). Vested interests in the status quo on the part of customers and other key resource holders may further inhibit organisations from pursuing policies or strategies that deviate from accepted norms (Christensen, 1997; Toms and Filatotchev, 2004).

Eisenhardt (1988) demonstrated that inertia played a significant role in perpetuating unfashionable compensation practices in US clothing retailers. This was in a situation in which there were unusually few pressures from the task environment to modify those practices, and may not be generalisable to less stable business environments.

This inertia-based explanation of isomorphism is compatible with theories that conceive of institutions as taken-for-granted assumptions (Zucker, 1977, 1987). However, while it may account for the perpetuation of practices that have already converged between organisations, it offers only an incomplete account of how they came to converge in the first place. It makes no assumptions as to the symbolic or other value of practices that are copied – rather, it implies that a whole range of practices may with the passage of time, become entrenched and isomorphic within a population of like organisations. In particular, it implies that isomorphism is a correlate of an environmental property, industry maturity.

Unlike the perspectives examined in the previous sub-sections, it does not explain why new practices, adopted by one or more pioneer organisations in response to changes in their task environment, come to be adopted by its peers. However, it does imply that the act of mimesis will over time become a taken-for-granted institution in its own right, for which proposition there is some limited empirical support (Westphal, Seidel and Stewart, 2001).

3.5 Non-institutional explanations for isomorphism

I conclude that, of the four explanations for isomorphism examined in the previous section, there is clear evidence for the influence of legal and state pressures and of resource penalties and incentives. The evidence of the effects of legitimation is more ambiguous, with recent studies seeming to show it as more of an enabler of isomorphic

behaviour than as a prime driving force. There is isolated evidence for the effect of inertia on isomorphism, but the extent of that effect requires further research. I now review explanations for isomorphic decisions advanced from outside the realm of institutional and resource dependency theories: simultaneous reaction to a common task environment; and the desire to replicate the economic benefits achieved by others.

3.5.1 Common reaction to the task environment – accidental imitation

Institutional theory (Tolbert and Zucker, 1996) allows that at the earliest stage of institutionalisation, a practice may be simultaneously adopted by several sets of managers unknowingly responding, in identical fashion, to similar perceptions of the task environment. This pre-institutional phenomenon, which I term *accidental imitation*, differs from normative or mimetic isomorphism, which are deliberate processes that become possible at the habitualisation stage, when the practices of one organisation have become known to others or when behavioural norms have become established within a field. However, even at the habitualisation stage, when a practice has become visible, it is possible that adopters are motivated by their own assessments of the economic benefits as well as by a desire to conform to emerging norms.

Empirical research has supported the notion that there is an association between task environment and isomorphism which co-exists with that of the institutional environment. Sometimes the two environments exert conflicting pressures: Haveman found (1993: 624) that "The pull of imitation, on which institutional theory depends, is balanced by the brake of crowded markets." In other instances, they have been found to be complementary: economic factors co-existed with institutional ones in determining adoption of formal personnel practices (Baron et al, 1988) and M-form organisation structures, even for late-stage adopters, for whom institutional pressures might be expected to predominate (Palmer et al, 1993).

The potential for confusing accidental with normative or mimetic isomorphism or, as it is sometimes expressed, the challenge of discriminating between the effects of the task and institutional environment, is well understood by theorists (Scott, 1987). However, there have as yet been no direct tests as to which out of the task environment and the institutional environment is more significant in determining organisational action, although Oliver (1997a), in a pioneering study, has investigated their relative impact on success. She found that, while firms' relationships with both task

environment (bodies controlling the supply of land, labour and other critical factors of production) and institutional environment (state, regulatory and professional bodies) were significant in determining organisational performance, the task environment had the greater influence, except where regulatory or institutional pressures were particularly intense.

3.5.2 Replication of economic benefits

Rather than developing independent assessments of the value of a practice, managers may consciously imitate the action of a competitor or some other organisation within its field, in the sincere, albeit boundedly rational, belief that it will reap similar economic benefits to those claimed by the first mover. Managers may use information relating to other organisations' use of a practice to estimate the value of that practice and determine whether to adopt it themselves. Such information has been found to take several forms (Haunschild and Miner, 1997): that large numbers of other organisations have adopted a practice, leading to frequency-based imitation; that organisations with certain attributes – large, successful, respected, prestigious or similar to the emulator – have done so, leading to trait-based imitation; or that certain organisations have reaped performance benefits from such adoption, resulting in outcome-based imitation.

Such deliberate mimetic behaviours cannot be deemed rational under all circumstances, but are likely to be moderated by the structure of the industry. Following Greve (1998a), Baretto (2000) argues that mimetic adoption is easily explained when the value of a practice increases with the number of adopters, as with technical standards under increasing returns (Arthur, 1996). Where, on the other hand, the value of a practice decreases with the number of adopters, and this decrease is known to the decision-makers, then mimetic adoption appears less rational. Greve holds that entry into new market positions falls into this latter category, although Kay (1993) uses the example of ice-cream sellers on the beach to demonstrate that precise imitation of an incumbent market position may be the most rational stance for a new entrant, since it will thus maximise its potential share of the available rents even as it reduces the quantity of rents available. It may also be that the incomer has, or believes it has, superior production efficiencies that enable it to operate profitably in emulation of an existing market position.

Isomorphism derived from the desire to replicate economic benefits is likely to be particularly prevalent where the true worth of a practice or its adoption is unclear

(Greve, 1998a; Baretto, 2000), so that the value of information regarding its adoption elsewhere is enhanced. Simulations have shown that when the benefits of adoption are real but difficult to realise and of minor importance, the result of mimetic behaviour may be a management fad (Strang and Macy, 2001). As further sets of managers decide to imitate the initial emulators, an informational cascade (Bikhchandani, Hirshleifer and Welch, 1992; Davis and Greve, 1997) may lead to widespread adoption of a practice in the belief that it will bring benefits, followed by its equally widespread abandonment should those benefits turn out to be ephemeral or illusory (Bikhchandani et al, 1992; Rao, Greve and Davis, 2001; Strang and Macy, 2001).

It has proved difficult to discriminate empirically between isomorphic behaviour based on replication of economic benefits and those based on legitimation. Both theories assume that imitation of a practice will depend on contact between organisations, and the prediction that large and highly visible organisations will be the most imitated is common to both economic benefit-based (Greve, 1998, 2000) and legitimation-based (Burns and Wholey, 1993; Haveman, 1993; Kraatz and Zajac, 1996; Westphal et al, 1997) theories. Indeed, Table 3.2 shows a number of instances where the two influences appear to co-exist within the same organisational field and exert complementary pressures upon decision-makers within it.

However, Haunschild has found evidence that, in some instances at least, it is the desire to replicate benefits that appears to be the stronger influence. She (Haunschild, 1993; Haunschild and Beckman, 1998) demonstrated that information about the benefits of different types of acquisition does pass between organisations as the result of interlocking directorates, and that such private information is significant in explaining isomorphism in the types of acquisition made, whereas she found (1993) no support for institutional explanations. It remains to be demonstrated whether this conclusion can be generalised to other forms of practice and inter-organisational contact.

3.6 Unresolved questions regarding isomorphism in strategic decisions

Returning to the framework for the examination of isomorphism in strategic decision making that I laid out at the end of Chapter 2, it can be seen, in the light of the preceding discussion, that strong empirical associations have been established between the incidence of isomorphism in adoption of a practice and both the value of the practice and the properties of the field in which it is disseminated. However, little is known

about the precise effects on isomorphic decisions of the business environment, the organisation's situation and internal properties and the properties of the decision. In some cases, relevant hypotheses and conjectures have been advanced by existing theorists. I summarise the state of knowledge under each of these five headings, preserving the order in which they were addressed in Chapter 2.

3.6.1 The effect of the business environment

As I established in section 2.3, the nature of an organisation's environment has long been recognised as an important influence upon its actions. However, its impact upon managers' propensities to take isomorphic decisions has not been investigated. Of the few studies that spanned more than one industry (Fligstein, 1985; Dobbin et al, 1993; Haunschild, 1993; Palmer at al, 1993) none investigated the impact of differential industry characteristics on patterns of isomorphism.

Since the debate as to whether isomorphic decisions are the result of strategic choice (Oliver, 1988; Kraatz and Zajac, 1996) or of some more deterministic factors (DiMaggio and Powell, 1983) is still a live one, it would be of interest to establish whether there are any associations between isomorphic behaviour and the environment that *might* be deterministic. The nature and root causes of such associations, should they be shown to exist, could then be the subject of further research.

Business environments can be analysed along three dimensions (Dess and Beard, 1984): munificence, complexity and dynamism. In munificent environments, where firms are not under great pressure to conform and have resources to devote to developing their own solutions, resource dependency theory clearly implies that isomorphic decisions would be less frequent.

However, the implications of changes along the other two dimensions are less clear. DiMaggio and Powell (1983) believed that isomorphism would be more common in situations of environmental uncertainty. This conjecture can be traced back to the notion (see section 3.3.1) that institutions are mechanisms for reducing uncertainty in decision-taking.

However, managers in uncertain environments may continue to take risks if they have developed (or believe they have developed) routines designed to manage the effects of environmental uncertainty (Brown and Eisenhardt, 1997; Courtney, Kirkland and Viguerie, 1997). Moreover, DiMaggio and Powell's (1983) proposition that

isomorphism is a function of structuration – specifically, they hypothesise that isomorphism will be more prevalent in highly concentrated industries than in fragmented ones – implies that in some cases isomorphism might be associated with a *reduction* in complexity.

Little empirical testing of these relationships has been undertaken, and all would warrant further investigation.

Although the age of an industry is widely believed to have implications for the behaviour of firms in it (e.g. Greiner, 1972; Hofer, 1975; Porter, 1980) and for their mortality rates (e.g. Hannan and Freeman, 1977), there has been little research into its implications for isomorphic behaviour, with few studies either comparing industries of different ages or degree of maturity, or examining longitudinal patterns other than differences between early and late adopters. For example, although Haveman (1993) controlled for organisational age, finding no significant relationships, she did not look at how isomorphic behaviour changed over the ten years covered by her study of market entry.

However, Kraatz and Moore (2002) incorporated time as a control variable in their twenty year study of the adoption of professional programmes by American liberal arts colleges, finding no significant relationships, Haunschild (1993) did take a more explicitly longitudinal perspective, finding little support in her data for the evolution of patterns of isomorphism based on the evolving of taken-for-granted assumptions. This latter line of research is worthy of being pursued further, since as well as throwing further light on the effects of industry age on organisational behaviour, it can help determine the validity of explanations for isomorphism based on inertia.

3.6.2 The effects of the properties of the field

It is clear, as shown in section 3.2, that the properties of the organisational field such as the degree of professionalisation and the density of linkages within it have a profound effect on the extent to which practices are disseminated between organisations. For the purposes of the current research, these influences are therefore taken as established facts, although there is scope for further research on whether certain types of linkage, such as interlocking directorates, have a greater effect than others.

It should be noted, however, that almost all this evidence is indirect; with few exceptions (Levitt and Nass, 1989; Kraatz and Moore, 2002), studies of isomorphism to

date, both within the neo-institutional paradigm and outside it, have not observed or produced direct evidence of conscious emulation of one firm by another. Rather, they have inferred that closeness of contact between organisations implied both knowledge of each others' practices and pressure to emulate them.

Yet, particularly when, as is the case in many studies, the organisational field being investigated is a single industry, managers within it will be subject to similar pressures from the task environment, to a greater degree than those outside the field. It remains possible, therefore, that in some cases phenomena that have been interpreted as emulation of practices observed in peer firms may in fact have been accidental isomorphism in reaction to this common task environment.

Decision-makers in different firms may, of course, have different backgrounds, experiences and hence cognitive processes, which may lead them to enact their common environment (Weick, 1979) in different ways, and hence take different actions. The resource-based (Wernerfelt, 1984; Barney, 1986, 1991; Dierickx and Cool, 1989; Peteraf, 1993) and knowledge-based (Grant, 1996; Spender, 1996) views of the firm rest upon the premise that such inter-firm differences will predominate. But it does not follow that any similarities between firms' strategies are, therefore, *necessarily* attributable to the institutional environment, or to conscious reaction to some information received regarding the economic value of the practice. Theorists working in this area (e.g. Scott, 1987) recognise that extent to which isomorphism is deliberate rather than accidental could usefully be tested further.

The influence of two specific field properties also warrants further investigation. DiMaggio and Powell (1983) proposed that isomorphism between firms in a field was a function of the degree of structuration of that field. They also hypothesised that isomorphism will be more common in fields where organisations transact with agencies of the state. Remarkably, given the body of research that has grown up around their theories, little testing has been undertaken of these or of a number of other hypotheses put forward in the same paper, perhaps because of the difficulty in operationalising the relevant constructs in field studies, although the observed effect of professionalisation is consistent with their hypothesis regarding the influence of structuration.

3.6.3 The perceived value of the precise practice

It has already been shown, in sections 3.4 and 3.5 that a considerable amount of empirical evidence exists that managers' assessment of the value of a practice, along

various dimensions, influences their decision whether or not to copy it. In this section, therefore, I address a methodological reservation regarding this body of studies, arising from possible definitional problems as to what constitutes isomorphism, which in turn emanate from certain ambiguities inherent to strategic decisions. I also highlight an unresolved question as to the relative importance to managers' isomorphic decisions of legitimation vis-à-vis the desire to reap economic benefits perceived elsewhere.

3.6.3.1 Fractality, temporal ambiguity, causal ambiguity and isomorphism

A strategic decision is typically fractal: it entails a stream of more minor decisions (Mintzberg et al, 1976) which may be "sporadic" - spread out over time (Hardy, 1985; Hickson et al, 1986; Pettigrew, 1990) – and may themselves comprise a range of sub-decisions. These may be the result of continuous processes of judgment that intermittently manifest themselves as choices (Kleinmuntz and Thomas, 1987).

I take as an example, the market entry decisions of Californian thrifts' following the loosening, in 1980, of regulations inhibiting their competition with banks (Haveman, 1993). A number of high-profile institutions led the way as thrifts diversified rapidly away from their core business, lending secured on residential property, into activities such as commercial lending, consumer finance and real estate development. Such diversification decisions comprised not merely decisions about which markets to enter, but ancillary decisions as to pricing, positioning and other elements of the marketing mix, location of offices and other facilities and quantities of personnel, funds and other resources to be committed. If there were changes to other facets of the thrift's strategy, for example a move to a greater market orientation, in tandem with the diversification, then these would have been likely to entail changes to its institutions – roles and structures (Whittington, McNulty and Whipp, 1994).

Observing such a move to a greater market orientation (hereinafter "the reorientation") retrospectively, however, it would not necessarily be clear whether the diversification decision, or the concomitant sub-decisions, preceded or followed it. It may be that the reorientation decision had been taken deliberately by the thrift's managers as part of a wide-ranging repositioning of the firm in its newly deregulated market place.

However, it is equally plausible that this reorientation might have occurred piecemeal, with the first sub-decision being taken without heed to its broader strategic consequences. A new branch might have been opened several years earlier in a hitherto

unexploited locality, and staffed by a keen young manager with new ideas for marketing the firm's products. His success might then have attracted the attention of head office managers, some of whom began to press for the more widespread adoption of his methods and listened sympathetically to his plea for different styles of loan, better tailored for the needs of his customer base. As the implications of each sub-decision unfolded over time, associated sub-decisions would have become increasingly attractive: as the new products attracted a more affluent clientele than the firm's previous core products, the thrift might have restyled certain branches to suit their tastes. When deregulation came, under this imagined scenario, it was not the trigger for a reorientation of the organisation's strategy, as it might have appeared to an outsider, but rather the removal of an obstacle to the implementation of a reorientation that had been set in train some time before.

The reorientation is thus discernable, not as a clear-cut decision taken in its own right at a specific point in time, but as a pattern that emerges from a stream of other decisions (Mintzberg and Waters, 1982, 1985). An outside observer would have difficulty, unless they had watched the process unfold, in determining retrospectively the order of events in the thrift's reorientation and diversification, and which of them was the cause, and which the consequence.

Strategic decisions thus display temporal ambiguity and causal ambiguity: neither the order of events, nor the direction of cause and effect, is easily discernable. Temporal ambiguities can in some cases be resolved by real-time observation or from the examination of documentary evidence, but causal ambiguities are less tractable. It is still, after much painstaking research, unclear whether the launch of Honda's small motorcycles in the US, retrospectively regarded as the trigger for its global success in the motorcycle industry, was a deliberate or an emergent strategy (Boston Consulting Group, 1975; Pascale, 1990; Mair, 1999).

Moreover, the strategic repercussions, or indeed the strategic nature, of a decision may become apparent only long after the event. Burgelman's celebrated (1994, 1996) study of Intel's exit from the production of memory, its original core business, and its recasting as a microprocessor firm, shows how radical change in strategy can come about with no greater top managerial intervention than the design of general decision rules of no original strategic import.

Even the fact that an organisation's top managers have endorsed a strategic decision does not necessarily imply that they were involved in it. Burgelman (1996) recounts how Intel's strategic change was legitimised by its top managers only after protracted debate. The same author's (1983, 1988) studies of internal corporate venturing show new ventures originating as initiatives by operational managers, then being adopted by middle managers and, if successful, retrospectively rationalized by corporate managers as part of the organisation's strategy concept.

Such are the difficulties in ascertaining the authorship, content and timing of decisions that some scholars prefer in their researches to identify actions, which are easier to observe and less ambiguous (Mintzberg and Waters, 1990; Rajagopalan and Spreitzer, 1997).

The foregoing has two significant implications for the investigation of isomorphism in strategic decisions. Firstly, the fractal nature of such decisions implies that there may be differences in the degree to which isomorphism is observable between them. Decisions which appear similar at a highly aggregated level of analysis – for example, decisions to diversify or to invest in new technology – may differ when one comes to examine details, such as the precise nature of the markets entered, the positioning adopted in those markets and the allocation of resources to different technologies. Such differences may prove to be substantive.

It is not obvious that the major decision is a more appropriate object of study than the concomitant minor ones, and it is equally unclear what degree of similarity among the minor elements is required in order for the strategic decision to count as isomorphic. Thus, in order to gain a complete picture of isomorphism in strategic decisions, researchers should examine both major decisions of a clearly strategic nature and the constituent minor decisions. They need also to be cognisant of the possible need to measure the degree of isomorphism between strategic decisions, rather than simply to observe isomorphism's absence or presence.

Secondly, the existence of temporal ambiguity implies that care must be taken in observing and comparing strategic decisions. It is possible that an organisation may have committed itself, de facto, to a course of strategic action, and have implemented some of the crucial sub-decisions, before announcing the strategy or before the nature of the strategic gestalt becomes apparent to an observer. If this eventuality is not taken into account, it is possible that the degree of isomorphism between two strategies may be

underestimated, if one is observed when it is still different from, but in the process of converging upon, the other, or overestimated, if the two strategies are observed at a point of similarity when they are in the process of diverging.

Researchers to date do not always appear to have appreciated, or responded to, these methodological challenges. There is no theoretical consensus, and no uniformity amongst empirical researchers, as to how alike organisational forms and practices need to be in order to qualify as isomorphic. On the one hand, Westphal et al (1997) chose to study the spread of TQM, rather than quality management systems in general. On the other hand, many identified instances of isomorphism have been at a highly aggregated level of analysis. Fligstein (1985) observed isomorphism in adoption of the M-form structure, but did not look at different implementations of that structure, although differences in the type of divisional structure adopted, for example whether the divisions relate to products, geographic markets or vertical markets, are of major strategic significance. Palmer et al (1993) simplified four categories of organisational form down to two in their own study of M-form adoption.

Haunschild (1993), in her study of acquisitions, did discriminate between vertical, horizontal and conglomerate acquisitions, and found in all three cases that there was clear evidence of isomorphism, and that the style of acquisition adopted by the imitators was identical to, and limited to, that adopted by the focal firm. But she did not discriminate further as to the strategic purpose of the acquisition, although there are many different purposes served by acquisitions (Hapeslagh and Jemison, 1986; Bower, 2001) and these differences are now known to lead to differences in the degree of legitimation accorded to acquirers by stock markets (Bieshaar, Knight and van Wassenaer, 2001).

There thus appears to be a need for finer-grained studies of isomorphism and of whether it can be observed simultaneously across a set of related practices, such as those involved in market positioning.

3.6.3.2 The status of legitimation as a driving force for isomorphism

With this methodological caveat, it can be concluded that researchers have validated the influence of two aspects of a practice's value on isomorphism in organisations' decisions: legal and state pressures and resource penalties and incentives. The evidence for the influence of legitimation, as against the desire for economic benefits, however, is less clear. Although legitimation is widely adduced as a major driving force for

isomorphic decisions, Table 3.2 shows no case in which it has been identified a cause of such decisions *independently* of legal, resource or economic considerations. In the case of US clothing retailers (Eisenhardt, 1988), it was inertia that influenced the continuation of isomorphism. A desire for continued legitimation may have contributed to this, but this was never investigated during Eisenhardt's research, and but since the practices in question did not conflict with the economic needs of the firms investigated, this could be cited as an example of legitimation leading to the adoption of practices with poor economic rationale, as suggested by neo-institutional theorists. Even in the case of US civil service reforms (Tolbert and Zucker, 1983), where profits were not an issue, the threat of resource removal through electoral defeat must have been a factor, alongside legitimacy, in the spread of practices between administrations.

On the other hand, it has been shown (Kraatz and Zajac, 1996) that economic considerations can lead to isomorphism, not merely in the absence of legitimation pressures, but despite their strong presence, and newer ethnographic evidence (Greenwood et al, 2002; Sherer and Lee, 2002) promotes a view of legitimation as an enabler in the spread of a practice for which there are persuasive economic justifications, rather than a driving force in its own right. There is no ethnographic evidence of practices being emulated on a wide scale primarily to gain legitimacy.

The proponents of models of imitation that are based around managers' desire to emulate economic benefits seen elsewhere, principally Eric Abrahamson, Heinrich Greve and their respective collaborators (Abrahamson and Rosenkopf, 1993, 1997; Abrahamson, 1996; Davis and Greve, 1997; Greve, 1998a, 2000; Rao et al, 2001), have forborne to criticise the neo-institutionalists, preferring to incorporate neo-institutional explanations alongside their own. But it is fair to ask, therefore: what, precisely, was being communicated within the organisational fields investigated in the studies listed in Table 3.1? Was it simply information as to the value of a practice, was it the "myth and ceremony" (Meyer and Rowan, 1977) associated with that practice, or was it some combination of the two?

This question warrants further investigation, since it has both theoretical and practical ramifications. I have already mentioned (3.4.3) that the primacy accorded to legitimation effects in the early neo-institutional publications is seen by some theorists (Whittington, 1992; Donaldson, 1995) as unduly deterministic and anti-managerial. A clarification of its actual importance relative to other motivating forces would advance

understanding of the degree of determinism inherent in managerial decision making. Practically, it would also assist those seeking to encourage the dissemination of a practice to know whether to emphasise legitimacy or economic benefits in their approaches to potential adopters.

3.6.4 The effects of the properties of the decision

As I pointed out in Chapter 2, the effects of differences in the nature of the decision have received little attention from scholars of strategic decision making (SDM), and this same gap is apparent in the theoretical and empirical research relating to isomorphism. Studies of isomorphism invariably focus on a single type of decision, and there have been no meta-studies comparing different types.

Evidence regarding the effects of different decision types is contradictory. One the one hand, there is a remarkable uniformity in the findings regarding isomorphism, across a wide range of decisions. On the other hand, there is a single outlier study that examined decisions with significantly different attributes to those scrutinised by other researchers. Paradoxically, both of these sets of research, which I now review in turn, pose questions for the prevailing, institutional view of isomorphism.

3.6.4.1 What types of decision are subject to isomorphism

A glance at Table 3.1 shows that the range of "innovations" and "institutions" for which isomorphism has been investigated is indeed broad. The types of decision copied range from top-level decisions relating to organisational form, corporate-level strategy, corporate governance and corporate finance, through market-entry and other business strategy decisions and practices, to low-level operational practices. They encompass practices at every stage of Tolbert and Zucker's (1996) model of institutionalisation: isolated pre-institutional practices, objectified "transitions" and sedimented, "routine-based" institutions.

The earliest empirical tests of the predictions of neo-institutional theory, in particular focussed upon the spread of fully sedimented, "routine-based" institutions. Such research has examined the degree of isomorphism between organisations' personnel practices (Baron et al, 1986; Eisenhardt, 1988; Dobbin et al, 1993), forms of organisation (Fligstein, 1985; Palmer et al, 1993; Burns and Wholey, 1993) and quality systems (Westphal et al, 1997).

There have been a number of empirical studies of isomorphism in phenomena that appear only to have reached the previous, objectification stage of institutionalisation,

the point at which otherwise merely instrumental structures become imbued with value and intrinsic worth. Diversifications by hitherto sleepy savings institutions (Haveman, 1993), the adoption of acquisition as a mode of business development (Haunschild, 1993) or the espousal of anti-takeover defences (Davis and Greve, 1997) all send strong symbolic messages to organisations' stakeholders regarding the organisation's culture and changes thereto. Such phenomena – product launches, market entries, acquisitions and new facilities – have been termed *transitions* (Brown and Eisenhardt, 1997).

Routine-based institutions pass through the objectification stage prior to sedimentation (Tolbert and Zucker, 1996) and thus acquire symbolic value. For example, it has been argued that both matrix structures (Burns and Wholey, 1993) and TQM (Westphal et al, 1997) are adopted as much on symbolic as efficiency grounds. The phenomena I have listed in the previous paragraph, however, do not imply behavioural change in an organisation and field in question and have therefore not passed on to the sedimentation stage. Some transitions are in fact one-off decisions that may have few ramifications for the organisation itself, and be largely enacted for the benefit of an audience outside the organisation, as is the case with poison-pill defences and new market entry.

While transitions *may* lead to deep-seated change to scripts as the organisation adapts to their aftermath – for example, as a newly-acquired subsidiary is integrated with the parent – they do not *necessarily* involve them at the point of adoption. And even after adoption, it is equally possible that the post-transition situation can be handled within pre-transition structures with only marginal changes to scripts: new markets handled alongside old, acquired firms integrated smoothly into the parent. Neither do these transitions themselves represent activities that are "stable or repetitive" – while some firms will make indeed make them a consistent element of their strategy, and develop institutions for activities such as acquisition search and post-merger integration, others, possibly to their detriment, view such transitions as one-off events and fail to develop any enduring routine-based institutions to deal with them (Brown and Eisenhardt, 1997; Frick and Torres, 2002).

A number of empirical studies of isomorphism have embraced isolated decisions that appear to be at the very earliest stages of institutionalisation. These include: choices of recipient of charitable contribution or investment banker (Galaskiewicz and Wasserman, 1989; Haunschild and Miner, 1997); adoption of anti-takeover defences (Davis and

Greve, 1997); and precise market or product choices (Haveman, 1993; Haunschild, 1993; Greve, 1998a, 2000; Rao, Greve and Davis, 2001). The Haveman and the Haunschild (1993) studies spanned this stage of institutionalisation and the later one discussed above. They examined both the spread of generic practices – respectively, diversification and acquisition – and the degree of isomorphism in the precise outcomes from such practices: the extent to which organisations respectively entered the same markets, and made the same kinds of acquisition.

The precise choices of product, market or adviser rarely have the symbolic resonance that, as I argued in the previous section, attaches to higher profile choices, such as the decision to diversify or to become acquisitive. Equally, decisions of this nature are devoid of the repetitive element of routine-based institutions - very rarely will one enter the same market or acquire the same firm twice.

Two unresolved questions emerge from these observations. The first relates to the nature of the link between institutionalisation and isomorphism: whether isomorphism can be regarded as an institutional phenomenon when it occurs for practices at such different stages of institutionalisation. The second relates to the existence of limits to the phenomenon of isomorphism: specifically, whether there exist classes of practice for which the natural impulse of the boundedly rational manager is to seek difference rather than sameness, and which are therefore less susceptible than other to imitation.

3.6.4.2 The possible effects of visibility, complexity and ambiguity

If a practice is complex to devise, implement or understand, or if it is difficult to tell a priori whether it offers any true benefits, or which variant of a practice is likely to work best in given circumstances, then, under bounded rationality, the temptation to mimic an organisation perceived as similar, or as a good role model, may be the greater. Similarly, the incentive to use an established solution as a basis for learning about a practice, rather than develop something *de novo*, will be greater. Absent such complexity or ambiguity, the firm may be more disposed to develop or retain a solution of its own.

A strong indication that the properties of the decision may indeed influence isomorphism in decision-making comes from Oliver's (1988) study of isomorphism in the strategies of voluntary organisations in Toronto, In her conclusion to this study, which I highlighted in section 3.2 as the one outlier in a raft of research confirming the connection between isomorphism and embeddedness, she writes (1988: 588):

> "...isomorphic forces may operate with varying effect on different organizational attributes. The principle of isomorphism predicts a unilateral imposition of environmental constraints on organizations as a whole within any niche, but selection processes may operate through the differential selection of specific predictable characteristics of organizations rather than organizations in their entirety."

One striking point regarding her research was that the decisions she examined were less visible and measurable than those in any of the other studies. It is possible to conceive of a senior manager poring over the organisation chart to decide the correct allocation of operations and functions between divisions, or calling a subordinate into their office for an update on the progress of the TQM programme (Westphal et al, 1997), or a discussion of which format to use for reporting of income tax credits (Mezias, 1990). It is less likely that they would discuss whether they had achieved the same degree of goal multiplexity, internal specialization, centralization or formalization as a neighbouring organisation. These, the elements of strategy studied by Oliver, are, however, socially constructed and routine-based, and some institutional theorists (Zucker, 1977, 1987) might expect these attributes to stimulate a degree of migration within an organisational field.

A second aspect of the decisions studied by Oliver is the unusual degree of outcome ambiguity. As Table 3.2 (page 73 at the end of this chapter) shows, in almost all the other studies, there was a clear reason why a bounded rational decision-maker might believe, however erroneously, that the practice to be adopted would bring economic benefit at the organisational or personal level, be it through access to resources, improved efficiency or market opportunities. However, there are simply no received recipes within the voluntary sector as to the "right" levels of goal multiplexity, formalization, and so on, in managing large groups of volunteers (Drucker, 1995; Farmer and Fedor, 1999). Since this implies that the adoption of one particular decision conferred little by way of legitimation, it is possible to rationalise the results of this study within a neo-institutional view of isomorphism. However, the very lack of received wisdom would heighten the value of information, gleaned from informal contacts, about other organisation's practices and might be expected to lead to trait-based imitation.

One reading of Oliver's findings is therefore that ambiguity and/or lack of visibility have reduced isomorphic activity otherwise associated with embeddedness. This would support the proposition (Greve, 1998a) that it is the most easily observable practices that will be emulated. On the other hand, DiMaggio and Powell (1983) believe that ambiguity, either in firm objectives or in the relationship between ends and means in a given environment, might increase the incidence of isomorphism, and this conjecture might logically be extended to encompass ambiguity inherent in a class of decision.

The final attribute of the decision that might affect the extent to which it is copied is its complexity. As I pointed out in section 3.6.3.1, it is unclear whether complex decisions with an array of component parts, such as a strategy, are as susceptible to copying as one of their component elements, such as market entry (Haveman, 1993; Greve, 1998a, 2000). Managers may imitate their peers in some decision elements, and develop their own methods in others. Or, different models may apply for different elements of behaviour (Haunschild and Miner, 1997): accounting or remuneration practices may be those adopted by the majority of firms in the country or industry, organisational forms may be based on those of prestigious role models, while marketing practices may be influenced by those that a new entrant is using successfully.

Since little research in general has been conducted into the impacts of decision attributes on decision-making, all these topics warrant investigation. The complexity issue could be tackled from two directions. One would be to take apparently isomorphic major decisions and inspect the degree of isomorphism to be found within the constituent sub-decisions. The second would be to take groups of related sub-decisions and assess the extent to which they aggregate into isomorphic major decisions. It is the latter approach that I shall be following in the present research.

3.6.5 The effects of the organisation's situation and internal properties

Cultural and other idiosyncratic internal factors may affect the extent to which a firm seeks out or avoids isomorphic decisions. Firms with strong strategic intent (Hamel and Prahalad, 1989, 1994) may be more likely to favour methods and policies they have developed themselves over those observed elsewhere. Some strategy processes are driven by dominant leaders (Hart and Banbury, 1994; Bailey and Johnson, 1995) who may impose their own ways-of-thinking even when these challenge the received industry wisdom (Hellgren and Melin, 1993). Entrepreneurs are less likely than non-

entrepreneurs to seek legitimacy from outside sources, and so firms with highly entrepreneurial leaders or cultures may be less open to pressures to imitate practices found elsewhere.

Most studies of isomorphic behaviour have however taken place at the level of the organisational field, using large populations of organisations. While such studies typically control for certain attributes of individual firms, such as size, profitability and prestige, there is room for a greater degree of understanding of the effect of firm-level contingencies on isomorphic decision-making.

Researchers have established that organisations perceived as successful are often imitated (Haveman, 1993; Burns and Wholey, 1993; Westphal et al, 1997), although not invariably (Kraatz and Zajac, 1996). However, it is not clear that the reverse is true – that it is unsuccessful organisations that do the most imitating. It may be profitable firms that imitate other profitable firms (Haveman, 1993). If, moreover, as DiMaggio and Powell (1983) imply, isomorphic behaviour is founded in part on the avoidance of risk, then prospect theory (see section 2.2.1) suggests it may actually be less frequent amongst poorly, or very poorly, performing firms.

There is also scope for a greater understanding of the internal characteristics that distinguish those firms that imitate a given practice from those that do not. There are well-established bodies of theory, some with empirical support, that link a firm's strategic direction to the demographic characteristics and tenure of the top management team (Hambrick and Mason, 1984). Organizational tenure of TMT members has been found to be strongly associated with strategic persistence, (Finkelstein and Hambrick, 1990; Grimm and Smith, 1991; Wiersema and Bantel, 1992), indicating that it may contribute to institutionalisation and to isomorphism based on inertia. Finkelstein and Hambrick (1990) found that conformity of firms to industry norms along six dimensions of strategy – advertising intensity, R&D intensity, plant and equipment newness, non-production overheads, inventory levels and debt/equity ratios – increased with the length of TMT tenure, indicating a measure of mimetic or normative isomorphism. This may be attributable to inertia, to increased importance being attached to legitimacy in the eyes of industry peers, suppliers, etc, as the TMT becomes more established within that community, or to increased availability of information as the TMT acquires a denser network of contacts within the organisational field.

SDM is also influenced, as discussed in Chapter 2, by characteristics of an organisation's culture, such as its degree of politicisation (Pettigrew, 1973; Dean and Sharman, 1993, 1996), and the strength of its mission and strategic intent. Each of these might therefore plausibly influence its managers' sensitivity to isomorphic pressures; I formulate precise hypotheses regarding the nature of such influences in Chapter 4.

I have already (section 3.4.3) mentioned that, although neo-institutional theory implicitly assumes that isomorphic pressures perceived by individuals will translate into specific organisational action, there are grounds for questioning that assumption. Research into strategic decision-making (sections 3.6.3.1 and 2.2.3) has shown how the relationship between stimulus and action may be obscure, even to the decision-makers themselves, until after action is taken (Weick, 1979; Mintzberg and Waters, 1990), and that considerations of power and politics may insert themselves between individual intention and organisational action. Westphal and Zajac's (2001) study of stock repurchase programmes has shown empirically that institutional pressures can indeed be counteracted by local power and political structures, particularly where the majority of legitimation benefits can be gained from announcing practices that in fact are not implemented in practice.

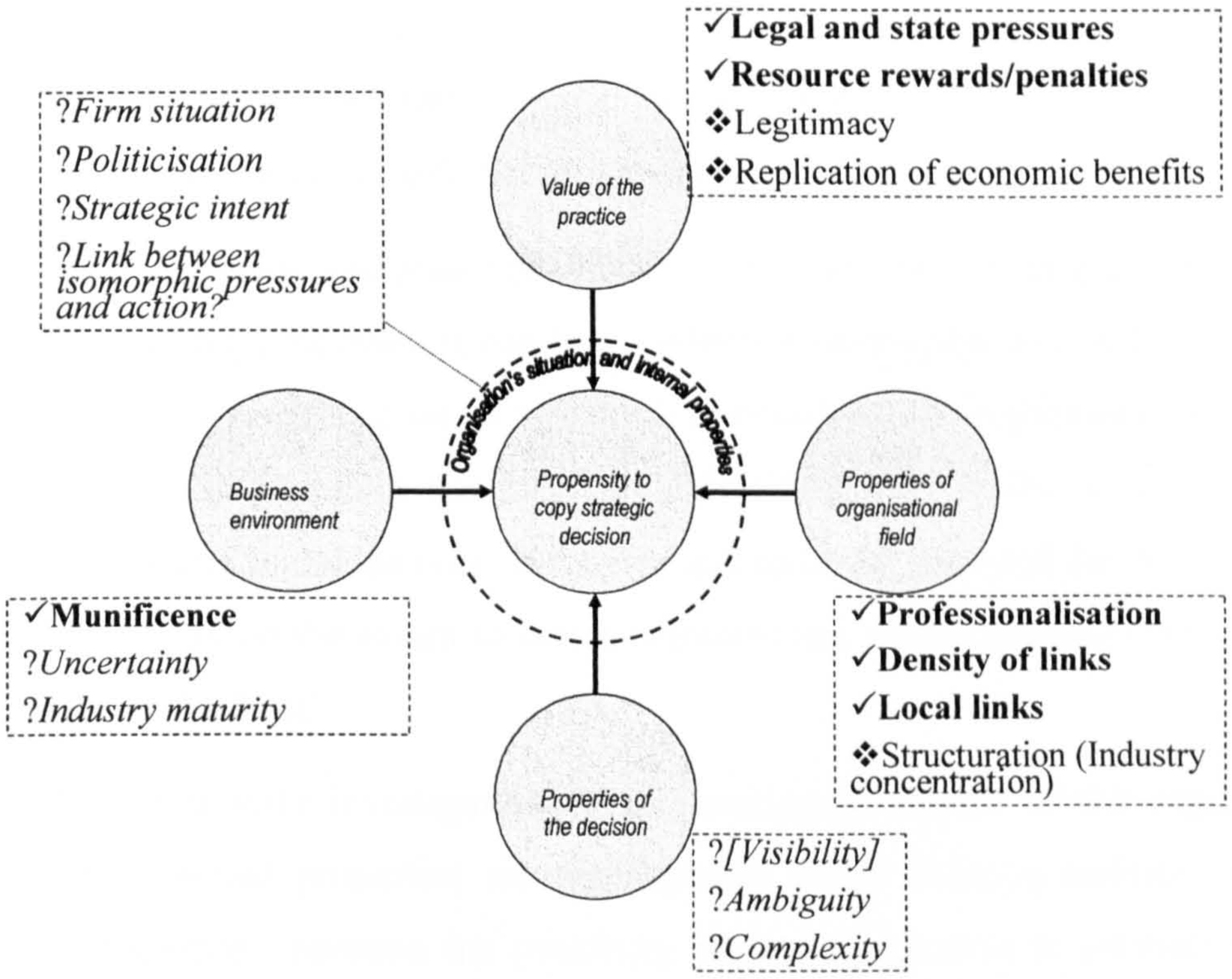
The degree and manner in which isomorphic pressures influence strategic decision-making, and vice versa, have been little studied, and there is a need to validate the assumption that pressures perceived by decision-makers to copy another firm's practices will actually result in such imitation.

3.7 Summary and topics for further research

In this chapter, I have reviewed the literature relating to isomorphic behaviour by organisations. The findings are summarised in figure 3.1, which is a development of the Figure 2.1 with which I concluded the previous chapter.

I have shown there is substantial empirical evidence demonstrating that the properties of the organisational field within which a practice is disseminated, notably degree of professionalisation and density of inter-organisational linkages, influence the degree of isomorphism in the adoption of the practice. There is also considerable evidence to show that the value of the practice, in terms of the legal and state pressures for its adoption and the resource rewards and penalties attached to adoption or rejection, also affects the prevalence of isomorphism.

Figure 3.1 A model of isomorphic strategic decision-making – known and unknown linkages



Key:

- ✓ **Linkages established from prior empirical research**
- ❖ Linkages hypothesised by earlier researchers but not established
- ? *New linkages to be tested during the current research*
- ? *[New linkages not to be tested directly during the current research]*

The legitimacy that attaches to a practice is widely cited as a motive for its adoption, but this connection has not been demonstrated. It is possible that decision-makers give greater weight to the economic benefits that they believe can be derived from emulating practices observed elsewhere. Earlier research has not been designed in a way that discriminates successfully between these two factors in the absence of resource dependency considerations. This question will be addressed in the present study.

Although the task environment has been shown to affect the degree of isomorphism in practice adoption, the precise attributes of the environment that induce this effect have not been investigated. It has been proposed (DiMaggio and Powell, 1983) that highly concentrated industries, as examples of highly structured organisational fields, and industries where there is a high degree of uncertainty will demonstrate higher incidences of isomorphism than, respectively, less concentrated ones and those more clarity as to the relationship between ends and means. These hypotheses will be

investigated during the current research. The effect on isomorphic behaviour of industry maturity, which may be related to earlier findings in respect of inertia, will also be investigated. The effect of environmental munificence in reducing isomorphism is deduced from resource dependency theory, which for the purpose of this thesis is treated as established fact; this effect will not be investigated further.

There has been hardly any prior research into links between the nature of the decision and decision-making processes or outcomes, whether isomorphic or not. Drawing on an earlier, anomalous, empirical result regarding isomorphism in organisational strategies (Oliver, 1988) I have argued that it is possible that the visibility or a decision, the degree of ambiguity in the decision outcomes and the complexity of the decision are all potential influences on the extent to which isomorphism can be expected between firms for decisions of that kind.

There has been little investigation of the contingent effects of the organisation's situation and internal properties on isomorphism in its decision-making. There are plausible associations between the proclivity of an organisation to emulate strategies seen elsewhere and its past performance, the degree of politicisation of its decision processes and the strength of its strategic intent. I shall elaborate further on these links when I draw specific hypotheses in Chapter 4.

Two, more general underlying themes, which I alluded to in section 3.6.5.1 above, have emerged from this review of the research: the pervasiveness of isomorphism and its linkage to institutionalisation.

Isomorphism is only one of a number of possible responses to institutional pressures (Oliver, 1991) and there are conflicting, concurrent pressures for isomorphism and difference (Deephouse, 1999). One question that arises is whether any classes of practice exist for which isomorphism is *not* the norm: for which, once informed of the policies of their peers or opponents, most managers would deliberately opt for difference rather than for imitation. It is quite conceivable that there is such a class of practices, but it has yet to be identified, and there is no published evidence that it has ever been sought. In section 3.6.3.1 I highlighted a methodological problem: a lack of uniformity in the degree of similarity that researchers have sought in pronouncing two organisations' practices to be isomorphic. By studying isomorphism in a range of practices simultaneously, as will be necessary in order to address the questions

regarding the effect of the nature of the decision, and operationalising tight definitions of the criteria for isomorphism, I intend to throw light upon this question.

Isomorphism was brought to prominence as a research topic by institutional theorists, and most empirical investigations have used that theoretical lens. No practice can be regarded as fully institutionalised unless it has spread broadly within a field of adopters. However, this does not mean that all instances of widespread adoption of a practice are evidence of institutionalisation, and the association between institutional theory and isomorphism is open to doubt on a number of grounds. Isomorphism is manifested in similar patterns, with similar sensitivity to embeddedness variables, for practices at quite different stages of institutionalisation; can it then be regarded as an institutional phenomenon? The evidence for legitimation as an important antecedent for isomorphism is not yet persuasive, indicating that isomorphism may be driven by resource dependency or the desire to emulate economic benefits. By investigating how patterns of isomorphism in a population develop over time, and discriminating between legitimation and other potential motivations for isomorphic decisions, I intend to extend our understanding of the link between institutionalisation and isomorphism.

Table 3.1 – Empirical studies of isomorphism

Study	Context/sample	Methodology	Main Findings
Coercive/osmotic spread of institutions as result of environmental pressures			
Tolbert and Zucker, 1983	Adoption of civil service reforms in US cities, 1880-1935	Review of historical archives	Demographic characteristics of city explain rate of adoption in early periods, but not in later periods, when reforms have become institutionalised
Baron, Dobbin and Jennings, 1986	Adoption of scientific management and bureaucratization of personnel practices by US firms, 1927-1946	Review of historical statistical surveys	Considerations of scale and control insufficient to explain adoption. Influence of unions, government and professionalisation of personnel function also important.
Dobbin, Sutton, Meyer and Scott, 1993	Adoption of formalized internal labour markets by US firms	Statistical based on retrospective questionnaires.	Legal pressures, existence of public sector models and professionalisation of personnel function have far greater impact than factors such is scale in explaining spread of practices.
Isomorphism in organisational form			
Fligstein, 1985	Adoption of M-form by top 100 US industrial firms	Statistical (logit)	Adoption of M-form influenced by product strategy, background of CEO, mimetic isomorphism (but not by ecology or transaction costs)
Palmer, Jennings and Zhou, 1993	Late adoption of M-form by 105 large US industrial firms in 1960s	Statistical	Adoption of M-form influenced by economic factors, CEO background, no. of firms in the industry using M-form (mimetic), debt levels (coercive) and CEO attendance at elite B-school (normative isomorphism)
Burns and Wholey, 1993	Adoption and abandonment of matrix management by US hospitals	Statistical	Opinion leaders adopt on technical grounds but followers largely motivated by normative considerations.
Thornton, 2002	Adoption of M-form in higher education publishing	Retrospective interviews, review of prior research, event-history	M-form adoption driven by replacement of "editorial" business logic by market-driven logic
Isomorphism in corporate-level strategy			
Haveman, 1993	Diversification into new markets by Californian thrifts	Statistical – organizational ecology	Large organizations follow other large organizations into new markets. Profitable organizations serve as role models for all types of organization.
Haunschild, 1993	Acquisitions by 327 US firms in 4 industries	Statistical –tobit	Firms more likely to make acquisitions if firms with which they have directors in common do; also make same type of acquisition.
Greenwood, Suddaby and Hinings, 2002	Diversification by accounting firms in Alberta, 1977-97	Archival analysis + retrospective interviews	Multidisciplinary business advisory practices originated by Big Five firms, adopted more widely after legitimation by professional bodies

Table 3.1 (continued)

Isomorphism in business-level strategy			
Oliver, 1988	Degree of goal multiplexity, internal specialization, centralization, formalization in voluntary organizations in Toronto	Network analysis	Isomorphism is the result of strategic choice. Little support for institutional and population ecology explanations.
Kraatz and Zajac, 1996	Offering of professional courses by US liberal arts colleges	Statistical + discrete - time event - history	Many colleges willing to implement "illegitimate" change and do not suffer performance penalties thereby. Less prestigious colleges do not imitate more prestigious. Global and local environment better predictor of strategic change than institutional factors.
Westphal, Gulati and Shortell, 1997	Adoption of TQM in US hospitals	Statistical (Heckman sample selection two-stage regression)	Embeddedness in social networks improved ability of early adopters to tailor TQM to their needs, but enhances likelihood that late adopters will yield to normative pressures to adopt standard model. Late adopters traded off efficiency against legitimacy.
Deephouse, 1996	Allocation of assets by commercial banks in Minneapolis-St Paul	Statistical - tobit	Firms more likely to be ranked highly by regulators and more likely to gain favourable press coverage if their asset allocation strategies conform closely to industry mean
Greve, 1998a	Adoption and abandonment of new formats by US radio stations	Event-history with some interviews	Entry into new market positions can be modelled as diffusion process driven by imitation of early adopters. Imitation more likely of firms within same region, in similar-sized markets and competing with SBU's in same corporation, and of sister SBUs.
Greve, 2000	Location of bank branches in Tokyo, 1894-1936	Statistical – logit	Decisions of large firms imitated.
Kraatz and Moore, 2002	Offering of professional courses by US liberal arts colleges	Discrete - time event - history	Colleges 70% more likely to adopt professional course if president has recently migrated from institution offering same programme

Table 3.1 (continued)

Top level practices			
Galaskiewicz and Wasserman, 1989.	Choice of recipient of charitable contributions by business corporations in Minneapolis-St Paul area	Statistical	Importance of boundary-spanning personnel. Firms more likely to support non-profits supported by other firms with whom CEOs had social ties. Non-profits more likely to get funding from firms that supported other non-profits with whom they shared directors.
Mezias, 1990	Reporting of income tax credits by Fortune 200	Statistical	Inclusion of institutional factors substantially increases explanatory power of models based on applied economics.
Davis and Greve, 1997	Adoption of poison pills and golden parachutes by US corporations	Statistical	Poison pills spread rapidly through influence of shared directors. Parachutes spread more slowly through geographic networks
Haunschild and Miner, 1997	Choice of investment bank adviser by US acquirers, 1988-93	Statistical (logit)	Evidence of simultaneous frequency-, trait and outcome-based imitation. Frequency of outcome-based imitation affected by salience of outcomes. High uncertainty associated with frequency-based imitation.
Westphal and Zajac, 2001	Stock repurchase programmes by 412 medium-large US firms	Statistical	Firms more likely to fail to implement formally adopted stock repurchase programmes if CEO powerful enough to resist institutional pressures
Glynn and Abzug, 2002	1,600 name changes by US firms, 1800-2000	Statistical	Attributes of new name likely to conform to practice in firm's new institutional environment
Operational practices			
Eisenhardt, 1988	Compensation policies in 54 US speciality retailers, 1980-81	Statistical complemented by qualitative interviews	Institutional (inertia) and agency perspectives complementary in explaining choice of compensation policy
Levitt and Nass, 1989	Imitative behaviour by textbook publishers	Statistical analysis of book content and sequencing. Some ethno-graphic data.	Although publishing conforms to garbage-can choice models, the outputs of different publishers in the same field are isomorphic. Effect most pronounced in disciplines with mature paradigms.
Lounsbury, 2001	Adoption of recycling practices at Great Lakes colleges and universities	Ethnographic	Larger and more selective schools more likely to seek legitimation with student body through higher profile programmes with dedicated co-ordinators
Rao, Greve and Davis, 2001	Initiation and abandonment of firm coverage by Wall Street analysts	Statistical (logit)	Adoption decisions occur as part of an information cascade underpinned by an "heuristic of social proof" which reduces search costs but leads to post-decision regret.
Sherer and Lee, (2002)	Introduction of non-partner-track promotion and recruitment in large US law firms, 1987	Discrete event history.	Change driven by resource scarcity in supply of partner-track lawyers. Early adopters, prestigious firms, legitimised practice for others.

Table 3.2 – Competing explanations for isomorphism

Study	Context/sample	State/legal or legitimacy causes adduced for isomorphism	Possible economic, resource dependency or other justification
Coercive/osmotic spread of institutions as result of environmental pressures			
Tolbert and Zucker, 1983	Adoption of civil service reforms in US cities, 1880-1935	Osmosis of taken-for-granted behaviours.	Fear of electoral change leading to resource penalties for incumbents
Baron, Dobbin and Jennings, 1986	Adoption of scientific management and bureaucratization of personnel practices by US firms, 1927-1946	Government and union normative and coercive pressure; normative pressure from professionalisation of HR function	Considerations of scale and control shown to be insufficient to explain adoption. Fear of strikes and withdrawal of government contracts a possible factor.
Dobbin, Sutton, Meyer and Scott, 1993	Adoption of formalized internal labour markets by US firms,	Normative spread of public sector best practice moderated by HR professionals	Threat of crippling lawsuits and loss of government contracts.
Isomorphism in organisational form			
Fligstein, 1985	Adoption of M-form by top 100 US industrial firms	Mimetic and normative isomorphism	Desire to replicate economic benefits of strategic fit of M-form. Fear of share price falls and consequent resource constraints
Palmer, Jennings and Zhou, 1993	Late adoption of M-form by 105 -large US industrial firms in 1960s	Coercive, mimetic and normative isomorphism	
Burns and Wholey, 1993	Adoption and abandonment of matrix management by US hospitals	Normative mimesis by followers	Desire to replicate (uncertain) economic benefits of matrix management
Thornton, 2002	Adoption of M-form in higher education publishing	None hypothesised (mimetic effects controlled for, not significant)	"Institutional logic" that M-form superior for extracting marketing synergies.
Isomorphism in corporate-level strategy			
Haveman, 1993	Diversification into new markets by Californian thrifts	Mimetic and normative isomorphism	Replication of economic benefits from growth opportunities as result of industry deregulation. Limited growth opportunities in existing markets.
Haunschild, 1993	Acquisitions by 327 US firms in 4 industries	Mimetic and normative isomorphism	Economic case ambiguous: potential economies of scale but risk of failure already well documented (Porter, 1987). But fear of being "left out" of economic benefits
Greenwood, Suddaby and Hinings, 2002	Diversification by accounting firms in Alberta, 1977-97	Legitimation by professional body as *enabler* of change in field	Market opportunity in task environment

Table 3.2 (continued)

Isomorphism in business-level strategy			
Oliver, 1988	Degree of goal multiplexity, internal specialization, centralization, formalization in voluntary organizations in Toronto	**None found**	Strategic choice relative to task environment. No clear economic advantage conferred by any one configuration over others
Kraatz and Zajac, 1996	Offering of professional courses by US liberal arts colleges	**None found**	Strategic choice relative to task environment: break with norms offered income generation opportunities
Westphal, Gulati and Shortell, 1997	Adoption of TQM in US hospitals	Legitimation and normative isomorphism	Fear of loss of Medicare accreditation. Replication of economic benefits
Deephouse, 1996	Allocation of assets by commercial banks in Minneapolis-St Paul	Legitimation resulted but not adduced as cause	Favourable treatment by regulators and press – cost savings and marketing benefits. Low marginal cost of isomorphism.
Greve, 1998a	Adoption and abandonment of new formats by US radio stations	None	Market opportunities. Replication of economic benefits.
Greve, 2000	Location of bank branches in Tokyo, 1894-1936	None adduced	Market opportunities. Replication of economic benefits.
Kraatz and Moore, 2002	Offering of professional courses by US liberal arts colleges	Normative isomorphism within adopter sub-group	Strategic choice relative to task environment as in Kraatz and Zajac, 1996
Top level practices			
Galaskiewicz and Wasserman, 1989.	Choice of recipient of charitable contributions by business corporations in Minneapolis-St Paul area	Mimetic isomorphism	Reduction of search costs on item of high public visibility but low strategic importance
Mezias, 1990	Reporting of income tax credits by Fortune 200	Conformance to accounting and regulatory standards confers legitimacy	Various. Institutional variables improve power of economic-based models, but reverse effect not tested.
Davis and Greve, 1997	Adoption of poison pills and golden parachutes by US corporations	None adduced	Personal resource dependency of directors. Replication of economic benefits.
Haunschild and Miner, 1997	Choice of investment bank adviser by US acquirers, 1988-93	Legitimation[4]	Replication of economic benefits.

[4] This study was not designed as a test of institutional theory. Institutional and information effects were given equal prominence as possible causes of isomorphism

Table 3.2 (continued)

Westphal and Zajac, 2001	Adoption and implementation of stock repurchase programmes by 412 medium-large US firms	Background institutional pressures an *assumption* of study – but **not sufficient** to outweigh local power structures	Resource dependency. Replication of (ambiguous) economic benefits – stock repurchase raises share price
Glynn and Abzug, 2002	1,600 name changes by US firms, 1800-2000	Legitimation; "symbolic isomorphism"	None apparent
Operational practices			
Eisenhardt, 1988	Compensation policies in 54 US speciality retailers, 1980-81	Inertia	None (but no task environment pressures to change practices)
Levitt and Nass, 1989	Imitative behaviour by textbook publishers	Normative isomorphism moderated by academics.	A mature industry, with relatively little scope for innovation. Mimesis compatible with dominant strategy of cost reduction (Porter, 1980)
Lounsbury, 2001	Adoption of recycling practices at Great Lakes colleges and universities	Legitimation with student body	Some (marginal?) benefits in recruitment and retention of students
Rao, Greve and Davis, 2001	Initiation and abandonment of firm coverage by Wall Street analysts	None adduced	Replication of economic benefits.
Sherer and Lee, (2002)	Introduction of non-partner-track promotion and recruitment in large US law firms, 1987	Legitimation by prestigious firms as *enabler* of change	Resource scarcity in task environment

Chapter 4

Development of hypotheses

In this chapter, I develop specific hypotheses to test the unanswered questions, set out in the concluding sections of Chapter 3, regarding isomorphism in strategic decision making. As I shall show as I expand on the background to the hypotheses, each of them has a twofold purpose: firstly, it aims to test the influence of the different potential sources of variation in the incidence of isomorphic decision-making, described in Chapter 2; secondly, and no less importantly, many of them are set up so that their investigation throws some light on the validity of aspects of the institutional and non-institutional explanations for isomorphism summarised in Chapter 3.

This chapter broadly follows the structure of the closing sections of Chapters 2 and 3, with hypotheses relating to environmental contingencies, the properties of the field, the perceived value of the precise practice, the properties of the decision and the organisation's situation and internal properties. I also review variables for which it is not possible to develop particular hypotheses, due to the ambiguity of the nature of their impact on isomorphic decision making; they will feature as control variables in this research.

4.1 The effects of the business environment

The reasons for investigating the existence of contingent links between environmental attributes and the incidence of isomorphic decisions were set out in section 3.6.1. They include the possibility of progressing the debate as to the degree of strategic choice (Oliver, 1988; Kraatz and Zajac, 1996) or determinism (DiMaggio and Powell, 1983) involved in such decisions.

On the basis of my earlier reviews of the literature, summarised in section 3.6.1, two attributes of the environment appear worthy of particular investigation: the industry's age, and by implication its stage in its life-cycle; and the degree of environmental uncertainty.

4.1.1 Effects of industry age

With the passage of time within an industry, routines (Nelson and Winter, 1982) become embedded within individual firms and technologies mature and become more widely shared (St John et al, 2003). This contributes to a more general phenomenon, the

more widespread sharing between firms of mental models or recipes (Spender, 1989) so that industry rules of the game (Porter, 1985) become established. Conformity with such rules of the game is likely to enhance an organisation's legitimacy with customers, competitors and suppliers of key inputs, including capital, improving its survival prospects (Meyer and Rowan, 1977), whereas "In the first early phase, conformity to the expectations of constituent groups is difficult, because uncertainty is so high that organisations do not have a target for imitative and alignment efforts." (St John et al, 2003: 530). Together, as described in section 3.4.4, the entrenchment of routines and increased pressures for conformity will promote inertia in the firm's decision-making. It is also possible that the practice of copying successful firms may become institutionalised as a decision-making heuristic.

Furthermore, as the industry ages, economic returns to exploitation of established routines become increasingly attractive and less risky relative to those from exploration of new ones (March, 1991) leading, for example, to an increased emphasis on process, as against new product, development (Porter, 1980).

Thus inertia, the desire for legitimacy, resource dependency and, to some extent, the desire to replicate economic benefits seen elsewhere, would all point to an increasing proportion of decisions becoming isomorphic with those of competitors as the industry grows older and more established. Regulatory and legal pressures are also likely to increase over time as the industry becomes larger, its effects upon society at large are better understood and societal pressures to correct any excesses grow: recent examples include attempts to increase the regulation of the PC software industry, with anti-trust legislation against Microsoft, and of the financial derivatives industry.

These inertial, legitimation and economic factors lead to the following hypothesis:

H1: The incidence of isomorphic behaviour in an industry is positively associated with the time since industry foundation.

It should however be noted that the impact of industry age on the economic benefits to be gained from isomorphic decisions is ambiguous. As an industry becomes more established, information regarding competitors' policies, and their success and failure rates becomes easier to obtain and to interpret (St John et al, 2003), but equally the firm gains better feedback regarding the effectiveness of its own practices. This will affect the marginal benefit, in terms of better information and reduced risk, from copying another firm's practices rather than continuing with or enhancing one's own.

Knowledge may also be gained as to the extent to which increasing adoption of a practice is advantageous or disadvantageous to an adopter (see 3.5.2 for a discussion), enabling managers in some cases to decide with more confidence to adopt distinctive practices or market positions.

A test of this hypothesis is thus also a test of non-institutional versus institutional explanations of isomorphic decision-making. If the hypothesis is not supported, this would indicate that the economic factors discussed in the previous paragraph were more influential than the mix of institutional and economic considerations invoked in developing the hypothesis.

4.1.2 Effects of environmental uncertainty

The contingent effects of environmental uncertainty were extensively investigated in the 1960s and 1970s, with a revival in the 1990s. Although the results of these studies are inconsistent and difficult to interpret (Milliken, 1987), links have been established between dynamism and uncertainty in the environment and aspects of organisational structure (Lawrence and Lorsch, 1967; Duncan, 1973; Osborn and Hunt, 1974; Paswan, Dant and Lumpkin, 1998). It has also been found that increased environmental uncertainty is associated with heightened boundary spanning activity (Leifer and Huber, 1977) and the development of indirect ties between competitors at board level (Lang and Lockhart, 1990). However, links with other strategic variables are less clear: Parnell, Lester and Menefee (2000) failed to find an association between the degree of environmental uncertainty experienced by firms and the generic strategy (according to Miles and Snow's (1978) typology) adopted.

As discussed in section 3.6.3, a managerial desire to avoid uncertainty, implicit in institutional theory and also a plausible economic-based motive for the emulation of decisions taken elsewhere, would imply an increase in the incidence of isomorphic behaviour as environmental uncertainty increased. Specifically, it would imply that the prevalence of isomorphism would increase in highly complex or dynamic environments, or where there were fluctuations in the degree of munificence, complexity or dynamism. The increased boundary spanning activity and board interlocks mentioned in the previous paragraph would similarly point to a positive association between isomorphic behaviour and environmental uncertainty (Galaskiewicz and Wasserman, 1989; Davis and Greve, 1997), motivated either by the desire for legitimation or by the desire to reap the economic benefits of the information derived from such linkages. There are no

grounds for suspecting either positive or negative associations between environmental uncertainty and isomorphic behaviour on the grounds of inertia, legal and state pressures or resource dependency. Therefore I derive the following hypothesis:

H2: The incidence of isomorphic behaviour in an industry will be positively associated with environmental uncertainty

A test of this hypothesis is a test, not just of the effects of the environment on isomorphism in strategic decision making, but also of the extent to which uncertainty avoidance forms part of the motivation for the emulation of decisions seen elsewhere.

4.2 The effects of the properties of the field

As I noted in section 3.6.3, the impact on isomorphic behaviour of such properties of an organisation's field as degree of professionalisation and density of linkages has been established in many studies. However, long-standing hypotheses relating to the effect of field structuration, and particularly industry concentration, have yet to be resolved.

In general, the effects of industry concentration are incompletely understood by economists, despite the availability of new, fuller economic databases, (Caves, 1998). Higher concentration appears to be associated with low rates of turnover due to entry and exit (Caves, 1998), and low rates of acquisition activity (Schoenberg and Reeves, 1999) but economics researchers have failed to find clear empirical correlations with other factors such as incumbent mobility (Caves, 1998). Efforts by researchers in innovation management to verify Schumpeter's (1942) hypothesis that the larger firms in more concentrated industries would be better able to fund intensive research and development have also had ambiguous results: R&D appears to be positively associated with industry concentration in Italy (Filatotchev, Piga and Dyomina, 2003) but negatively associated with it in Australia (Rogers, 2002).

In the specific case of industry concentration's influence on isomorphic behaviour, neo-institutional theory (DiMaggio and Powell, 1983) posits a positive association. This is because dominant firms, with high market shares, would constitute highly visible role models, and deviation from their practices would jeopardise the legitimacy of other firms and their managers. This would be reinforced by resource dependency effects, since these dominant firms would establish clear expectations among resource-controlling stakeholders as to the practices that are likely to be successful. Dominant firms might also impose norms on their suppliers, channels and buyers in terms of, say,

payment terms or lot sizes, which those players would then transmit to, or even impose upon, smaller firms in the industry.

It is unclear how increasing industry concentration might influence managers motivated by a desire to replicate economic benefits from elsewhere; this will depend on how easy it is to understand such benefits (Greve, 1998a). On the one hand, with increasing concentration, managers may find it easier to see which practices are leading to success – insofar as market share can be deemed an appropriate measure of success – and will know which competitors have gained leadership and thus constitute models to be emulated. They would, furthermore, be more likely to economise on search costs and avoid risk through the adoption of practices that had been proven to be successful elsewhere, if they came under pressure from powerful industry leaders. However, where the effect of a particular practice in an organisation's success is clear, it may not lead to imitation; managers may instead use that information to pursue a conscious policy of differentiation from the market leaders (Deephouse, 1999).

On balance, however, institutional and non-institutional arguments combine to suggest the following hypothesis:

H3: The incidence of isomorphic behaviour in an industry will be positively associated with industry concentration.

A negative finding with respect to this hypothesis would, on the other hand, indicate that decision-makers make more heedful and discriminating use of the information derived from market leader behaviour than is supped by institutional theory.

4.3 The effects of the perceived value of the precise practice

As I noted in section 3.6.3, little direct evidence has been produced that, in taking isomorphic decisions, decision-makers are consciously reacting to evidence from other firms that the practice that they are "imitating" confers economic value, legitimacy or any of the other benefits discussed in sections 3.3 and 3.4. Mimetic, coercive and normative isomorphism all require some knowledge of the strategies being deployed by competitors or other peer organisations, and few studies have produced clear evidence of the existence of such knowledge

If pressures for economic effectiveness in a given task environment are the dominant cause of isomorphism, then imitation will occur in broadly equal measure, regardless of whether or not managers have knowledge of other firms' strategies. If it is either

legitimation or the desire to replicate economic benefits that underlie isomorphic behaviour, on the other hand, then isomorphism between firms is something more than simultaneous reaction to the task environment, and knowledge of what other firms are doing will affect the proportion of isomorphic decisions, according to the following hypothesis:

H4a: In a given industry, the proportion of isomorphic decisions will vary significantly according to whether or not the emulator firm has knowledge of the strategies that it is mimicking.

The competitive intelligence relating to the economic benefits from a decision could, in theory, result in either isomorphic or non-isomorphic (Deephouse, 1999) decisions; managers might use such information to conclude that a distinctive practice or market position was more desirable than isomorphism. However, if it is legitimation that drives isomorphism, then such information of a practice's adoption should consistently enhance the probability of a isomorphic decision. The search for legitimacy can be expected to generate a higher incidence of unthinking mimetic behaviour by managers than the more heedful, albeit boundedly rational, assessments of the economic benefit, so that a slightly stronger version of H4a applies, as follows:

H4b: In a given industry, the proportion of isomorphic decisions will be greater when the emulator firm has knowledge of the strategies that it is mimicking.

4.4 The effects of the properties of the decision

As I have already discussed in sections 2.3 and 3.6.4, the influence of the nature of the decision on SDM processes in general and isomorphism in SDM in particular has been little studied. In the absence of prior theory, the hypotheses that follow therefore draw largely upon *a priori* reasoning.

4.4.1 Ambiguity and isomorphism

DiMaggio and Powell (1983) have conjectured that firms will be more likely to model themselves on successful organisations where the relationship between ends and means is uncertain. Hypothesis H2 posits an association between isomorphic behaviour and

uncertainties emanating from the environment. But uncertainty in the relationship between ends and means may be a property of the decision itself. When managers decide to cut prices or increase advertising expenditure, they do so in the expectation, not least from economic theory, that the result, *ceteris paribus*[5], will be an increase in sales. However, when they decide to change the nature of their advertising message or the balance of their spend between media, the outcome is invariably less certain. There are no established theories to indicate which form of message or advertising medium are most likely to bear fruit. Trial and error, abetted by market research, are the order of the day. Accordingly, there is the following hypothesis:

H5: the proportion of isomorphic decisions will be highest for decisions where the relationship between ends and means is least clear.

Like H2, this hypothesis constitutes a test of the influence of uncertainty avoidance on isomorphic decisions. Note that the direction of this relationship is not self-evident. Decision ambiguity was identified in section 3.6.4.2 as one possible cause for the findings of Oliver (1988) that isomorphisms in various dimensions of strategy were a function of strategic choice rather than institutional (or population ecology) influences. If there is too much ambiguity in the outcome of a decision, then the information derived from observations of the experiences of other organisations may appear valueless to the decision-maker. If the incentive to emulate another firm's practices disappears in the absence of some reasonable expectation of equivalence of outcomes, then the relationship between ends-means clarity and isomorphism might be the opposite of that hypothesised.

4.4.2 Combinatorial complexity and isomorphism

I have already discussed (section 2.1) the fractal nature of strategic decisions and (section 3.6.3) the lack of studies that observe isomorphism across a set of related practices or sub-decisions. In this section, I set out a simple hypothesis, a test of which will remedy this gap in the literature.

In order to do so, I introduce the concept of combinatorial complexity of a strategic decision, defined as the number of sub-decisions that need to be taken in order to

[5] Of course, *cetera* rarely are *pares*, and the actual outcome will depend on the systemic properties of the firm's competitive environment and on the actions of competitors. But in terms of defining the relative uncertainty inherent in different types of decision, this statement holds good.

establish that decision. Thus the adoption of a matrix (Burns and Wholey, 1993) or M-form (Fligstein, 1985; Palmer et al, 1993) structure has a combinatorial complexity of 1 – a firm either has one of those types of structure or it does not. A marketing strategy, as defined by the classic marketing mix, has a combinatorial complexity of 4 (product, price, people, place).

The larger the number of different types of decisions a firm's managers are required to take, the larger the number of alternative role models that present themselves, each with different qualifications for emulation (Haunschild and Miner, 1997). I therefore posit the following hypothesis:

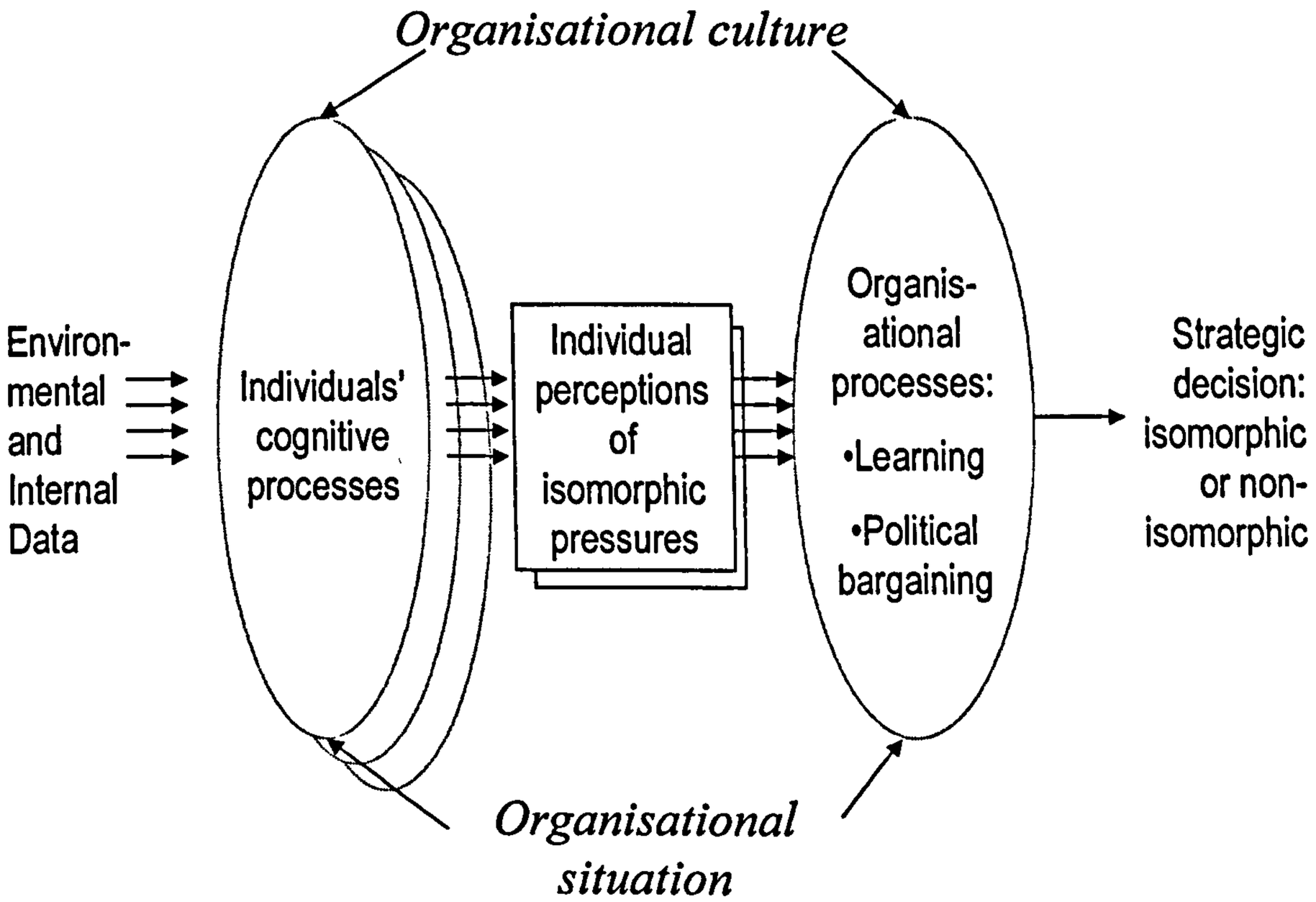
H6: The degree of isomorphism observed in a given market will diminish with the combinatorial complexity of the decision involved.

Support for this hypothesis will support the views of theorists such as Haunschild, Miner and Oliver that convergence between organisations' practices and strategies is less inexorable than originally posited by DiMaggio and Powell (1983).

4.5 The effects of firm situation and internal factors

As I established in sections 2.3.5 and 3.6.5, idiosyncratic aspects of the organisation, based upon its culture have a considerable influence upon the mindset of decision-makers and thus upon decision processes and outcomes. The history of the organisation and the personal backgrounds of decision participants will shape decision-makers' cognitive processes (Hambrick and Mason, 1984; Hodgkinson and Sparrow, 2002). These will determine the issues that are considered (Kiesler and Sproull, 1982; Ocasio, 1997) and the solutions that are contemplated (Cyert and March, 1963, Kiesler and Sproull, 1982) by the people involved. These will be further moderated by the extent to which the firm's situation is framed as favourable or unfavourable.

Figure 4.1 The impact of internal factors and organisation's situation on isomorphic strategic decision-making in organisations



The processes involved in the formulation of isomorphic decisions are shown in Figure 4.1, a modification of the more general schema set out in Figure 2.1. Individuals, on the basis of data from the organization and its environment as filtered through their cognitive processes, perceive isomorphic pressures based upon the strength of factors, such as the resource, legitimacy and economic benefits attached to a practice, set out in Chapter 3. Political and learning processes within the organisation then determine which, if any of these perceived isomorphic pressures result in a isomorphic decision. Both individual cognitive processes and organisational processes are shaped by the organisation's culture and moderated by its situation.

In the following sub-sections, I set out hypotheses as to the relationship between isomorphic pressures and isomorphic action; between the organisation's situation and isomorphic pressures and action; and between culture and isomorphic pressures and two prominent manifestations of an organisation's culture, namely its strategic intent and the degree of political behaviour.

4.5.1 Effect of isomorphic pressures on incidence of isomorphic decisions

As already mentioned, a positive association between isomorphic pressures and frequency of isomorphic action is an implicit assumption of neo-institutional theory. Indeed, most theories of organisational decision-making posit some association between stimulus and action, even though they may differ as to whether the stimulus is perceived prior to the action or is only consciously invoked post hoc (Weick, 1979; Bourgeois, 1980).

It will be the power structures within the organisation (Pfeffer, 1981) that will dictate which issues are likely to be the subject of significant decisions, and issues of power and politics that are the key determinant of whether individual perceptions of isomorphic pressures translate into organisational action. Power, however, is likely to rest with groups that are critical in enabling the organisation to deal with its environment (Hambrick, 1981). It is these groups that are most likely, by virtue of their links with the environment, to perceive isomorphic pressures and, by virtue of their power, to be able to translate them into action.

Since power and politics are thus unlikely to obstruct the intuitively plausible causal linkage between pressure and action, we have the following hypothesis:

H7: Isomorphic decisions are more frequent in firms where the perceived strength of isomorphic pressures is high.

4.5.2 Organisational situation, isomorphic pressures and isomorphic behaviour

Managerial attitudes and the consequent decisions are affected by the manner in which a decision is framed (Kahneman and Tversky, 1984, Bateman and Zeithaml, 1989; Greve, 1998b; Hodgkinson et al, 1999). Whether a TMT approaches a decision in the context of perceived success or failure affects the riskiness of the decisions that are contemplated. If isomorphism is seen as a means of avoiding risk, then the decision context will affect managers' perceptions of whether they are under pressure to emulate their peers.

Empirical studies have found that observed that highly performing firms are the most often imitated (Haveman, 1993; Burns and Wholey, 1993), an observation that is consistent with isomorphism as means of obtaining any of the forms of benefit

discussed in Chapter 3, be it legitimation, resource benefits or economic benefits. Such imitation of successful firms may be by other successful firms seeking a low-risk way of preserving their position. However, Deephouse (1999) contends that isomorphic behaviour is associated with firms whose priority is survival, whereas those seeking economic rents and competitive advantage will privilege non-isomorphic decisions that lead to the development of distinctive strategies and strategic resources. This can be expressed in the following hypothesis:

H8: Isomorphic behaviour will be more common amongst poorly performing firms than amongst better-performing ones.

Prospect theory (Kahneman and Tversky, 1979; Kahneman and Lovallo, 1993), on the other hand, holds that people will have a greater tendency to ignore risk if their perceived situation is unfavourable, which will be the case if their performance has been poor. Managers in such circumstances are more likely to adopt heterodox, risky strategies in an attempt to redeem their situation (Kahneman and Tversky, 1979; Greve, 1998b). Thus they will perceive isomorphic pressures less strongly than their higher performing peers, whether those pressures emanate from the desire for legitimation or to emulate economic benefits seen elsewhere, leading to the following hypothesis:

H9: The perceived level of isomorphic pressures within an organisation will be negatively related to its past performance.

It will be remarked that H7, H8 and H9 appear to be mutually inconsistent: on the face of it, no more than two of the three hypotheses can be true. For example, if both H7 and H9 are true, then it appears inevitable that H8 will fail. Two remarks can be made in this regard.

Firstly, this inconsistency is more superficial than real. H7 is a general hypothesis, whereas H8 and H9 are specific to the effects of organisational situation. It is quite possible for H7 to hold for most isomorphic pressures, but not for those specifically related to organisational performance.

Secondly, as the arguments deployed above in support of the hypotheses indicate, each represents a current thread within the theories relevant to isomorphic decisions, and so inconsistencies in the hypotheses accurately reflect inconsistencies between the relevant theories. In particular, the apparent contradiction between H8 and H9 reflects

the fact that the asymmetrical nature of attitudes to risk, as found by prospect theory, has yet to be fully integrated into institutional theory. Indeed, tests of these hypotheses can be taken as a test of whether prospect theory holds for organisations as well as individuals, a proposition for which there has hitherto been only limited (e.g. Greve 1998b) empirical support.

4.5.3 The effect of strategic intent

An organisation's mission, vision, values and strategic intent are prominent symbolic manifestations of a firm's culture, to which many writers (e.g. Drucker, 1973, 1994; Hamel and Prahalad, 1989, 1994; Campbell and Yueng, 1991; Collins and Porras, 1991, 1995, 1996; Collis and Montgomery, 1998) accord great importance. For example, Lyles and Schwenk (1992) place them at the core of the organisation's knowledge set. Although the benefits of mission, vision and values have not been conclusively demonstrated (Bart and Baetz, 1998), missionary organisations (Mintzberg, 1979) are held to benefit from speedier decision-making, lower agency costs and enhanced reputations vis-à-vis their peers. Mission and strategic intent play a prominent part in the strategy processes of certain firms (Hart and Banbury, 1994).

Essential elements of effective missions and visions include (Campbell and Yueng, 1991; Collins and Porras, 1991, 1996) a clear ideology or set of values, a core purpose or set of superordinate goals for the organisation and an envisioned future, which may incorporate exacting, "stretch" goals (Hamel and Prahalad, 1993; Collins and Porras, 1996). Because such aspects of organisations are likely to be easily observable as well as important, they are suitable candidates as independent variables in exploring the impact of culture on isomorphic behaviour.

While isomorphic pressures may lead organisations to adopt some of the symbolic manifestations of strategic intent, such as mission statements, true organisational visions are generally held to be manifestations of deep-seated internal values and aspirations, largely immune to external influences. Strategic intent may indeed lead the organisation to reinvent its environment rather than respond to it (Hamel and Prahalad, 1994). Organisations showing strong strategic intent are thus more likely to invent their own rules, and so to act in defiance of industry norms, to ignore resource dependency issues and to use information on competitors' actions in order to differentiate themselves rather than emulate competitors' actions, leading to the following hypothesis:

H10: The perceived level of isomorphic pressures within an organisation will be negatively related to the strength of its strategic intent.

4.5.4 The effect of political behaviour

For the same reasons as strategic intent, political behaviour is a prominent manifestation of an organisation's culture that is highly suitable for study as an independent variable in the the development of isomorphic decisions in organisations. It too is both important, for reasons already discussed in section 2.2.3, and likely to be easily observable to both insiders and outsiders.

The dysfunctional (Eisenhardt and Bourgeois, 1988; Dean and Sharfman, 1996) aspects of political behaviour derive from the manner in which it increases the level of affective conflict within a group (Amason, 1996). This is because political processes are organised around the self-interest of groups or individuals, rather than that of the organisation (Dean and Sharfman, 1996: 375). Affective and cognitive conflict are correlated (Amason, 1996) so that such pressures are likely to militate against organisations' capacity to absorb economically rational arguments in favour of isomorphism, based on information drawn from the task environment or the organisational field relating to economic benefits perceived elsewhere. This leads to the following hypothesis:

H11a): High levels of political behaviour within an organisation will be negatively associated with isomorphic pressures derived from information relating to peer behaviour

One way in which these conflicts might be resolved is by the intervention of powerful external stakeholders exerting pressures for coercive isomorphism (DiMaggio and Powell, 1983). This has been observed as a major influence on the adoption of specific policies by universities (Covaleski and Dirsmith, 1988; Lounsbury, 2001). Equally, internal participants may invoke coercive pressures from respected outsiders (Buchanan and Boddy, 1992) in order to legitimate their own positions. Such political pressures may serve to undermine the taken-for-granted assumptions supporting existing practices, leading them to be deinstitutionalised (Oliver, 1992).Thus:

H11b): High levels of political behaviour within an organisation will be positively associated with isomorphic pressures based on legitimation.

4.6 Effects not to be tested

4.6.1 Top management team constitution

Since, as I observed in section 3.6.5, theory accords a prominent role in the formation of an organisation's culture to its leaders, it would be natural and desirable to draw hypotheses relating the isomorphic pressures and/or isomorphic behaviour to the attributes of those leaders. In this section, I discuss why it has proven impossible to formulate such hypotheses.

Such hypotheses would have related to the constitution of the top management team, a better predictor of firm behaviour than the attributes of the CEO (Hambrick, 1994). Hambrick and Mason (1984) proposed that the organisation was a reflection of its top managers, and used the precepts of bounded rationality to argue that the age, functional backgrounds and other career experiences, education, socioeconomic roots, financial situation and group characteristics of the TMT would affect the cognitive biases, and hence the strategic choices and then the performance, of the organisations that they controlled. A considerable literature has arisen to test these propositions (Finkelstein and Hambrick, 1990; Priem, 1990; Lant et al, 1992; Simons, 1995; West and Schwenk, 1996; West and Meyer, 1998; Knight et al, 1999). Researchers have examined the capability of top management teams with differing lengths of service, functional backgrounds and degrees of diversity in their ethnographic make-up to respond to environments displaying varying degrees of dynamism, munificence and slack (Dess and Origer, 1987; Priem, 1990).

However, research has failed to find an unambiguous relationship between these variables, even after controlling for environmental contingencies (Priem, 1990; West and Schwenk, 1996). After an extensive and inconclusive study, West and Schwenk (1996) concluded that this line of research had reached a dead end.

Heterogeneity in tenure, age and background, both at TMT level and more generally within organisations, has nonetheless been shown to have significant effects on a variety of indicators. Increased top management diversity in educational and functional background has been associated with increased innovativeness (Bantel and Jackson, 1989), diversity in industry tenure with increased growth rates (Eisenhardt and

Schoonhoven 1990) and diversity in educational background with an increased propensity to change (Wiersema and Bantel, 1992). This is believed to be because "diversity enhances the breadth of perspective, cognitive resources, and overall problem-solving capacity of the group" (Hambrick, Cho and Chen, 1996: 662).

Other studies are reported to have found contradictory effects, however, with heterogeneity within the top management team negatively associated with innovation and propensity to change because of the communication difficulties and lack of shared paradigms within the TMT (Hambrick et al, 1996; Pelled, Eisenhardt and Xin, 1999).

In the specific case of isomorphic decision making, there is some limited empirical evidence, from the airline industry, that TMT characteristics have an effect: more educated TMTs are more likely to match competitors' actions with identical responses (Smith, Grimm, Gannon and Chen, 1991). However, because research into the effects of diversity has in general yielded such inconclusive results, I advance no hypotheses regarding such effects on isomorphic pressures, but my research design includes control variables to take account of their potential impact.

4.6.2 Other variables

From the discussion in Chapters 2 and 3, a number of other variables can be identified for which it would have been desirable to test the relationship with isomorphic pressures and/or incidence of isomorphic decisions. These include the leadership and learning styles to be found within the organisation. The design and context of the study used for this research, which I discuss in the following chapter, have however precluded the testing of such hypotheses, for reasons which I discuss in the section devoted to Study Limitations in Chapter 7.

Considerations of study design also prevent the testing of the effect of a decision's visibility to top management on isomorphic decision making.

Chapter 5

Study Methodology

In this chapter, I describe and justify the laboratory methodology used to test the hypotheses set out in Chapter 4. I start by setting out the design parameters for the study. I then review the strengths and weaknesses of the different settings available for testing hypotheses of the type set out in the previous chapter – computer-based digital simulation, experiment, laboratory within a simulated environment and field – and justify my choice of a laboratory method using a simulated environment for this study. Next, I describe the design used, showing how it is appropriate to the hypotheses set whilst also reviewing the compromises made vis-à-vis an ideal experimental design. Finally, I describe the manner in which each of the variables was operationalised, and discuss the implications for the external and internal validity of the results.

It should be noted that in this chapter and this thesis I distinguish between simulations which take place without human intervention (other than to capture the outcomes), typically realised on a computer, and those which provide simulated environments to which human participants respond. The former I shall refer to as "simulations" or sometimes, for added emphasis, "pure simulations" or "digital simulations". The latter I shall refer to as "simulated environments" or, since they are often deployed as the context for business games, "games".

5.1 Study design parameters

In developing this study, I have set a number of design parameters with a view to enhancing the distinctive contribution of the thesis whilst meeting the design requirements, summarised in Table 5.1, that arise from the nature of the hypotheses themselves.

Design Parameter 1 As I concluded in section 3.6.3, one of the most important unresolved questions relates to the relative importance, as a motivator of isomorphic decisions, of legitimation versus the desire to capture economic benefits perceived elsewhere The influence of legal and state pressures and of resource dependency considerations, on the other hand, has already been established, and so it would be highly desirable to either control for their influence or assess the effect of the other influences in their absence. This is particularly desirable given the difficulty

encountered by earlier researchers in separating legitimation from resource dependency effects.

Table 5.1 Summary of hypotheses and design implications

Hypo-thesis	*Dependent variable*	*Independent variable*	*Hypo-thesised association*	*Implications for study design*
H1	Incidence of isomorphic behaviour in industry	Time since industry foundation	Positive	Longitudinal data dating back to industry foundation
H2		Environ-mental uncertainty	Positive	Cross-sectional or longitudinal data spanning environments with varying degrees of uncertainty
H3		Industry concen-tration	Positive	Cross-sectional or longitudinal data spanning industries with varying degrees of concentration
H4a)	Proportion of isomorphic decisions by firm	Knowledge of strategies mimicked	Significant in either direction	Data on precisely what was decided at what point, and on the information available to decision maker at the time
H4b)			Positive	
H5	Proportion of isomorphic decisions by firm	Clarity of ends/means relationship for decision	Negative	Comparative data for decisions with different levels of clarity in relationship between ends and means; ideally taken at similar points in time
H6	Degree of isomorphism in market	Combin-atorial complexity of decision	Negative	Data relating to combinatorially complex decisions and to constituent sub-decisions
H7	Frequency of isomorphic decisions by firm	Perceived isomorphic pressures	Positive	Data on precisely what was decided at what point. Data perceived isomorphic pressures at point when decision taken
H8	Perceived isomorphic pressures	Firm per-formance	Positive	Data on isomorphic pressures and performance at point when decision taken
H9	Frequency of isomorphic decisions	Firm per-formance	Negative	Data on performance at point when decision taken
H10	Perceived isomorphic pressures (on various bases)	Strategic intent	Negative	Data on isomorphic pressures, strategic intent and political behaviour at point when decision taken
H11a)		Political behaviour	Negative	
H11b)			Positive	

Although resource dependency and legal and state pressures feature amongst the influences cited in support of certain of the hypotheses, notably H1, they are not crucial

to the plausibility of any of the hypotheses, so removing them from consideration would not compromise the arguments invoked in Chapter 4.

Design Parameter 2 I discussed in sections 3.6.3 and 3.6.4 the unresolved questions regarding the universality and pervasiveness of isomorphic behaviour, and the effects of decision attributes. These inform, in particular, H5 and H6, but also H1, since the idea that isomorphic decision-making increases with industry age is also a manifestation of the neo-institutional theory that organisations are destined to become more similar. This means that the study design must allow the comparison of isomorphic decision-making between different types of decision, and between different sub-decisions within an overall strategy, as well as incorporating a longitudinal dimension so that the effects of the passage of time can be assessed.

Design Parameter 3 As I mentioned in section 3.6.3, most research hitherto has observed isomorphic outcomes but not linked such outcomes directly to given stimuli, or probed the processes whereby the decisions were reached. In order to investigate these linkages and processes, it is necessary within the study to establish precisely which decisions were taken, at what point in time. Hypotheses H1, H2, and H3 associate such decisions with the environmental contingencies at the point at which they were taken, H7 with the perceived isomorphic pressures at the time and H9 with the firm's performance. H4a and H4b require in addition that the study captures the information available to decision-makers regarding the practices of role models.

Design Parameter 4 Following on from Design Parameter 3, and also from the points made in section 3.6.5, it is desirable, in order to improve understanding of the processes underlying isomorphic decisions, to measure isomorphic pressures and the cultural factors that might affect them, in order to be able to test hypotheses H7-H11b inclusive.

Design Parameter 5 I highlighted in 3.6.1 the dearth of research comparing patterns of isomorphism across different industries and markets. H2 and H3 require the presence of cross-sectional or longitudinal data spanning environments that differ in uncertainty or structuration.

Design Parameter 6 Both the institutional and the economic explanations for isomorphic behaviour depend fundamentally on notions of bounded rationality. The research must therefore confront decision makers with situations where they confront limitations in both their access to information and in the time available to process it.

5.2 Simulations, laboratory and field research – a comparison

In order to meet the design parameters, five research methods can be considered; in decreasing order of the control exerted over the environment in which phenomena are measured, and increasing order of realism, they are: pure simulations, experiments, quasi-experiments, simulated environments and field research. In the following sub-sections I discuss briefly their strengths and weaknesses and their applicability to the current research.

5.2.1 Pure digital simulations

Simulations are "techniques for studying mathematically complex systems" (Winsberg, 2003: 107). In a simulation, both subjects and the environment in which they operate are replaced by appropriate theoretical models whose behaviour is simulated. In the physical sciences there are instances where, for ease of measurement, one analogue system may be chosen to simulate another. For example, for ease of measurement, an electrical damped harmonic oscillator may be used to simulate the behaviour of mechanical ones (Winsberg, 2003). Such analogues are not available to researchers on human behaviour, so that simulations are typically undertaken, as they increasingly are also in the physical sciences, using digital approximations to expected real-world behaviour, realised on a computer.

Simulations of this kind enable the researcher to control, with considerable precision, environmental conditions and the rules governing their evolution, alongside any behavioural rules or decision heuristics utilised by any agents simulated by the system. They have been employed as "management flight simulators" which encourage managers to express their tacit assumptions as to the behaviour of a system, explore the implications of differences between assumptions and also explore the behaviour of the system under different evolutionary and competitive conditions; use of such techniques is held to promote organisational learning (Senge and Sterman, 1992; Sterman, 1994, 2000, 2001).

Simulations also have a number of roles in organisational research. They have been used to explore the implications of different types of institutional structure and decision rules in areas such as innovation diffusion (Abrahamson and Rosenkopf, 1993, 1997; Strang and Macy, 2001) organisational decision-making (Cohen, March and Olsen, 1973; March and Shapira, 1992) and organisational learning (March, 1991). Some such

studies are purely exploratory – they answer the question "how would the world, or the organisation, look if these conditions were met?"

A second class of simulation study may attempt to establish normative findings as to the kinds of behaviours that might be utilised or avoided by human actors. Thus Kleinmuntz (1987) used Monte Carlo methods to investigate the efficacy of different decision-making heuristics for tackling a simulated medical treatment problem, showing that they outperformed random strategies but were usually outperformed by more sophisticated decision rules incorporating Bayesian estimates of probabilities of patient recovery under different treatment scenarios. Such exercises may incorporate elements of experimental design to ensure that, for example, all variants of the decision rules are tested under comparable combinations of conditions in the simulated environment.

The degree of control offered to the researcher over all elements of simulation means that the internal validity of research based upon them is extremely high. External validity, on the other hand, depends on the accuracy with which the underlying model captures the physical and institutional structure of the real system, alongside the decision rules being employed by any simulated actors. Some researchers attempt to calibrate their models against real world data: Sterman showed (1988) that the TREND function, a simple extrapolative model of expectations, adequately models changes over time in forecasters' expectations of energy demand and (1987) that the decision rules in a capital acquisition model were close to those used when human subjects participated in a business game modelled upon the simulation. In other cases, such as the innovation diffusion studies cited above, readers are implicitly left to themselves to judge the external validity of the simulation, on the basis of the degree of correspondence between simulated outcomes and those perceived in the real world.

Digital simulations (e.g. Strang and Macy, 2001) have, as I have already mentioned, been used to explore patterns of diffusion of a practice within a field. However, given the current state of knowledge, it would not be feasible to develop a model that met the design parameters for this research. As discussed in section 3.4.3, there is as yet no clearly validated set of theories on which to base a model of isomorphic behaviour or, as discussed in Chapter 4, the formation and influence of isomorphic pressures. There has been so little research into the differential effects of various kinds of decision, moreover, that there is almost no empirical evidence against which to judge the validity of a model of that aspect of the process.

Whilst interesting results might emerge from a comparison of the behaviour of different models, based for example upon legitimation and upon the replication of economic benefits, it is far from evident that this would have any greater success than empirical research to date in discriminating between the effects of the two stimuli, as required in design parameter 1. Accordingly, I reject pure, digital simulation as a methodology for this research.

5.2.2 Experiments and quasi-experiments

Experimental research is the primary technique for identifying causal relationships between variables. This is achieved by isolating the elements that are in common and those that differ between similar instances of an event, and perhaps by observing concomitant variation between two factors. It requires objective observation, in a strictly controlled situation, of phenomena induced by the experimenter by the variation of certain factors while others are kept constant (Christensen, 1994). It is the prevailing research method in the physical sciences and psychology.

A key defining aspect of the experimental method is the control exerted over the results through the elimination, or the holding constant, of factors irrelevant to the enquiry. This is achieved principally through the random allocation of subjects to phenomena, the deployment of "controls" – groups of subjects that are not treated with any of the experimental factors and can thus serve as a basis of comparison – and the limitation of the environment to the confines of the laboratory.

Where either randomization or the use of control subjects is absent, then the internal validity of the research is necessarily compromised. If only a single group is observed, without controls, or if the control group has not been carefully matched to the sample, ideally through random allocation of subjects, the result is a "pre-experiment" whose internal validity is suspect. If both control (even if not fully matched) and sample are observed before and after treatment, or if there are multiple observations of the sample before and after treatment, so that a clear baseline and effect are observable, then the research design is deemed a quasi-experiment, whose results may still be usable with qualifications[6].

Laboratory methods, which include research in simulated environments (section 5.2.3) along with experiments and quasi-experiments, have a number of benefits

[6] If multiple treatments are administered to a single group, so that it essentially serves as its own control, then the design qualifies as a full experiment.

(Griffin and Kacmar, 1991; Christensen, 1994; Brown and Lord, 1999). They allow researchers to study situations that are too rare to be observed in the field, have yet to arise in real life or could not be observed there for ethical or practical reasons. Researchers can control extraneous conditions (Griffin and Kacmar, 1991), isolate particular constructs of interest (Swieringa and Weick, 1982) and make causal statements regarding the relationship between them, since well-designed experiments have high internal validity (Christensen, 1994; Taylor, Goodwin and Cosier, 2003). Finally, laboratory studies allow a large number of observations to be made within a compressed time frame (Clark and Montgomery, 1998).

5.2.2.1 Experiments in the social sciences

Experimental methods have a long history of usage within the social sciences (Swieringa and Weick, 1982; Roth, 1988; Griffin and Kacmar, 1991; Kagel and Roth, 1995; Moser, 1998); Roth (1988) attributes the first informal experiments in economics to Bernouilli in 1735. More recently, economists have used experiments to test, and in some cases to develop, key theoretical propositions relating to two-person bargaining (e.g. Roth and Malouf, 1979, 1982; Guth, Schmittberger, and Schwarze, 1982), free-rider behaviour (Smith, 1980; Marwell and Ames, 1981; Kim and Walker, 1984), the prisoner's dilemma (Lave, 1962), the 'winner's curse' in auctions (Bazerman and Samuelson, 1983; Kagel and Levin, 1986) and in second-price auctions (Cox, Smith and Walker, 1983, 1985), and prospect theory (Tversky and Kahneman, 1986; Kahneman, Knetsch and Thaler, 1986; Kahneman and Lovallo, 1993). Accountancy researchers have used experiments and simulations to investigate, *inter alia*, the effect of different accounting treatments on financial analysts' valuations of firms (Barrett, 1971; Bollom, 1973; Dietrich, Kachelmeier, Kleinmuntz and Linsmeier, 2001), the factors used by auditors in assessing internal controls (Ashton, 1974) and taxpayers' behaviour in reporting income under different tax rates (Moser, Evans and Kim, 1995).

The use of experimental studies within decision-making research is also well established. Tjosvold and Field (1983) used an experiment on 114 undergraduate students to determine the effects of different decision-making strategies on the speed and quality of decisions and on the degree of commitment to the decisions in question. Whitney and Smith (1983) employed a case-study based experiment, in which 88 students assumed the roles of operations managers and strategic planners, to show how consensus formation within organisation sub-groups can polarise attitudes and impede effective strategy implementation. Schweiger, Sandberg and Ragan (1986) used an

experiment, based on the experiences of 120 MBA students in analysing a strategic management case study, to assess the relative efficacy of dialectical enquiry, devil's advocacy and consensus in SDM. More recently, Hodgkinson et al (1999) have employed an experiment, again involving undergraduate subjects, to show the efficacy of cognitive mapping in eliminating the framing bias that sometimes affects strategic decision-making. Laboratory methods allow processes governing decision-making and the arrival at consensus to be observed more directly than field studies (Dess and Origer, 1987).

5.2.2.2 Criticisms of the experimental method

Nonetheless, the role of experimentation in the social sciences outside psychology remains controversial, largely on account of concerns regarding their external validity. In economics, a number of experiments have been criticised because the situations in which they place participants are too far from their real world experience, a criticism that is echoed by some psychologists (Christensen, 1994). Other criticisms of economics experiments relate to the incentives offered for completing the tasks being too trivial or the time available for learning how to respond too short (Binmore, 1999; Loewenstein, 1999). These, however, fall short of rejecting the notion of experiments in economics, amounting rather to a plea for more careful experimental design, a concern echoed by Roth (1994).

In the fields of accountancy and organisation studies too, some researchers have expressed concerns relating to the external validity of laboratory studies, particularly given the prevalence of students as subjects (Swieringa and Weick, 1982; Griffin and Kacmar, 1991; Brown and Lord, 1999). The proportion of published articles in management featuring laboratory studies is small (7.5%) by comparison with field studies (55%) and is in decline (Griffin and Kacmar, 1991; Taylor, Goodwin and Cosier 2003).

However, other researchers have expressed the view that such concerns have been exaggerated (Brown and Lord, 1999) and that the preponderance of field studies in refereed journals may be due simply to bias on the part of editors, reviewers and researchers (Taylor et al., 2003). A review of laboratory studies in management (Locke, 1986) concluded that there was no support for the belief that they produced different results from field studies. Loomes (1999) concludes that in economics, experiments have generated bodies of largely consistent data that throw doubt upon long-standing economic theories and suggest a persistent "fuzziness" in decision-makers' thought

processes. He suggests that the challenge is to design experiments that match the challenges to the experience of the subject so that the outcomes will be more representative of decisions taken by sophisticated participants in the markets or contexts under examination.

This view echoes the importance placed by Swieringa and Weick (1982: 80) on what they term "experimental realism" – that the laboratory situation appears meaningful to participants in a way that compels them to react seriously to it. If a laboratory study possesses experimental realism, then considerations of "mundane realism" – precise affinities with real-life situations – assume minor importance.

5.2.2.3 Simulated environments in experimentation

Clearly, however, a degree of mundane realism assists experimental realism, and this has led some researchers to employ computer-based simulated environments with a view to enhancing both. "Simulations…can be used to replicate natural settings. They can be used to capture some of the reality of those settings, obtain high subject involvement and preserve some confounding elements that are part of any natural setting" (Swieringa and Weick, 1982: 61).

They also allow the researcher to control the treatments to which subjects are exposed and the order in which they are encountered, thus facilitating the delivery of experiments with a factorial design, which has proved attractive to some researchers in decision-making. Kleinmuntz and colleagues have examined the impact on decision making of the manner in which data are presented and perceived: the effects of provision of a Bayesian decision aid on "cures" in a medical simulation, under two different probabilities of "death" resulting from "treatments" prescribed (Kleinmuntz and Thomas, 1987); the impact, on subjects' rankings of different simulated loan applications, of the way in which data are presented, the number of different applications presented at one time, subject experience and feedback (Schkade and Kleinmuntz, 1994; Fenema and Kleinmuntz, 1995); the effect on responses to general knowledge questions of inducing respondents to assess relevant conditional probabilities (Kleinmuntz, Penemer and Peecher, 1996). In these studies, the experimental method is adhered to carefully: the experience of each participant – the "medical cases" or "loan applications" that they view – is very similar in all regards apart from those, such as order or presentation, deliberately varied by the experimenter.

Other researchers, while adhering to experimental method insofar as subjects are randomly allotted to conditions, or all experience similar starting conditions, have deviated from it in other regards. Sometimes subjects are allowed to self-select their groups rather than be randomly allocated to them, as was the case with Gladstein and Reilly's (1985) study of decision making under threat.

Other deviations occur when researchers assess the impact of factors endogenous to the simulation: differing conditions governing the complexity of a simulated environment on subjects' decisions regarding new product development (Paich and Sterman, 1993) and inventory management (Diehl and Sterman, 1995); and the effects of past success on strategy persistence (Audia, Locke and Smith, 2000). In these studies, there is scope for significant history effects due to variation between subjects' experiences as the result of their own autonomous decisions. For example, in the two experiments undertaken by Sterman and colleagues, subjects' experience could vary significantly according to decisions taken in the first few iterations of the simulation. In the case of Audia et al's (2000) study, subjects were left to decide how much information to purchase in order to make their decisions. a true experiment would have allocated varying, but controlled, amounts of information to different subjects according to a factorial design.

These deviations from the experimental gold standard did not, however, destroy the studies' internal validity. Gladstein and Reilly's study meets the criteria for a quasi-experiment. In the case of Sterman and colleagues' two studies, the similarities in the patterns of different subjects' decisions were so strong that it was clear that history effects were not substantive. Audia et al measured their subjects' information purchases and controlled statistically for their effect on the dependent variable, thus blending field experimental techniques. These studies demonstrate how a measure of variation in the strict experimental method has come to be accepted in order to take advantage of the realism offered by simulated environments. I return to this in section 5.2.3 below.

5.2.2.4 Appropriateness of experiments for present study

The isomorphism and institutional theory literatures feature very little experimental work, and the one major exception (Zucker, 1977) can be criticised for lack of mundane, or even experimental realism: the guessing of the distance travelled by a beam of light in a darkened room is not, in this writer's experience, a standard element of workplace practice. A laboratory study may thus be able to make a distinctive contribution in this area of theory.

Experiments would clearly meet design parameter 1: a laboratory setting would allow for the elimination of legal, state and resource dependency pressures. It should be feasible to development an experiment, or more probably a set of experiments, that conform to design parameters 2, 3 and 5. Design parameter 6, which mandates conditions conducive to boundedly rational thinking, indicates that a simulated setting might be needed which either embodies complexity (e.g. Paich and Sterman, 1993; Diehl and Sterman, 1995) or where time constraints are sufficient to inhibit subjects from fully analysing all available alternatives.

However, I contend that design parameter 4, which involves the investigation of the cultural antecedents of isomorphic pressures, cannot be met in an experimental context, since the synthesis of political and cultural phenomena to an acceptable degree of experimental realism poses great difficulties. Such phenomena can only be observed in a field or field-like setting.

5.2.3 Simulated environments

I have mentioned that certain studies have employed simulations experimentally in research in ways that do not, strictly speaking, meet textbook standards of experimental methodology. Within some of these studies, there is clearly as much interest in phenomenological observation of human behaviour within the simulated environment as in the behaviour of the ostensible dependent variables of the study. Thus, Kleinmuntz and Thomas (1987) gave prominence to the fact that none of the subjects in the medical simulation attempt treatment without testing, although this might be deemed a rational strategy; the number of tests used was neither a dependent nor independent variable in the experiment. Similarly, the most important conclusions of Diehl and Sterman (1995) related, not to the experimentally determined effects of dynamic complexity on performance, but to the poor overall performance of subjects relative to potential and to their overall insensitivity to demand factors.

Sterman's earlier (1989a, 1989b) studies of decision-making behaviour in simulations of capital acquisition and inventory management display a still more pronounced phenomenological bias. These are laboratory studies, and may be called "experiments" when written up in published articles, but they are clearly not even quasi-experiments: in neither is there an independent variable that is systematically manipulated. They can be seen retrospectively as part of a developing trend to treat simulated environments, not as experimental settings, but as representations of field environments, within which

research can be undertaken using fieldwork, rather than experimental, methods. Rather than subjects being allocated to set treatments or conditions, whose effects are then measured, the conditions experienced by subjects are monitored and their impact on the dependent variables of interest is analysed statistically. For example, Sterman's (1989b) observation of subjects' behaviour in the Beer Game led to an estimate of the decision rule implicit in their "beer orders"; none of the parameters in the rule was subject to experimental variation.

The earliest such "quasi-field" (Marinova, 2004) studies date from the desire to validate the use of business games as tests of managerial performance in assessment centres in the 1960s. Starting from the late 1970s, a considerable body has emerged of simulation-based studies, mainly in the areas of group behaviour and decision making and strategic management, but to a lesser extent also examining organizational behaviour and decision support systems – see Keys and Wolfe (1990) and Lant and Montgomery (1992) for reviews.

Table 5.2 Published studies based on Markstrat2 and Markstrat3 simulations

Study	Topic	Subjects	Publication
Hogarth and Makridakis, 1981	Impact of decision rule on performance	MBAs	Management Science
Ross, 1987		MBAs	
Cook and Page, 1987	Correlation between risk and return for different strategies	Execs	Journal of Business Research
Glazer, Steckel and Winer, 1987	Effect of group attitude, effort and influence distribution on performance	MBAs	Journal of Business Research
Lant and Montgomery, 1987	Impact of success and failure on risk-taking and search behaviour	MBAs & execs	Journal of Business Research
Utsey, 1987	Comparison of profit from actual decisions with potential profit	Execs	Journal of Business Research
Walsh, Henderson and Deighton, 1988	Negotiated belief structures within groups	MBAs	Organizational Behavior and Human Decision Processes
Walsh and Henderson, 1989	Impact of attribution on commitment escalation	MBAs	Journal of Social Psychology
Lant, 1992	Manner in which aspirations adapt to performance	MBAs & execs	Management Science

Table 5.2 continued

Study	Topic	Subjects	Publication
Glazer and Weiss, 1993	Effect of planning style and marketplace turbulence on decision making/performance	Execs	Journal of Marketing Research
Clark and Montgomery, 1996	Effect of competitor awareness on performance	MBAs	Marketing Letters
Van Bruggen, Smidts and Wierenga, 1996	*Effect of quality of marketing decision support systems on performance under differing conditions of time pressure*	*MBAs*	*Int. Journal of Research in Marketing*
Clark and Montgomery, 1998	Deterrent effect of reputation and antecedents of credibility	MBAs	Management Science
Clark and Montgomery, 1999	Processes whereby managers identify competitors	MBAs & execs	Journal of Marketing
Van Bruggen, Smidts and Wierenga, 1998	*Effect of marketing decision support systems on decision effectiveness under differing conditions of time pressure*	*MBAs*	*Management Science*
Lant and Hurley, 1999	Effect of aspirations, and performance feedback on investment commitment	MBAs & execs	Group and Organization Management
Kilduff, Angelmar and Mehra, 2000	Relationship between demographic and cognitive team diversity, and between diversity and performance	Execs	Organization Science
Fenwick and Neal, 2001	Effect of gender composition on group performance	Under-graduates	Gender, Work and Organization
Malter and Dickson, 2001	Impact of individual learning skills on firm performance	Under-graduates	Int. Journal of Research in Marketing
Van Bruggen, Lilien and Kacker, 2002	Improvement in estimates of marketing variables from using multiple informants	Under-graduates	Journal of Marketing Research
Chandy, Prabhu and Antia, 2003	*Effect of firm dominance and technology expectations on new technology investment*	*MBAs*	*Journal of Marketing*
Marinova, 2004	Effect of market knowledge diffusion on innovation effort and firm performance	MBAs	Journal of Marketing

Italicised studies followed experimental procedures with random allocation of subjects to groups and conditions.

Simulations used include Tycoon (Gladstein and Reilly, 1985) The Executive Game (Remus, 1987) and MasterPlanner (Saunders Stern, Wensley and Forrester, 2000), but the best-established simulated environment is Markstrat (Larreche and Gatignon, 1990), a marketing simulation which has formed the basis for twenty-two published studies, summarised in Table 5.2, of which only three have followed experimental disciplines of

allocating subjects randomly to groups and treatments, and administering similar treatments to different subjects, or groups of subjects.

Simulated environments have a number of advantages, apart from those already discussed in section 5.2.2.3. They allow researchers to interrogate subjects, using the kinds of research instruments common in fieldwork, and observe actual behaviours, while minimising the danger of disruption to the research from unexpected environmental events and giving the researcher increased confidence in the internal validity of the findings, by virtue of their control of the simulation context and structure (Clark and Montgomery, 1998). They permit compression of the time dimension: 8-10 "years" of simulated gameplay can be compressed into a matter of weeks or even days.

They nonetheless entail greater compromises on internal validity than is found in experiments. Because events in the simulation are determined by competitive interaction between teams of participants, the range of treatments experienced will vary from team to team and between experimental settings: it is rarely possible to ensure that all subjects undergo a similar set of conditions without distorting the educational experience for which they have often paid substantial sums. Such differences may even be hard-coded into the simulation: in Markstrat, for example, groups' starting positions vary in terms of market share and profitability, which may significantly effect observed behaviours (Ross, 1987). Other compromises are discussed in section 5.3.1.2 below.

Simulated environments also entail compromises on external validity, albeit to a lesser extent than in many experiments. The use of student subjects, while commonplace in all areas of the social sciences, raises the same issues already (5.2.2.2) discussed in relation to experiments – I discuss this further in section 5.3. It is not self-evident that longitudinal developments in respondents' attitudes and learning fully simulate those that occur in the field over more protracted periods. Quite a number of studies (see Table 5.2 for examples) use performance within the game as a dependent variable, thus implicitly assuming that performance in the simulated environment is a valid predictor of performance in the field, which in turn entails two further assumptions.

The first is that the game software models the competitive environment with sufficient precision that differences in subject decisions and behaviours in the game lead to similar differentials in group performance – e.g. profits or market share – as would occur in real industries. For simplified simulations, such as those employed by Sterman

and associates, which model only a limited set of parameters, this assumption may well be justified. However, for more complex, whole enterprise simulations, such as Markstrat, it is not evident that the decisions that lead, say, Firm A to be the most profitable firm and Firm B to be second most profitable in a simulated five-firm industry would yield the same rankings in a real life competitive environment. The current state of theoretical knowledge of economics and organisations does not yet enable us to predict real-world outcomes with anything approaching this degree of precision. The second assumption is that strong performance in a business game is a good predictor of later managerial performance in a firm, a contention for which there is no clear empirical evidence (Wolfe, 1976; Wolfe and Roberts, 1986, 1993; Keys and Wolfe, 1990).

The growing canon of published work cited in this section is testament to the acceptance of quasi-fieldwork in simulated environments as a valid compromise between the observability and control offered by the laboratory and the external validity of true field environments. For the purposes of the present study, an appropriately specified simulated environment would allow: the exclusion of legal, state and resource dependency pressures (Design Parameter 1); the incorporation of different types of strategic decision and sub-decisions as well as a longitudinal dimension (Design Parameter 2) and cross-sectional exposure to different environments (Design Parameter 5); the identification of the precise timing of specific decisions and of associated environmental and other contingencies and of the information at decision-makers' disposal (Design Parameter 3); the administration of questionnaires to measure isomorphic pressures and their hypothesised precursors (Design Parameter 4); and the imposition of time pressures and/or sufficient complexity (Design Parameter 6). The fact that there are no published studies of the isomorphism using business simulations would add to the distinctiveness of the research.

5.2.4 Field environments

It remains to consider whether a fully-fledged field study would be acceptable as a research design. Design parameters 2, 4 and 6 could also be met in a field environment. It would, however, be difficult to "switch off" legal, state or resource pressures in a field setting, or to measure them with sufficient precision to control for their effect, so Design Parameter 1 could be met with difficulty if at all. Design Parameter 5 could in theory be met, but only at considerable cost; I conjecture that this is why H3 has yet to

be validated. For reasons discussed in Chapter 2.1, Design Parameter 3 cannot be met in a field environment, so that none of the hypotheses requiring precise temporal association of decisions with other contingent variables could be tested there. However, the hypotheses H10, H11a) and H11b), where isomorphic pressures are the dependent variable, would be susceptible to field study.

5.3 Study method

There are thus two candidate methods for this study: a combination of experimental methods, for hypotheses H1-H9 inclusive, and field studies, for H10, H11a) and H11b); or a quasi-field study in a simulated environment to test all hypotheses. All choices between candidate methods involve trade-offs along a number of dimensions (McGrath, 1982; Keys and Wolfe, 1990; Lant and Montgomery, 1992): the ability to generalize from the sample to the population, the control and precision with which to evaluate the behaviours and the realism of the setting in which the actors behave.

In this instance, considerations of convenience and of parsimony in the use of resources also came into play. As I have argued in 5.2.2.4, Design Parameter 6, with the need to place subjects in a situation in which decision making would be boundedly rational, points to the use of a simulated environment or game as the basis for any experiments conducted for this study. Isomorphic pressures (independent variable of H7) could be synthesised outside the simulated environment, but the game in question would need to have sufficient experimental realism that, when subjects mimicked other organisations' practices, they did so for reasons similar to those underlying isomorphic decisions by firms in real life. This would not necessarily need to be a whole enterprise game – Paich and Sterman (1993) observed isomorphic decision making in a simplified simulated environment where subjects had been told that the simulated "competitor" was using naïve decision rules. However, it would need to embody a range of decisions and sub-decisions (for H5 and H6), and be sufficiently complex to allow for comparison of the effects of varying environmental uncertainty (to test H2), the numbers of competitors (H3) and the available competitor information (H4a and b).

The cost in time and effort of developing a simulated environment of such complexity specifically for this purpose, and then verifying its external validity, would be prohibitive. Of the researchers referenced in this section, only Audia et al (2001) and Kleinmuntz and his associates have done so. The management flight simulators developed for various teaching purposes by Sterman and colleagues tend to include only

sparse competitive information and span a single environment – they are thus unsuitable for the present study, and an experimenter would in any case confront the challenge of finding ways to guard against the "video game mentality" (Isaacs and Senge, 1992), which drives subjects to play the game repeatedly to find optimal strategies, rather than using their own boundedly rational judgment.

The attractions of using a commercially available whole enterprise business game are thus considerable, as are those of having a single setting for the research, rather than splitting it between experiment and fieldwork. Since an appropriate exercise, the BRANDMAPS™ marketing strategy game (Chapman, 1994a, 1994b) was being used in the institution where I am employed, I opted for a quasi-field study within this simulated environment.

The compromises that this decision entails with regard to internal and external validity will be discussed in section 5.4. However, this choice of method and setting have two advantages over and above those already discussed. Firstly, it places the study within the stream initiated by Haveman (1993) and Greve (1998a, 2000) who studied isomorphism in the adoption of new market positions, extending this work to firm's actions in perpetuating or changing existing positions. Secondly, since there has been no published, simulation-based research in isomorphism or institutional theory, it constitutes a source of distinctiveness for the present thesis.

5.3.1 Suitability of BRANDMAPS as a research environment

BRANDMAPS simulates competition between firms marketing up to four variants of a mythical product ("Vaporware") in a number of geographic markets (seven in this implementation), each with differing demand conditions and customer preferences.

Firms can enter and leave particular markets, potentially allowing for the existence of markets with different number of competitors as required by design parameter 5. They develop products to meet perceived customer demands, specify production levels, set advertising and promotion budgets and orientations and determine marketing channels and salesforce levels[7]; longitudinal observation of a range of strategic decisions and concomitant sub-decisions is thus feasible, meeting design parameter 2. Participants may purchase a variety of sophisticated market studies to assist their decisions, the

[7] The software also allows for decisions as to how much production capacity should be purchased for use in subsequent periods. This feature was not enabled during this study – capacity automatically expanded or contracted to match production requirements for a given period.

content of which can be captured by the researcher, thus affording insight into which information informed which decisions, fulfilling design parameter 3. The interactions between the variables are complex and non-linear, increasing the simulation's mundane realism and external validity whilst rendering it extremely difficult for participants to second-guess the algorithms, so that their decisions are perforce boundedly rational, as required by design parameter 6.

The task environment modelled by this implementation of BRANDMAPS can be classified, using Dess and Beard's (1984) typology, as munificent, stable and complex. Munificence results from the absence of resource constraints: cash is available without limitation, although interest charges become penally high once debt exceeds 50% of equity, and penalties for mistaken decisions are low – for example, market entry decisions can be reversed at minimal cost other than the loss of sunk investment in advertising. This, together with the absence of legal and state pressures from the model, means that the simulated environment meets design parameter 1, whilst limiting the external validity of the findings. Stability comes from the low variation in demand from period to period, although there are sufficient variations in dynamism between markets to meet design parameter 5. Significant variations in customer requirements across products and geographic areas confer complexity upon the environment, reinforcing the need for boundedly rational decision making.

The business simulation unfolds over several weeks, allowing time for the administration of questionnaires to participants as required by design parameter 4.

5.3.1.1 BRANDMAPS compared with Markstrat

BRANDMAPS thus meets all the study design criteria laid out in section 5.1. It has been used since the late 1970s to develop marketing analysis, planning and strategy skills for business students in North America, Europe and Japan. BRANDMAPS regularly figures alongside Markstrat in surveys of high quality business games (e.g. Fritzsche and Burns, 2001; Puto, 2004), and there is some anecdotal evidence to the effect that it is a more challenging student experience. Despite this, it has not hitherto been used for published research.

It has, nonetheless, a number of potential advantages vis-à-vis Markstrat. Because it simulates results for the entire firm, rather than just the marketing function, its face validity and the consequent confidence that isomorphic decision-making will parallel that in real life is higher. Because teams start from a uniform position, any positions of

advantage are likely to be correlated with good (albeit perhaps fortuitous) decisions, and perceived as such should a team decide to emulate such decisions. With asymmetric starting positions, such as those imposed by Markstrat, a potential emulator could never be sure if its own or a competitor's position resulted from its own decisions or from its starting endowments, which might distort the value of the information conveyed by a competitor's adoption of a practice, and also relationship between a firm's isomorphic behaviour and it own performance (H8).

5.3.1.2 Complex versus simple simulations

The length and extra complexity of BRANDMAPS, however, while contributing to external validity, poses issues of internal validity. In this subsection, I review how this extra complexity affects each of main extraneous variables (Christensen, 1994) that might threaten the internal validity of the study: history, maturation, instrumentation, selection, mortality, subject effects, experimenter effects, sequencing and subject sophistication.

In so doing, I use as a comparator a hypothetical simulation similar to that used by Paich and Sterman (1993) in their study of decision making for a new product under conditions of boom and bust. Paich and Sterman's simulator embodied just two decision variables, price and target capacity, and was played by student subjects, as homework, over 38 simulated periods, during a real elapsed time of ten days. It involved one competitor, whose decisions were synthesised by the computer and on occasion emulated by the human subjects. As I have already argued, this particular simulation, whilst permitting sufficient variation in the synthesised environment to test the effects of varying environmental uncertainty (H2) was not rich enough in either decisions or in numbers of competitors to meet the other design parameters for the present study. However, it possible to conceive of a development of this simulator, in which experimental variations were possible in the numbers of competitors (to test H3), the amount of supplied information (H4a and b) and numbers and types of decision variables (H5 and H6) could be tested.

I limit my discussion also to the testing of hypotheses H1-H7 inclusive. The measurement of the isomorphic pressure, cultural and political variables required for H8-H11b is, as already stated, simpler but less externally valid in a simulated environment than in the field, and this is not related to the complexity of the simulation except in the extreme case when subjects are too pressurised to complete questionnaires.

History threats derive from extraneous variables intervening between measurements of dependent variables. The necessarily more protracted timescale of the more complex game, needed to allow the subjects to give decent consideration to the choices available to them, will inevitably allow more scope for such extraneous factors to come into play. For example, some newsworthy business event, or some feature of a module being taken by a significant number of the students, might influence them towards or away from isomorphic decisions. Assignments on other modules, or even outbreaks of influenza or other "bugs", may form a distraction that compresses the timescales available for certain decisions, perhaps making isomorphic decisions more attractive as "short cuts".

It should also be noted that such history effects are also potential influences on the internal validity of full-scale longitudinal field studies, which may span years rather than mere weeks. It is usual in field research to control for only the most obvious extraneous events, such as wars or economic crises, and this in effect is the policy that was followed for the present study. In the event, no overt signs were detected, during my observation of group decision processes, of any such extraneous factors at play. BRANDMAPS appeared to be a focal point for many of the groups and to take priority over other learning activities, an observation echoed in many of the published studies featuring similar exercises.

Maturation threats emanate from changes in biological and psychological conditions that occur with the passage of time, such as the onset of fatigue, boredom or frustration. Such threats appear to be equally applicable to the complex and to the simple exercise. While Paich and Sterman (1993) attempted to avoid fatigue effects by allowing their subjects ample time for the entire exercise and by not limiting the time available for each round of decisions, it would be a rare cohort of students in which at least some of the decisions for some of the trials were not completed in haste and at the last available moment. Fatigue or frustration might logically appear to be greater threats to a protracted and complex exercise, but this would be offset with the threat that boredom with a repetitive task would constitute in a simpler exercise. For a motivated student, the challenge of mastering complexity might serve keep the task fresh and challenging, thus sustaining commitment to the simulation and hence the study.

Learning is another aspect of maturation that occurs during both simple (e.g. Sterman, 1987) and complex simulations. It however does not pose a threat to the current study,

being one of the potential influences on isomorphic behaviour over time that informs H1. I consider possible interaction effects of time with other independent variables in section 5.4 below.

Instrumentation threats are the results of changes in the assessment of the dependent variable as a result, for example, or improved skill or declining attention levels on the part of the observer. Such threats are absent in both complex and simple simulations, where the dependent variable (here, isomorphic decisions) is recorded automatically by the game software.

Statistical regression refers to a phenomenon whereby extreme scores in any sample will tend to move towards the mean with repeated testing. Since this is a function of repetition, rather than of duration or complexity, this threat will be equally present for simple or complex simulations with similar numbers of iterations.

Selection biases are introduced through non-random allocation of subjects to treatment conditions and are similarly not inherently a function of simulation complexity. However, with a simpler game played over a short space of time, it may in the event prove more feasible to persuade subjects to work in teams that they do not select themselves, either randomly allocated or matched in terms of academic ability, age and work experience. In practice, where groups of students, rather than individuals, have been the subjects of complex, whole enterprise simulations such as Markstrat, then group composition has invariably been self-determined by the subjects themselves rather than at random. In the admirably frank words of Gladstein and Reilly in the Academy of Management Journal (1985: 625), "We do not know what effect this self-selection may have had." The possible implications for the present study are reviewed in section 5.4.

Mortality threats arise from the loss of subjects from various experimental groups, in a fashion that distorts their comparability. This might be expected to be a greater danger for a complex simulation on account of its longer duration and consequent higher potential drop out rates, than for a simpler one. However, the challenge inherent in the more complex simulation, students' loyalty to their team mates and the fact that such complex simulations tend to be graded appear to serve to offset any tendency on students' part to quit the exercise. Mortality simply was not an issue for the present study, and has not been reported as such for any of the studies based on complex simulations that were reviewed in section 5.2.3. On the other hand, Sterman

experienced a high proportion of mortality in his (1989b) study of decisions in the Beer Game, which is perhaps the simplest conceivable externally valid simulation exercise[8]. This mortality, due to inadequate record keeping on the part of participants, did not distort the outcomes simply because its design did not involve the allocation of subjects to treatment conditions. Mortality from this particular cause would not occur within a computer-based simulation, whether simple or complex, but the example serves to illustrate that simplicity is not of itself insurance against threats of this nature.

Subject effects relate to socially constructed preconceptions on the part of subjects as to the nature of the task confronting them. On the basis of perceptions formed relating to the *demand characteristics* of the study – their notions as to the study purpose, derived from briefings by the researchers, from the research setting itself and from rumours in and around the participant group – subjects will arrive at an idea of the task required of them and then set out to fulfil it. In so doing, they will be influenced by a desire for *positive self presentation* to act during the study in a manner that appears to portray them in the best possible light.

For example, Paich and Sterman (1993) found that a number of respondents followed a strategy, during their "boom and bust" simulation, of aggressive early expansion to capture experience curve benefits. Whether this was through a desire to impress the professors with their learning or for lack of a compelling alternative is not known; however, this turned out to be an inappropriate strategy for the environment modelled by the simulation and did not even succeed in giving the desired positive self-image. The professors' comments in the 1993 paper make it clear that they would have been more impressed with a strategy that showed greater sensitivity to the demand and feedback characteristics of the environment.

This illustrates the possibility that participants in a simple simulation, with relatively few decision variables at their disposal, might be inclined to second-guess the nature of the response expected of them, and tailor their decisions accordingly. In the particular case of this study, there was a clear danger that subjects, having been lectured (by this researcher amongst others) on the benefits of differentiation, might have been

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[8] The Beer Game requires teams of four participants to play the roles of various players in the supply chain for beer. Their only decision is how much beer to order each period, in response to orders received from colleagues further down the supply chain (those playing the role of retailer receive "orders" from a simulated customer). They are told to minimise the (easily calculated) joint costs of stockholding and stockouts. The simulation takes the form of a board game and record keeping is manual.

influenced to avoid emulating decisions seen elsewhere, to a degree that distorted the outcomes of the research.

Within a complex simulation, this danger recedes. The study setting is typically no different from the normal learning environment, and certainly dictated more by the demands of pedagogy than of research, so there are few cues, erroneous or otherwise, to be drawn from it. The profusion of decisions to be taken will make it very difficult for subjects to identify the demand characteristics of the study or to fix on any one decision, or pattern of decisions, that will yield positive self-presentation. The true nature of the study can indeed be disguised because of the amount of confounding information emerging from the simulation (see Hogarth and Makridakis, 1981, for an example). Subjects are more likely to conclude that positive self-presentation will come from doing well in the game, which typically they display a strong desire to do in any case. This gives both uniformity of motivation across the sample, and congruence between participant and researcher aims. The self-presentation motive is also helpful to the present study in that it introduces legitimation pressures into the simulated environment.

Experimenter effects arise when the expectations of the researcher are in some manner transmitted to the subjects. These can affect field as well as laboratory studies, and may be equally a threat with both complex and simple simulations. As with subject effects, however, the greater profusion of influences assailing the subjects and the fact that the setting is pedagogic rather than research-based would imply that researcher expectations are more likely to be picked up and to influence proceedings in a simple simulation.

Sequencing effects come about when a subject's response to one treatment are influenced by prior treatments, and are as likely to occur in simple as in complex simulations. Finally, **subject sophistication**, which I mention for completeness, comes about when certain effects can only be perceived and reported to a researcher by subjects familiar with the discipline in question. This is not relevant to phenomena such as isomorphism, which is observed directly by the researcher rather than mediated by the subjects, and is not influenced by the complexity of the simulation. Studies of this nature in any case invariably used sophisticated subjects such as MBA students.

The choice between a complex and a simple simulation is very similar to that between quasi-field and experimental settings; those arguments are rehearsed in 5.2.2 and 5.2.3 above. It amounts to a choice between the superior external validity of the

complex simulation and the more clear cut internal validity of the simple one: in a simple simulation, it is easier to design exercises that focus upon the behaviour of one or two variables, without confounding history effects and interference between variables. However, the advantage in internal validity of the simpler simulation is offset by the reduction in subject effects conferred by the complex simulation.

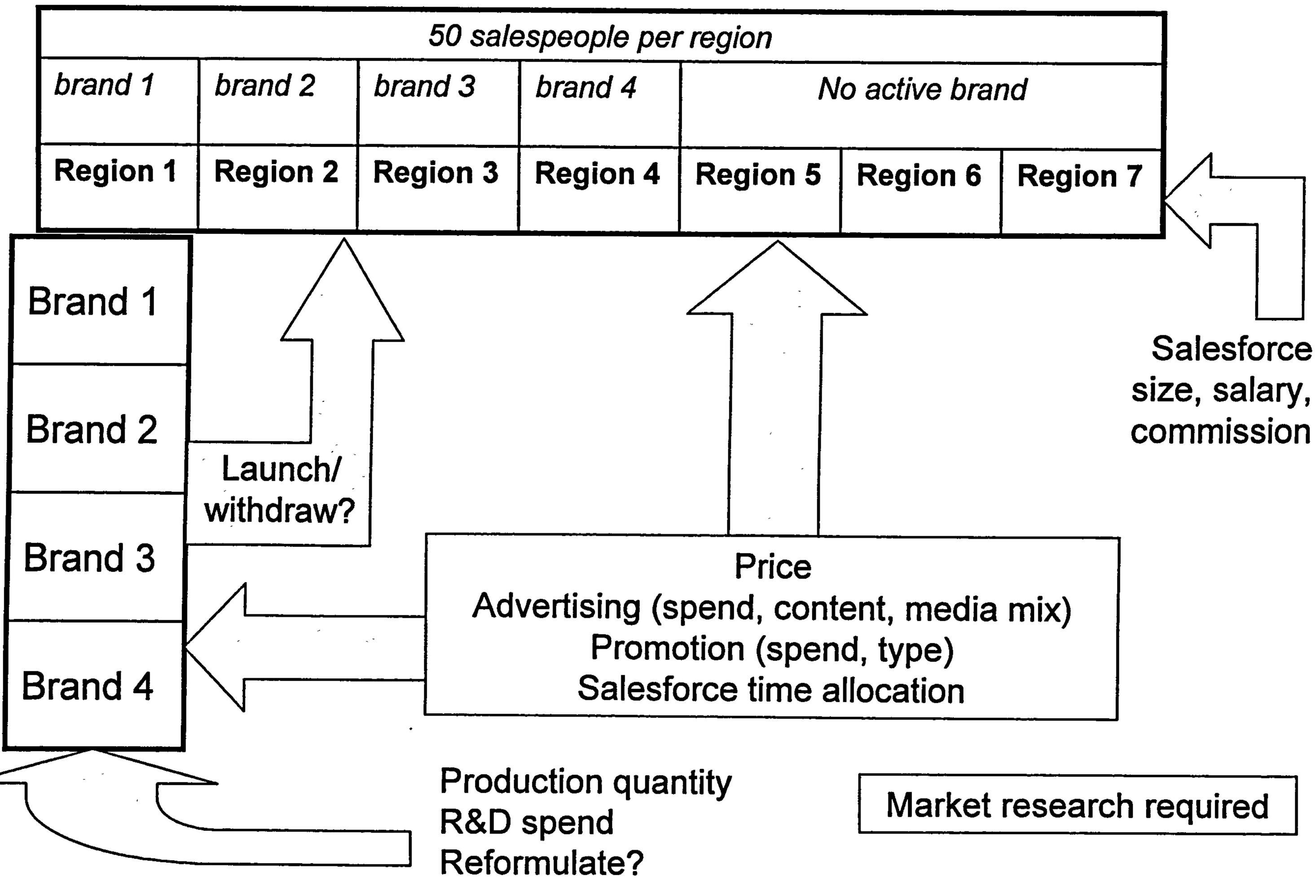
It is of course possible for a simulation to become too complex, so that external validity is lost and subject actions become random efforts to get through the game, unguided by any business logic. However, the danger of subject confusion has been shown (Sterman, 1989a, Diehl and Sterman, 1995) to be present for simpler simulations as well. BRANDMAPS is, as the following description will show, one of the most complex business games of its kind. However, the decisions it requires from participants are a reasonable approximation to those that a similar small team of marketing executives might be called upon to make in real life, albeit over a longer time scale. Use of this, and similar simulated environments, can be seen as a valid response to the challenges (see section 5.2.2.2) posed by scholars such as Loomes (1996).

An examination of the decisions taken by subjects during the present research reveal some that lack any apparent logic, such as those where products are launched with projected revenues that fail to cover the marketing budget, and some where there is evidence of desperation – radical cuts in prices or boosts to advertising. But my observations of the group processes showed that right to the end of the game there was a consistent attempt to apply business logic, however flawed, to the situations experienced. I conclude that it constitutes a viable setting for my research.

5.3.2 The BRANDMAPS simulation – study setting

I now proceed to a detailed description of the study setting. BRANDMAPS admits of considerable tailoring by each adopter to fit the requirements of a given teaching situation. The description that follows is of the implementation used at Westminster Business School during the second semester (February-May) of academic year 1999/2000.

Figure 5.1 Quarterly Decisions in BRANDMAPS
(starting position in italics)



The game forming the basis of this study lasted for seven periods, each lasting one quarter[9] in game time and one week in real time. Students played the game in seven self-selected groups (see 5.3.5 for details) each representing one firm in the "Vaporware" industry. The groups assumed management of their firm at the end of the first "quarter", when it had been trading for an indeterminate length of time, and managed it until the game ceased at the end of quarter eight. The true duration of the game was known to each group at the start of the exercise; there was no attempt to prevent endgaming.

5.3.2.1 Starting position

At the end of quarter 1, each firm offered four products or "brands" (numbered 1-4), which were completely undifferentiated: brand 1 from each firm was identical in terms of price and formulation to that offered by every other firm. The raw materials for each of the four brands were the same, but the proportions of each differed between brands. There were five basic raw materials; in addition brands could differ in terms of the degree of compatibility they offered users with other Vaporware brands, and in terms of the number of months' warranty offered (up to a maximum of 9). Compatibility and Warranty were potential differentiation factors but carried heavy cost implications.

Brand 1 was originally priced at around $675 and was formulated to offer a lower degree of functionality than the three other brands, each of which had slightly different formulations but a similar starting price, $2,700.

Each firm had an active presence in four regions, named after and given certain size and demand characteristics intended to mirror the nature of, Northern Europe, Southern Europe, Central Europe and the United Kingdom. Each firm offered Brand 1 in Northern Europe, Brand 2 in Southern Europe, Brand 3 in Central Europe and Brand 4 in the UK, and no other products in any of the seven markets. All seven firms had identical results from that first quarter of trading, with a 14.3% share of each of the four active markets.

Each maintained a salesforce of 50 persons in each of the four active markets, and also in each of the remaining three regions: US, Pacific and Canada. This enabled any firm to enter any of the three untapped regions immediately, if they so chose. The role of the salesforce was to persuade dealers to stock their firm's brands; dealers, whose behaviour was modelled by the game software, were, participants were warned,

[9] The designation of the periods in question as quarters rather than years was not important, since in this

"thoughtful, rational buyers" (Chapman, 1994a: 23) who represented the only available distribution channel and who might delist a brand that failed to average at least a 2% market share over four successive quarters. There were no provisions for direct negotiation with dealers or for the setting up of exclusive dealerships.

5.3.2.2 Participant decisions

For quarter two, and for each of the subsequent quarters, teams were able to make decisions as follows (they are summarised in Figure 5 1).

For each brand they could specify the quantity to be produced, and a percentage of extra production to be made available at extra cost in the event of demand outstripping supply. Production capacity automatically and instantly adjusted to meet the specified production quantities. They could allocate a sum to research and development for the brand: the handbook indicated such investment this would, in an unspecified fashion and timescale, serve to enhance consumer perceptions of product quality and that a constant flow of investment of at least a specified minimum level was preferable to occasional large injections of funds.

They could, finally, propose a new formulation for the brand involving changes to the proportions of any or all of the raw materials, and/or to compatibility and/or warranty. They were warned that such proposals should normally be undertaken only after extensive market research. Such proposals carried a moderate cost for "R&D and retooling", along with those of a mandatory "patent search". If a proposed new formulation was too close to that of any existing Vaporware brand, it was deemed in breach of patent and could not be implemented. Otherwise, it was implemented immediately, with all dealer and factory inventories of the old version of the brand being sold off at a heavy discount. An experience curve effect meant that unit production costs fell once accumulated production for a brand had passed a certain point. Such experience benefits were lost if a brand was reformulated. Old and new versions of a brand could not co-exist, and new brands could only be introduced if an existing one was withdrawn.

For each region, the team could vary the size of its salesforce, subject to a maximum increase per region in any one quarter of 50 persons; there were no limits on the size of reductions. Both hiring and firing carried up front costs. They could also alter the compensation of the salesforce, varying either or both of salary or commission levels,

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implementation of the game there was no seasonality of demand.

but were warned not to allow compensation levels to differ excessively between regions in order to avoid "morale problems".

Teams could introduce any brand, new or existing, into any region with immediate effect; a moderate fixed cost per brand per region was chargeable. Brands could also be dropped from any region, with zero notice or penalty. Firms might, but were not required to, schedule advertising, salesforce and R&D activity for a brand in advance of that brand's launch in a particular region, as had occurred in quarter 1.

For each brand in each region, the teams could vary the proportion of salesforce time to be allocated to it. They could set the list price of the product to the dealer; this was then marked up by the dealer before sale to the end user. Teams had no control of end user prices, and could only discover them by purchasing market research. They could offer temporary rebates to dealers as an incentive to stock a particular brand. They could invest in up to two promotional activities from a menu of ten, including some incentives to dealers, some to the sales force, or a direct rebate to the customer. They could also specify just the amount to be invested in promotion and leave the rest to the "regional sales manager's" (i.e. the software's) discretion. They could vary the amount to be spent upon advertising in the quarter, and also the "media mix" (direct marketing, magazines, newspapers, radio, TV) to be used and the "media content": up to two product attributes (price, quality, uses, benefits and availability) that the advertising should emphasise. Regions varied in their sensitivity to advertising, price and other elements of the marketing mix.

Teams were required to submit a sales forecast for each brand in each region. Forecasts did not affect production, but inaccuracies in the forecasts were reflected in a uplift to fixed overhead costs to reflect the implications for facilities and manpower planning.

Finally, teams could purchase any number of market research reports from a list of fifty. Examples are shown in Exhibit 1, but the menu includes research on: economic projections; total industry statistics for sales force sizes and compensation levels and various types of marketing expenditure; competitor financial performance or market shares; precise information on competitors' prices, media content or other decisions, including one study that gives full information on the marketing mix for any selected products or brands; consumer perceptions of particular products; conjoint analyses and

other reports designed to assess price sensitivities or consumer preferences for different product attributes or preferences between actual and/or hypothetical brands.

Decisions for each period were submitted to the module leader on disc or (exceptionally) on paper forms. The game software then calculated each group's sales, profit and loss, balance sheet and other performance data for that period. It also computed a quantitative assessment of group performance, which contributed to the grade for the module and was based on groups' rankings in terms of return on equity, market share growth and operating efficiency. However, groups' performance on this measure was never reported to them during the game. The most visible measure of comparative performance was share price: each group received a report of this each quarter for all participating firms. Groups were also informed of their own ROI and their aggregate market share by volume and value of sales.

5.3.2.3 Underlying model

Since performance in the game is not a dependent variable in any of the hypotheses, the mundane realism with which BRANDMAPS models firm and market behaviour is not central to the validity of the study. The crucial factor for external validity is experimental realism – since I am investigating the effect of performance as an independent variable (H8 and H9), it is important that subjects believe that the performance reported by the game software is a reasonable proxy for that which would have resulted from comparable decisions in a real world environment, so that isomorphic decisions in the game are made on a similar basis to that obtaining in real firms.

Nonetheless, for the sake of completeness, and also to help the reader assess experimental validity, I summarise here the key features of the model, although I refrain from giving details that might assist a BRANDMAPS participant to second guess the software. The actual detailed equations, which are commercially confidential; can be found in the Instructor's Manual (Chapman, 1994b) and also as Appendix 1[10]. at the end of this thesis. Many equations include random noise factors to simulate market uncertainty, lagged terms to simulate end-user and dealer inertia and special conditions to simulate market reactions to sudden changes of direction, including new product introductions. The software models evolution in user tastes during the game, so that the participants are aiming at a moving target.

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[10] Appendix 1, for reasons of commercial confidentiality and copyright, is available only to the examiners

A firm's performance in BRANDMAPS is largely driven by its sales, of which the main determinants are market size and market share (see Figure 5.2). The size of a market in a given region in a given quarter is determined essentially by GNP and the total "marketing effort" by all firms in that and the previous quarter. GNP is a composite of regional population, per capita income and consumer price index, whose levels and growth rates are set by the game administrator; the levels can be discovered by the students via market research.

A brand's share of a given market is a function of: the marketing effort for that brand in that market, relative to the total marketing effort in that market; and the previous quarter's market share. "Marketing effort" is a measure of the effectiveness of a firm's marketing of a given brand in a given region as reflected in end-users' perceptions of the value for money offered by a brand. As shown in Figure 5.3, it has three main components: perceived performance of the brand; perceived convenience in purchasing and using the brand; and price charged by the dealer to end users.

Price to end users, as already mentioned, is a function of the list prices set by teams, dealer rebated and any discount offered within the brand's promotional budget.

Perceived performance is a function of two factors: the closeness of the brand's formulation to the user's ideal, and the end-users perception of the brand's quality, which is in itself a non-linear function of accumulated R&D spend.

Perceived convenience is the most complex quantity modelled by BRANDMAPS. It is driven by some of the same factors that drive perceived performance: perceived brand quality and a subset of product attributes. These are attenuated by: customer awareness (a complex function of advertising spend, mix and content together with other elements of the marketing mix, so that brands that promise different attributes to those delivered are penalised); dealer activity in stocking and promoting a brand (driven by a combination of salesforce effort and expected profit margins, which in turn are a complex function of dealer rebates and promotional activity and of historic sales of that brand in that region); and price stability – radical movements in price, in either direction, are modelled as causing inconvenience and are penalised.

Population
•Per capita income
•CPI

GNP

Base demand

Total market size

Other brands' marketing efforts

Marketing effort (see Fig. 5.3)

Market share

Sales

Salesforce size, compensation & effort

Salesforce compensation

Advertising spend

Costs

Earnings

Promotional spend

Share Price

Production

Sales forecast

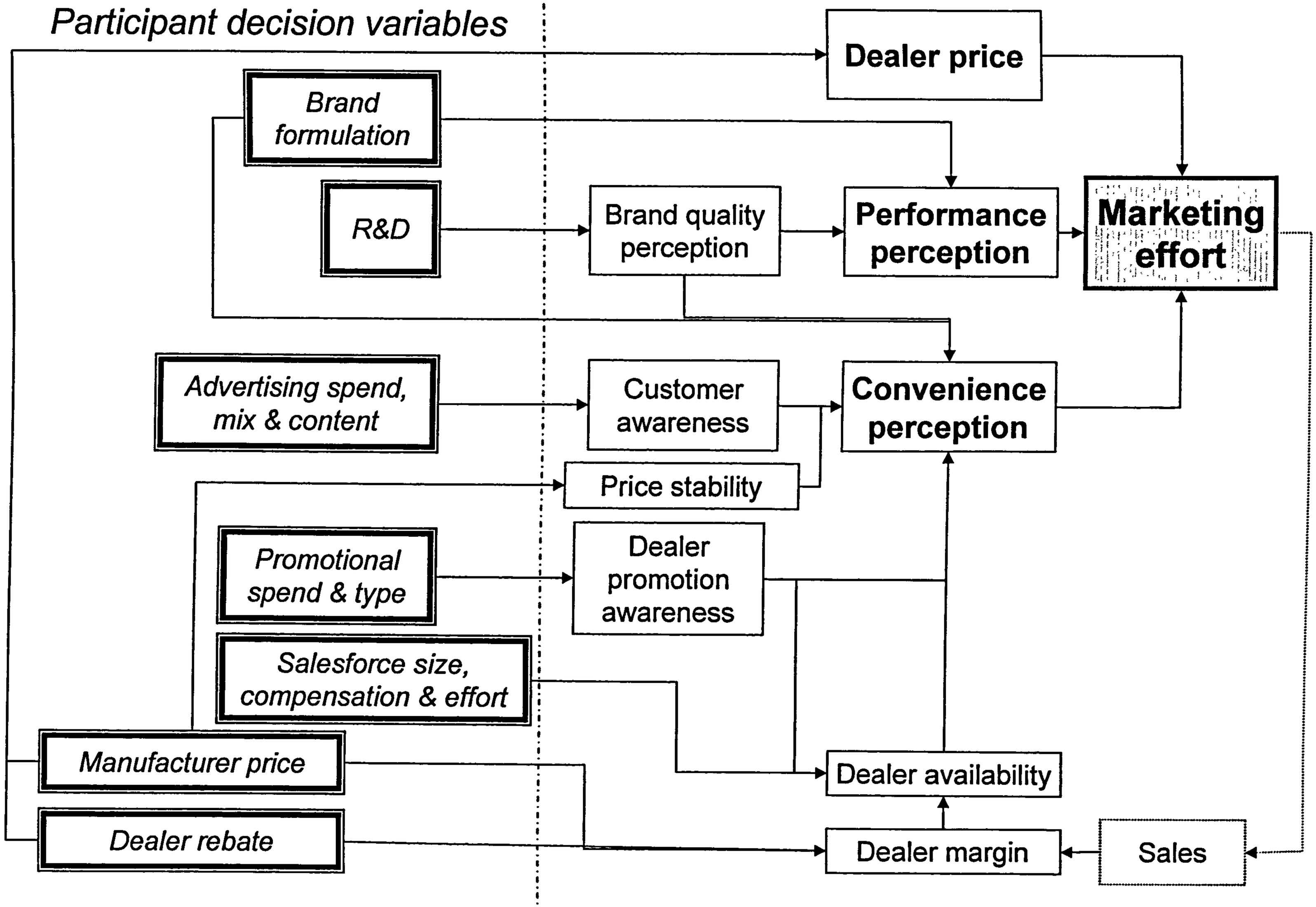
Figure 5.2 Sales and earnings in BRANDMAPS

Key:

Game administrator inputs

Participant decision variable

Figure 5.3 Calculation of brand's "marketing effort" in BRANDMAPS



Market shares are translated into revenues and costs and inventory levels in a straightforward algebraic fashion (summarised in Figure 5.2), though costs may be increased as a result of poor forecasting or attenuated through experience curve effects, as already discussed. Overheads costs are set, and balance sheet movements modelled, in a similarly predictable fashion, so that the complexity of the model from the point of view of the participant resides in understanding the effects of marketing decisions on sales volume.

The firm's stock price is driven by financial and market performance in a manner intended to reflect, simplistically, the responses of real bourses to such information.

5.3.3 Study context

The BRANDMAPS game on which the current studies are based formed the focus of an MBA elective module in strategic marketing, taken in this instance by 34 students formed into seven groups/firms.

The experimenter played no role in teaching or grading the module, and no academic credits were contingent upon participation in the experiment[11]. The students were given a short presentation about the aims of the research, which they were told related to strategic decision-making, and the likely demands upon them, and were asked as a group whether they were prepared to participate. They agreed without demur, although one student later failed to complete any questionnaires – no comment was made about this, during or after the study. The only inducement offered for participation was some brief feedback upon the social processes and interpersonal interactions observed in each group of students. The danger of bias through "resentment due to coercive recruitment" (Whitney and Smith, 1983: 171) is therefore small.

5.3.4 Study design

The entire universe of information available to each group at a given point in time, along with the decisions groups took on the basis of that information, was recorded by the game software and was available to the researcher. Instrumentation effects thus pose no threat to the internal validity of this part of the study.

[11] The experimenter was the lead instructor for another module which was compulsory for all students in the class in question, and tutored half of them on that module. There is no evidence that the students felt in any way inhibited or threatened as a result of this relationship. Many of them felt able to comment frankly to the experimenter about the strengths and weaknesses of the module.

In addition to the game inputs and outputs, survey data were collected from participants. Questionnaires (see Exhibit 2) were administered to each student just before they handed in their decisions for periods 2, 4 and 6 and at the conclusion of the game, just before they obtained the final results[12]. The questionnaires asked participating students to express, on a seven-point Likert scale, their degree of agreement or disagreement with a number of statements representing measures of the dependent and independent variables for H10, H11a and H11b, along with a number of other variables that were subsequently discarded from the study. Apart from a small adjustment to the wording used in the final questionnaire, to reflect the fact that the game had finished, there were no adjustments made to the research instrument over time.

Of the 136 questionnaires distributed over the four periods, 122 were completed. As previously mentioned, one student failed to complete any questionnaires. One further questionnaire was not returned for each of periods 2 and 4, six for period 6 and two for period 8; one of those two was also amongst the six missing for period six. Participation rates for each period thus varied between 79% and 94%. At least three members (i.e. a majority) of every group submitted completed questionnaires for each period. There is little evidence of mortality within the study; all group members remained enrolled right through the module and participated throughout in group decision making.

By sampling at a number of different points in time, with the study variables being able to alter state between observations, in a situation analogous to a longitudinal field study, this design avoided the danger that in a simulation "a single run provides only a single, complex observation." (Swierenga and Weick, 1982: 61). The extent and intensity of groups' deliberations over each period's decisions, both observed by this researcher and reported by the participants, was evidence that every quarter was a separate event, and the each period's decisions were effectively independent of those in the preceding periods, except insofar as information as to the effects of earlier decisions would inform subsequent ones. Only at the very end of the game was there evidence of maturation effects in the form of fatigue, a briefer decision-making process and a tendency to perpetuate rather than revise earlier decisions.

Four of the seven groups also agreed to be observed during one or more of their decision-making sessions. Limited resources, together with the facts that different

[12] Since there was reason to expect that attendance at the session prior to the period 8 decision would have

groups' meetings often coincided, that some groups were unwilling to be observed and that others held their meetings in inaccessible places, such a members' workplaces, meant that it was impractical to observe any single group right through the game, or to see a cross-section of groups for any single decision period. In the event, four of the groups were observed in a total of five meetings; two were very short, although the others lasted in excess of one hour. This was insufficient to give a coherent picture of group behaviours, so that the desired triangulation was therefore not effectively achieved and there is thus no effective check on the convergent validity of the survey measures. However, the observations did generate isolated points that have contributed to the study.

The MBA students were naïve participants – they had not been exposed to institutional theory and the questionnaire contained items unrelated to isomorphic pressures, political behaviour or strategic intent. The questions on these topics were interspersed through the questionnaire, which served to reduce the risk of subject effects. The identification of the demand characteristics of the research (Christensen, 1994) would have been extremely difficult, not least because I was myself at that stage pursuing a line of enquiry that was different from that presented in this thesis, so that the risk of conscious or unconscious bias in the responses was small. Some positive self-presentation effects may, however, have distorted measurement of the political behaviour variable – I discuss this in section 5.4.10.

My tardiness in arriving upon a research question was in one sense an unfortunate deviation from the Popperian ideal of scientific enquiry, but had the benefit of nullifying any potential experimenter effects. The lecturer in charge of the strategic marketing module was also unaware of the precise aims of the research, and so was unable to bias the students' responses even if he had desired to do so.

As discussed in 5.3.1.2, the embedding of the research within a challenging, time consuming and assessed simulation exercise minimised the likelihood that students would have either time or energy to devote to devising questionnaire responses or to modifying game decisions in a way that might distort the research outcomes. Subject effects therefore posed little threat to the internal validity of the study. On the other hand, because the outcomes were assessed, and the exercise was embedded in an educational context in which some students might have felt the desire to impress their

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been poor, the decision was taken to postpone data collection for this period.

instructor and avoid ignominy within their peer group, legitimation remained as a possible influence on the decision processes of participants.

5.3.5 Demography of sample and external validity

The students, 19 male and 15 female, ranged in age from 25 to 52, with a mean age of 32.1 years and a median age of 30.7. All but seven of the subjects were under 35 years of age at the start of the study. All had a minimum of three years' managerial experience. There are no published guidelines for the size and demographic characteristics required of a student sample in order to give adequate external validity, and surprisingly few studies report the ages of participants. The sample for this study is, on average, three years older and with more managerial experience than the sample reported by Schweiger et al (1986), and five years older than those reported by Walsh and Henderson (1989) and Marinova (2004). Clark and Henderson (1996, 1998) do not report the ages of the second-year Stanford MBA student participants in their studies; if their profile resembled that of the 2004 class, whose mean age on entry was 28 years (Stanford, 2003) then it would be similar to that of Schweiger et al. Many other studies (e.g. Tjosvold and Feld, 1983; see Table 5.2 for other examples) use undergraduate subjects, sometimes mixed with postgraduates (e.g. Whitney and Smith, 1983). I conclude that the age profile of this sample is slightly closer to that of the managerial population at large than was the case for comparable published studies, and so meets or exceeds their standards of external validity on that score.

However, the sample remains somewhat younger and less experienced and with a higher proportion of females than might be expected from a sample of practising senior managers. For example, Hodgkinson et al (1999) report a sample of senior managers with a similar spread of ages (25-50) to that in the current study but a considerably higher mean (37.1). Kilduff et al.'s (2000) sample of executive MBA participants similarly lay in the age range 26-56, with a mean of 41.

This difference would only threaten the external validity of the results if these differences might be expected to affect the variables under consideration (Weick, 1964; Whitney and Smith, 1983). To translate this into the terms of this study, external validity will be threatened if there is some reason to believe that the relative youth and inexperience of the sample and the high proportion of females in it will affect the manner in which isomorphic pressures are influenced by political behaviour and strategic intent. Note that differences between the *levels* of these variables in the sample

and the population at large will not destroy external validity as long as the *relationships* between them are unaffected. Similarly, external validity will be affected if there is reason to believe that young, inexperienced or female managers are more or less likely than others to take isomorphic decisions when their firms are unsuccessful, when they possess knowledge of competitors' activities, when isomorphic pressures are strong or as the industry ages.

However, Remus (1996) reports *no* marked differences between the decision making of managers and graduate business students, and there is little empirical evidence for *any* generic differences in employee behaviours that are attributable to age, gender or race (Pelled, Eisenhardt and Xin, 1999). Increasing age has been shown to reduce employees' proclivity to change jobs (Youngblood, Mobley and Meglino, 1983), and to lead to a reduction in change-seeking and risk-seeking behaviour (Carlson and Karlsson, 1970; Vroom and Pahl, 1971; Child, 1974; Wiersema and Bantel, 1992). Contemporary theorists, however, believe that firm-specific factors such as length of tenure in post (Flaherty and Pappas, 2002) and *diversity* in ages, genders and background (Finkelstein and Hambrick, 1990; Pelled et al, 1999; Simons, Pelled and Smith, 1999) have greater impact than do state variables such as the average age or the gender make-up.

In the context of the present studies, there is thus no empirical evidence that the demographic make-up of the sample will affect the observations of the decision-making variables, although there will be a need to control for diversity within the student groups, a point to which I return when I discuss control variables below.

If isomorphic behaviours are socially constructed as less risky than non-isomorphic, a young sample is less likely to respond to given stimuli with an isomorphic decision than the more mature managerial population at large. Carlson and Karlsson (1970: 714) estimate that on an index of change-proneness that has a reference value of 1.00 for a typical 20-24 year old, the value for 30-34 year olds (the mean and median for the study sample) is 0.55 whereas the value for 44-54 year olds (anecdotally a likely age for a senior manager) is of the order of 0.2-0.25. Thus, estimates of the degree of isomorphic behaviour from this study are likely to be biased downwards, although the precise extent of this bias is unclear, since the risk-taking proclivity of the "average manager" alters little between the ages of 33 and 48 (Vroom and Pahl, 1971).

The empirical evidence supporting the widespread prejudice against laboratory methods on the grounds of limited external validity thus appears extraordinarily thin, and not a concern for the present study.

5.3.6 Size of sample and internal validity

Turning now to considerations of internal validity, the sample, with 34 individuals in seven groups, is somewhat smaller than those employed for most of the other studies cited above. The smallest study with individual (as against group) subjects had 66 participants and most others had over 100. For the Markstrat studies with group respondents cited in Table 5.2, the median sample size was 28 groups, with almost all utilising between 15-35 groups. The two largest studies (Lant, 1992; Fenwick and Neal, 2001) sampled 50 and 60 groups respectively. However, even smaller sample sizes, of six groups, have on occasion been accepted as valid for both experimental (Whitney and Smith, 1983) and quasi-field (Marinova, 2004) studies.

Other measures of sample size support this view that the study, while small, is not unreasonably so. For isomorphic pressures, strategic intent and political behaviour, the seven groups were each sampled at four different points during the game, yielding a total of 28 datapoints. This compares with 23 groups, sampled once, in Tjosvold and Field (1983), six groups, each yielding a single reading, for Whitney and Smith (1983), and 30 groups, each yielding a single reading, in Schweiger et al (1986). However Zucker's (1977) sample consisted of 180 individuals, of whom 45 contributed to all three stages of the study. More recent studies by Clark and Montgomery (1998), with 15 groups each sampled at three points during the game, Hodgkinson et al (1999) with 81 undergraduates and Audia et al (2000), with 168 individuals each yielding a single data point, also generated significantly more data than the current study.

Other factors to be discussed in section 5.4 in relation to the individual variables contribute further limitations to the internal validity of this portion of the research, which is thus best considered as an exploration of the utility of laboratory-based investigations for culturally based phenomena of this kind.

For hypotheses H1-H9, the unit of analysis was the decision rather than the group, and here my dataset consisted of 715 isomorphic decisions in a total population of 3464. The internal validity of this portion of the research should therefore be adequate.

The groups into which students were formed themselves were not random - students selected their fellow group members. This, as mentioned above, is common practice in quasi-field studies of this nature, and it was a longstanding practice on the module and programme to allow students to select their own group. I judged that an insistence on random groups would jeopardise the degree of participation in the study.

Three of the seven groups consisted entirely of full-time students, two entirely of full-time students and two were mixed. Thus there is a danger that the groups might, after all, have a number of ready-formed institutions at the very start of the game. The novelty of the challenge posed by the game, which none of the students had played previously, would mitigate this danger, but as groups were not observed during their initial two decision periods (to avoid embarrassment during the forming and norming process), there is no direct evidence of its extent. Where feasible, I control for the effects of cohort coherence.

5.4 Operationalisation of variables

In this section, I discuss how the dependent and independent variables for each hypothesis were operationalised. I shall assess impact of maturation, statistical regression and selection on the internal validity of each study variable. I have established, through the previous discussion, that the impacts of instrumentation, mortality, subject effects, experimenter effects and subject sophistication were minimal or absent during the study, and that there is no evidence of history effects.

5.4.1 Total decisions

The decisions taken by each group in each period are described in section 5.3.2.2. I reluctantly excluded R&D and product reformulation decisions from the analysis. None of the market research provided by the game software reported competitors' R&D levels – the best data available reported industry average spend by region. It was therefore impossible for firms to take informed isomorphic decisions, and including R&D would thus have distorted the measure of the proportion of decisions taken with foreknowledge, which is important for the testing of H4a and H4b.

It would have been desirable to include reformulation decisions, since it is they that conform most closely to the classical definition of a strategic decision, in that they involve substantial commitment (Ghemawat, 1991). However, the structure of the game prevents a group from reformulating a product so that its attributes come within a

defined "patent zone" of a pre-existing brand, so precise isomorphism is not possible. Such decisions were in any case so few in number (9, or 0.3% of the total) that their omission could not distort the overall level of the analysis.

For the purposes of the ensuing discussion, I divide the remaining decisions into the following categories: "activity" decisions – whether to launch a brand in or withdraw it from a given region; "marketing" decisions each region in which a brand was active – price levels, advertising spend, media content, media mix, spend on sales promotion, and types of activity to which to allocate that promotional spend; "effort" decisions regarding the number of salespeople to hire in each region and the proportion of their time to be allocated to each brand within that region; and. "compensation" decisions for salespeople by region.

It was necessary to exclude from the analysis decisions that had been recorded by the software but were in fact simply carry-overs from earlier periods that had not been reset. I therefore recorded the following as valid decisions: all activity decisions; all marketing decisions for active brands in regions where they were being actively marketed and all compensation decisions for regions where there were active salespeople. For the effort decisions, it was necessary to decide whether to treat the decisions on numbers of salespeople as separate from the decisions on allocation of effort, or to treat them as a composite decision as to the numbers of salesperson equivalents associated with a given brand in a given region. The observed meetings offered no guidance as to the subjects' thought processes, but since the most precise competitor information offered to the participants used the composite (number of salespersons attached to each brand), this was the practice that I followed. The result of this was to reduce the number of decisions considered independently by 279, or 8%.

Table 5.3: Numbers of decisions by group and period

	Group 1	Group 2	Group 3	Group4	Group 5	Group 6	Group 7	Total	Mean	c.v
Period 3	159	95	102	98	54	77	74	659	94.14	0.35
Period 4	127	87	88	115	51	82	104	654	93.43	0.27
Period 5	106	78	94	102	45	86	91	602	86.00	0.24
Period 6	103	71	85	78	45	72	83	537	76.71	0.23
Period 7	103	70	72	75	45	70	90	525	75.00	0.24
Period 8	89	70	62	69	45	70	82	487	69.57	0.20
Periods 3-8	687	471	503	537	285	457	524	3464	494.86	0.248

Finally, I excluded all decisions taken in the first two quarters. Decisions corresponding to the first quarter, the game's starting point, were taken by the game software and were the same for all groups, so that decisions that were deliberately isomorphic with another group's independent decisions were not possible until the third quarter. The final population comprised 3,464 decisions (see table 5.3).

There is a maturation effect, as groups withdraw from market positions that prove unviable, so that the mean number of decisions per group falls steadily over time. The coefficient of variation (final column, Table 5.3) also declines, but the decline is not monotonic and so it is unclear whether it constitutes statistical regression or a symptom of the fatigue referred to in section 5.3.4.

There is one particularly adventurous and active group (group 1) and one particularly cautious one (group 5) but no evidence of any bifurcation in the sample in a manner that might indicate selection effects.

5.4.2 Isomorphic decisions

To measure the number of isomorphic decisions, all decisions taken by each group in each quarter were compared to those taken in previous quarters by that and all competing groups. As I shall discuss below, issues of definition made it necessary to operationalise a number of alternative versions of this construct, but in the first instance I identified a decision as isomorphic if it resembled a decision taken by one or more competing groups in the previous quarter more closely than it resembled the equivalent decision taken by the group itself, or if it was the unaltered continuation of such a decision taken in a previous period. Perpetuations of past isomorphic decisions continued to be counted as isomorphic in subsequent periods even if the groups that were being emulated had since altered their own practices.

My aim throughout this classification process was to be generous in defining isomorphism, so as to capture every instance where one group might be deemed to be imitating another. I could then assess later the effects of tightening that definition to exclude decisions that fell outside certain criteria.

I isolated decisions relating to Brand 1, the low-priced, downmarket brand, from those relating to the other three brands, which I treated as closer substitutes. This may have caused me to misclassify some decisions relating to firms 4 and 5, who repositioned their respective Brands 1 in quarters 4 and 5 respectively, and their

imitators. However, the repositioned brands both had prices that started out at more than treble the price for other firms' Brand 1, and even after later reductions were still approximately 100% higher than those other brands'. They were also marketed in different regions from most other firms' Brand 1. The number of decisions for which there was scope for misclassification between isomorphic and non-isomorphic was therefore few.

For quantities measured as continuous variables, such as prices, advertising expenditure and salaries, two forms of isomorphism were observable. The first, which I term isomorphism of level, occurred where, for example, one group appeared to be trying to match another group's prices or advertising expenditure closely. The second type, which I term directional isomorphism, occurred where, for example, a group appeared to be following another group's price cut with a cut of their own, but were not attempting to match it precisely. I also recorded the absolute distance between the decision taken and the closest of the competitor decisions that it appeared to be emulating, as a percentage of the quantity that was being copied. So where, for example, a group responded to a competitor price of $2500 by cutting its own price for that brand to $2550, the difference was recorded as 2%. I felt it necessary, again in the first instance, to not stipulate absolute equivalence as a condition for isomorphism since, in some cases, it would be difficult for a group to match a competitor precisely, even if it wished to do so. For example, for most of the market research reports provided in the game, price information related to the prices at which dealers were selling to end-users. Groups could however change only the factory prices at which they sold to the dealers, and could not precisely determine the mark-ups those dealers would charge, which might vary from quarter to quarter.

There were three decision variables not calibrated on a continuous scale: media content, media mix and promotional type. For media content, groups could select for emphasis in their advertising up to two attributes, such as quality or price, from a list of six. I recorded an isomorphism of level, with a distance of 0%, where one group matched another's media content precisely. As an alternative to isomorphism of level and directional isomorphism I developed a third category, partial isomorphism, for cases where the match of attributes was less straightforward. Where only one attribute within a group's media content matched another group's, I recorded a partial isomorphism with a distance of 50%. Where both attributes were being emphasised by at least one competitor, but there was no single group that was emphasising both

together, then I recorded a partial isomorphism with a distance of 25% (an arbitrary figure mid-way between zero and 50%).

For media mix, where groups could allocate advertising between media in any proportion and invariably used all five possible media, I could find no objective basis on which to identify partial isomorphism. Where, for example, a group had identical allocations to another on three of the five media, but greatly different allocations on the remaining two, it was unclear whether this was any more of less "isomorphic" than where the two groups differed on their use of all five media, but only marginally so. However, I recorded an isomorphism of level where one group matched another's mix precisely.

For promotional type, firms could opt to leave the allocation of promotional activity to the sales manager's discretion, or decide to allocate 100% of it to one of nine activities, or to allocate 65% of it to one, major, activity and the remaining 35% to a second, minor, one. I recorded an isomorphism of level with a distance of 0% where a group's allocation precisely matched that of at least one other group. I recorded a partial isomorphism with a distance of 65% where the matched activity was the minor one for either party, a distance of 35% where it constituted the major activity for both and a distance of 30% (100% - 2x35%) where the major and minor activity of the imitator respectively mimicked the minor and major activity of the other party. I recorded a distance of 10% (another arbitrary figure) where the major activity of the imitator mirrored the major activity of another group, and the minor activity imitated either activity of a third group.

Since the entire population of decisions, rather than a sample, was used for these measures, internal validity was high. The distinction between partial isomorphism and isomorphism of level was clear and not subject to judgement. The distinction between isomorphism of level and directional isomorphism was in some cases more arbitrary, but in the end I did not find it necessary to discriminate between the two in my analysis: it was sufficient to use the measured distance between two decisions (an objective measurement, not subject to judgement) to discriminate between differing degrees of isomorphism. Thus, the identification of isomorphism is robust and reliable, with the invention of distance measures for certain combinations of media mix and promotional type being the only arbitrary feature.

As I discussed in section 2.2.4, there are issues in defining how alike two decisions need to be in order to consider them isomorphic. In order to ensure that the results were robust, I operationalised four alternative definitions of isomorphism, as four datasets of decisions. The first, and most all embracing, dataset 1, included all isomorphisms, whether they were new decisions or perpetuations of past decisions, and comprised 1,176 decisions, or 33.9% of the total (see Table 5.4).

Table 5.4: Numbers of decisions by category – dataset 1

	Marketing	Activity	Compensation	Sales effort	Total
Total decisions taken	2400	96	558	410	3464
No of isomorphic decisions	767	25	210	174	1176
-level/ directional	331	25	76	118	550
-partial	165	0	0	0	165
-perpetuation	271	0	134	56	461
Isomorphic % of total	32.0%	26.0%	37.6%	42.4%	33.9%
% of isomorphic					
-level/directional	43.1%	100.0%	36.2%	67.8%	46.8%
-partial	21.5%	0.0%	0.0%	0.0%	14.0%
-perpetuation	35.3%	0.0%	63.8%	32.2%	39.2%

Dataset 2 excluded perpetuations of past decisions, on the grounds that in such cases the firm was showing isomorphism with itself rather than with other firms, and comprised 715 decisions or 20.6% of the total. This dataset did not discriminate between decisions on the basis of distance.

The third dataset further restricted isomorphic decisions to those with a distance of 12.5% or less from the decision of which they were a copy. The choice of the 12.5% breakpoint was largely arbitrary, and was arrived at after inspecting the data for a point at which there was a substantial gap before the next most distant decision. Dataset 3 comprised 447 decisions.

Table 5.5: Percentage of isomorphic decisions by group and period – dataset 2

	Group 1	Group 2	Group 3	Group4	Group 5	Group 6	Group 7	Mean	c.v.
Period 3	18.2%	11.6%	20.6%	29.6%	14.8%	7.8%	45.9%	20.9%	0.62
Period 4	28.3%	28.7%	30.7%	16.5%	47.1%	13.4%	34.6%	27.2%	0.41
Period 5	25.5%	9.0%	25.5%	22.5%	40.0%	17.4%	25.3%	22.8%	0.41
Period 6	29.1%	26.8%	18.8%	32.1%	31.1%	13.9%	13.3%	23.3%	0.35
Period 7	25.2%	14.3%	9.7%	17.3%	15.6%	8.6%	16.7%	16.0%	0.34
Period 8	6.7%	15.7%	16.1%	13.0%	15.6%	7.1%	6.1%	10.9%	0.43
Periods 3-8	22.4%	17.6%	20.9%	22.0%	27.4%	11.6%	23.7%	20.6%	0.24

The final set of decisions, dataset 4, contained only 332 decisions, and operationalised the strictest possible definition of isomorphism, comprising only isomorphisms of level with a distance of zero.

Table 5.5 shows the proportion of each group's decisions that count as isomorphic under the broadest definition that excludes repeated decisions. There is clearly a substantial range of values, so that discriminant validity is adequate.

There is no clear sign of any maturation effect: the mean proportion oscillates before falling over the last two periods. The coefficient of variation falls and then rises again – there is little systematic evidence of statistical regression.

There is one group (group 6) that consistently takes a lower proportion of isomorphic decisions than the mean; this is neither the most nor least active group in terms of overall number of decisions taken. All other groups have at least two periods when they are below the sample mean and two when they are above it. I conclude that there is little evidence of distortion through selection effects.

5.4.3 Industry age

This variable was simply operationalised as the quarter, in game time, in which a decision was recorded.

5.4.4 Environmental uncertainty

The measurement of environmental uncertainty poses considerable methodological problems in field studies, with researchers disputing the validity of research instruments and debating whether the correct measure is of "objective" uncertainty or "perceived" uncertainty (Milliken, 1987; Kreiser and Marino, 2002). Here, my aim is to seek associations between objective uncertainty and organisational action, with managers' socially constructed perceptions being an intermediate variable to be investigated, perhaps, at some later point.

The seven regions in BRANDMAPS were similar in terms of munificence – resource constraints were not apparent in any of the seven – and complexity – the difficulty that they posed game participants in the understanding of market dynamics. Neither did either of these parameters change over time. Thus, of the three possible sources of environmental uncertainty (Dess and Beard, 1984; Kreiser and Marino, 2002), only the degree of dynamism varied between region and time period.

Milliken (1987) has commented that measures of environmental uncertainty should attempt to capture unpredictability rather than simple volatility (e.g. rates of change). Accordingly, I have measured this variable as the coefficient of variation of the size of the market, measured by value[13], over the three periods prior to that in which the decision was recorded. For this variable, therefore, there were no readings prior to quarter 4.

Discriminant validity again appeared adequate with a range of readings between 0 and 1.1, though heavily skewed in the rage 0-0.2 (Table 5.6)

Table 5.6: Numbers of instances encountered by groups of markets with volatilities (v) in indicated ranges

	Group 1	Group 2	Group 3	Group4	Group 5	Group 6	Group 7
Not present	2	0	1	3	10	0	2
0<v≤0.02	7	7	7	7	7	7	7
0.02<v≤0.05	4	4	4	4	3	4	4
0.05<v≤0.1	7	8	7	7	7	8	7
0.1<v≤0.2	5	6	6	5	3	6	5
0.2<v≤0.3	4	4	4	3	3	4	4
0.3<v≤0.5	3	3	3	3	1	3	3
v>0.5	3	3	3	3	1	3	3
	35	35	35	35	35	35	35

Groups are almost equally exposed to markets of differing levels of volatility, so that the validity of this measure is not compromised by selection effects. There is prima facie evidence of a maturation effect, with volatility diminishing over time; volatility and age are significantly correlated (Kendall tau = -0.24, p [one tailed test]= 0.0276). This is what would be expected of a real industry as it matured, but means that the results of H2 must be interpreted with due caution.

5.4.5 Industry concentration

Industry concentration was measured as the Herfindhal index (i.e. the sum of the squares of the market shares, measured by value[14] of all participating firms) for each of the seven regions in the quarter prior to that in which the decision was recorded, so that it represented the situation as groups would have perceived it at the time when they were deliberating upon their decisions. Discriminant validity of this variable appeared

[13] As with the Herfindhal index, the measures by volume and by value were highly correlated (tau = 0.58, p<0.0001) but the value measure yielded the more significant results.

adequate, with a range of readings between 0.14 and 0.93, although heavily skewed in the range 0.1-0.3 (Table 5.7).

Table 5.7: Numbers of instances encountered by groups of industries with Herfindhal indices (h) in indicated ranges

	Group 1	Group 2	Group 3	Group4	Group 5	Group 6	Group 7
No presence	2	0	2	3	13	0	2
0<h≤0.15	5	5	5	5	5	5	5
0.15<h≤0.2	21	21	21	21	17	21	21
0.2<h≤0.25	8	8	7	8	7	8	8
0.25<h≤0.3	1	1	1	1	0	1	1
0.3<h≤0.4	1	1	1	1	0	1	1
0.4<h≤0.61	3	3	2	3	0	3	3
h>0.61	1	3	3	0	0	3	1
	42	42	42	42	42	42	42

It will be seen that, with the exception of the unadventurous Group 5, which chose to enter no new markets and so avoided exposure to any of the most concentrated ones, all groups obtained near equal exposure to industries at different concentration levels. Selection effects therefore have not affected the internal validity of this variable. Maturation effects are also absent, since highly concentrated industries mostly occurred either at the beginning of the game, when firms are venturing into the US, Pacific and Canada regions, or at the end, when there has been a shake-out in those same regions. The correlation between the Herfindhal index and industry age is correspondingly low (Kendall tau=0.11, p=0.355); in effect, this element of the study resembles an ABA experimental design (Christensen, 1994: 357) in which an alternation of treatments – high industry concentration/low concentration/high concentration – serves to obviate sequencing and maturation effects.

Within BRANDMAPS there is no interaction between the regions: competitive decisions made in one region do not affect another, so each can legitimately be regarded as a separate industry. My observations indicated that participants were treating them as entirely separate, with no observed attempts to retaliate in one region against competitive actions in another.

5.4.6 Degree of knowledge

For each of the isomorphic decisions taken by each group in Quarter n, the market research reports issued to the imitator group in the quarter n-1 were scrutinised. The

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[14] I also calculated the Herfindhal indices for market share measured by volume. The values of the two sets of indices were highly correlated (Kendall tau = 0.84, p<0.0001), but the index measured by value gave a larger number of significant results.

degree of prior knowledge available to that group in making that decision was then assessed by the researcher and classified on the following four point ordinal scale:

0) no relevant information available

1) vague information available indicating prevailing industry norms for the quantity to which the decision related

2) precise information available indicating prevailing industry norms for the quantity to which the decision related

3) precise information available regarding competitors' decisions for the quantity and region to which the decision related.

This classification was straightforward. Sample copies of the relevant market research reports and a table of the category for which each was consigned for a given class of information can be found in Exhibit 1 at the end of this chapter.

The market research reports capture all the information that is officially available to each group. There remains the possibility that groups were exchanging information informally, or acquiring it illicitly. In one instance during the meetings I observed, (Group 5 meeting to discuss their Quarter 4 decisions) a group member jocularly boasted that she had been "spying", but this was an isolated case, and information thus gained appeared to be trivial, and directional rather than precise. It is therefore unlikely that information acquired by these means has distorted the analysis.

5.4.7 Decision ambiguity

The decisions taken were allocated to three classes depending on the degree of ambiguity involved between decision and outcome, using arguments similar to those in section 4.4.1. The classification is summarised in Table 5.8.

Table 5.8: BRANDMAPS decisions classified by decision-outcome ambiguity

Causally clear	Moderately ambiguous	Highly ambiguous
Price	Salesforce salary	Media content
Advertising spend	Sales commission	Media mix
Promotional spend		Promotional type
Salesforce effort		Market entry/exit

Salesforce compensation decisions were classified as moderately ambiguous because there is ambiguity whether any increase in sales will outweigh the extra cost of raising compensation levels, partly because of danger that increased compensation will enable

personnel to reach their target quarterly earnings more quickly, and may curtail rather than increase incentives.

5.4.8 Effects of combinatorial complexity

The marketing strategy was assessed at the level of the brand in a given region, since this was the level at which competitive decisions are taken in BRANDMAPS. I conducted the analysis for the period 8, the end of the game, to give isomorphic patterns the maximum possible time to emerge.

The degree of isomorphism between brand strategies was assessed at four stages of combinatorial complexity: price alone (complexity 1), price plus advertising spend and promotional spend (complexity 3), those three marketing variables plus salesforce effort and compensation (complexity 6) and all marketing and salesforce variables (complexity 9).

I used the methodology set out in section 5.4.2 to assess the degree of similarity between strategies, and set the breakpoint for accepting two strategic elements as isomorphic as a distance of 12.5%, the same criterion used for accepting a decision as part of dataset 3 in the earlier chapters. This meant that the step from complexity 6 to complexity 9 was an exacting one; isomorphism in the three final variables, media type, media mix and promotional type, could only be achieved through a precise match between firms.

The exception to the use of the 12.5% criterion was my initial groupings of brands by price point. Here, I used my own subjective perceptions of how a consumer might group the brands, given the range of prices at which products were being offered in that market. The groupings are described in Table 5.9.

I then tracked the extent to which firms in each price grouping retained strategic similarity as the combinatorial complexity of the strategy increased. I counted the proportions of strategic elements classified as isomorphic at each stage of combinatorial complexity, and also the numbers of complete matches between pairs of firms within a price grouping.

Table 5.9 Price groupings by region, period 8

Grouping	Price band	No of firms	No of pairings
Region 1 (1 firm outside groupings)			
1.1	$600-659	3	3
1.2	$1,300-1,600	3	3
1.3	$1,800-2,150	3	3
Region 2 (1 firm outside grouping)			
2.1	$2,600-3,100	7	21
Region 3 (2 firms outside groupings)			
3.1	$2,000-2,200	4	12
3.2	$2,500-2,525	2	1
Region 4 (2 firms outside grouping)			
4.1	$2,500-2,700	8	28
Region 5 (1 firm outside groupings)			
5.1	$600-689	3	3
5.2	$1,250-1,400	2	1
Region 6 (1 firm outside groupings)			
6.1	$610-669	4	6
6.2	$2,000-2,200	2	1
6.3	$2,525-2,700	2	1
Region 7 (1 firm outside grouping)			
7.1	$2,700-2,750	2	1

5.4.9 Performance

In developing a measure of performance to use as the independent variable in H8 and H9, it was less important to mimic the measures typically used in field studies, such as ROI and ROS, than to use measures that groups might be using to monitor their own progress relative to their competitors, since it is their construction of their relative position which might be expected to influence the decision to copy another group.

Each group received each quarter detailed profit and loss statements for each brand in each region. However, only the aggregate earnings and dividend figure was obtainable for competing groups, and this was purchased by only two groups on a regular basis (intermittently by a third group). This was not therefore seen as an appropriate performance indicator for the purposes of this study.

There was no consistency between groups in the measures mentioned in the observed meetings. Since each group received a report of stock prices for all participating groups each quarter, this was adopted as one performance measure. Market share was mentioned in several meetings, and of the seven groups, three purchased market share data for all or almost all quarters, a fourth group on three consecutive occasions and a further group once. It was therefore in common use by many groups and forms a logical

measure of performance in a marketing simulation. I therefore recorded market share by volume and by value for each group in each quarter.

Since some groups might have focused more on growth than on actual levels of performance as a performance indicator, I recorded both levels and growth rates for each of the three measures. For stock prices, the growth rate was the percentage growth in price seen in each quarter versus the previous quarter. For the two market share measures, the growth rate recorded was the arithmetic difference between the share in each quarter and the previous quarter.

5.4.10 Isomorphic pressures

As discussed in Chapter 3, in this study I measure the strength of 'isomorphic pressures' *as perceived by the participants*. In this, I differ from previous researchers who have preferred, through carefully constructed proxy measures such as the density of contacts between the organisation and others in its organisational field, to measure pressures actually exerted by external bodies. Since no earlier surveys utilising these constructs were available, I operationalised the extent of isomorphic pressures using the survey questions set out in Table 5.10.

These questionnaire items covered three of the four types of isomorphism identified by DiMaggio and Powell (1983). The item for coercive isomorphism could also be seen as a partial measure of normative isomorphism, although such pressures were expected to be similar for all participants, since all had been subjected to identical and recent normative conditioning as to what constituted acceptable management behaviour through their MBA instruction.

Table 5.10: Operationalisations of the isomorphic pressures constructs

Respondents were asked to express agreement/disagreement on a seven-point Likert scale to the following questions (italicised wording did not feature on the questionnaire):
Isomorphic pressures based on legitimation
There is a lot of pressure to be the best-performing group *(competitive isomorphism)*
Our decisions are what our instructors would expect us to do *(coercive isomorphism)*
Mimetic isomorphic pressures based on information relating to peer behaviour
We are adopting our decisions because other groups have been succeeding with them
The policies we use are based on successful, real-life companies

Since the third of these questions ("We are adopting our decisions because other groups have been succeeding with them") did not apply at the time of first completion of the questionnaire, because the respondents had at that stage no opportunity to see

which strategies had been successful, responses to that question for that period were set at the mid-point (4) of the Likert scale. For all items, the full range of the scale was used at various stages, indicating a reasonable degree of discriminant validity.

My original intention was to utilise the four items as a single scale, since DiMaggio and Powell (1983) indicated that the different types of isomorphism overlapped and might be expected to coexist. However, the Cronbach alpha of the combined measures was only 0.355, and no combination of three of the four measures showed a Cronbach alpha higher than 0.40, well below the accepted minimum of 0.7. Even the two items relating to mimetic pressures based on information, which might be expected to reflect different aspects of a respondent's impulse to copy success, correlated poorly, with a Cronbach alpha of 0.19. The two items relating to legitimation had a Cronbach alpha of 0.12.

I discuss possible reasons for, and implications of, these low reliability scores in section 5.6 below. However, my conclusion was that the four questions, whilst legitimately grounded in a single body of theory, were in fact measuring different things, and I have therefore used four separate single item measures of isomorphic pressure, whose names and abbreviations are summarised in Table 5.11.

Table 5.11 Measures of isomorphic pressure

Question	Construct	Abbreviation	Range
There is a lot of pressure to be the best-performing group	Competitive isomorphic pressure	COMPI	3.25-6.25
Our decisions are what our instructors would expect us to do	Coercive isomorphic pressure	COERCI	2.66-5.75
We are adopting our decisions because other groups have been succeeding with them	Mimetic pressure from within industry	MIMIN	1.75-5.67
The policies we use are based on successful, real-life companies	Mimetic pressure external to industry	MIMEX	3.00-6.25

As with the two following survey-based measures, the mean score for each group was computed for each of the four periods at which the questionnaire was administered. This sacrificed some of the discriminant power, but a broad range of responses was obtained for each of the four measures (Table 5.11, column 4).

In testing H11a and H11b, there was the further complication that theory has not established by what mechanism such pressures translate into action.

One plausible train of events is that isomorphic decision-making would be stimulated by a rise in the overall level of pressures within the organisation, as perceived by the

totality of its members. It is equally possible, however, that isomorphic decision-making might be governed by the number of people in the organisation that were experiencing a certain, critical level of isomorphic pressure, with isomorphic decision-making becoming the norm once that proportion of individuals surpassed a certain boundary.

For H11a and H11b, I therefore operationalised two versions of each of the isomorphic pressure constructs. The *mean level* of pressure within the group would be the appropriate measure if the first of the two mechanisms described in the previous paragraph was the relevant one. For the second eventuality, I measured the *proportion* of group members reporting a pressure above 4.5 on the seven point scale. The choice of the 4.5 breakpoint was to some extent arbitrary, based on my scrutiny of the raw data.

5.4.11 Political behaviour

I experienced considerable problems in operationalising a valid measure of political behaviour for this study. The political behaviours observed in the context of organisational change (Buchanan and Boddy, 1992) were unlikely to manifest themselves in the context of the small groups undertaking the BRANDMAPS exercise. For example: since resources within the game were not dependent on particular personal behaviours, and since real-life resources such as computers were freely and equally available to all, the granting and withdrawal of resources was not available as a political behaviour; information, while scarce, was equally available to all members in a group, so that counter intelligence information did not feature as an effective political weapon; and the sponsorship of change agents and the removal of resistant elites were not options in small groups. I therefore did not seek to measure these behaviours in this study.

Although a field-tested scale for measuring political behaviour in SDM already existed (Dean and Sharfman, 1996), it too was inappropriate for this study and sample. Dean and Sharfman's (hereafter D&S) first question ("Were group members primarily concerned with their own goals, or those of the organisation?") lacked relevance in the context of a newly created "organisation" with no goals outside the game. Where individuals did have personal goals at variance with those of the team, these were more likely to translate into free rider behaviour than into an attempt to manipulate the group decisions. I had already observed, during trial research, that students reacted strongly against implications that some were exerting power over others – there was a strong group norm to appear democratic, and questions mentioning power had low

discriminant validity. Thus, I did not use D&S' third question ("To what extent was the decision affected by power and influence among group members?"). Finally, I judged that the open-ended questions, drafted by D&S for use in their structured interviews with experienced managers, were less appropriate for use in questionnaires to be completed in a limited timeframe without recourse to advice in the event of doubts as to what was being sought.

Table 5.12: Operationalisations of the political behaviour construct

Respondents were asked to express agreement/disagreement on a seven-point Likert scale to the following questions:
There was no dispute about the decisions we finally took last quarter Many in the group initially opposed the decisions that were taken Several of the group got together to press for this set of decisions, although the rest were less sure

Accordingly, I tried to design questions that evoked evidence of phenomena that were indicative of political behaviour, rather than get students to indicate directly whether they believed that political factors were at work. The phenomena in question were: the existence of disputes and opposing views within the group prior to the decision, since in the absence of disputes, political behaviour will not manifest itself; and negotiation between coalitions (Pfeffer, 1981; Narayanan and Fahey, 1982; Pettigrew and Whipp, 1991). The relevant questionnaire items are shown in Table 5.12

Although the questions relate more to the discovery of the preconditions for political behaviour than to the identification of such behaviour in operation, the hope was that together they would furnish a reliable gauge of political activity. However, the reliability of the combined measure of political behaviour, derived from averaging the scores of the three questions, was poor, with a Cronbach alpha of 0.35. I have therefore used the responses to the final question in table 5.12 as a single item indicator of political behaviour.

The discriminant validity of this measure appeared adequate, with all seven points on the scale being used, though on amalgamation of individual into group measures, the range was compressed to 2.25-5.0.

This variable may have been subject to a self-presentation effect, with subjects reluctant to admit to the existence of conflict in their group. Maturation and selection effects were controlled for by the use of relevant control variables (see 5.4.13) and so are not discussed here.

5.4.12 Strategic intent

I was unable to discover an appropriate measurement scale for strategic intent in the literature. Collins and Porras (1994) have instruments for assessing the attributes of visionary companies, but this relies on abundant pre-existing data about the firm and its institutions and could not be applied to a student group in a simulation. Bourgeois (1980) measured the related concept of consensus on goals by comparing the weights managers attached to items such as profit, growth, innovation and community service – again, this was not appropriate to the simulation context and in any case omitted the visionary and long-term aspects of strategic intent.

Table 5.13: Operationalisations of the strategic intent construct

Respondents were asked to express agreement/disagreement on a seven-point Likert scale to the following questions: We have a clear view of the winning strategy My team members and I share similar goals and objectives We have a long-term plan that guides our decisions

A scale for strategic intent was therefore developed based upon plausible attributes of shared long-term vision, and is shown in Table 5.13. As with the previous two variables, discriminant validity appeared adequate, although compressed by the group averaging process to a range of 3.66-6.09. Reliability for the combined three-variable measure was just outside normally accepted criteria, with a Cronbach alpha of 0.68.

5.4.13 Control variables

For the examination of H10, H11a and H11b, where regression analysis is employed to assess the degree of association, I included a number of control variables.

5.4.13.1 Group heterogeneity

The reasons for including measures of group heterogeneity as control variables were established in section 4.6.1. I have followed common practice (Hambrick, Cho and Chen, 1996) in using demographic proxy measures of differences in team members' cognitive structures, rather than seeking to measure these structures directly.

Educational background is one variable that is commonly measured in diversity studies, but was not needed in this case since this sample was drawn from an MBA class with highly standardised entry requirements. Management tenure within the firm is another frequently measured source of diversity. In this exercise, all members of all groups start with no experience and develop experience together at, presumably, a broadly similar rate, so length of service will not be a source of inter-group variation.

However, within this study observations from different time periods were to be combined in a single series, and differences in tenure, along with degree of familiarity within the group may be a source of longitudinal variation. I therefore introduced a control variable representing elapsed time, measured simply by the period in which an observation was taken.

Of the other sources of diversity commonly measured in studies, age heterogeneity could be controlled for by using a variable representing the coefficient of variation (standard deviation/mean) of the ages in each group, but information on functional backgrounds was unavailable. I have, however, introduced dummy variables to take account of whether groups were all full-time students, all part-time students or mixed.

Heterogeneity in national background is not commonly controlled for in diversity studies, presumably because they invariably use managers or samples of firms drawn exclusively from the USA. Given the large number of nationalities represented within the sample, and the abundant evidence (Hofstede, 1980, 1991) of national cultural differences as a potent potential source of cognitive heterogeneity, I introduced a control variable measured by the number of nationalities present in each team of five. This varied between 1 (there were some all UK groups) and 5. Recent research has in fact suggested (Earley and Mosakowski, 2000) that the relationship between consensus formation and number of nationalities is U-shaped, with consensus being favoured by high degrees of both uniformity and diversity but inhibited by intermediate levels of diversity. However, I felt that our teams were too small to permit a full operationalisation of this relationship, and so opted for a simpler, linear version.

5.4.13.2 Top management team tenure

As already discussed (section 3.6.5) there is are empirically established links between length of TMT tenure and adherence to industry norms. Hence it would be expected that the length of tenure of a TMT would be positively associated with sensitivity to isomorphic pressures.

Since all groups in the BRANDMAPS simulation have the same length of tenure, it is impossible in the current exercise to test this variable independently of industry age. I do, however, include industry age as a control variable to take account of increasing length of tenure in the population as a whole.

5.4.13.3 Average age

Since managers have been shown to become more risk-averse with age (Carlson and Karlsson, 1970; Vroom and Pahl, 1971; Child, 1974; Wiersema and Bantel, 1992), and

since risk-aversion is a possible source of isomorphic pressures, I controlled for the average age of group members.

5.5 Summary

In this chapter, I have demonstrated why a simulated environment is appropriate for studies in which it is necessary both to gather attitudinal data and to measure precisely which decisions were taken, on the basis of which information, and how closely they resembled those previously taken by others. I have summarised the issues on internal and external validity of quasi-field studies based on simulated environments, showing that there is a consistent stream of such studies, including those based, like the current study, on marketing games, in reputable journals.

I have reviewed the issues relating to internal and external validity arising from both the overall study design and the operationalisation of individual variables, demonstrating that there are no significant threats to validity on either count. I have demonstrated that though the design for the study is basically sound, there is some danger that the small sample size and low number or readings for the isomorphic pressure, political behaviour and strategic intent variables may prejudice reliability.

Exhibit 1: BRANDMAPS Marketing Research Content Analysis

Report		Price	Advertising Spend	Media Content	Media Mix	Promotional Spend	Promotional Type	Sales Effort	Sales Salary	Sales Commission	Entry/exit	Comments
	1 = vague data on industry norms *2 = precise data on industry norms* *3 = precise information on competitors' decisions*											
1	Competitive Information – Dividends and Earnings											
2	Brand Composition Analysis											
3	Industry Sales Force Size							2				
4	Industry Advertising		2									
5	Industry Sales Force Compensation								2	2		
6	Industry Promotion					2						
7	Industry R&D											
8	Media Content Analysis			3								
9	Promotional Type Analysis						3					
10	Conjoint Analysis											"Competing" brands are hypothetical
11	Customer Brand Awareness										3	
12	Concept Testing											
13	Preference Testing, Two Existing Brands	3										Information only for specified products
14	Preference Testing, One Existing and One Hypothetical Brand	3										Information only for specified products
15	Preference Testing, Two Hypothetical Brands											
16	Operating Statistics Report		1		1		1	1	1	1		
17	Brand Quality Ratings										3	
18	Patent Search											
19	Competitive Information - Balance Sheets											
20	Test Marketing Experiment											
21	Brand Perceptual Ratings										3	
22	Aggregate Market Statistics											
23	Reformulation Activity											
24	Market Shares										3	
25	Dealer Prices	3										
26	Dealer Rebates										1	
27	Dealer Promotion Awareness					1					1	
28	Dealer Availability										3	
29	Competitive Position Audit	1	1			1		1	1	1		
30	Patent Zone Search											
31	Industry Sales Volume Forecast											
32	Brand Sales Volume Forecast											
33	Reformulation Activity – Detailed										1	

Report		Price	Advertising Spend	Media Content	Media Mix	Promotional Spend	Promotional Type	Sales Effort	Sales Salary	Sales Commission	Entry/exit	Comments
	1 = vague data on industry norms *2 = precise data on industry norms* *3 = precise information on competitors' decisions*											
34	Another Conjoint Analysis											As Report 10
35	Advertising Program Experiment											
36	Competitive Information – Brand Marketing Profiles	3	3	3	3	3	3	3			3	For requested products and regions
37	Competitive Information - Sales Force Compensation Statistics							3	3	3		
38	Promotion Experiment											
39	Competitive Information - Unfilled Sales Volume										3	
40	Competitive Information – Brand Margin Analysis	3										
41	Regional Summary Analysis	3	2			2		2			3	
42	Marketing Research Ordering Statistics											
43	Marketing Support Spending Productivity Analysis		2			2		1	1	1		
44	Population Forecasts											
45	Per Capita Income Forecasts											
46	Consumer Price Index Forecasts											
47	Self-Reported Attribute Preferences											
48	Brand Satisfaction Ratings										3	
49	Dealer Inventory Analysis										3	
50	Price Sensitivity Analysis	3									3	

MARKETING RESEARCH STUDY # 1 (COMP INFO - DIVIDENDS AND EARNINGS)

	CURRENT QUARTER		CUMULATIVE YEAR-TO-DATE
	DIVIDENDS	EARNINGS	EARNINGS
FIRM 1	1,000,000	-155,440	-2,355,433
FIRM 2	0	2,640,000	2,641,010
FIRM 3	6,343,242	9,029,727	19,029,727
...			

MARKETING RESEARCH STUDY # 2 (BRAND COMPOSITION ANALYSIS)

PRODUCT 7-2 COMPOSITION: 65/23/25/45/ 5/5/8 [Patent Protection Zone 19]

MARKETING RESEARCH STUDY # 3 (INDUSTRY SALES FORCE SIZE)

	QUARTER 25	QUARTER 26	QUARTER 27	QUARTER 28	QUARTER 29
REG. 1 (U.S.)	310	390	450	480	575
REG. 2 (U.K.)	295	195	100	150	125
REG. 3 (C.EUROPE)	320	375	375	190	210
REG. 4 (CANADA)	300	200	255	270	225
REG. 5 (PACIFIC)	100	80	90	85	92
TOTAL	1,325	1,240	1,270	1,175	1,227

MARKETING RESEARCH STUDY # 4 (INDUSTRY ADVERTISING)

	QUARTER 12	QUARTER 13	QUARTER 14	QUARTER 15	QUARTER 16
REG. 1 (EASTERN)	7,500,000	1,600,000	1,000,000	3,000,000	5,500,000
REG. 2 (SOUTHERN)	6,400,000	2,650,000	2,750,000	7,000,000	6,500,000
REG. 3 (CENTRAL)	9,050,000	7,900,000	8,600,000	8,000,000	5,500,000
TOTAL	28,950,000	25,200,000	43,050,000	45,200,000	42,000,000

MARKETING RESEARCH STUDY # 5 (INDUSTRY SALES FORCE COMPENSATION)

	ALL REGIONS	REGION 1 (EASTERN)	REGION 2 (SOUTHERN)	REGION 3 (CENTRAL)	REGION 4 (PACIFIC)
Salaries	2,580	2,602	2,533	2,611	2,568
Commissions	650	699	979	484	464
Compensation	3,230	3,301	3,512	3,095	3,032
Compensation (SD)	278	281	321	219	234
Commission Rate	1.8	1.7	2.0	1.5	2.0

MARKETING RESEARCH STUDY # 6 (INDUSTRY PROMOTION)

	QUARTER 5	QUARTER 6	QUARTER 7	QUARTER 8	QUARTER 9
REG. 1 (EASTERN)	5,960,000	7,192,000	5,725,186	9,200,000	5,200,000
REG. 2 (SOUTHERN)	4,760,000	2,408,000	1,500,000	4,500,000	3,000,000
REG. 3 (CENTRAL)	6,250,000	4,500,000	9,225,186	5,500,000	4,750,000
REG. 4 (WESTERN)	7,000,000	4,650,000	6,306,483	1,300,000	6,700,000
TOTAL	23,970,000	18,750,000	22,756,856	20,500,000	24,650,000

MARKETING RESEARCH STUDY # 7 (INDUSTRY R&D)

	QUARTER 15	QUARTER 16	QUARTER 17	QUARTER 18	QUARTER 19
AVERAGE R&D	571,250	497,500	412,500	302,666	244,375

MARKETING RESEARCH STUDY # 8 (MEDIA CONTENT ANALYSIS)

	QUARTER 55	QUARTER 56	QUARTER 57	QUARTER 58	QUARTER 59
REGION 1 (U.S.)					
Product 1-1	12	12	12		15
Product 2-1	1	0	21	7	14
Product 4-2	19	19	13	14	11
Product 6-1	8	15	15	15	15
REGION 2 (EUROPE)					
Product 1-3			7	7	7
Product 3-2				9	10
Product 4-3	16	7	7	7	15
...					

MARKETING RESEARCH STUDY # 9 (PROMOTIONAL TYPE ANALYSIS)

	QUARTER 8	QUARTER 9	QUARTER 10	QUARTER 11	QUARTER 12
REGION 1 (EASTERN)					
Product 1-1	10	0	0		32
Product 2-1	48	0	23	26	92
Product 5-1	9	9	0	6	10
Product 6-1	0	10	10	10	10
REGION 2 (SOUTHERN)					
Product 3-2				43	94
Product 4-3	96	10	10	10	10
...					

MARKETING RESEARCH STUDY #10 (CONJOINT ANALYSIS)

		REGION 6 (PACIFIC)
RELATIVE IMPORTANCES (given the attribute levels in the design of this conjoint study)	SYNTECH	13.7%
	PLUMBO	23.2%
	GLOMP	23.6%
	TRIMICRO	17.6%
	FRALANGE	.0%
	COMPATIBILITY	4.6%
	WARRANTY	3.1%
	DEALER PRICE	14.1%
WEIGHTS FOR ATTRIBUTE #1. SYNTECH	Level #1 (10)	65.3
	Level #2 (40)	64.4
	Level #3 (60)	37.8
	Level #4 (70)	7.2
WEIGHTS FOR ATTRIBUTE #2. PLUMBO	Level #1 (20)	1.6
	Level #2 (40)	25.4
	Level #3 (60)	100.0
WEIGHTS FOR ATTRIBUTE #3. GLOMP	Level #1 (20)	99.9
	Level #2 (40)	84.4
	Level #3 (60)	17.6
	Level #4 (80)	.0
WEIGHTS FOR ATTRIBUTE #4. TRIMICRO	Level #1 (10)	10.6
	Level #2 (20)	39.1
	Level #3 (30)	67.8
	Level #4 (40)	85.2
WEIGHTS FOR ATTRIBUTE #5. FRALANGE	Level #1 (5)	13.5
WEIGHTS FOR ATTRIBUTE #6. COMPATIBILITY	Level #1 (2)	43.8
	Level #2 (4)	51.3
	Level #3 (6)	56.9
	Level #4 (8)	63.4
WEIGHTS FOR ATTRIBUTE #7. WARRANTY	Level #1 (2)	47.1
	Level #2 (4)	52.9
	Level #3 (6)	56.5
	Level #4 (8)	60.3
WEIGHTS FOR ATTRIBUTE #8. DEALER PRICE	Level #1 (500)	90.3
	Level #2 (750)	67.2
	Level #3 (1,000)	44.4
	Level #4 (1,250)	30.4

MARKETING RESEARCH STUDY #11 (CUSTOMER BRAND AWARENESS)

	QUARTER 6	QUARTER 7	QUARTER 8	QUARTER 9	QUARTER 10
REGION 1 (NORTHERN)					
Product 1-1	37.92	28.82	24.92		42.42
Product 3-1	43.00	62.67	63.17	50.16	53.64
Product 4-2	32.60	36.32	43.51	40.50	66.13
Product 6-1	30.60	59.16	76.32	79.95	78.74
REGION 2 (EASTERN)					
Product 1-3			19.15	42.37	47.02
Product 3-2				17.62	47.28
Product 4-3	17.92	28.76	46.27	48.79	73.25

...

MARKETING RESEARCH STUDY #12 (CONCEPT TESTING)

CONCEPT TESTING RESULTS FOR REGION 3 (S.EUROPE): QUARTER 33
CONCEPT 34/76/12/91/ 5/2/6 : 13.9% DEGREE-OF-INTEREST

MARKETING RESEARCH STUDY #13 (PREFERENCE TESTING, 2 EXISTING BRANDS)

TEST RESULTS FOR REGION 1 (NORTHERN): QUARTER 6 (SPRING)
PRODUCT 1-2, DEALER PRICE = 880 : 40.1% PREFERENCE
PRODUCT 9-3, DEALER PRICE = 1.520 : 59.9% PREFERENCE

TEST RESULTS FOR REGION 1 (NORTHERN): QUARTER 6 (SPRING)
PRODUCT 1-2, DEALER PRICE = 880 : 12.9% PREFERENCE
PRODUCT 9-3, DEALER PRICE = 1.222 : 81.1% PREFERENCE

MARKETING RESEARCH STUDY #14 (PREFERENCE TESTING, 1 EX AND 1 HYP)

TEST RESULTS FOR REGION 2 (WESTERN): QUARTER 22 (SPRING)
PRODUCT 8-3, DEALER PRICE = 1.841 : 12.9% PREFERENCE
PRODUCT 33/35/67/12/ 5/7/8, DEALER PRICE = 1.922 : 87.1% PREFERENCE

MARKETING RESEARCH STUDY #15 (PREFERENCE TESTING, 2 HYP BRANDS)

TEST RESULTS FOR REGION 3 (EUROPE): QUARTER 36 (FALL)
PRODUCT 22/12/27/43/ 5/3/2, DEALER PRICE = 1.520 : 41.2% PREFERENCE
PRODUCT 94/44/ 4/11/ 5/9/3, DEALER PRICE = 1.110 : 58.8% PREFERENCE

MARKETING RESEARCH STUDY #16 (OPERATING STATISTICS REPORT)

		INDUSTRY NORMS		
	FIRM 6	MINIMUM	AVERAGE	MAXIMUM
OPERATING STATISTICS (YTD)				
ADVERTISING/REVENUES	7.0%	2.5%	5.7%	9.4%
EMERGENCY PRODUCTION PREMIUMS/REVENUES	.0%	.0%	.0%	.0%
INVENTORY CHARGES/REVENUES	1.4%	.2%	1.5%	2.7%
[EMERG PREMIUMS + INV CHARGES]/REVENUES	1.4%	.2%	1.5%	2.7%
MARKETING RESEARCH/REVENUES	.1%	.1%	.4%	.9%
PROMOTION/REVENUES	4.4%	1.3%	4.3%	6.8%
RESEARCH AND DEVELOPMENT/REVENUES	.5%	.3%	.9%	1.8%
SALES FORCE SPENDING/REVENUES	8.3%	2.7%	4.8%	8.3%
DEPRECIATION/PRODUCTION VOLUME	112.2	108.2	119.6	129.0
LOST MARGIN DUE TO STOCKOUTS/REVENUES	.0%	.0%	.6%	2.6%
MARKETING SUPPORT SPENDING/REVENUES	20.2%	6.9%	15.8%	22.3%
PROFITS/REVENUES	6.5%	3.9%	8.2%	14.4%
SALES FORECASTING ACCURACY SCORE	22.8%	22.8%	55.4%	95.5%
OPERATING EFFICIENCY SCORE	29.0	25.0	35.0	55.5
FINANCIAL RATIOS				
DEBT LEVERAGE	4.3%	.0%	17.6%	56.1%
INVENTORY TURNS	3.9	3.9	6.8	12.2
REVENUE TO WORKING CAPITAL	20.0	2.2	14.2	20.0
RETURN ON ASSETS	4.4%	2.1%	6.0%	11.9%
RETURN ON EQUITY	4.6%	2.1%	7.2%	15.3%

MARKETING RESEARCH STUDY #17 (BRAND QUALITY RATINGS)

	QUARTER 25	QUARTER 26	QUARTER 27	QUARTER 28	QUARTER 29
Product 1-1	45.57	35.29	28.11		24.77
Product 1-2	2.28	4.63	6.11	24.78	46.77
Product 1-3			2.17	22.54	47.18
Product 2-1	31.67	23.71	27.49	42.20	49.84
Product 2-2	36.49	43.91	48.65	52.93	59.65
Product 2-3	20.50	32.05	42.03	48.93	52.66
Product 3-1	58.54	50.28	58.11	62.11	63.41
Product 3-2	37.10	49.08	55.92	51.82	58.26
...					

MARKETING RESEARCH STUDY #18 (PATENT SEARCH)

*** PATENT FOR PROPOSED PRODUCT COMPOSITION IS AVAILABLE
PRODUCT 35/45/55/12/ 5/9/7 WOULD NOT VIOLATE ANY EXISTING PATENT(S) ***

MARKETING RESEARCH STUDY #19 (COMPETITIVE INFORMATION - BALANCE SHEETS)

****
DIVISIONAL BALANCE SHEET FOR FIRM 1. QUARTER 55
****

ASSETS			
CASH			5,431,851
MARKETABLE SECURITIES			19,045,029
FINISHED GOODS INVENTORY:			
PRODUCT 1	(10,467 Units)	[$ 601.25 Per Unit]	6,293,331
PRODUCT 2	(0 Units)	[$ .00 Per Unit]	0
PRODUCT 3	(44,795 Units)	[$ 468.01 Per Unit]	20,964,326
PLANT:			
CURRENT PLANT		[CAPACITY = 99,716]	71,741,712
PLANT ON ORDER FOR 1 QUARTER HENCE		[CAPACITY = 0]	0
TOTAL ASSETS			123,476,249
LIABILITIES AND EQUITY			
LOANS			0
INITIAL (QUARTER 0) CORPORATE CAPITALIZATION			120,000,000
- DIVIDENDS PAID, PRIOR TO THIS YEAR			-3,608,825
- DIVIDENDS PAID, END OF QUARTER 1 OF THIS YEAR			-880,000
- DIVIDENDS PAID, END OF QUARTER 2 OF THIS YEAR			0
- DIVIDENDS PAID, END OF QUARTER 3 OF THIS YEAR			0
- DIVIDENDS PAID, END OF QUARTER 4 OF THIS YEAR			0
+ RETAINED EARNINGS (AFTER-TAX INCOME PRIOR TO THIS YEAR)			5,325,074
+ YEAR-TO-DATE EARNINGS (AFTER-TAX INCOME THIS YEAR)			2,640,000
TOTAL LIABILITIES AND EQUITY			123,476,249

MARKETING RESEARCH STUDY #20 (TEST MARKETING EXPERIMENT)
EXPERIMENTAL (TEST CASE) SCENARIO
TEST MARKETING RESULTS FOR PRODUCT 1-1 FOR REGION 2 (EUROPE)

	QUARTER 11 [Actual]	QUARTER 12 [Forecast]	QUARTER 13 [Forecast]	QUARTER 14 [Forecast]
MARKET SHARE	8.51%	5.65%	5.12%	4.90%
INDUSTRY SALES (Units)	85.497	92.499	96.290	89.470
**PRICE	570	700	700	700
BRAND SALES (Units)	7.278	5.224	4.930	4.381
REVENUE	4.148.460	3.656.800	3.451.000	3.066.700
PRODUCT COSTS	1.519.578	1.090.722	1.029.338	914.712
REBATES	0	0	0	0
SALES COMMISSIONS	41.484	109.704	103.530	92.001
TRANSPORTATION	189.228	135.824	128.180	113.906
DUTIES & TARIFFS	0	0	0	0
GROSS MARGIN	2.398.170	2.320.550	2.189.952	1.946.081
TOTAL FIXED COSTS	4.841.484	6.209.704	6.203.530	6.192.001
OPERATING INCOME	-2.443.314	-3.889.154	-4.013.578	-4.245.920
**Product Composition	11/12/13/ 24/ 5/5/6	11/12/13/ 24/ 5/7/7	11/12/13/ 24/ 5/7/7	11/12/13/ 24/ 5/7/7
Advertising Spending	2.000.000	2.000.000	2.000.000	2.000.000
Media Content & Mix	1 & 55555	1 & 55555	1 & 55555	1 & 55555
**Promotion Spending	1.000.000	2.000.000	2.000.000	2.000.000
Promotional Type	10	10	10	10
Res & Dev Spending	250.000	250.000	250.000	250.000
**Sales Force Salary + Commis	2.500 + 1	3.000 + 3	3.000 + 3	3.000 + 3
Sales Force Size	200	200	200	200
Sales Force Time Allocation	50%	50%	50%	50%
Sales Force Spending	1.541.484	1.909.704	1.903.530	1.892.001
Customer Brand Awareness	76.96%	75.96%	75.72%	72.75%
Dealer Promotion Awareness	93.83%	98.32%	96.05%	96.10%
Dealer Availability	74.98%	74.31%	68.75%	65.01%
Product Quality Rating	55.93%	54.94%	56.03%	55.06%
Perceived Performance	.01%	.01%	.01%	.01%
Perceived Convenience	39.42%	26.98%	25.49%	23.43%

*** NOTES ***
In this test marketing experiment, OPERATING INCOME is calculated assuming that administrative overhead for this brand is at its base level and that research and development spending associated with this brand is completely allocated to this market region. Double asterisks ("**") to the left denote decision variables that have been changed in this test marketing experiment.

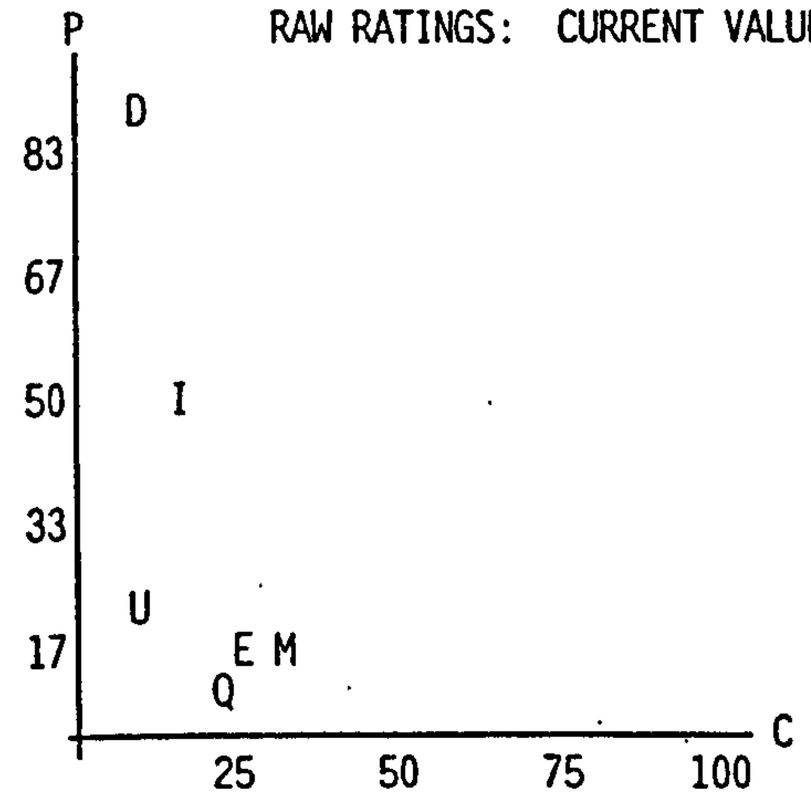
MARKETING RESEARCH STUDY #21 (BRAND PERCEPTUAL RATINGS)

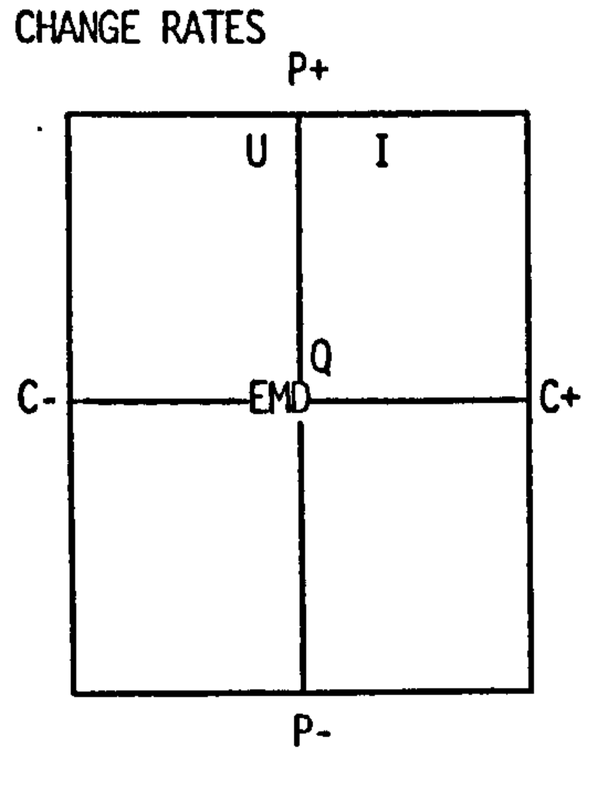
		CORRELATION BETWEEN VOLUME MARKET SHARE AND ..					
	Data Points	PERFOR	CONVEN	DEALER PRICE	PREVIOUS VOLUME MK SHARE	PERFOR PER $000	CONVEN PER $000
REGION 1 (EASTERN)	11	-.01	.35	-.01	.65	.08	.49
REGION 2 (SOUTHERN)	9	.58	.61	.01	.87	.64	.64
REGION 3 (CENTRAL)	6	.78	.83	.00	.80	.75	.82
REGION 4 (WESTERN)	10	.59	.84	.39	.85	.63	.86
REGION 5 (PACIFIC)	14	.34	.23	.48	.65	.23	.34
REGION 6 (EUROPE)	15	.56	.38	.32	.70	.44	.46
REGION 7 (CANADA)	8	.44	.33	.22	.36	.41	.51

	MEAN SELF-REPORTED IMPORTANCE WEIGHTS			
	PERFORMANCE PERCEPTION	CONVENIENCE PERCEPTION	DEALER PRICE	SUM
REGION 1 (EASTERN)	19.42	30.86	49.72	100.00
REGION 2 (SOUTHERN)	24.62	33.04	42.34	100.00
REGION 3 (CENTRAL)	32.82	29.18	37.99	100.00
REGION 4 (WESTERN)	29.96	27.01	43.03	100.00
REGION 5 (PACIFIC)	33.21	32.12	34.67	100.00
REGION 6 (EUROPE)	41.22	21.22	37.56	100.00
REGION 7 (CANADA)	28.98	51.01	20.01	100.00

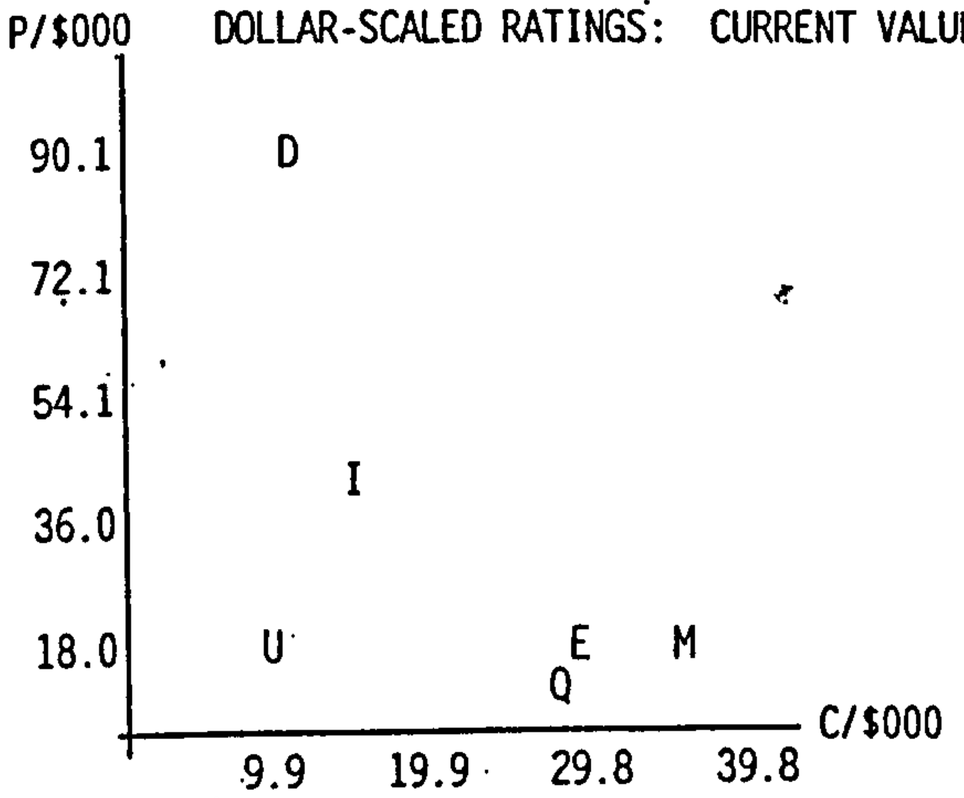
PERCEPTUAL MAPS FOR MARKET REGION 3 (CENTRAL): QUARTER 88 (FALL)

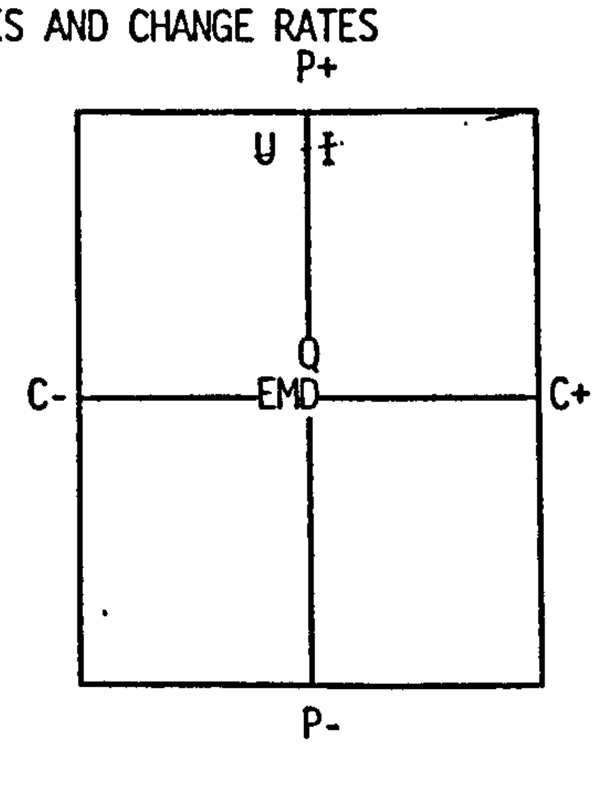
RAW RATINGS: CURRENT VALUES AND CHANGE RATES





P/$000 DOLLAR-SCALED RATINGS: CURRENT VALUES AND CHANGE RATES





LEGEND

A	1-1	E	2-1	I	3-1	M	4-1	Q	5-1	U	6-1	Y	7-1	3	8-1	7	9-1	LEGEND	
B	1-2	F	2-2	J	3-2	N	4-2	R	5-2	V	6-2	Z	7-2	4	8-2	8	9-2		
C	1-3	G	2-3	K	3-3	O	4-3	S	5-3	W	6-3	1	7-3	5	8-3	9	9-3		
D	1-4	H	2-4	L	3-4	P	4-4	T	5-4	X	6-4	2	7-4	6	8-4	@	9-4		

MARKETING RESEARCH STUDY #22 (AGGREGATE MARKET STATISTICS)

	POPULATION	CONSUMER PRICE INDEX	PER CAPITA INCOME	INDUSTRY SALES VOLUME PREVIOUS	INDUSTRY SALES VOLUME CURRENT
REGION 1 (EASTERN)	91,715,304	1,130	13,562	255,093	278,035
REGION 2 (SOUTHERN)	40,534,496	975	11,383	99,532	103,557
REGION 3 (CENTRAL)	72,766,512	1,096	13,022	237,398	233,082
REGION 4 (WESTERN)	51,312,308	1,073	12,474	192,002	205,160

...

MARKETING RESEARCH STUDY #23 (REFORMULATION ACTIVITY)

NUMBER OF REFORMULATION BIDS SUBMITTED	=	4
LOWEST REFORMULATION BID SUBMITTED	= $	555
AVERAGE REFORMULATION BID SUBMITTED	= $	404,438
HIGHEST REFORMULATION BID SUBMITTED	= $	673,198
NUMBER OF SUCCESSFUL REFORMULATION BIDS	=	4
LOWEST SUCCESSFUL REFORMULATION BID	= $	555

Product 1-3 Has Been Reformulated Since Last Quarter
Product 2-3 Has Been Reformulated Since Last Quarter
Product 7-4 Has Been Reformulated Since Last Quarter
Product 9-1 Has Been Reformulated Since Last Quarter

Study 24 – see overleaf

MARKETING RESEARCH STUDY #25 (DEALER PRICES)

	QUARTER 5	QUARTER 6	QUARTER 7	QUARTER 8	QUARTER 9
REGION 1 (EASTERN)					
Product 1-1	735	733	1,288		1,288
Product 4-2	1,288	1,403	1,408	1,433	1,608
Product 6-1	855	2,274	2,289	2,398	3,185

...

MARKETING RESEARCH STUDY #26 (DEALER REBATES)

	QUARTER 5	QUARTER 6	QUARTER 7	QUARTER 8	QUARTER 9
REGION 1 (U.S.)					
Product 1-1	0	0	0		0
Product 2-1	0	0	20	0	0
Product 6-1	0	0	0	0	0
REGION 2 (CANADA)					
Product 1-3		0	0		0
Product 2-2			40		0
Product 3-2			0		0

...

MARKETING RESEARCH STUDY #24 (MARKET SHARES)

OVERALL VOLUME MARKET SHARES [CURRENT]

FIRM 1 OVERALL MARKET SHARE =	11.44	[Previous Market Share = 9.99]
FIRM 2 OVERALL MARKET SHARE =	26.58	[Previous Market Share = 27.07]
FIRM 3 OVERALL MARKET SHARE =	8.79	[Previous Market Share = 6.68]
FIRM 4 OVERALL MARKET SHARE =	23.34	[Previous Market Share = 22.89]
FIRM 5 OVERALL MARKET SHARE =	25.03	[Previous Market Share = 24.16]
FIRM 6 OVERALL MARKET SHARE =	4.82	[Previous Market Share = 9.21]

VOLUME MARKET SHARES

	QUARTER 41	QUARTER 42	QUARTER 43	QUARTER 44	QUARTER 45
REGION 1 (EASTERN)					
Product 1-1	12.72	6.84	.08		5.59
Product 2-1	11.66	4.62	10.74	17.20	12.70
Product 3-1	9.39	12.90	16.51	15.44	15.84
Product 4-2	37.11	43.28	26.89	29.23	32.30
Product 5-1	15.28	13.59	17.15	9.84	19.37
Product 6-1	6.62	17.54	28.62	28.29	14.20
REGION 2 (SOUTHERN)					
Product 1-3			6.29	13.50	13.01
Product 2-2				1.25	.98
Product 3-2				5.28	13.59
Product 4-3	19.08	54.42	74.43	68.98	72.42

...

OVERALL DOLLAR MARKET SHARES [CURRENT]

FIRM 1 OVERALL MARKET SHARE =	9.69	[Previous Market Share = 8.75]
FIRM 2 OVERALL MARKET SHARE =	24.94	[Previous Market Share = 23.47]
FIRM 3 OVERALL MARKET SHARE =	10.24	[Previous Market Share = 8.88]
FIRM 4 OVERALL MARKET SHARE =	21.70	[Previous Market Share = 18.37]
FIRM 5 OVERALL MARKET SHARE =	22.66	[Previous Market Share = 25.98]
FIRM 6 OVERALL MARKET SHARE =	10.77	[Previous Market Share = 14.55]

DOLLAR MARKET SHARES

	QUARTER 41	QUARTER 42	QUARTER 43	QUARTER 44	QUARTER 45
REGION 1 (EASTERN)					
Product 1-1	9.42	3.16	.05		4.02
Product 2-1	8.53	2.10	8.58	12.96	10.97
Product 3-1	8.66	19.59	20.50	18.12	16.91
Product 4-2	48.14	38.22	19.52	22.56	29.01
Product 5-1	12.20	10.84	17.58	9.81	13.84
Product 6-1	5.70	25.09	33.76	36.55	25.26
REGION 2 (SOUTHERN)					
Product 1-3			8.25	15.32	14.63
Product 2-2				1.11	.85
Product 3-2				6.42	14.20
Product 4-3	22.15	55.38	75.06	68.78	70.33

...

MARKETING RESEARCH STUDY #27 (DEALER PROMOTION AWARENESS)

	QUARTER 5	QUARTER 6	QUARTER 7	QUARTER 8	QUARTER 9
REGION 1 (CANADA)					
Product 2-1	23.85	.13	82.31	87.71	89.74
Product 3-1	75.09	77.27	77.51	49.43	88.59
Product 4-2	82.35	87.46	88.00	86.68	77.47
Product 5-1	42.20	14.52	.07	49.84	72.34
Product 6-1	.01	89.01	89.15	91.53	96.85

...

MARKETING RESEARCH STUDY #28 (DEALER AVAILABILITY)

	QUARTER 5	QUARTER 6	QUARTER 7	QUARTER 8	QUARTER 9
REGION 1 (EASTERN)					
Product 1-1	53.45	45.47	33.83		11.62
Product 4-2	31.85	78.21	81.01	74.25	75.38
Product 5-1	65.37	60.61	56.10	55.99	45.75
Product 6-1	51.48	49.59	68.65	86.33	89.87
REGION 2 (SOUTHERN)					
Product 1-3			4.33	19.57	49.90
Product 2-2				1.01	1.01
Product 4-3	5.46	32.81	64.32	81.99	85.83

...

MARKETING RESEARCH STUDY #29 (COMPETITIVE POSITION AUDIT)

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COMPETITIVE POSITION AUDIT FOR PRODUCT 6-2 QUARTER 81 (WINTER)

****

	REGION 1 (U.S.)	REGION 2 (CANADA)	REGION 3 (EUROPE)	REGION 4 (JAPAN)
Product Actively Distributed?	Yes	Yes	No	Yes
Current Volume Market Share	15.36	4.74	.00	15.98
Previous Volume Market Share	24.13	14.61	.00	22.11
Relative Sales Revenues	-	-		Average
Relative Gross Margin	Average	-		Average
Relative Operating Income	Average	Average		++
Relative Distributor Price	Average	Average		Average
Change in Manufacturer Price?	No	No		No
Relative Performance	-	Average		Average
Relative Convenience	Average	Average		Average
Relative Product Desirability	-	Average		Average
Relative Product Quality	Average	Average		Average
Relative R&D Spending	-	Average		Average
Product Just Reformulated?	No	No		No
Relative Customer Awareness	Average	--		Average
Relative Advertising Spending	-	Zero		-
Change in Media Content?	No	No		No
Relative Deal Awareness	---	--		-
Relative Promotion Spending	--	Zero		-
Relative Dealer Availability	+	+		Average
Relative Dealer Margin	--	-		Average
Relative Dealer Rebate	Zero	Zero&Ave		Zero
Relative Sales Force Effort	+	Average		Average
Relative Sales Force Size	+	-		-
Relative Sales Force Compens	---	+		--

Legend: ++++	More Than 2.0 Standard Deviations Above Mean
+++	Between 1.5 and 2.0 Standard Deviations Above Mean
++	Between 1.0 and 1.5 Standard Deviations Above Mean
+	Between 0.5 and 1.0 Standard Deviations Above Mean
Average	Between -0.5 and +0.5 Standard Deviations From Mean
-	Between 0.5 and 1.0 Standard Deviations Below Mean
--	Between 1.0 and 1.5 Standard Deviations Below Mean
---	Between 1.5 and 2.0 Standard Deviations Below Mean
----	More Than 2.0 Standard Deviations Below Mean
Zero	Variable Has Value of Zero (0)
Zero&Ave	Variable Has Value of Zero (0) Which Also Equals Average

MARKETING RESEARCH STUDY #30 (PATENT ZONE SEARCH)

PATENT ZONE SEARCH AROUND 12/23/34/45/ 5/6/6:
11/22/33/44/ 5/6/6 OK 11/22/33/45/ 5/6/6 XX 11/22/33/46/ 5/6/6 OK
...

MARKETING RESEARCH STUDY #31 (INDUSTRY SALES VOLUME FORECASTS)

	QUARTER 7 [History]	QUARTER 8 [History]	QUARTER 9 [History]	QUARTER 10 [Forecast +/- Error]
REGION 1 (U.S.)	252,347	255,093	278,035	299,996 +/- 7,083
REGION 2 (U.K.)	52,407	99,532	103,557	107,544 +/- 2,922
REGION 3 (C.EUROPE)	211,294	237,398	233,082	228,580 +/- 4,845
REGION 4 (JAPAN)	235,875	192,002	205,160	220,616 +/- 5,035
REGION 5 (HK/T/K/S)	35,875	92,002	105,160	120,616 +/- 6,036

*** NOTE ***
"Error" corresponds to the 90% confidence interval for the forecast value. For example, a forecast of "110,120 +/- 4,451" corresponds to a 90% degree-of-confidence that the true value lies between 105,669 (110,120-4,451) and 114,571 (110,120+4,451). Of course, this also implies that there is a 10% chance that the true value will be less than 105,669 or more than 114,571.

MARKETING RESEARCH STUDY #32 (BRAND SALES VOLUME FORECASTS)

	QUARTER 7 [History]	QUARTER 8 [History]	QUARTER 9 [History]	QUARTER 10 [Forecast +/- Error]
REGION 1 (EASTERN)				
Product 6-1	72,231	72,177	39,494	14,028 +/- 918
REGION 2 (SOUTHERN)				
REGION 3 (CENTRAL)				
Product 6-1			12,981	21,232 +/- 879
Product 6-3	12,321	15,634	21,321	34,543 +/- 1,243
REGION 4 (WESTERN)				
Product 6-2	101,981	123,123	56,712	21,321 +/- 2,123

*** NOTE ***
"Error" corresponds to the 90% confidence interval for the forecast value. For example, a forecast of "110,120 +/- 4,451" corresponds to a 90% degree-of-confidence that the true value lies between 105,669 (110,120-4,451) and 114,571 (110,120+4,451). Of course, this also implies that there is a 10% chance that the true value will be less than 105,669 or more than 114,571.

MARKETING RESEARCH STUDY #33 (REFORMULATION ACTIVITY - DETAILED)

NUMBER OF REFORMULATION BIDS SUBMITTED	=	4
LOWEST REFORMULATION BID SUBMITTED	= $	555
AVERAGE REFORMULATION BID SUBMITTED	= $	404,438
HIGHEST REFORMULATION BID SUBMITTED	= $	673,198
NUMBER OF SUCCESSFUL REFORMULATION BIDS	=	4
LOWEST SUCCESSFUL REFORMULATION BID	= $	555

Product 3-4 Has Been Reformulated Since Last Quarter To 80/30/40/20/50/7/5
Product 6-3 Has Been Reformulated Since Last Quarter
...

Study 34 – output is identical to Study 10

MARKETING RESEARCH STUDY #35 (ADVERTISING PROGRAM EXPERIMENT)

RESULTS OF ADVERTISING EXPERIMENT FOR PRODUCT 5-2 IN REGION 2 (CANADA):
Advertising Spending = $ 1,250,000
Media Content (#) = 21
Media Mix (#s) = 22559
Estimated Customer Awareness For Product 5-2 = 50.5%

MARKETING RESEARCH STUDY #36 (COMPETITIVE INFORMATION - BRAND PROFILES)

	DEALER		ADVERTISING			PROMOTION		SALES FORCE
	Price	Rebate	$ Amount	MC	Media	$ Amount	Type	SIZE
REGION 1 (U.S.)								
Product 1-3	901	0	1.750.000	15	55555	1.250.000	26	44
Product 4-4	905	0	2.000.000	6	33456	500.000	96	200
Product 5-2	1.223	100	2.000.000	14	23433	500.000	74	100
Product 7-3	905	0	5.000.000	6	33456	500.000	96	20
REGION 2 (EUROPE)								
Product 1-2	867	50	500.000	15	55555	0	0	40
Product 3-1	1.180	0	2.000.000	14	12789	3.000.000	69	100
...								

MARKETING RESEARCH STUDY #37 (COMPETITIVE INFORMATION - SFC STATISTICS)

	ALL REGIONS	REGION 1 (U.S.)	REGION 2 (U.K.)	REGION 3 (C.EUROPE)	REGION 4 (CANADA)
FIRM 1					
Salaries	2.665	2.790	2.500	2.700	2.650
Commissions	469	687	439	228	562
Compensation	3.134	3.477	2.939	2.928	3.212
Commission Rate	1.3	1.0	2.0	1.0	2.0
Sales Force Size	870	220	200	250	200
...					
INDUSTRY					
Salaries	2.580	2.602	2.533	2.611	2.568
Commissions	650	699	979	484	464
Compensation	3.230	3.301	3.512	3.095	3.032
Compensation (SD)	387	312	479	299	374
Commission Rate	1.8	1.7	2.0	1.5	2.0
Sales Force Size	3.270	870	750	850	800

MARKETING RESEARCH STUDY #38 (PROMOTION EXPERIMENT)

RESULTS OF PROMOTION EXPERIMENT FOR PRODUCT 9-3 IN REGION 8 (AUST&NZ):
Promotion Spending = $ 1.500.000
Promotional Type (#) = 18
Estimated Dealer Promotion Awareness For Product 9-3 = 69.0%

MARKETING RESEARCH STUDY #39 (COMPETITIVE INFORMATION - UNFILLED SALES)

	ALL REGIONS	REGION 1 (U.S.)	REGION 2 (U.K.)	REGION 3 (FRANCE)	REGION 4 (GERMANY)
FIRM 1					
Product 1-1	0		0	0	
Product 1-2	15,000	14,000			
Product 1-3	0	0	0		0
Firm 1 Total	15,000	14,000	0	0	0
FIRM 2					
Product 2-1	0		0	0	
Product 2-2	1,016	1,000			
Product 2-3	0	0	245		0
Firm 2 Total	1,016	1,000	0	0	0
...					
INDUSTRY	20,056	15,000	5,056	0	0

MARKETING RESEARCH STUDY #40 (COMPETITIVE INFORMATION - BRAND MARGINS)

	BRAND FORMULATION [AND REFORMULATION QUARTER]	ESTIMATED [PER UNIT] PRICES, COSTS, AND MARGINS: Dealer Price	Manuf Price	Unit Cost	Margin
REGION 1 (EASTERN)					
Product 1-4	30/30/30/ 5/ 5/5/5 [**]	920	575	320	255
Product 2-4	30/30/30/ 5/ 5/5/5 [**]	924	578	320	258
Product 9-4	44/44/44/44/ 5/4/4 [3]	897	560	293	267
REGION 2 (SOUTHERN)					
Product 1-1	41/23/81/22/ 5/1/1 [2]	899	580	153	427
...					

*** NOTES ***
(1) "Brand Formulation" refers to the last "recorded" formulation of a brand. Formulations are only "recorded" when a firm executes Marketing Research Study #2 ("Brand Composition Analysis") or Marketing Research Study #33 ("Reformulation Activity - Detailed").
(2) "Reformulation Quarter" refers to the quarter in which the last recorded brand formulation occurred. Quarter "**" refers to brands that have not been reformulated since quarter 0.
(3) "Dealer Price" is the price at which dealers sell brands to customers.
(4) "Manuf Price" is the price at which manufacturers sell brands to dealers.
(5) "Unit Cost" is the raw materials, production, labor, plant depreciation (assuming full capacity usage), and transportation and shipping costs. Experience curve cost reductions and smoothing cost adjustments, if any, in production and labor are not included within these "Unit Cost" figures. Other components of variable costs (dealer rebates and sales commissions) are also not included in these "Unit Cost" figures.
(6) "Margin" equals "Manuf Price" minus "Unit Cost."

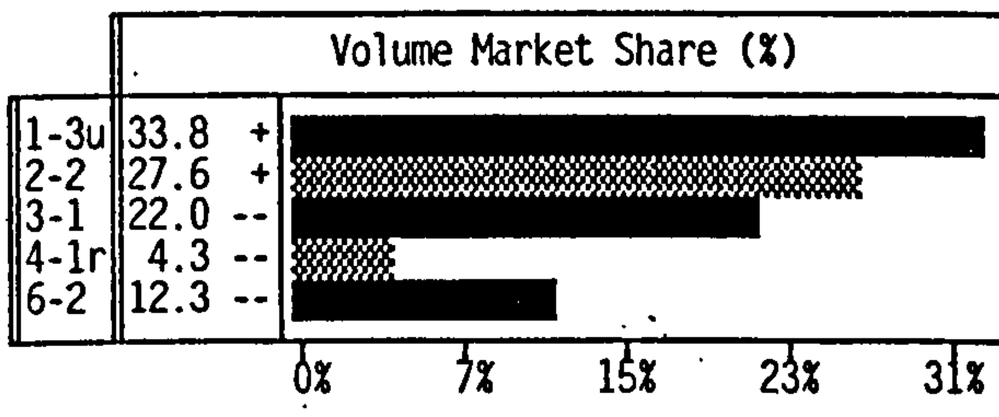
MARKETING RESEARCH STUDY #41 (REGIONAL SUMMARY ANALYSIS)

REGION STATISTICS, REGION 2 (MEXICO), QUARTER 44 (FALL)

	Quarter		Change (%)
	Previous	Current	
Population	40,979,028	41,357,708	.9
Consumer Price Index	930	949	2.0
Per Capita Income	11,146	11,496	3.1
Industry Sales Volume	71,125	66,361	-6.7
Industry Advertising	8,000,000	4,000,000	-50.0
Industry Average D_Price	878	887	-1.0
Industry Promotion	3,000,000	4,000,000	33.3
Industry Average R&D	250,000	350,000	20.0
Industry Sales Force	400	350	-12.5

BRAND PERFORMANCE STATISTICS, REGION 2 (MEXICO), QUARTER 44 (FALL)

	Volume Market Share (%)	D_Price	P_Per	P_Con
1-3u	33.8 +	$ 798	57.7	27.4 ++
2-2	27.6 +	$ 842	24.3 -	21.3 ++
3-1	22.0 --	$1,028 -	11.6 -	12.9 --
4-1r	4.3 --	$1,279	58.0 +	2.9 -
6-2	12.3 --	$ 774 +	1.5 --	15.0 --



*** NOTES ***
(1) An "r" after a product number denotes a reformulation in this quarter. A "u" denotes unfilled orders in this quarter. A "*" denotes a product that has been reformulated and that has unfilled orders in this quarter.
(2) Changes of more than 25%, from the previous-quarter value, are flagged by "++" and "--" to the right of the current-quarter entry for increases and decreases, respectively. Changes of more than 5% but less than 25%, from the previous-quarter value, are flagged by "+" and "-" to the right of the current-quarter entry for increases and decreases, respectively. Changes of less than 5% from the previous quarter are not flagged.
(3) "D_Price" is dealer price, "P_Per" is perceived performance, and "P_Con" is perceived convenience.

MARKETING RESEARCH STUDY #42 (MARKETING RESEARCH ORDERING STATISTICS)

MR #	Marketing Research Study	Ordering Frequency
1	COMPETITIVE INFORMATION - YTD EARNINGS	High
2	BRAND COMPOSITION ANALYSIS	Moderate
3	INDUSTRY SALES FORCE SIZE	Very Low
4	INDUSTRY ADVERTISING	Very Low
5	INDUSTRY SALES FORCE COMPENSATION	Low
6	INDUSTRY PROMOTION	Very Low
7	INDUSTRY R&D	Low
8	MEDIA CONTENT ANALYSIS	Moderate
9	PROMOTIONAL TYPE ANALYSIS	Low
10	CONJOINT ANALYSIS	Very High
...		

MARKETING RESEARCH STUDY #43 (MARKETING SUPPORT SPENDING PRODUCTIVITY)

MARKETING SUPPORT SPENDING PRODUCTIVITY ANALYSIS, REGION 6 (JAPAN)

	Product 2-1	Product 2-2	Product 2-3	COMPARATIVE NORMS: FIRM 2 (In All Regions)	COMPARATIVE NORMS: INDUSTRY (In This Region)
SALES VOLUME PER $000 OF:					
Advertising	4.0		13.7	17.0	8.5
Promotion	10.9		37.1	45.8	23.0
Research & Development	32.3		109.8	135.6	68.0
Sales Force Compensation	5.1		15.3	13.0	9.8
SALES REVENUE PER $ OF:					
Advertising	2.3		7.5	9.7	4.8
Promotion	6.3		20.3	26.1	13.1
Research & Development	18.7		60.0	77.3	38.7
Sales Force Compensation	2.9		8.3	7.4	5.6

MARKETING RESEARCH STUDY #44 (POPULATION FORECASTS)

	QUARTER 31 [History]	QUARTER 32 [Forecast]	QUARTER 33 [Forecast]	QUARTER 34 [Forecast]	QUARTER 35 [Forecast]
REG. 1 (U.S.)	110,281,568 [100.00]	111,381,656 [101.00]	112,619,728 [102.12]	113,866,448 [103.25]	115,062,488 [104.34]
REG. 2 (U.K.)	50,397,428 [100.00]	50,919,024 [101.03]	51,528,744 [102.24]	52,120,060 [103.42]	52,777,044 [104.72]
REG. 3 (GERMANY)	84,437,184 [100.00]	85,300,120 [101.02]	86,142,776 [102.02]	87,087,536 [103.14]	87,972,984 [104.19]
REG. 4 (FRANCE)	62,765,016 [100.00]	63,546,976 [101.25]	64,411,756 [102.62]	65,203,948 [103.89]	65,973,252 [105.11]

MARKETING RESEARCH STUDY #45 (PER CAPITA INCOME FORECASTS)

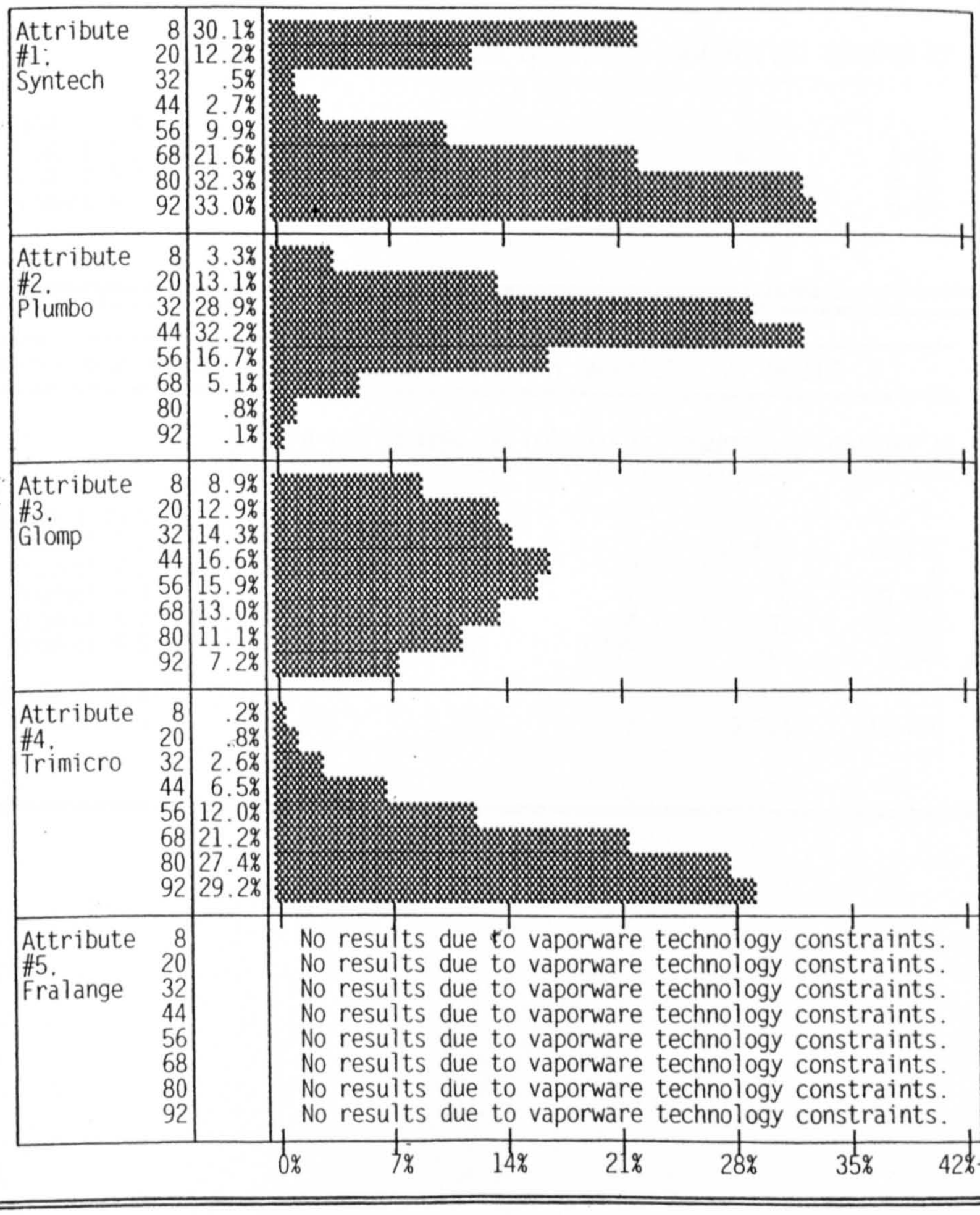
	QUARTER 80 [History]	QUARTER 81 [Forecast]	QUARTER 82 [Forecast]	QUARTER 83 [Forecast]	QUARTER 84 [Forecast]
REG. 1 (EASTERN)	15,905 [100.00]	16,051 [100.92]	16,250 [102.17]	16,419 [103.23]	16,594 [104.34]
REG. 2 (SOUTHERN)	13,400 [100.00]	13,530 [100.96]	13,669 [102.01]	13,807 [103.03]	13,944 [104.06]
REG. 3 (CENTRAL)	14,930 [100.00]	15,082 [101.02]	15,261 [102.22]	15,383 [103.03]	15,545 [104.12]
REG. 4 (WESTERN)	14,318 [100.00]	14,478 [101.12]	14,627 [102.16]	14,799 [103.36]	14,964 [104.52]

MARKETING RESEARCH STUDY #46 (CONSUMER PRICE INDEX FORECASTS)

	QUARTER 43 [History]	QUARTER 44 [Forecast]	QUARTER 45 [Forecast]	QUARTER 46 [Forecast]	QUARTER 47 [Forecast]
REG. 1 (CANADA)	1.407 [100.00]	1.427 [101.40]	1.452 [103.17]	1.472 [104.64]	1.491 [106.01]
REG. 2 (U.K.)	1.121 [100.00]	1.132 [100.98]	1.143 [101.90]	1.154 [102.89]	1.166 [104.00]
REG. 3 (U.S.)	1.373 [100.00]	1.392 [101.43]	1.414 [102.98]	1.432 [104.29]	1.454 [105.91]
REG. 4 (C.EUROPE)	1.319 [100.00]	1.339 [101.55]	1.355 [102.77]	1.378 [104.50]	1.399 [106.11]

MARKETING RESEARCH STUDY #47 (SELF-REPORTED ATTRIBUTE PREFERENCES)

REGION 8 (CANADA) REGION 8 (CANADA)



MARKETING RESEARCH STUDY #48 (BRAND SATISFACTION RATINGS)

Brand Satisfaction, Relative To Current Brands

	QUARTER 23	QUARTER 24	QUARTER 25	QUARTER 26	QUARTER 27
REGION 1 (U.S.)					
Product 1-2	43.75	42.46	17.18	9.56	7.86
Product 3-1	45.52	46.15	17.65	9.72	8.04
Product 4-3		24.89	17.78	10.35	8.07
REGION 2 (U.K.)					
Product 1-1	9.66	10.55	10.73	10.54	10.52
Product 1-2	9.61	7.98	8.68	9.02	9.01
Product 7-1	9.49	8.85	8.05	7.45	7.38
Product 9-3	10.28	9.47	8.64	8.29	7.98

...

Brand Satisfaction, Relative To "Ideal" Brand

	QUARTER 23	QUARTER 24	QUARTER 25	QUARTER 26	QUARTER 27
REGION 1 (U.S.)					
Product 1-2	35.46	35.53	14.21	8.30	6.33
Product 3-1	36.20	36.44	13.96	8.25	6.35
Product 4-3		16.29	14.51	8.30	6.49

...

MARKETING RESEARCH STUDY #49 (DEALER INVENTORY ANALYSIS - ALL BRANDS)

	QUARTER 12	QUARTER 13	QUARTER 14	QUARTER 15	QUARTER 16
REGION 1 (U.S.)					
Product 1-2				11,552	12,771
Product 2-2			0	0	0
Product 3-1	12,556	6,930	0	0	28,482
Product 4-2			60	291	20,922
Product 6-3	9,048	6,189	3,179	2,310	986
REGION 2 (U.K.)					
Product 1-1	7,840	6,120	0	6,314	10,716

...

MARKETING RESEARCH STUDY #50 (PRICE SENSITIVITY ANALYSIS)

REGION 7 (HK/T/K/S) REGION 7 (HK/T/K/S)

Estimated Preference Shares Given Product Formulations and Dealer Prices of All Actively Distributed Products	Product 1-1 @ $ 919: 25.5% Product 2-2 @ $ 803: 24.4% Product 5-2 @ $ 913: 27.9% Product 8-3 @ $1,033: 22.2%
Product 1-1 Estimated Preference Shares at Various Dealer Prices Given Current Product Formulations and Dealer Prices of All Other Actively Distributed Products	Product 1-1 @ $ 700: 42.0% Product 1-1 @ $ 750: 37.5% Product 1-1 @ $ 800: 33.4% Product 1-1 @ $ 850: 29.8% Product 1-1 @ $ 900: 26.6% Product 1-1 @ $ 950: 23.8% Product 1-1 @ $1,000: 21.4% Product 1-1 @ $1,050: 19.2% Product 1-1 @ $1,100: 17.3%

*** NOTES ***
(1) Preference shares refer to market shares if only two aspects of the whole marketing program, formulation and dealer price, matter to customers.
(2) A 20% range around current dealer price is used in this price sensitivity analysis. Extrapolations beyond the immediate vicinity of current dealer price are likely to be unreliable. Substantial dealer price changes are likely to lead to competitive counter-responses thus making preference share predictions problematic.
(3) These preference shares should be viewed as long-run "full information" estimates to which market shares might stabilize assuming that customers have equal access (i.e., equal awareness, equal distribution, equal "convenience," etc.) to all products actively distributed in this market.

Exhibit 2: Questions administered to participating students

STRATEGY FORMULATION QUESTIONNAIRE

Date: 18 May 2000

Name:

Group (as entered in Brandmaps)

Age: 29 Gender (M/F):

Nationality: British

Please indicate your agreement or disagreement with each statement on the following scale:

1 = strongly **disagree**

4 = neither agree nor disagree

7 = strongly **agree**

	1	2	3	4	5	6	7
1. We had a clear view of the winning strategy	☐	☐	☐	☐	☐	☑	☐
2. In our group there were one or two people who seemed to win all the arguments	☑	☐	☐	☐	☐	☐	☐
3. My team members and I shared similar goals and objectives	☐	☐	☐	☐	☐	☐	☑
4. There was a lot of pressure to be the best-performing group	☐	☐	☐	☐	☑	☐	☐
5. Everyone in our group had a good understanding of how the game works	☐	☐	☐	☐	☑	☐	☐
6. I agreed with most of the decisions we took in the final quarter	☐	☐	☐	☐	☐	☑	☐
7. I think the game is a good reflection of how businesses operate in real life	☐	☐	☑	☐	☐	☐	☐
8. The previous period's results had been completely unexpected	☐	☑	☐	☐	☐	☐	☐
9. Our decisions were what our instructors would expect us to do	☐	☐	☑	☐	☐	☐	☐
10. There was no dispute about the decisions we finally took in the last quarter	☐	☐	☐	☐	☐	☐	☑
11. In our group, it was usually the most logical argument that won, no matter who put it forward	☐	☐	☐	☐	☐	☐	☑
12. I found my business learning and experience very relevant when working out what to do in the game	☐	☐	☐	☐	☑	☐	☐
13. The policies we use were based on successful, real-life companies	☐	☐	☐	☑	☐	☐	☐
14. We had a long-term plan that guided our decisions	☐	☐	☐	☐	☑	☐	☐

Please turn over

	1	2	3	4	5	6	7
15. Many in the group initially opposed the decisions that were taken	☑	☐	☐	☐	☐	☐	☐
16. There were influential people in our group with a good understanding of how the game worked	☐	☐	☐	☑	☐	☐	☐
17. The other group members had a good understanding of my role and the problems I faced	☐	☐	☐	☑	☐	☐	☐
18. I understood the other members' roles and problems	☐	☐	☐	☑	☐	☐	☐
19. After seeing the previous quarter's results and market research, it was clear what we had to do	☐	☐	☐	☐	☐	☐	☑
20. We adopted our decisions because other groups had been succeeding with them	☐	☐	☐	☐	☑	☐	☐
21. Several of the group got together to press for our final set of decisions, although the rest were less sure	☑	☐	☐	☐	☐	☐	☐
22. Some team members had a view of what is needed to win the game that is different from mine	☑	☐	☐	☐	☐	☐	☐
23. Anyone in the group who could put forward good reasons for suggesting a particular course of action was likely to get their way	☐	☐	☐	☐	☐	☑	☐
24. I treated our company in the game exactly like the last company I used to work for	☐	☑	☐	☐	☐	☐	☐
25. I had no problem in making sense of the last set of results	☐	☐	☐	☐	☐	☐	☑
26. After previous period's results we needed to rethink our whole approach to the game	☑	☐	☐	☐	☐	☐	☐

Thank you for your co-operation

Please return questionnaire to Adrian Haberberg (Room 201, Management Block, Marylebone Road) or to your BRANDMAPS game co-ordinator).

Please email any queries to Adrian on A.B.Haberberg@wmin ac.uk

Chapter 6

Results

In this chapter, I summarise the study data and report on the results of the tests of the hypotheses developed in Chapter 4.

6.1 Nature of the decisions data

Figures 6.1-6.8 give summary statistics for the distributions of the quarterly group data for numbers of isomorphic decisions and proportions of isomorphic decisions for each of the four datasets. The distributions of these variables in Dataset 1, and the distribution of proportions of isomorphic decisions for Dataset 3, do not differ significantly from the normal distribution, whereas the distribution of numbers of isomorphic decisions for Dataset 3 and of both variables in Dataset 2 and 4 are non-normal.

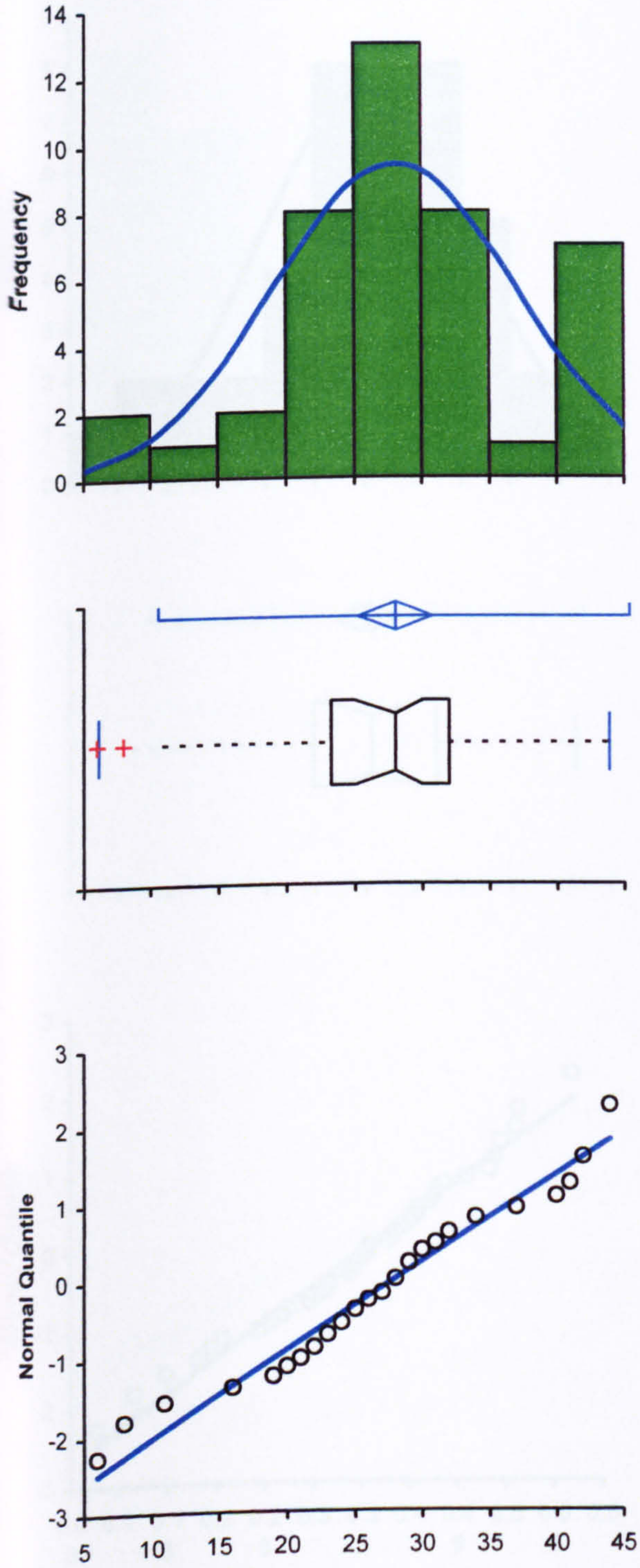
Given that the distributions of the measures of concentration and uncertainty are also skewed away from the normal, standard statistical techniques of correlation, regression and analysis of variance are inappropriate for these data. However, hypotheses H1-H8 do not require a demonstration that the dependent variables vary continuously with the independent ones. In order to verify these hypotheses, it is only necessary to demonstrate a much weaker association of high levels of isomorphic decisions with the passage of time, and with high levels of concentration and uncertainty. These associations can be adequately tested using non-parametric techniques that compare the rankings of reading of the two variables and do not assume them to be normally distributed.

6.2 H1: Effects on isomorphic behaviour of industry age

Table 6.1 summarises the trend in decision-making over time for dataset 1. The total number of decisions taken (which is of course the same for all datasets) is highest in the early quarters as new markets are entered and products launched, and then falls away as firms refine their product-market strategy. The number of isomorphic decisions taken is stable between quarters 4 and 7, and then dips in quarter 8. This appears to be the result of a fall in the overall number of decisions taken, which may be indicative of some end-gaming, or simply of fatigue, on the part of participants. The proportion of decisions classed as isomorphic rises steadily, including period 8.

Test **Figure 6.1 Summary statistics and test for normality**
Numbers of isomorphic decisions by period and group
Dataset 1 - isomorphic decisions including perpetuations

Performed by Adrian Haberberg **Date** 16 August 2003



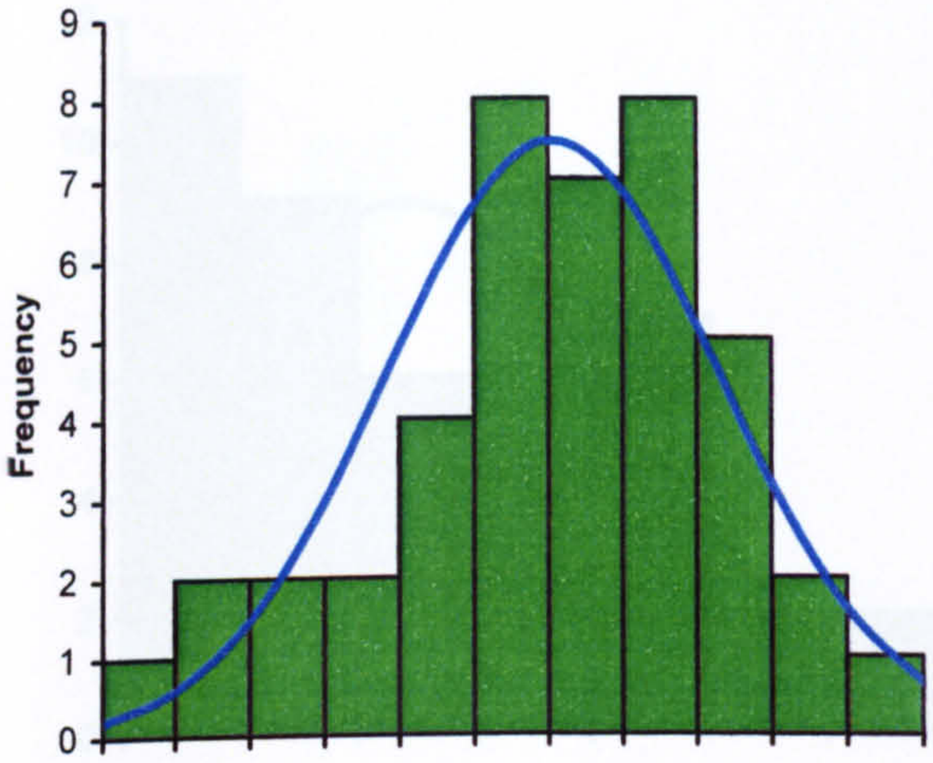
n	42
Mean	28.000
95% CI	25.238 to 30.762
Variance	78.5366
SD	8.8621
SE	1.3674
CV	32%

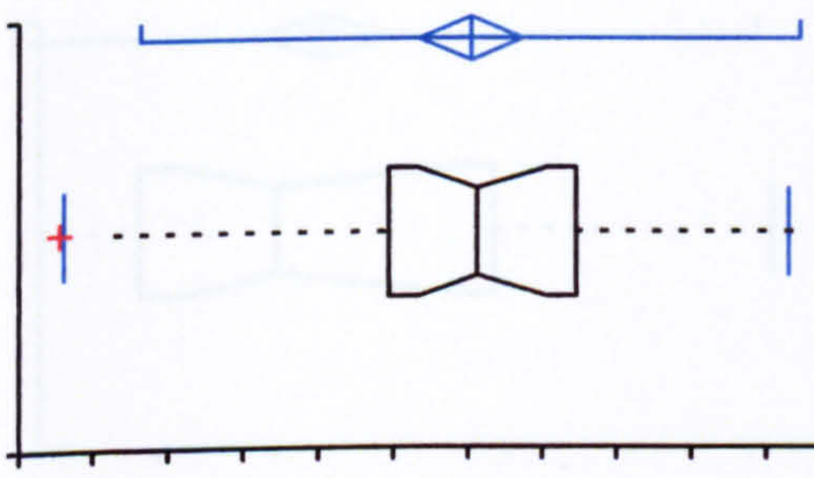
Median	28.000
95.6% CI	25.000 to 30.000
Range	38
IQR	8.75

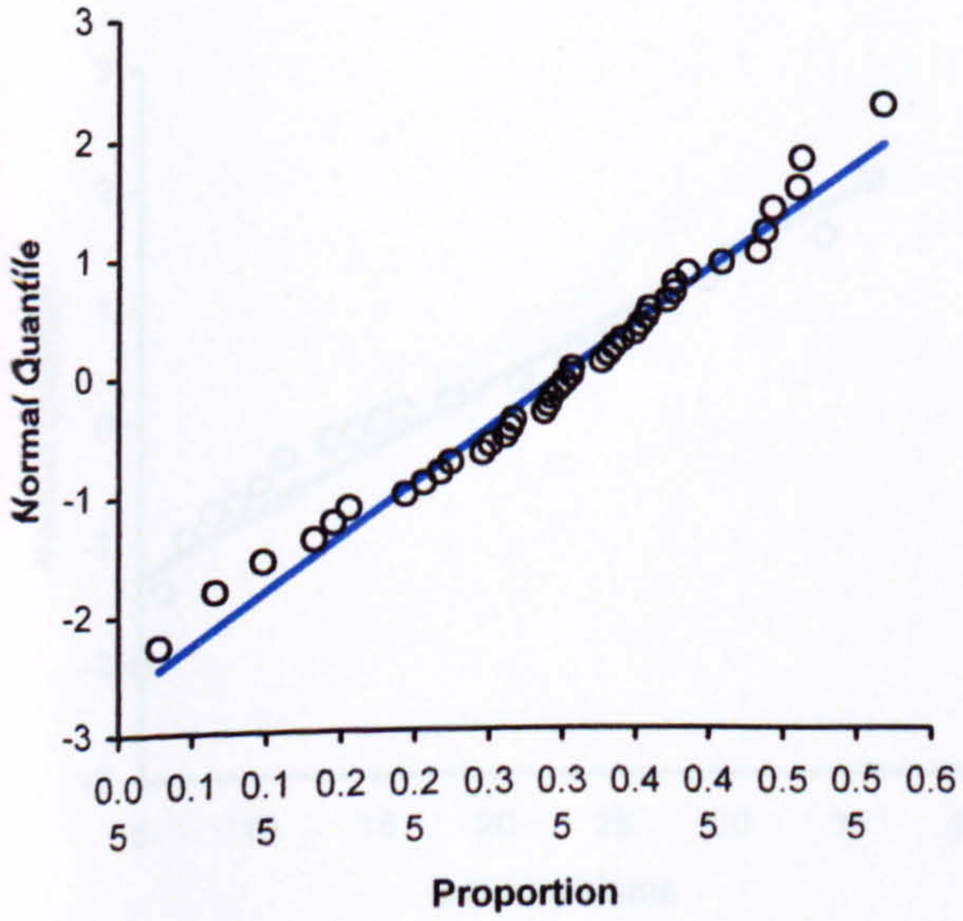
Percentile	
2.5th	6.150
25th	23.250
50th	28.000
75th	32.000
97.5th	43.850

	Coefficient	p
Shapiro-Wilk	0.9620	0.1736
Skewness	-0.3089	0.3790
Kurtosis	0.3245	0.5046

Test	**Figure 6.2 Summary statistics and test for normality** Proportion of decisions that are isomorphic by period and group Dataset 1 - isomorphic decisions including perpetuations
Performed by	Adrian Haberberg
Date	16 August 2003







n	42
Mean	0.352878
95% CI	0.317928 to 0.387827
Variance	0.0125786
SD	0.1121544
SE	0.0173058
CV	32%

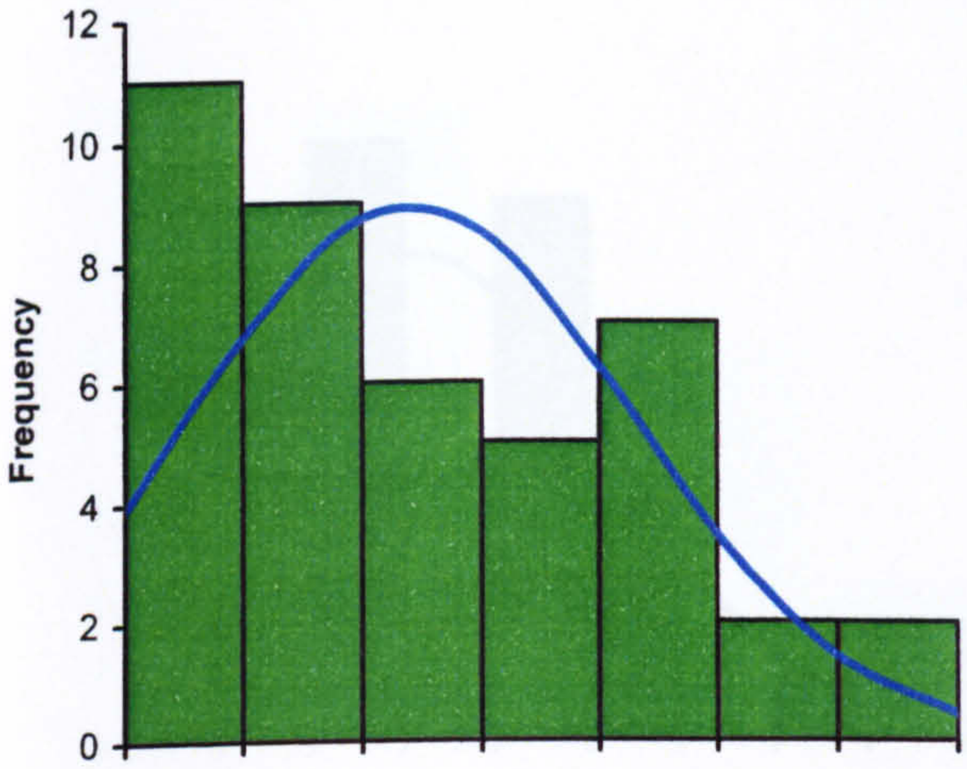
Median	0.356732
95.6% CI	0.317073 to 0.403846
Range	0.49071
IQR	0.12609

Percentile	
2.5th	0.080762
25th	0.297240
50th	0.356732
75th	0.423333
97.5th	0.564522

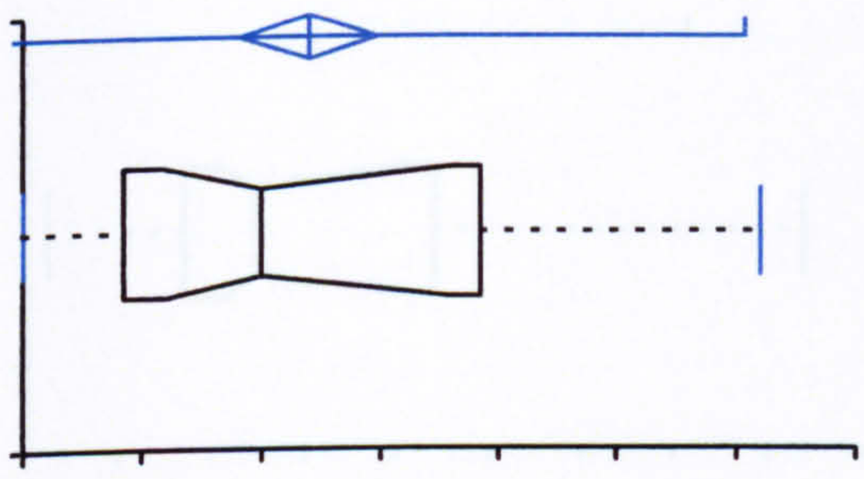
	Coefficient	**p**
Shapiro-Wilk	0.9766	0.5352
Skewness	-0.4835	0.1763
Kurtosis	-0.0120	0.8364

Test **Figure 6.3 Summary statistics and test for normality**
Numbers of isomorphic decisions by period and group
Dataset 2 - isomorphic decisions excluding perpetuations

Performed by Adrian Haberberg **Date** 16 August 2003

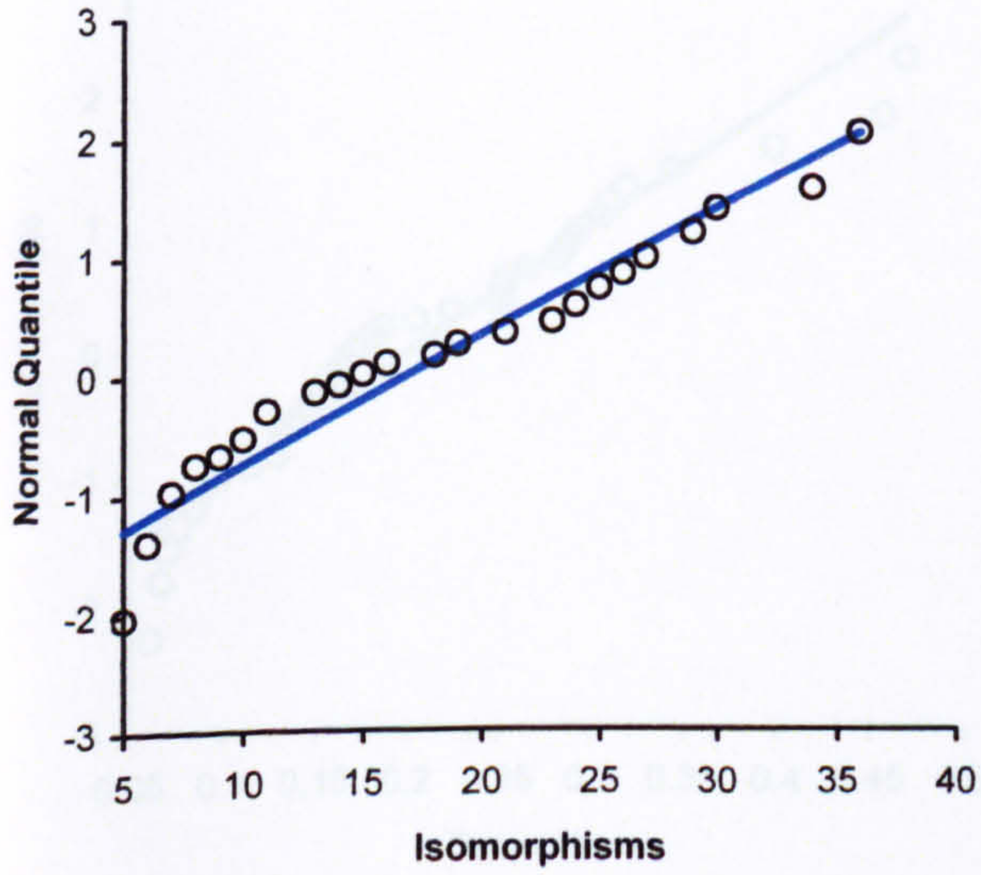


n	42
Mean	17.024
95% CI	14.107 to 19.941
Variance	87.6336
SD	9.3613
SE	1.4445
CV	55%



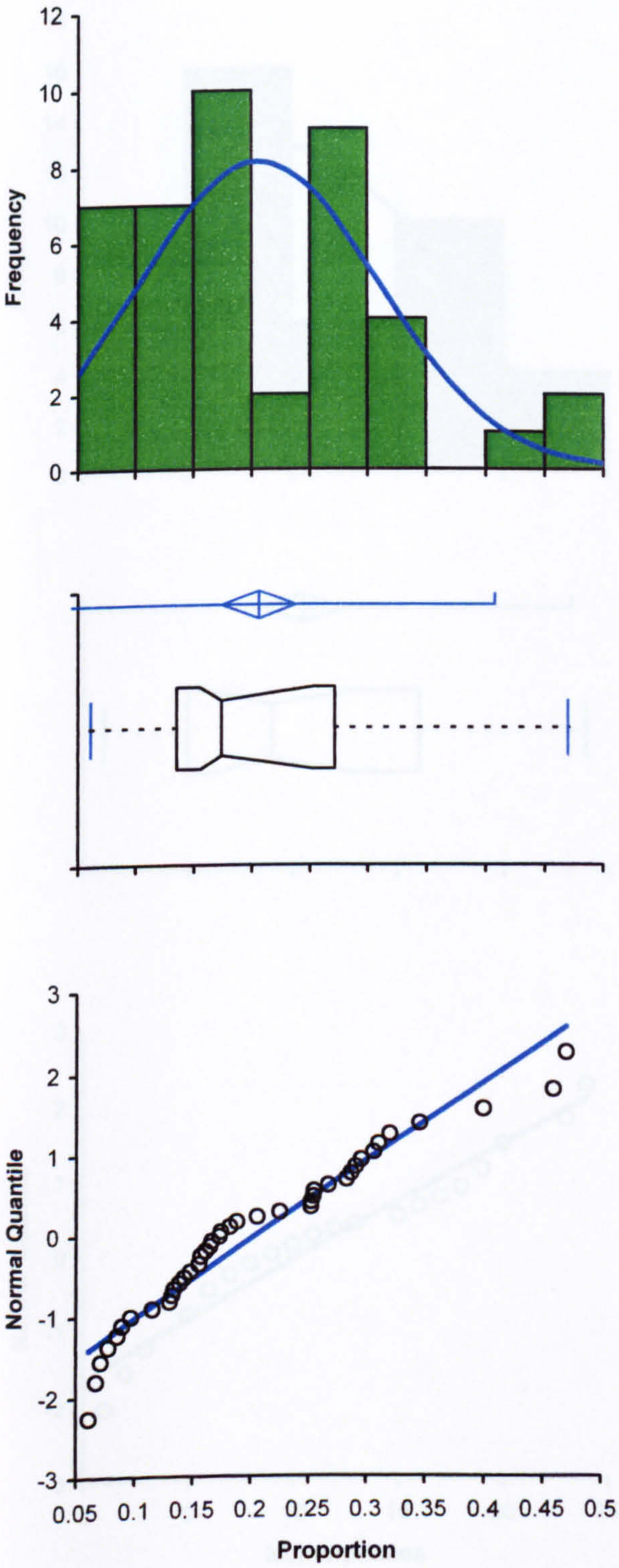
Median	15.000
95.6% CI	11.000 to 23.000
Range	31
IQR	15

Percentile	
2.5th	5.000
25th	9.250
50th	15.000
75th	24.250
97.5th	36.000



	Coefficient	p
Shapiro-Wilk	0.9213	0.0067
Skewness	0.4460	0.2102
Kurtosis	-1.0117	0.0297

Test	**Figure 6.4 Summary statistics and test for normality** Proportion of decisions that are isomorphic by period and group Dataset 2 - isomorphic decisions excluding perpetuations
Performed by	Adrian Haberberg
Date	16 August 2003



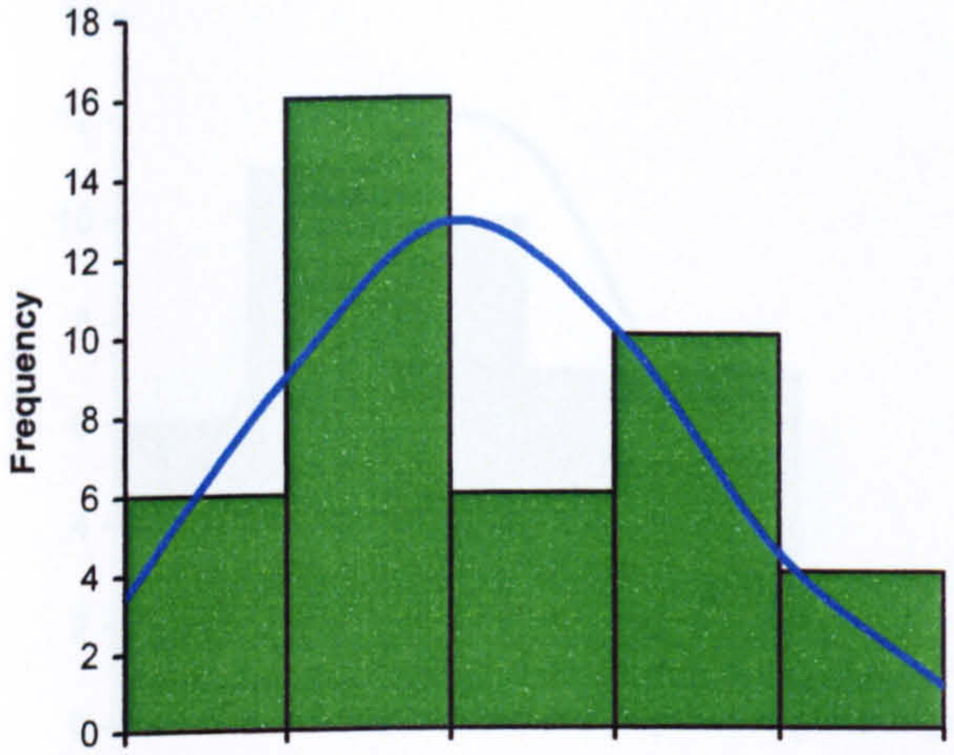
n	42
Mean	0.206187
95% CI	0.174141 to 0.238233
Variance	0.0105753
SD	0.1028361
SE	0.0158680
CV	50%

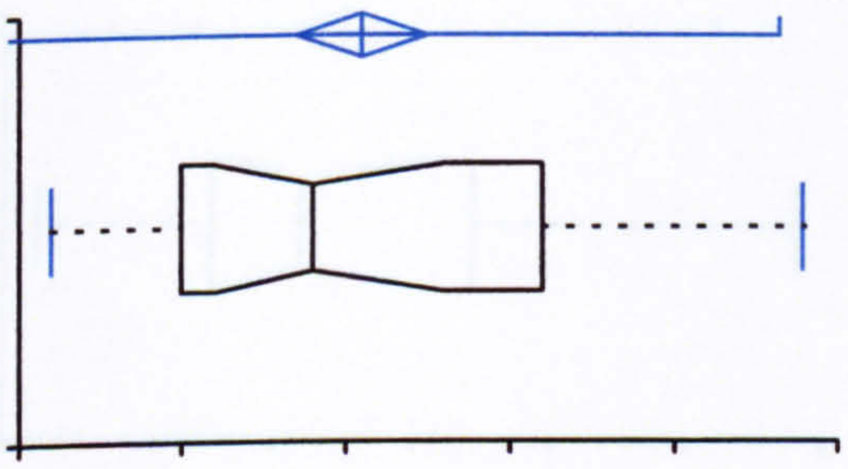
Median	0.173876
95.6% CI	0.155556 to 0.252747
Range	0.40961
IQR	0.13624

Percentile	
2.5th	0.061459
25th	0.135332
50th	0.173876
75th	0.271570
97.5th	0.469754

	Coefficient	p
Shapiro-Wilk	0.9365	0.0216
Skewness	0.7801	0.0367
Kurtosis	0.2033	0.6086

Test	**Figure 6.5 Summary statistics and test for normality** Numbers of isomorphic decisions by period and group Dataset 3 - isomorphic decisions, distance <=12.5%
Performed by	Adrian Haberberg
Date	16 August 2003

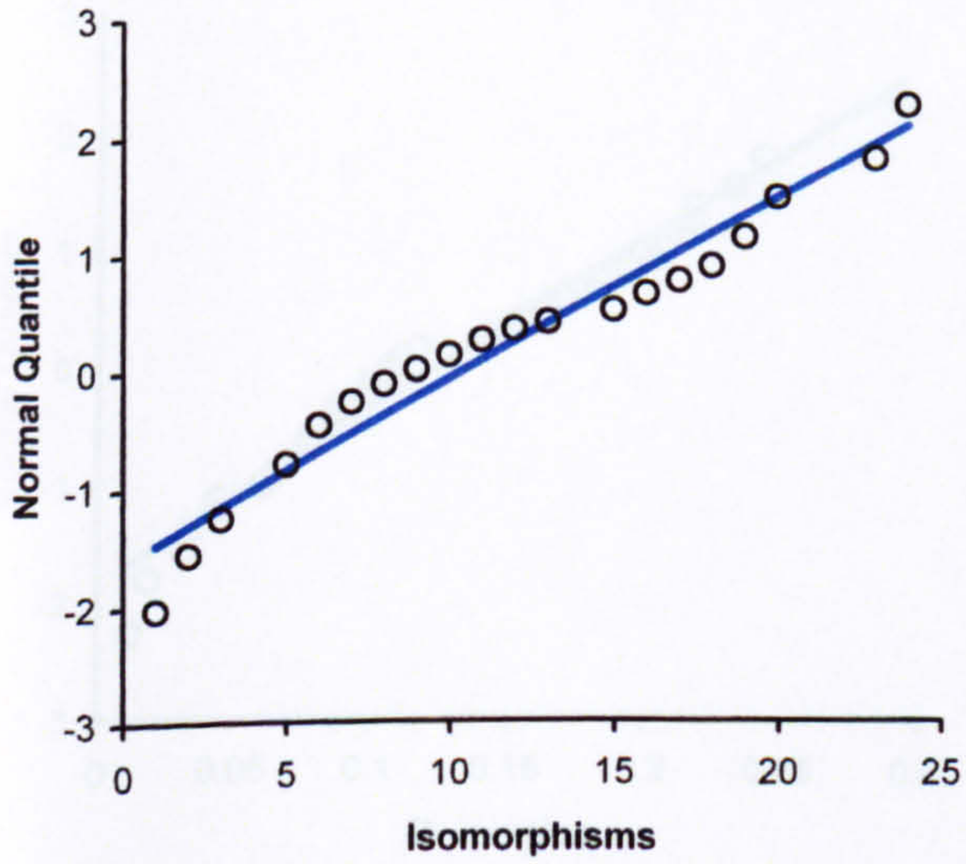




n	42
Mean	10.524
95% CI	8.506 to 12.541
Variance	41.9141
SD	6.4741
SE	0.9990
CV	62%

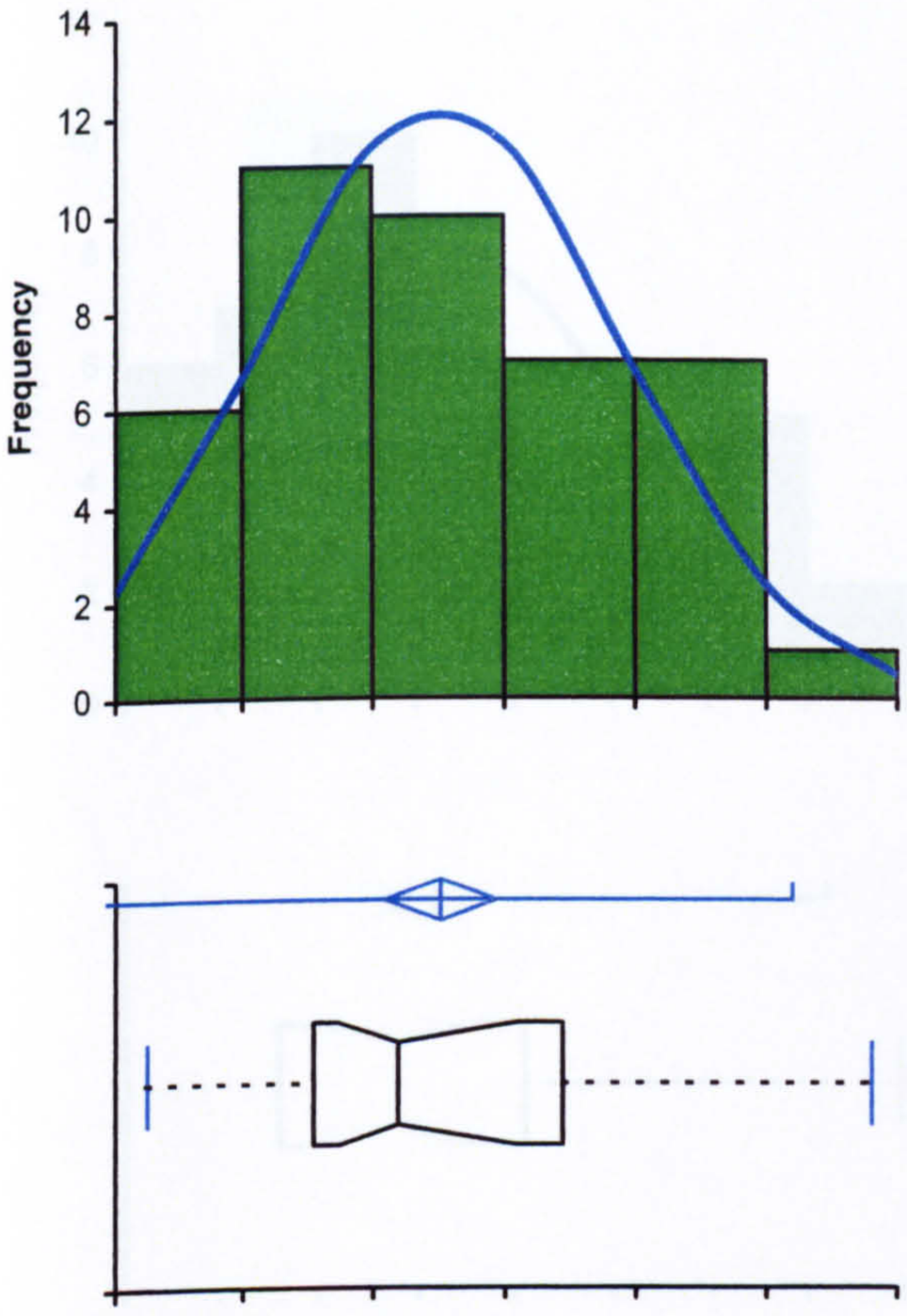
Median	9.000
95.6% CI	6.000 to 13.000
Range	23
IQR	11

Percentile	
2.5th	1.000
25th	5.000
50th	9.000
75th	16.000
97.5th	23.925



	Coefficient	p
Shapiro-Wilk	0.9358	0.0204
Skewness	0.4216	0.2349
Kurtosis	-1.0112	0.0299

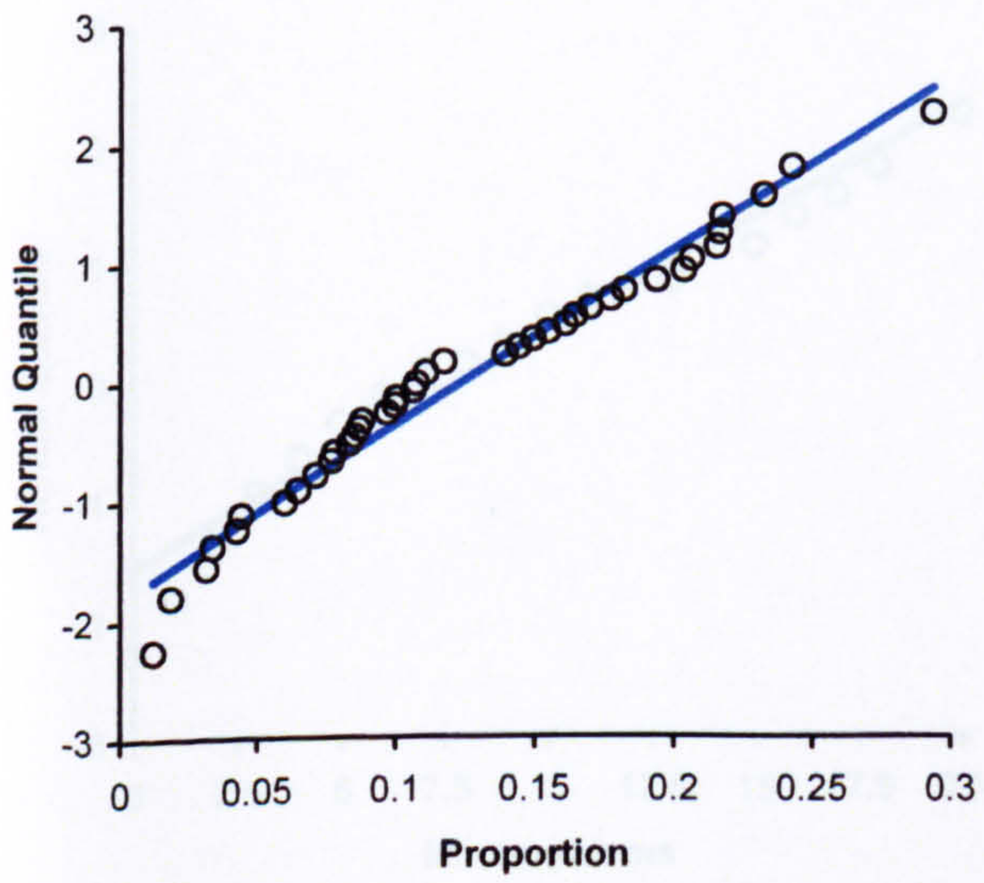
Test	**Figure 6.6 Summary statistics and test for normality** Proportion of decisions that are isomorphic by period and group Dataset 3 - isomorphic decisions, distance <=12.5%		
Performed by	Adrian Haberberg	**Date**	16 August 2003



n	42
Mean	0.125579
95% CI	0.104251 to 0.146908
Variance	0.0046845
SD	0.0684431
SE	0.0105610
CV	55%

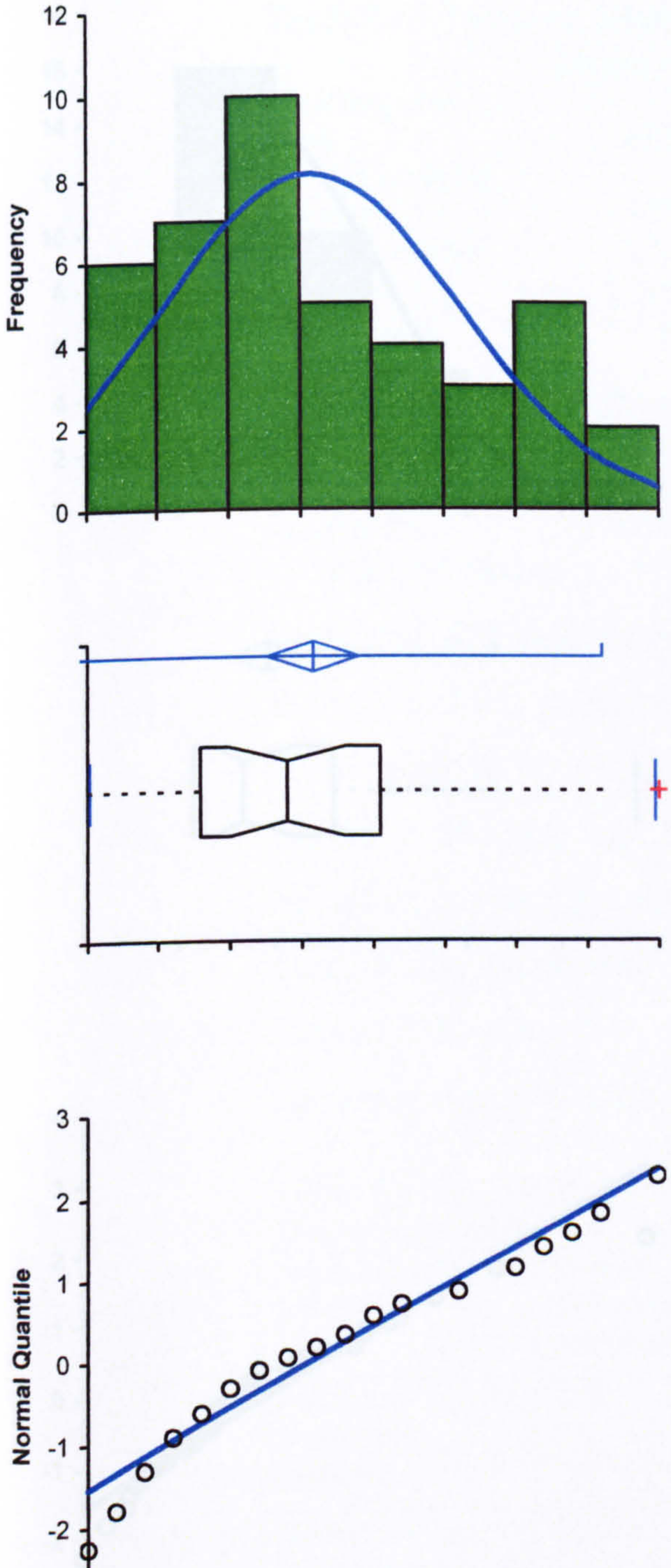
Median	0.109477
95.6% CI	0.086957 to 0.154930
Range	0.28192
IQR	0.09485

Percentile	
2.5th	0.012669
25th	0.077258
50th	0.109477
75th	0.172104
97.5th	0.290302



	Coefficient	p
Shapiro-Wilk	0.9673	0.2668
Skewness	0.4078	0.2499
Kurtosis	-0.5570	0.4144

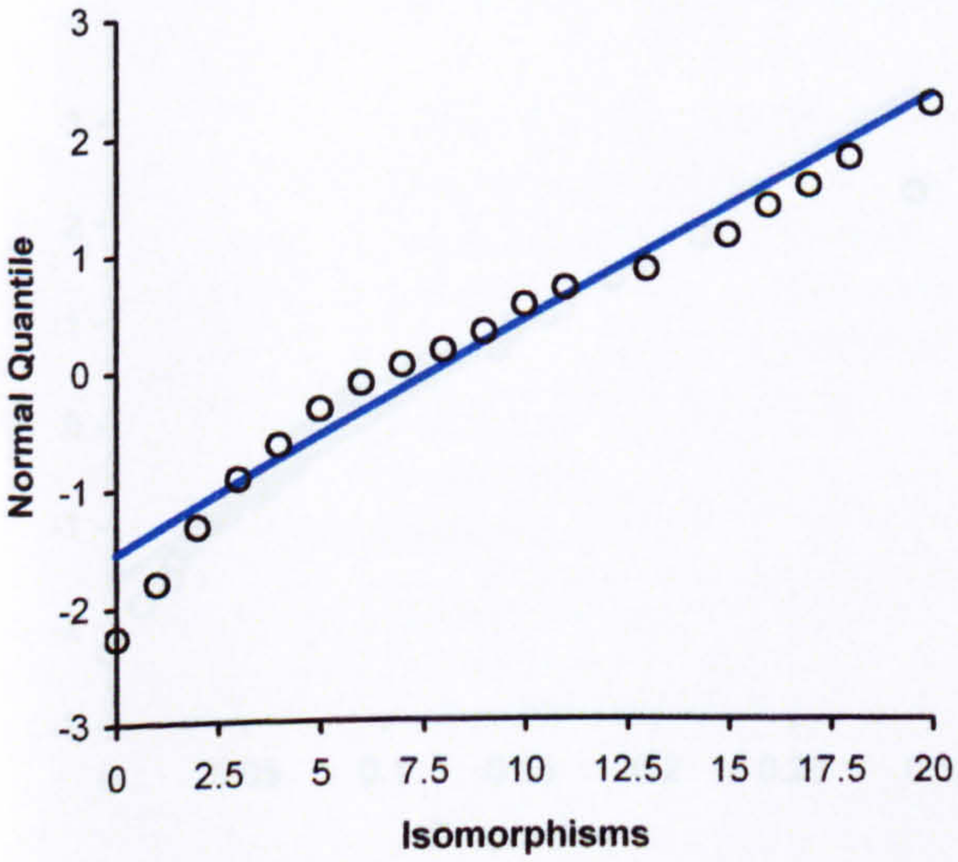
Test	**Figure 6.7 Summary statistics and test for normality** Numbers of isomorphic decisions by period and group Dataset 4 - isomorphic decisions, distance = 0%
Performed by	Adrian Haberberg
Date	16 August 2003



n	42
Mean	7.905
95% CI	6.300 to 9.510
Variance	26.5273
SD	5.1505
SE	0.7947
CV	65%

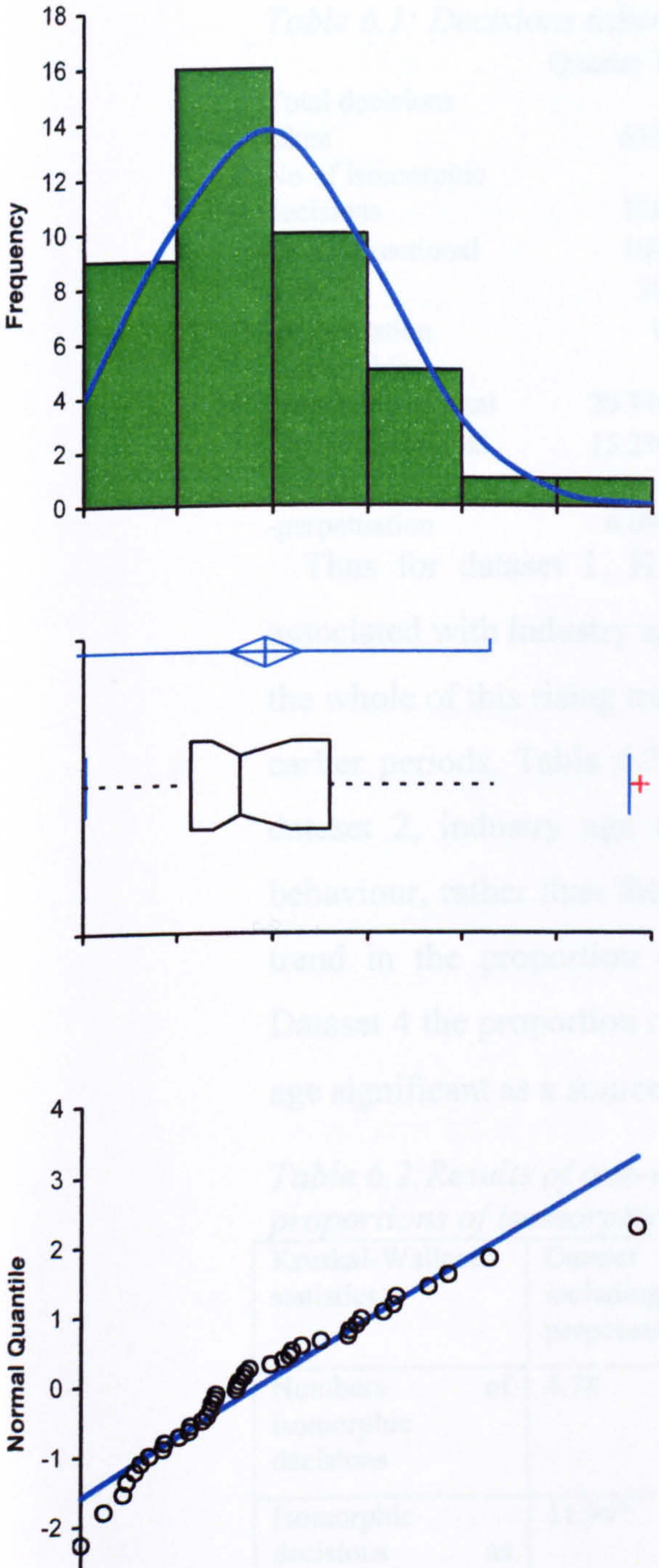
Median	7.000
95.6% CI	5.000 to 9.000
Range	20
IQR	6.25

Percentile	
2.5th	0.075
25th	4.000
50th	7.000
75th	10.250
97.5th	19.850



	Coefficient	p
Shapiro-Wilk	0.9426	0.0351
Skewness	0.6063	0.0953
Kurtosis	-0.5524	0.4205

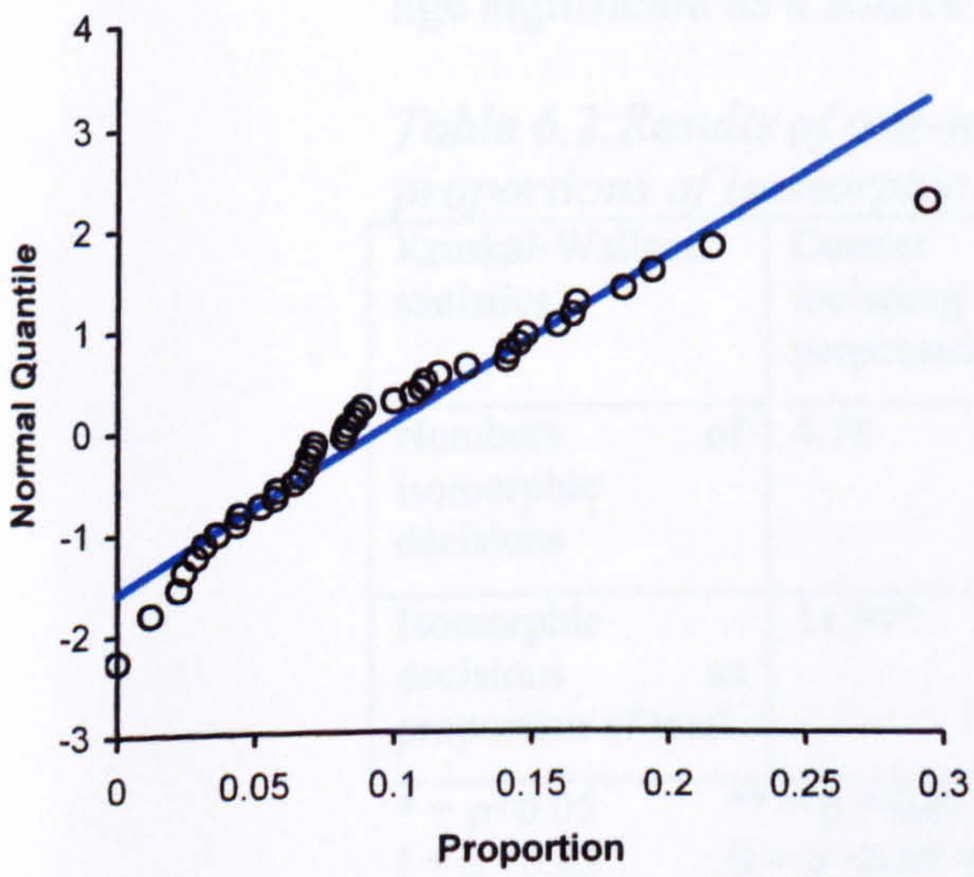
Test	**Figure 6.8 Summary statistics and test for normality** Proportion of decisions that are isomorphic by period and group Dataset 4 - isomorphic decisions, distance = 0%
Performed by	Adrian Haberberg
Date	16 August 2003



n	42
Mean	0.095804
95% CI	0.076870 to 0.114739
Variance	0.0036920
SD	0.0607616
SE	0.0093757
CV	63%

Median	0.082843
95.6% CI	0.068627 to 0.109890
Range	0.29412
IQR	0.07269

Percentile	
2.5th	0.000915
25th	0.057350
50th	0.082843
75th	0.130039
97.5th	0.288275



	Coefficient	p
Shapiro-Wilk	0.9396	0.0277
Skewness	1.0254	0.0085
Kurtosis	1.4542	0.0832

A Kruskal-Wallace one way analysis of variance shows that period is significant as a source of variance in the proportion of decisions that is isomorphic (Kruskal-Wallace statistic 11.94, p=0.036) but not in the number of such decisions (Kruskal-Wallace statistic 4.78, p=0.440).

Table 6.1: Decisions taken by type of isomorphism and time period, dataset 1

	Quarter 3	Quarter 4	Quarter 5	Quarter 6	Quarter 7	Quarter 8	Total
Total decisions taken	659	654	602	537	525	487	3464
No of isomorphic decisions	138	216	206	215	214	187	1176
-level/directional	100	135	106	99	66	44	550
-partial	38	43	31	26	18	9	165
-perpetuation	0	38	69	90	130	134	461
Isomorphic proportion of total	20.9%	33.0%	34.2%	40.0%	40.8%	38.4%	33.9%
- level/directional	15.2%	20.6%	17.6%	18.4%	12.6%	9.1%	15.9%
-partial	5.8%	6.6%	5.1%	4.8%	3.4%	1.8%	4.8%
-perpetuation	0.0%	5.8%	11.5%	16.8%	24.8%	27.5%	13.3%

Thus for dataset 1, H1, that the incidence of isomorphic behaviour is positively associated with industry age, is supported. However, inspection of Table 6.1 reveals that the whole of this rising trend is accounted for by isomorphic decisions perpetuated from earlier periods. Table 6.2 summarises the results for other datasets, showing that for dataset 2, industry age is a significant source of *negative* variation in isomorphic behaviour, rather than the hypothesised positive variation. Dataset 3 shows a declining trend in the proportion of isomorphic decisions from quarter 4 onwards, while in Dataset 4 the proportion rises to a peak in quarter 6 and then declines; in neither case is age significant as a source of variation in the incidence of isomorphic decisions.

Table 6.2:Results of one-way analyses of variance due to industry age on number and proportions of isomorphic decisions

Kruskal-Wallace statistics	Dataset 1 – including perpetuations	Dataset 2 – unlimited distance	Dataset 3 – distance ≤ 12.5%	Dataset 4 – distance = 0
Numbers of isomorphic decisions	4.78	17.02!!	10.76	6.38
Isomorphic decisions as proportion of total	11.94*	14.20!	8.48	3.72

* = p<0.05 ** = p < 0.01 with rising trend (consistent with H1)
! = p <0.05 !! = p <0.01 with falling trend (counter to H1)

I conclude that H1 is supported only insofar as isomorphism can be regarded as a result of inertia in organisational decision-making. Once inertial decisions are excluded from the set of isomorphic decisions, the relationship with industry age disappears or even runs counter to the hypothesis.

6.3 H2: Effects on isomorphic behaviour of environmental uncertainty

Table 6.3: Correlations between volatility and proportions of isomorphic decisions

Correlation coefficient (Kendal tau); n = 35	Dataset 1 – including perpetuations	Dataset 2 – unlimited distance	Dataset 3 – distance ≤ 12.5%	Dataset 4 – distance = 0
All decisions	0.19†	0.34**	0.25*	0.12
Marketing decisions	0.03	0.28**	0.09	-0.02
Activity decisions (n=24)	0.21	0.21	0.21	0.21
Compensation decisions	-0.09	0.24*	0.13	0.0
Effort decisions	0.29**	0.30**	0.35**	0.12

† = p < 0.1 * = p<0.05 ** = p < 0.01 ***=p < 0.001

I used the Kendall rank correlation coefficient to test H2 that there would be an association between environmental uncertainty and the incidence of isomorphic behaviour (Table 6.3).

For the complete decision set, the coefficients were positive, as predicted by the hypothesis. For datasets 2 and 3, the coefficients for the complete decision set were significant at the 5% confidence level or better, and the correlation coefficients for all the sub-classes of decision carried the predicted sign and some were significant. I conclude that there is support for H2

However, this conclusion is somewhat sensitive to the definition of isomorphism. If perpetuations of past decisions are included as isomorphisms, then the correlation coefficient is no longer significant at the 5% level, though it is still of the hypothesised sign and significant at the 10% level. This is unsurprising – a set of decisions of which over one-third are carry-overs from past periods will naturally show less sensitivity to environmental change than sets without this inertial ballast. However, if the definition of isomorphism is tightened still further, to exclude all but precise copies of other firms' decisions (dataset 4), then none of the correlation coefficients remains significant. There is no evident explanation for this.

6.4 H3: Effects on isomorphic behaviour of industry concentration

I computed Kendal rank correlations between the Herfindahl index for each market and time period and the proportion of isomorphic decisions taken in that market in the

following period. The correlations were positive, as hypothesised in H3, but were not significant at the 5% level (Table 6.4, first row).

Examination of different types of decision, however, reveals that this overall result hides a number of countervailing outcomes. For two classes of decision, activity and effort, the correlation is positive and significant, a result which is robust against variations in the operationalisation of isomorphism (although the coefficient for effort decisions in dataset 4 falls just outside the 5% confidence interval).

Table 6.4: Correlations between Herfindahl indices and proportions of isomorphic decisions of different types

Correlation coefficient (Kendal tau); n = 42	Dataset 1 – including perpetuations	Dataset 2 – unlimited distance	Dataset 3 – distance ≤ 12.5%	Dataset 4 – distance = 0
All decisions	0.09	0.15†	0.14†	0.08
Marketing decisions	-0.14	-0.03	-0.11	-0.15
Activity decisions (n=31)	0.28*	0.28*	0.28*	0.28*
Compensation decisions	0.14†	-0.07	-0.06	-0.12
Effort decisions	0.41***	0.28**	0.25*	0.19†
Pricing decisions	0.09	0.06	0.07	-0.06

† = p < 0.1 * = p<0.05 ** = p < 0.01 ***=p < 0.001

The proportions of isomorphic marketing and compensation decisions almost always show negative, but not significant, correlations. Within the marketing decision set, the proportion of isomorphic pricing decisions shows no correlation with industry concentration, although standard micro-economic theory would suggest that prices should converge around one, or at best a few, dominant models in concentrated industries.

Overall, however, I conclude that H3 is not supported.

6.5 H4: The effect of foreknowledge on isomorphic behaviour

I compared the number of isomorphic and non-isomorphic decisions that occurred when groups had foreknowledge of the levels of competitors' decisions with the numbers that that occurred in the absence of such knowledge. The results for the various definitions of foreknowledge and isomorphism are given in Table 6.5.

Table 6.5: The effect of foreknowledge on isomorphic behaviour, by type of knowledge and definition of isomorphism

X^2 statistics N = 3463	Degree of foreknowledge		
Dataset - Definition of isomorphism	Precise	Directional or better	Vague or better
Dataset 1 – including perpetuations(Note 1)	8.77**	20.30***	17.73***
Dataset 2 – unlimited distance	0.93	6.47*	2.07
Dataset 3 – distance ≤ 12.5%	6.83**	12.14***	8.48**
Dataset 4 – distance = 0	8.31**	13.47***	10.40**

Note 1: Observations in dataset 1 are not independent: X^2 test not usable with these data. Results for information only.

* p<0.05** p<0.01 *** p<0.001, relationship in hypothesised direction

For definitions of isomorphism apart from dataset 2 (no perpetuated decisions, no limitation on distance within which decision can be regarded as isomorphic) there was clear support for both H4a, that there is an association between foreknowledge and frequency of isomorphic decision-making, and H4b, that that association is consistently positive. For dataset 2, the hypotheses were supported only for the middle operationalisation of foreknowledge, where firms had either directional or precise knowledge of competitors' practices.

On examining the individual types of decision, however, two opposing patterns emerge that are robust against different operationalisations of foreknowledge (Table 6.6) and isomorphism (Table 6.7).

Table 6.6: The effect of foreknowledge on isomorphic behaviour, by type of knowledge and category of decision, dataset 2

X^2 statistics		Degree of foreknowledge		
Category of decision	N	Precise	Directional or better	Vague or better
All	3464	0.93	6.47*	2.07
Marketing	2400	10.39**	28.59***	23.08***
Compensation	558	[5.05]!	[5.08]!	[6.69]!!
Effort	410	[4.30]!	[5.08]!!!	[52.38]!!!

Table 6.7: The effect of directional or better foreknowledge on isomorphic behaviour, by category of decision and definition of isomorphism

X^2 statistics	Definition of isomorphism			
Category of decision	Dataset 1 – including perpetuations	Dataset 2 – unlimited distance	Dataset 3 – distance ≤ 12.5%	Dataset 4 – distance = 0
All	20.3***	6.47*	12.14***	13.47***
Marketing	77.26***	28.59***	36.45***	34.56***
Compensation	[12.43]!!!	[5.08]!	[1.26]	[0.14]
Effort	[9.28]!!	[5.08]!!!	[18.15]!!!	[20.61]!!!

Note 1: Observations in dataset 1 are not independent: X^2 test not usable with these data. Results for information only.
X^2 statistics in [square brackets] indicate relationships in direction counter to hypothesis
* p<0.05** p<0.01 *** p<0.001, relationship in hypothesised direction
! p<0.05 !! p<0.01 !!! p<0.001, relationship in direction counter to hypothesis

For marketing decisions, the existence of foreknowledge is consistently and significantly related to a propensity to take isomorphic decisions, and this relationship obtains for all levels of foreknowledge. H4a and H4b are thus both supported for this category of decisions. On the other hand, for decisions relating to the sales force, whether numbers of salespeople or their compensation levels, the relationship is also present, but in the negative direction – i.e. knowledge of competitors' decisions renders a group significantly *less* likely to copy them. This negative relationship is significant for effort, but not always for compensation, decisions. (The relationship could not be tested for activity decisions, since in every case a group taking such a decision possessed at least one piece of market research showing which competitor brands were active in which markets.)

I conclude that there is clear evidence of a relationship between foreknowledge and isomorphic decisions, indicating support for H4a. However, the direction of the relationship differs for different types of decision, so that H4b is not supported.

6.6 H5: Decision ambiguity and isomorphism

I computed contingency tables comparing the numbers of isomorphic decisions taken for decisions in the three classes. In order to check that the outcome was not overly dependent on the allocation of decisions to classes, I also computed two further sets of contingency tables, for clear decisions versus ambiguous (moderately and highly) and for highly ambiguous versus moderately or unambiguous. The results are summarised in Table 6.8.

Table 6.8 Effect of decision ambiguity on proportion of isomorphic decisions
statistics in [square brackets] indicate relationships in direction counter to hypothesis

X^2 statistics N = 3463	Test of ambiguity		
Dataset - Definition of isomorphism	Clear vs moderate vs high	Clear vs (moderate + high)	(Clear + moderate) vs high
Dataset 1 – including perpetuations	N/A (note 1)		
Dataset 2 – unlimited distance	20.56***(note 2)	[1.23]	4.70*
Dataset 3 – distance ≤ 12.5%	[16.64]!!!	[15.91]!!!	[10.55]!!
Dataset 4 – distance = 0	3.89 (note 2)	[0.90]	[0.15]

* p<0.05 ** p<0.01 *** p<0.001, relationship in hypothesised direction
! p<0.05 !! p<0.01 !!! p<0.001, relationship in direction counter to hypothesis
Note 1: Observations in dataset 1 not independent: X^2 test not usable with these data.
Note 2: These two contingency tables showed a U-shaped relationship with ambiguity: the proportion of isomorphic decisions was above expected levels for both clear and highly ambiguous decisions, and below expected levels for moderately ambiguous ones.

Only one of the contingency tables shows a relationship that is unambiguously significant in the hypothesised direction. It is outnumbered by instances where the relationship is U-shaped, is in the direction counter to the hypothesis or is not significant. I conclude that H5 is not supported.

6.7 H6: Effects of combinatorial complexity

Table 6.9 summarises the effect of increasing combinatorial complexity on the proportions of observed isomorphisms between strategic elements. I have been unable to identify a statistical test of the significance of these changes, but the results are highly indicative.

Table 6.9 Proportions of strategic elements that are isomorphic between pairs of groups at different stages of combinatorial complexity, period 8

Grouping	Complexity 1 (Price)	Complexity 3 Marketing mix	Complexity 6 Mix+salesforce	Complexity 9 Total strategy
Region 1				
1.1	100%	33.3%	27.8%	18.6%
1.2	100%	44.4%	33.3%	25.9%
1.3	100%	33.3%	33.3%	22.2%
Region 2				
2.1	100%	42.9%	42.1%	30.2%
Region 3				
3.1	100%	61.1%	52.8%	35.2%
3.2	100%	66.7%	66.7%	44.4%
Region 4				
4.1	100%	55.1%	52.5%	38.0%
Region 5				
5.1	100%	66.7%	44.4%	29.6%
5.2	100%	66.7%	50.0%	33.3%
Region 6				
6.1	100%	44.4%	38.9%	31.5%
6.2	100%	66.7%	50.0%	33.3%
6.3	100%	33.3%	66.7%	55.6%
Region 7				
7.1	100%	33.3%	33.3%	22.2%
Wtd. Total	*100%*	*50.5%*	*46.5%*	*33.2%*

The proportion of isomorphic decisions falls by nearly 50% in moving from a combinatorial complexity of 1 to a complexity of 3, with falls being observable in every single price grouping. The impact of the next increase in combinatorial complexity from 3 to 6 is far smaller – only four percentage points, with one of the 13 groupings showing an increase and 3 showing no change. Increasing combinatorial complexity further, to 9, reduces the proportion of isomorphic strategic elements by a further 13 percentage points, to one-third, with every grouping showing a decrease.

An analysis (Table 6.10) of the number of totally isomorphic strategies at each stage reinforces this message. Of the 84 pairings of firms that could be deemed to be following isomorphic strategies if only their prices were observed, only 8 could be deemed to have isomorphic marketing mixes. Of these, 6 pairings are within a single grouping in Region 4, which was the most evenly contested of the seven regions – the leading brand in period 7 had only 16% of the market by value, and there were a further five brands with whose share of the market were 3 points or less below that leading total. Only 3 of those 8 pairings, all from within that same regional grouping, are still isomorphic after their salesforce strategies are considered, and none if the full range of marketing decisions is taken into account.

Table 6.10 Numbers of marketing strategies that are isomorphic between pairs of groups at different stages of combinatorial complexity, period 8

Grouping	**Complexity 1 (Price)**	**Complexity 3 Marketing mix**	**Complexity 6 Mix+salesforce**	**Complexity 9 Total strategy**
Region 1				
1.1	3	0	0	0
1.2	3	0	0	0
1.3	3	0	0	0
Region 2				
2.1	21	0	0	0
Region 3				
3.1	12	1	0	0
3.2	1	0	0	0
Region 4				
4.1	28	6	3	0
Region 5				
5.1	3	0	0	0
5.2	1	0	0	0
Region 6				
6.1	6	1	0	0
6.2	1	0	0	0
6.3	1	0	0	0
Region 7				
7.1	1	0	0	0
Total	*84*	*8*	*3*	*0*

Although the sample is small, I conclude, in the absence of a statistical test to confirm the significance of the differences, that the data offer support for H6.

6.8 H7: The effect of isomorphic pressures on isomorphic behaviour

Table 6.11 gives the Kendal rank correlation coefficients relating the proportion of isomorphic decisions taken in a given period to the two measures, mean level and proportion (see 5.4.10) of the strength of perceived isomorphic pressures in the previous period. The data were limited to decisions taken in quarters 3, 5 and 7, corresponding to the isomorphic pressures questionnaire data for quarters 2, 4, and 6.

Table 6.11: Kendal rank correlations between isomorphic pressures and proportion of isomorphic decisions

	Dependent variable: Proportion of isomorphic decisions							
	Dataset 1		Dataset 2		Dataset 3		Dataset 4	
Independent variable:	tau	p	tau	P	Tau	p	tau	p
Competitive isomorphic pressure – mean level	-0.07	0.33	-0.08	0.70	-0.01	0.54	-0.04	0.60
Competitive isomorphic pressure – proportion	0.18	0.14	-0.04	0.60	0.06	0.36	0.12	0.24
Coercive isomorphic pressure – mean level	-0.20	0.89	-0.30	0.97	-0.32	0.98	-0.27	0.96
Coercive isomorphic pressure – proportion	-0.05	0.62	-0.26	0.94	-0.26	0.94	-0.15	0.82
Mimetic pressure from within industry - mean level	0.02	0.46	0.08	0.32	0.08	0.32	0.07	0.33
Mimetic pressure from within industry - proportion	0.49**	0.002	0.10	0.28	0.24	0.08	0.20	0.13
Mimetic pressure external to industry – mean level	-0.22	0.91	-0.21	0.91	-0.21	0.91	-0.18	0.86
Mimetic pressure external to industry – proportion	-0.14	0.81	-0.19	0.87	-0.07	0.66	-0.03	0.57

* p<0.05 ** p<0.01 *** p<0.001

There is clearly little evidence that the incidence of isomorphic decisions is, as hypothesised, positively related to the strength of isomorphic pressures. There is a significant correlation, in the hypothesised direction, between the proportion of isomorphic decisions and the proportion measure of mimetic pressure from within the industry (i.e. perceived pressures to copy other groups). However, this is observed only for Dataset 1 (which includes inertial decisions) and is not robust against variations in definitions of isomorphism, although the coefficient for Dataset 3 is significant at the 10% confidence level. None of the other correlation coefficients is significant at even the 10% level, and many indicate a negative relationship between pressures and outcomes, rather than the positive one hypothesised.

I conclude that H7 is not supported. There is also further evidence from these results that the different forms of isomorphic pressures behave differently, and may therefore separate phenomena rather than part of a single one.

6.9 H8: The effect of performance on isomorphic behaviour

I compiled a set of contingency tables (see table 6.12 for an example) comparing the numbers of isomorphic versus non-isomorphic decisions taken by groups ranked low against a given performance measure, to those taken by groups ranked high by that same measure in any given period. They relate decisions taken in quarter n to performance measured in quarter n-1, the latest information available to the group when compiling its decision.

Table 6.12: Example of a contingency table comparing decisions taken by high and low performing groups for dataset 2

Decisions	Value share rank		
Isomorphism	3 or less	4 or more	Total
Yes	339 (295.4)	376 (419.6)	**715**
No	1092 (1135.6)	1657 (1613.4)	**2749**
Total	**1431**	**2033**	**3464**

These tables were compiled for all six performance measures and for all six possible breakpoints between high and low performance, for decisions taken from quarter 3 (the first point in the game for at which groups had information on relative performance and other groups' decisions on which to base isomorphic decisions) onwards.

The results for dataset 2 are summarised in Table 6.13. It is clear that if performance is measured by rate of growth, then H8, that isomorphic behaviour will be more common amongst poorly performing firms than in the population as a whole, is not consistently supported, although firms that ranked in the top half measured by stock price growth do seem to make relatively fewer isomorphic decisions than those ranked in the bottom half. However, if performance is measured in terms of level of stock price or market share, then a clear pattern does emerge supporting H8, with lower performing groups more likely to take isomorphic decisions than their higher performing peers.

Table 6.13: Significance of differences between incidences of isomorphic decisions in high- and low-performing groups, dataset 2

X^2 statistics, n=3464 (all decisions)	Definition of low performance (ranking by performance amongst 7 groups)					
Performance measure	Lowest ranked	Amongst 2 lowest	Amongst 3 lowest	Amongst 4 lowest	Amongst 5 lowest	Not top ranked
Stock price	5.59*	29.26***	12.38***	8.11**	18.9***	18.3***
Market share by volume	5.6*	1.46	3.87*	7.13**	9.57**	2.61
Market share by value	16.39***	10.01**	13.02***	15.07***	36.45***	27.03**
Growth in stock price	0.76	0.30	3.62	13.94**	5.96*	6.14*
Growth in volume market share	2.76	0.01	0.09	0.01	3.08	4.34*
Growth in value market share	0.00	0.03	3.61	0.43	10.67**	3.69

* p<0.05 ** p<0.01 *** p<0.001

This finding appears to be robust against the particular breakpoint used to differentiate high from low performance. It was also robust against changes in the definition of isomorphism, as demonstrated in Table 6.14 (in the interest of clarity of presentation, only stock price data are shown in this table).

Table 6.14: Comparison across datasets of significance of differences between incidences of isomorphic decisions in high- and low-performing groups

X^2 statistics, n=3464 (all decisions)	Definition of low performance (ranking by performance amongst 7 groups)					
Performance measure: Stock price	Lowest ranked	Amongst 2 lowest	Amongst 3 lowest	Amongst 4 lowest	Amongst 5 lowest	Not top ranked
Dataset 1 – including perpetuations (see note 1)	0.01	11.36**	9.54**	10.08**	3.65	9.54**
Dataset 2 – unlimited distance	5.59*	29.26***	12.38***	8.11**	18.90***	18.30***
Dataset 3 – distance ≤ 12.5%	3.23	26.01***	13.18***	6.34*	4.44*	8.56*
Dataset 4 – distance = 0	1.60	25.49***	13.56***	5.83*	4.38*	5.08*

Note 1: Observations in dataset 1 are not independent: X^2 test not usable with these data. Results for information only.

* p<0.05 ** p<0.01 *** p<0.001

It also appears to be robust against the precise measure of performance used, a phenomenon that demanded further investigation. It was possible that this robustness came from correlations between the performance measures, so that the same groups were emerging as high performers on all measures. However, an initial visual check indicated that, outside the early periods when it might be expected that one or two groups might seize an early lead on all three measures, different groups figured amongst the leaders depending on which measure was taken (Table 6.15).

Table 6.15: Top performers by different measures

	Top performing groups measured by		
Quarter	Stock price	Market share by volume	Market share by value
2	6, 2	2, 6	6, 2
3	6, 2	6, 2	6, 4
4	6, 7	2, 7	6, 2
5	6, 5	2, 3	3, 4
6	6, 5	2, 3	3, 4
7	5, 3	2, 7	3, 4

Since these data are highly non-normal, standard correlations could not be used to verify the degree of association between them, and the standard non-parametric tests, which rely on ranking of observations, cannot be used to compare data across time periods, since rankings of observations in different time periods cannot be combined. However, I examined the Kendall rank correlation coefficients between each of the three performance measures in each period (Table 6.16).

Table 6.16: Correlations between different performance measures by period

Kendall rank correlation coefficients, two-tailed test, n=7		Quarter					
Variables		2	3	4	5	6	7
Stock price vs volume share	Tau	0.43	0.62	0.43	-0.14	0.05	0.14
	p	0.24	0.07	0.24	0.77	1.00	0.77
Stock price vs value share	Tau	0.43	0.14	0.24	-0.24	-0.24	0.33
	p	0.24	0.77	0.56	0.56	0.56	0.38
Volume share vs value share	Tau	0.81	0.33	0.43	0.52	0.52	0.24
	p	0.01	0.38	0.24	0.14	0.14	0.56

p = probability that two variables are not correlated; low p = high correlation.

In only two cases was there a probability of greater than 90% that two of the variables are correlated. In 8 of the 18 cases the probability was 50% or less. I conclude that the three variables are not associated and constitute distinct measures of performance. This finding is slightly surprising in that volume market share is actually one of the factors that influences stock prices in BRANDMAPS (Chapman, 1994).

In order to test further the strength of the association between isomorphic behaviour and performance, I computed for each period, beginning in quarter 3, the Kendall rank correlation coefficients between each of two measures of isomorphic behaviour, number of isomorphic decisions and proportion of total decisions that are isomorphic, and the six performance measures detailed earlier (each lagged one period). I tested number, as well as proportion, of isomorphisms to capture the possibility that groups, in seeking to emulate successful peers, might take more decisions than if they had no such impulse.

Here I used a one-tailed test of the hypothesis that high performance would coincide with low incidence of isomorphism. The resulting correlations for dataset 2 are given in Table 6.17; results for the other datasets are similar. The data show that the relationship established earlier between isomorphic behaviour and performance does not extend to a correlation. Very few of the coefficients are significant, none is significant for a majority of periods for any single combination of independent and dependent variable

and for the final three periods the majority of coefficients are positive, indicating a relationship in the opposite direction to that hypothesised.

Table 6.17: Correlations between isomorphic behaviour and previous quarter's performance, by period, dataset 2

Kendall rank correlation coefficients, one-tailed test, n=7	Quarter					
	3	4	5	6	7	8
Dependent variable: No of isomorphic decisions Independent variable:						
Stock price	-0.49	-0.29	-0.49	-0.62*	-0.78**	0.20
Market share by volume	-0.39	0.00	-0.29	0.14	0.10	0.49
Market share by value	-0.59*	-0.29	-0.39	0.24	0.00	0.49
Growth in stock price	-0.49	-0.29	-0.29	0.14	0.00	0.39
Growth in volume market share	-0.39	0.49	-0.39	0.14	0.29	-0.2
Growth in value market share	-0.59*	0.10	-0.29	0.14	0.49	0.00
Dependent variable: Isomorphic decisions as a proportion of total Independent variable:						
Stock price	-0.71**	-0.24	-0.14	-0.33	-0.71**	0.43
Market share by volume	-0.33	-0.43	-0.52*	0.05	-0.14	0.14
Market share by value	-0.52*	-0.90***	-0.71**	0.14	0.14	0.33
Growth in stock price	-0.71**	-0.24	0.05	0.24	0.14	0.43
Growth in volume market share	-0.33	-0.14	-0.05	0.43	0.52	-0.52*
Growth in value market share	-0.52	-0.33	0.05	0.24	0.52	0.14

* p<0.05 ** p<0.01 *** p<0.001

I conclude that H8 is supported for a range of definitions of performance and of isomorphic behaviour, but that the relationship between performance and isomorphic behaviour is non-linear.

6.10 Influences on isomorphic pressures – H9, H10, H11a and H11b

These final hypotheses, H9, H10, H11a and H11b, together form a study within a study, on which I report in this section. The methodology for operationalising the requisite variables, through questionnaires, is different from that used for the other data. The method of hypothesis testing, using least squares regression, is also distinct from that used elsewhere in the study.

Table 6.18 gives descriptive statistics for each of the variables, together with Pearson and Kendall coefficients for the correlations between them and Pearson coefficients for the correlations between the study variables and the control variables.

Table 6.18: Summary statistics and correlation matrix

N=28	COMPI	COERCI	MIMIN	MIMEX	PB	SI	MSHR	SPR
Mean	4.76	3.90	3.73	4.44	3.68	4.95	14.3	258.4
Standard deviation	0.747	0.693	0.876	0.643	0.745	0.708	3.30	70.51
Competitive isomorphic pressures (COMPI)	-	0.156	-0.091	0.082	0.024	0.361!	0.214	0.201
Coercive isomorphic pressures (COERCI)	*0.051*	-	-0.237	0.229	-0.318!	0.249	0.001	0.270
Mimetic pressures – industry (MIMIN)	*-0.046*	*-0.172*	-	-0.081	0.321!	-0.145	-0.150	-0.211
Mimetic pressures – external (MIMEX)	*-0.085*	*0.084*	*-0.034*	-	-0.029	0.392!	0.147	-0.026
Political behaviour (PB)	*-0.014*	*-0.189*	*0.250**	*0.042*	-	-0.317	0.087	0.083
Strategic intent (SI)	*0.241!*	*0.162*	*-0.101*	*0.306!*	*-0.213*	-	0.154	0.368
Market share % (MSHR)	*0.137*	*0.035*	*-0.128*	*-0.104*	*-0.054*	*0.102*	-	0.191
Stock price (SPR)	*0.156*	*0.147*	*-0.214*	*-0.008*	*0.040*	*0.254*	*0.193*	-
Mean Age	-0.292	0.374*	-0.283	0.260	-0.289	-0.196	0.059	0.132
Age diversity	-0.391*	-0.155	-0.255	-0.423*	-0.104	-0.564**	0.148	-0.182
Period	0.022	0.060	0.047	-0.459*	0.309	0.009	0.000	0.784***
Number of nationalities	0.200	0.283	0.225	-0.337	0.415*	-0.125	-0.098	-0.277
All full time (dummy)	0.062	-0.115	0.273	-0.204	0.369	0.053	-0.258	-0.124
All part time (dummy)	0.221	-0.233	0.056	-0.002	-0.133	0.285	0.174	0.041

Italicised figures are Kendal rank correlation coefficients, others are Pearson correlation coefficients

* p<0.05** p<0.01 *** p<0.001, relationship in hypothesised direction where hypothesis exists, or significant under 2-tailed test where no hypothesis

! p<0.05 !! p<0.01 !!! p<0.001, relationship in direction counter to hypothesis

The Kendal coefficients are shown because very few of the variables are normally distributed, and under those circumstances the confidence intervals for the Pearson correlation coefficient is not strictly valid. However, in almost every case here, the Pearson and Kendal coefficients agree.

There are four instances where the two correlation coefficients have different signs; in three of these case (COMPI/MIMEX, COMPI/PB, MIMEX/PB) the correlations are close to zero, but there is one instance (MIMEX/MSHR) where the sign is different and the absolute value of the coefficient in each case is above 0.1. In no case does the sign differ where the coefficient is close to being statistically significant by either measure. With one exception, to be discussed below, the correlations shown as statistically significant by the Pearson formula are confirmed as such by the Kendall formula.

The correlation matrix indicates poor levels of support for the hypotheses drawn in this chapter. None of the dozen correlations between the different measures of isomorphic pressures and those of performance is significant; many are close to zero and of those that are not, those relating MIMIN (mimetic pressures from within the industry) to market share (MSHR) and to stock price (SPR) are negative, rather than positive as hypothesised. H9 is therefore not supported.

Of the correlations of strategic intent (SI) with the different measures of isomorphic pressure, only that with MIMIN has the hypothesised negative sign. The other correlation coefficients indicate a positive association between SI and isomorphic pressures; those with competitive isomorphic pressures (COMPI) and externally driven mimetic pressures (MIMEX) are significant at the 5% level. H5 is thus not supported.

The correlations of political behaviour (PB) with COMPI and MIMEX are close to zero. The correlation of PB with coercive isomorphic pressures (COERCI) is significant at the 5% level by the Pearson measure, but only at the 10% level by the Kendall measure ($p=0.088$). However, it indicates a negative, rather the hypothesised positive association (it is one of the pressures derived from legitimation). The correlation of PB with MIMIN is significant at the 5% level according to both Pearson and Kendall measures, but is positive when the hypothesis calls for a negative sign. Thus neither H11a nor H11b is supported.

All control variables except the dummies for cohort identity are significantly correlated with at least one of the isomorphic pressure measures, and each of the latter, with the exception of MIMIN, is significantly correlated with at least one of the control

variables. The control variables also show noteworthy correlations with some of the independent variables, in particular the positive correlation between share price and time period and the negative correlation between strategic intent and age diversity.

Table 6.19 Best fit OLS regressions of isomorphic pressure variables on control variables

Dependent variable	COMPI	COERCI	MIMIN	MIMEX
Intercept	21.904***	-0.578		6.276***
Std. Error	4.996	1.303		0.313
Age	-0.490**	0.162**		
Std. Error	0.136	0.058		
Age diversity		-4.729*		-6.093***
Std. Error		2.000		1.301
Period				-0.132**
Std. Error			No	0.037
No of nationalities	-0.252		significant	
Std. Error	0.189		regression	
All full time	-1.384*		models	-0.688**
Std. Error	0.496			0.196
All part time	-2.252*			-0.821**
Std. Error	0.868			0.290
R^2	0.433	0.251		0.620
Adjusted R^2	0.334	0.191		0.554
F-statistic	4.393**	4.184		9.393***
p(F-statistic)	0.009	0.027		0.0001

† p<0.10* p<0.05** p<0.01 *** p<0.001

Further investigation using ordinary least squares multiple regression analyses (Table 6.19) shows that the control variables alone explain substantial proportions of the variance in competitive isomorphic pressures (43%), coercive isomorphic pressures (25%) and mimetic pressures external to the industry (62%). Pressures to copy other groups are, however, not apparently associated with any of the control variables.

6.10.1 H9: Isomorphic pressures and performance

Tables 6.20 and 6.21 summarise the results of regressions of the four isomorphic pressure variables on the two performance measures. They show qualified support for H9.

Where market share is the independent variable (Table 6.20), the hypothesis is not supported. Where COERCI or MIMIN is the dependent variable the regression models are not significant. With COMPI or MIMEX as the dependent variable the models are significant, but the MSHR regression coefficients are not significant at the conventional 5% confidence limit, though those coefficients are significant at the 10% confidence level when MIMEX is the dependent variable.

Table 6.20 Best fit OLS regressions of isomorphic pressure variables on market share[15]

Dependent variable	COMPI	COERCI	MIMIN	MIMEX
Intercept	22.012***	-0.675	No significant models or coefficients	0.214
Std. Error	4.780	1.822		2.261
MSHR	0.063†	0.007		0.046†
Std. Error	0.036	0.038		0.027
Mean Age	-0.517***	0.162*		0.157*
Std. Error	0.131	0.060		0.063
Age diversity		-4.777*		-7.210***
Std. Error		2.057		1.850
Period				-0.132**
Std. Error				0.038
No of nationalities	-0.297			0.063
Std. Error	0.182			0.125
All full time	-1.337*			
Std. Error	0.476			
All part time	-2.464*			
Std. Error	0.839			
R^2	0.504	0.252		0.617
Adjusted R^2	0.391	0.158		0.595
F-statistic	4.463**	2.692†		7.075***
P(F-statistic)	0.006	0.069		0.000

† p<0.10* p<0.05** p<0.01 *** p<0.001

Table 6.21 Best fit OLS regressions of isomorphic pressure variables on stock price

Dependent variable	COMPI	COERCI	MIMIN	MIMEX
Intercept	16.368***	0.938	5.634***	5.858***
Std. Error	3.423	1.604	0.707	2.377
SPR	0.006*	-0.005†	-0.010**	0.005*
Std. Error	0.003	0.003	0.004	0.002
Mean Age	-0.373**	0.069*		-0.015
Std. Error	0.100	0.050		0.073
Age diversity			-4.750*	-4.688**
Std. Error			2.068	1.430
Period	-0.130	-0.112	0.275*	-0.248***
Std. Error	0.083	0.092	0.110	0.060
No of nationalities				
Std. Error				
All full time	-1.153*			-0.573†
Std. Error	0.472			0.139
All part time	-1.571*			-0.748
Std. Error	0.677			0.458
R^2	0.492	0.196	0.313	0.701
Adjusted R^2	0.376	0.096	0.227	0.615
F-statistic	4.256**	1.953	3.637	8.195***
P(F-statistic)	0.007	0.148	0.027	0.000

† p<0.10* p<0.05** p<0.01 *** p<0.001

[15] For the sake of brevity, only the associations with market share by value are shown here. The results for share by volume are similar.

However, Table 6.21 shows that stock price, as independent variable, features, with regression coefficients that carry a positive sign, as per hypothesis, and are significant at the 5% level, in regression models on COMPI and MIMEX that are significant at the 0.1% level. Stock price, as the most visible indicator of comparative performance, is the most intuitively plausible trigger for isomorphic pressures. In both models, the association is after controlling for time period, so that the factor at work can be inferred to be the information conveyed by price movements, rather than some disguised inertial effect.

The regression coefficients of SPR on COERCI and MIMIN carried a negative sign, counter to the hypothesis. However, neither the coefficient of SPR nor the best model in which it featured with COERCI as dependent variable were significant at the 5% level. The regression coefficient of SPR on MIMIN was significant, in a significant model, but that model, unlike the others featured in Tables 6.20-6.21, featured residuals that were not normally distributed (Jarque Bera statistic 8.317, p=0.016). This appears to be because MIMIN itself has an unusual distribution, with two peaks, whereas the other isomorphic pressure variables follow single-peaked distributions much closer in shape to the normal distribution.

I conclude that there is limited support for H9, but that the relationship between performance and isomorphic pressure is not uniform across the different types of isomorphism, a finding I discuss further in the following chapter.

6.10.2 H10: Isomorphic pressures and strategic intent

The regressions of the isomorphic pressure constructs on strategic intent fail to support H5 (Table 6.22).

When COMPI and COERCI are the dependent variables, SI features with significant regression coefficients in models (Table 6.23, columns 2 and 5) that however are significant only at the 10% level, and also in models (columns 3 and 4) that are significant at the 5% level or better, but only with a non-significant regression coefficient. The regression coefficients in all cases are positive, whereas the hypothesis is of a negative relationship.

The regression coefficients for SI on MIMIN, on the other hand, carry a negative sign, as hypothesised. However, the best models feature SI with a coefficient that is significant at the 10% level in a model (Table 6.23 column 6) that too is only significant

with a 10% confidence limit, and with a regression coefficient significant at the 5% level in a model (column 7) that is however not significant even at the 15% level.

Table 6.22 Best fit OLS regressions of isomorphic pressure on strategic intent

Dependent variable	COMPI		COERCI		MIMIN		MIMEX
Intercept	2.083†	27.127**	-1.596	2.299*	6.252***	-12.065	14.644**
Std. Error	1.110	8.035	2.008	0.896	1.657	11.389	4.052
Strategic Intent	0.414*	0.334	0.199	0.384*	-0.495†	-0.581*	0.298*
Std. Error	0.191	0.200	0.206	0.185	0.268	0.274	0.136
Mean Age		-0.692**	0.159*			0.524	-0.283*
Std. Error		0.237	0.059			0.325	0.103
Age diversity		4.877	-3.602		-5.871*	-11.853*	
Std. Error		3.743	2.318		2.523	5.133	
Period							-0.133**
Std. Error							0.038
No. of nationalities	0.177	-0.517			0.187	0.793†	-0.413*
Std. Error	0.129	0.332			0.150	0.455	0.146
All full time		-1.614**		-0.412		1.045	-0.958*
Std. Error		0.522		0.271		0.716	0.361
All part time		-3.126*		-0.889*		2.612	-2.004**
Std. Error		1.144		0.399		1.569	0.635
R^2	0.192	0.509	0.279	0.236	0.237	0.329	0.630
Adjusted R^2	0.127	0.369	0.189	0.141	0.142	0.137	0.524
F-statistic	2.964†	3.628*	3.093	2.472	2.484†	1.716	5.963***
p(F-statistic)	0.070	0.013	.0046	0.086	0.085	0.167	0.0009

† p<0.10* p<0.05** p<0.01 *** p<0.001

Finally, MIMEX features as dependent variable (column 8) in a significant model where SI has a significant regression coefficient. That coefficient is however positive, counter to the hypothesis.

I conclude that there is no support for H10.

6.10.3 H11: Isomorphic pressures and political behaviour

Table 6.23 summarises the results of least-squares regressions of the isomorphic pressure variables on political behaviour (PB).

In the regressions of MIMIN and MIMEX, the two information-based forms of isomorphic pressure, the coefficients of PB are different from zero only at the 10% level of significance and in any case carry a positive sign. The best regression model featuring MIMIN is furthermore only significant at the 10% level. Hypothesis H11a, which called for a negative association between these variables and PB, is therefore not supported.

Table 6.23 Best fit OLS regressions of isomorphic pressure on political behaviour

Dependent variable	COMPI	COERCI	MIMIN	MIMEX
Intercept	32.365**	5.888***	2.344**	3.016
Std. Error	9.095	0.694	0.820	2.906
Political behaviour	-0.344†	-0.307†	0.377†	0.248†
Std. Error	0.197	0.170	0.218	0.135
Mean age	-0.764**			0.077
Std. Error	0.251			0.082
Age diversity	3.524	-4.227*		-6.492***
Std. Error	3.534	1.855		1.351
Period	0.043			-0.157***
Std. Error	0.056			0.038
No. of nationalities	-0.527			
Std. Error	0.338			
All full-time	-1.698**	-0.413		-0.543
Std. Error	0.538	0.294		0.336
All part-time	-3.457	-1.084*		-0.417
Std. Error	1.209	0.413		0.510
R^2	0.518	0.337	0.103	0.674
Adjusted R^2	0.349	0.222	0.068	0.580
F-statistic	3.066	2.923	2.984†	7.222
p(F-statistic)	0.023	0.043	0.096	0.000

† p<0.10* p<0.05** p<0.01 *** p<0.001

The regression coefficients of PB when the dependent variables are COMPI and COERCI, the constructs measuring legitimation-based isomorphic pressures, are similarly significant only at the 10% confidence level and carry the opposite sign to that implied by the hypothesis. H11b, which hypothesised a positive relationship between these pressures and PB, is thus not supported.

6.10.4 The impact of control variables

It has already been shown (Table 6.19) that the control variables account for a substantial proportion of the variance of all isomorphic pressure variables other than MIMIN. All of the control variables emerged with significant coefficients in at least one statistically significant regression model (Table 6.24).

The 'number of nationalities' variable was significant only in a few models for which external mimetic pressures were the dependent variable. All other variables were significant influences on at least two of the four isomorphic pressure variables, and age diversity on all four. The sign of the age and period coefficients varied between dependent variables, but the diversity variables were consistently negatively associated with isomorphic pressures. On the limited evidence of this study, increased diversity lowers sensitivity to isomorphic pressures.

Table 6.24 Control variables with regression coefficients significantly different from zero in regression models with statistically significant F-values

Dependent variable	COMPI	COERCI	MIMIN	MIMEX
Age	-	+		+
Age diversity	-	-	-	-
Period			+	-
No of nationalities				-
All full time	-			-
All part time	-			-

A '+'or '-' sign in a cell indicates that the relevant variable appears, with a significant ($p<0.05$) regression coefficient carrying that sign, in at least one regression model whose F-statistic occurs with $p<0.05$. Analysis includes some regression models not shown in Tables 6.19-6.23.

This study is thus consistent with others (see section 4.6.1) showing that TMT diversity influences teams' cognitive processes. Studies of isomorphic behaviour have not hitherto taken account of diversity or other TMT characteristics as either an explanatory or a control variable. The findings of this study indicate that future researchers in the area would be advised to control for such factors.

Chapter 7

Synthesis, Discussion and Conclusions

In this chapter, I summarise the results from the previous chapter, discuss the individual and combined implications and draw the conclusions of my research. In section 7.1, I discuss the implications of the findings in relation to the individual hypotheses. In section 7.2 I return to my original research question, and draw together the conclusions regarding the model of isomorphic decision making in firms which I developed in Chapters 2 and 3. In sections 7.3 and 7.4 I discuss the implications for theory and managerial praxis. After exploring the limitations of the study, I summarise the conclusions and end with suggestions for how this research might be extended.

For convenience, I summarise the hypotheses that have been tested in this thesis, and the key findings, in Table 7.1 overleaf.

7.1 Outcomes of tests of individual hypotheses

7.1.1 H1: Effects on isomorphic behaviour of industry age

H1: The incidence of isomorphic behaviour in an industry is positively associated with the time since industry foundation. ***Supported if inertial decisions included as isomorphic. Not supported for other definitions of isomorphism.***

I have found no association between isomorphic behaviour and industry age unless a definition of isomorphic decision is used which leads to the inclusion of large numbers of perpetuations of past decisions.

Non-inertial isomorphic activity appears to peak around quarters 4 and 5 and then diminish. Emulation of opponents' decisions is most common early in the game, while participants are still developing their sense-making capacity. This phenomenon is compatible with the idea that early isomorphic decisions are the results of information cascades, when the value of information is still difficult to assess, and could also be ascribed to managers' using imitation as a means of reducing uncertainty in the early stages of the game. Once participants have learnt how their industry functions, they acquire the confidence to differentiate. There is no sign of the institutionalisation over time of heuristics based around the copying of competitors as a means of economising on search costs.

Table 7.1 Summary of hypotheses and key findings

Hypo-thesis	*Dependent variable*	*Independent variable*	*Hypo-thesised association*	*Finding*
H1	Incidence of isomorphic behaviour in industry	Time since industry foundation	Positive	Supported if inertial decisions included as isomorphic. Not supported for other definitions of isomorphism.
H2		Environ-mental uncertainty	Positive	Supported.
H3		Industry concen-tration	Positive	Not supported overall. Differences in behaviour of different types of decision.
H4a)	Proportion of isomorphic decisions by firm	Knowledge of strategies mimicked	Significant in either direction	Supported.
H4b)			Positive	Not supported.
H5	Proportion of isomorphic decisions by firm	Clarity of ends/means relationship for decision	Negative	Not supported.
H6	Degree of isomorphism in market	Combin-atorial complexity of decision	Negative	Supported.
H7	Frequency of isomorphic decisions by firm	Perceived isomorphic pressures	Positive	Not supported.
H8	Frequency of isomorphic decisions	Firm per-formance	Negative	Supported where performance is measured in terms of level.
H9	Perceived isomorphic pressures	Firm per-formance	Positive	Limited support, not uniform across different types of isomorphism.
H10		Strategic intent	Negative	Not supported.
H11a)	Isomorphic pressures from info on peer behaviour	Political behaviour	Negative	Not supported.
H11b)	Isomorphic pressures based on legitimation		Positive	Not supported.

With only one run of the simulation with a single cohort, it is however necessary to be cautious about the external validity of the findings. It is not possible to be sure whether the pattern of decision-making over time seen in this study, including for example the fall recorded in the number of decisions in period 8, was a function of an eight period simulation or a more general phenomenon, or whether the elapsed real- and game-time were sufficient for realistic patterns of institutionalisation and isomorphism to emerge.

7.1.2 H2: Effects on isomorphic behaviour of environmental uncertainty

H2: The incidence of isomorphic behaviour in an industry will be positively associated with environmental uncertainty. ***Supported.***

The view of isomorphic behaviour as a means of reducing environmental uncertainty, which was supported by the findings in respect of H1, gains further backing from the support found for H2. Imitation of other firms might be a mechanism whereby organisations may adjust to increased volatility in their environments, facilitated perhaps, in real life, by an increase in boundary-spanning activity as uncertainty increases, as has been observed in field studies (Leifer and Huber, 1977; Lang and Lockhart, 1990).

In this context, it is interesting that the correlations between volatility and proportions of isomorphic decisions are, with only two exceptions, positive. They do not show the differences in sign between the different types of decision that are visible in the correlations between industry concentration and proportion of isomorphic decisions. This may be an indication that the use of isomorphic decisions is a general response to increased environmental uncertainty, whereas firms respond to increased concentration (H3) by a more intricate fine tuning of their strategies, emulating competitors in some elements but not others.

7.1.3 H3: Effects on isomorphic behaviour of industry concentration

H3: The incidence of isomorphic behaviour in an industry will be positively associated with industry concentration. Not supported overall. Differences in behaviour of different types of decision.

This result must be treated with some caution; although, as argued in section 5.4.5, the internal validity of the measurements is quite high, it is necessary to be cautious in

generalizing from individual markets in a simulation to industries in the real world. That said, the lack of support for this old conjecture of DiMaggio and Powell's would, if substantiated by further research, throw into doubt the link that those two theorists assert between isomorphic decision-making and the degree of structuration in an organisational field, and has ramifications for the role of institutional theory which I discuss in section 7.3.1 below.

In contrast to what was observed in testing H2, the directions of the correlations between proportions of isomorphic decisions with industry concentration are seen to differ between the different types of decision. The simplified nature of the business simulation means that one cannot extrapolate this result by, for example, saying that real-life marketing mix decisions will behave differently from sales force hiring decisions but similarly to compensation decisions. However, this observation does support Oliver's (1988) conjecture regarding the differential effect of isomorphic forces on different organisational attributes.

7.1.4 H4: The effect of foreknowledge on isomorphic behaviour

H4a): In a given industry, the proportion of isomorphic decisions will vary significantly according to whether or not the emulator firm has knowledge of the strategies that it is mimicking. ***Supported.***

H4b): In a given industry, the proportion of isomorphic decisions will be greater when the emulator firm has knowledge of the strategies that it is mimicking. ***Not supported.***

The clear support for found here for H4a reinforces the findings of earlier studies (Baron et al, 1986; Dobbin et al, 1993; Palmer et al, 1993) in indicating that economically rational reactions to the task environment are not the only factors stimulating isomorphic decisions. The contribution of this study is to have validated those findings by directly observing the knowledge available to the emulator firm, rather than adducing it from proxy variables. If all firms were reacting purely to the task environment, their foreknowledge of each others' behaviour would not have had a significant association with patterns of isomorphic behaviour. My finding that there is such an association indicates that the information available is significant in driving isomorphic decision-making, with the task environment setting the context within which the value of such information is assessed.

Perhaps the most significant result in the study, however, is the supplementary finding that different types of decision are correlated in different directions with the possession of relevant knowledge. This provides further support for Oliver's (1988) conjecture that isomorphic forces operate differently on different classes of decision. More importantly, it provides evidence of discrimination in participants' use of the information at their disposal: some types of information are used as the basis for imitation, others as the basis for differentiation. This observation is compatible with the view of isomorphism as based on the emulation of economic benefits perceived elsewhere. It is not compatible with views of isomorphic behaviour based upon legitimation, which would imply a more slavish imitation of target organisations' whole range of practices.

7.1.5 H5: Decision ambiguity and isomorphism

H5: The proportion of isomorphic decisions will be highest for decisions where the relationship between ends and means is least clear. ***Not supported.***

I have failed to find an association between the degree of ambiguity inherent in a decision and the extent to which it is likely to be isomorphic. The absence of evidence for an association, positive or negative, between these two variables would support the idea that it is decision visibility, rather than decision ambiguity, which is behind Oliver's 1988 findings that any isomorphism in the strategies of her Canadian voluntary organisations was due to strategic choice. It thus lends support to Greve's (1998a) contention that decision visibility – the other unusual feature of the decisions studied by Oliver – is a driver of imitation.

The finding in respect of H5 appears anomalous in the light of the positive association found between environmental uncertainty and the incidence of isomorphic behaviour. There is no evident reason why managers' reaction to uncertainty should be different for different aspects of that phenomenon. In an established firm, it might be argued that routines are developed to handle uncertainties inherent in the nature of different types of decision, which are a constant aspect of working life, but that less regular uncertainties, such as those attached to environmental change, invoke isomorphism as a defensive behaviour. However, these differences would be less prominent in the context of the present study, where decisions and environment are equally unfamiliar to participants.

It may simply be that further research with larger samples will come to more compatible conclusions for H2 and H5. However, the findings from this study as they stand indicate that there may be undiscovered subtleties relating to the way in which decision makers respond to uncertainty from different sources. I pursue this point further in Section 7.3.3.

7.1.6 H6: Effects of combinatorial complexity

H6: The degree of isomorphism observed in a given market will diminish with the combinatorial complexity of the decision involved. ***Supported.***

The finding that isomorphism diminishes with increasing combinatorial complexity provides an alternative or ancillary explanation for Oliver's (1988) finding to those discussed in relation to H3, H4 and H5. I believe that the constructs that she operationalised in her test of strategic isomorphism were far more combinatorially complex than those in any other study in the area. It is interesting to note that most of what is known about isomorphism is based on studies of variables with very low combinatorial complexity. This must reflect upon the generalisability of those findings, an issue to which I shall return below.

7.1.7 H7: The effect of isomorphic pressures on isomorphic behaviour

H7: Isomorphic decisions are more frequent in firms where the perceived strength of isomorphic pressures is high. ***Not supported.***

The lack of association between isomorphic pressures and frequency of isomorphic practices (H7) is a surprising finding. It may be that this arises from the problems in my operationalisation of the isomorphic pressure variables (see section 5.4.10), and one must be cautious in generalising from a mere 21 observations. However, the absence of even weak evidence of an association for three of the forms of isomorphic pressure across any of the datasets is striking.

Insofar as there were any indications of an association, they were for the variable measuring pressures to mimic other firms in the industry, which is clearly the stimulus most directly related to the isomorphic outcomes being observed in this study. The most significant correlations with incidence of isomorphic decisions were observed for the "proportion" measure of this variable. Of these, only one was statistically significant at normally accepted levels of confidence, and that was for Dataset 1, where a significant

proportion of the decisions labelled as isomorphic were perpetuations of earlier decisions. There appears to be no evident reason why perpetuations should be more sensitive to isomorphic pressures than other forms of isomorphic decision, and it may be that this result is simply an aberration.

The lack of support for H7 might be interpreted as evidence that isomorphism is no more than a coincidental response to the task environment, were it not for the clear support for H4a. In the light of that other result, however, it casts some doubt on the decision making model, implicit in neo-institutional theory, that shows individuals' subjective perceptions of the strength of forces leading towards isomorphism translating readily into isomorphic action. Moreover, this result has been obtained in a laboratory context, where political disruption to the decision-making process is likely to be less than in real life, a point that I amplify in section 7.1.11 below. This has broader implications for institutional and decision making theories, which I explore in section 7.3.

7.1.8 H8: The effect of performance on isomorphic behaviour

H8: Isomorphic behaviour will be more common amongst poorly performing firms than amongst better-performing ones. ***Supported where performance is measured in terms of level.***

The robust finding, from analysis of a substantial population of decisions, of support for H8, a positive relationship between poor performance and isomorphic behaviour, is consistent with Deephouse's (1996) association of isomorphism with survival seeking, which in turn lends itself to a number of further explanations. The most obvious explanation in a real life context would be that poorer performers are more dependent than good ones on outside resources and so more susceptible to pressures based on resource dependency.

However, in a simulated context from which resource dependency is absent, the explanation must be sought elsewhere. It may be that the desire for legitimation weighs more heavily on poor performers that on successful ones, although the investigation if H9 offered only limited support for this proposition. Alternatively, it may be that poorly performing firms are more disposed to follow their peers because of a greater desire to avoid risk, but this would seem unlikely in light of findings from earlier studies on the risk preferences of individuals (Kahneman and Tversky, 1979) and organisations (Greve, 1998b).

The final alternative is that that information regarding the strategies of other firms is worth more to poorer performers than to more successful ones. In real life, this might be because they have fewer resources to devote to researching and developing their own practices. In the present study, where such resource constraints are not binding, a more likely explanation is that underperforming decision makers lack confidence in their own competences and are more disposed to rely upon the decisions of others.

7.1.9 H9: Isomorphic pressures and performance

H9: *The perceived level of isomorphic pressures within an organisation will be positively related to its past performance.* ***Limited support, not uniform across different types of isomorphism.***

Significant, positive associations were found between performance as measured by stock price and two forms of perceived isomorphic pressure: competitive pressures (to win the game) and externally driven mimetic pressures. The association with mimetic pressures internal to the industry was negative, although the problems with this regression model (see 6.10.1) mean that this result must be treated with particular caution.

H9 was derived from prospect theory, and the partial support for that hypothesis appears at first glance to substantiate Greve's (1998b) extension of that theory from individual decisions to firm-level strategic decisions. However, a measure of caution is required here. The model of management behaviour implied by these results is one where success enhances decision-makers' sense of the importance of winning and stimulates them to look outside the industry for best practice to emulate, whereas poor performance encourages decision-makers to look inside the industry for models. Reconciling this model with prospect theory requires that established practices from outside an industry be seen by managers as less risky than successful practices within it; there is no obvious reason why this should be the case.

A more plausible explanation would be that risk is less an issue here than pressures to make best use of the information available in the time available. Managers of poorly performing firms use their scarce allocation of time defensively to look for proven, workable models within the industry, whereas their higher performing peers, having already exhausted what the industry has to offer, are driven by pressures to win the game to look outside it for workable practices. This explanation is compatible with the

findings of Haunschild and Miner (1997) that different circumstances can induce firms to chose different targets to emulate.

However, caution is needed in generalising from the differences between these single-item constructs. This explanation needs to be validated in a field study, to ensure that it is not unduly influenced by the artificial time pressures of the simulation.

From the data in section 6.10.1 it is clear that the association of perceived isomorphic pressures with the stock price performance measure was considerably stronger than with market share. Of the two performance measures, stock price featured with regression coefficients significant at the 5% level where the dependent variable was competitive isomorphic pressure, mimetic pressure external to industry or (albeit in a flawed model) mimetic pressure from within the industry. This compares with a coefficient significant at, at best, the 10% level for market share.

This cannot, of course, be translated directly into a real world context, by saying that stock market performance is more likely to impact isomorphic behaviour than other measures of firm success. However, it does imply that researchers looking for associations between mimetic behaviour and firm performance (e.g. Haveman, 1993) should select a measure, like stock price in the present study, which is clearly likely to both be easily visible to decision-makers within the mimicking firm and enable it to rank itself among its competitors. Visible, if imprecise, indicators such as prestige (Burns and Wholey, 1993) or size (Greve, 2000) are more likely to influence decision-makers than more objectively valuable performance measures such as return on assets (Haveman, 1993).

7.1.10 H10: Isomorphic pressures and strategic intent

H10: The perceived level of isomorphic pressures within an organisation will be negatively related to the strength of its strategic intent. ***Not supported.***

No support was found for H10. It is possible that, with a larger sample and better designed instruments to improve the reliability of the measures of the dependent variables, a pattern of significant relationships might be established. However, the data from this study (see 6.10.2) indicate that such associations are most likely, for at least three of the four types of isomorphic pressure, to be positive: an increased level of strategic intent would imply an increased degree of sensitivity to competitive and coercive isomorphic pressures and to mimetic pressures from outside the industry.

An alertness to competitive pressures is not, in fact out of line with the picture painted by theorists. It is compatible, for example, with the manner in which Komatsu made the dethroning of Caterpillar the centrepiece of its strategy in the earthmoving equipment industry (Hamel and Prahalad, 1989). However, the positive association between mimetic pressure external to industry and strategic intent, which is one of the few statistically significant relationships established in this part of the study, implies that strategic intent does not necessarily correspond with the individualistic urge to reinvent portrayed by Hamel and Prahalad, but perhaps instead to a drive to match standards set in other contexts. This would also explain a positive association between strategic intent and coercive isomorphic pressure, but only if the question used to assess this form of isomorphic pressure was viewed as a measure of normative pressure to adopt best practices rather than of coercive pressures to obey the precepts laid down by tutors. The present research would have been enhanced had there been more questions and if normative and coercive isomorphism been measured through separate sets of questionnaire items.

If the negative relationship between strategic intent and mimetic pressure from within the industry, possibly hinted at by the data in this study, were to be found in later studies to be significant, it would suggest that firms with high strategic intent, while sensitive to external isomorphic pressures, were more likely to ignore those from within their own industry.

7.1.11 H11: Isomorphic pressures and political behaviour

H11a): High levels of political behaviour within an organisation will be negatively associated with isomorphic pressures derived from information relating to peer behaviour ***Not supported.***

H11b): High levels of political behaviour within an organisation will be positively associated with isomorphic pressures based on legitimation. ***Not supported.***

No significant relationships were found between isomorphic pressures and political behaviour, although, as with strategic intent, the possibility remains that they might be detected in a fuller study, with a larger dataset and better operationalisations of the variables concerned. A with H10, however, the data here suggest that any associations found would be in the opposite direction to those hypothesised. This would imply that political behaviour would enhance an organisation's sensitivity to information on its peers' practices, and be disruptive of outside legitimation pressures. The picture that

this paints of the effects of political activity, as a benign mechanism for promoting rational discussion within a firm and interfering with the influence of arguments based on individual rather than organisational welfare, is intriguing, but at variance with much of the research summarised in section 2.2.3.

It may be safer to conclude, however that, with hindsight, this particular setting was inappropriate for the study of political behaviour. It may be that the teams were simply too small, and the stakes too low, for political behaviour to emerge. In the simulation context, for example, there was no reason for group members to seek the support of outside stakeholders for use in political bargaining, as has been observed elsewhere (Pfeffer and Salancik, 1974; Pfeffer, 1981). Outside stakeholders exercised no power within the organisation – the only one that might have exercised such power, the module tutor, would certainly have declined to intervene in any group conflicts. There were also no resources for group members to use as bargaining counters (Buchanan and Boddy, 1992).

7.2 Synthesis: towards an integrated theory of isomorphic behaviour in organisations

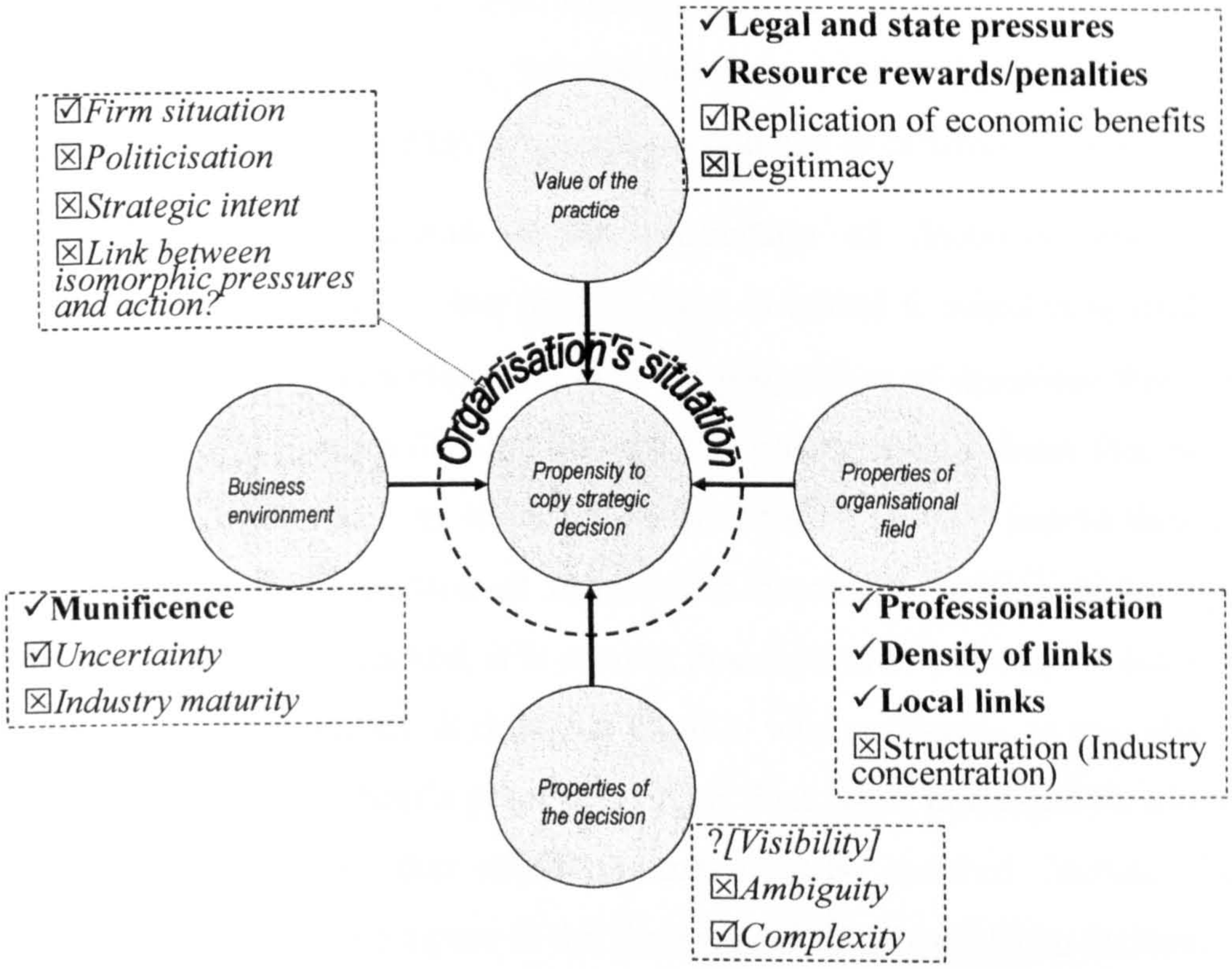
Let me now return to my research question, "Which factors influence the propensity of organisations to copy the strategic decisions of others?" and set out an integrated theory reconciling the findings of the earlier studies, summarised in Chapters 2 and 3, with those of my own research.

Figure 7.1, a development of Figure 3.1 from Chapter 3, summarises my findings and conclusions, integrates them with the findings or earlier researchers and sets out the final model of isomorphic decision making. I review each of the elements of the figure in turn.

7.2.1 The effect of the business environment

Two facets of the environment have emerged as likely to affect the probability of an isomorphic rather than a differentiated decision: its dynamism and its munificence. This study has found a positive relationship between isomorphic behaviour and environmental dynamism, which I have imputed to managers using isomorphic decisions to limit their uncertainty exposure to acceptable levels.

Figure 7.1 Isomorphic strategic decision-making – summary of results



Key:

✓	**Linkages established from prior empirical research**
☑	Linkages hypothesised by earlier researchers and supported by this study
☒	Linkages hypothesised by earlier researchers but not supported by this study
?	*[New linkages not tested directly during the current research]*
☑	*New linkages tested and supported during the current research*
☒	*New linkages tested but not supported during the current research*

The effect of the munificence of the environment has been established through earlier studies. It has been shown to interact with the quality of organisations' institutional relationships in determining performance (Oliver, 1997a) and it is logical to infer that it will also interact with those same relationships in affecting the decisions taken. In munificent environments, the availability of resources from institutional stakeholders will have less weight in directing an organisation's decisions than where resources are scarce, so that incidence of isomorphic decisions in pursuit of scarce resources is likely to decline as environmental munificence increases.

Although Hofer (1975) has invoked the industry life cycle as the source of a multitude of contingent influences on business strategy, my research offers no support for industry maturity as a causal factor in isomorphic decision-making. On the evidence of this study, indeed, the proportion of isomorphic decisions within those that are

actively reconsidered in each period actually declines over time – the practice of isomorphism does not itself become institutionalised and inertial. On the basis of my findings in respect of H1, it is the inertial perpetuation by organisations of past decisions that appears to contribute to the convergence of practices within an industry.

Inertia leads to a reduction in the proportion of decisions that are actively reconsidered over time. If to this inertial base is added a small proportion of newly isomorphic decisions, this serves to reduce the proportion of decisions that come up for reconsideration and, potentially, to increase the proportion of firms that have adopted the most common practices, as observed by Eisenhardt (1988). Inertia thus contributes to an increase in the proportion of isomorphic outcomes as an industry ages but. as Donaldson (1995) has remarked, it is more a description of patterns of decision-making than a theory of their causes. It does not explain *why* managers, at any given moment, may opt to copy another firm's practices, rather than some home-grown alternative; for this, one or more of the other causal factors must be invoked. Inertia, like industry maturity, does not therefore figure in the final model of propensity to imitate.

In view of the indeterminate results of my investigation of the link between isomorphic behaviour and decision complexity, I do not feel justified in postulating any relationship with environmental complexity, the one dimension of Dess and Beard's (1984) typology that has not been considered here.

7.2.2 The effects of the properties of the field

Three properties of the organisational field have been shown, by other researchers, to affect the incidence of isomorphic behaviour: professionalisation, density and local intensity. Increasing professionalisation of the relevant functional staff has been shown to be a factor in the transmission of isomorphic practices (Baron et al, 1986; Dobbin et al, 1993). By establishing a common language and frame of reference, it makes it more likely that professionals in different organisations will pick up the relevant information, evaluate it similarly and arrive at similar decisions. The density of contacts between managers in a field has been established as a significant independent variable, positively associated with the incidence of isomorphism, in many studies (e.g. Galaskiewicz and Wasserman, 1989; Davis and Greve, 1997; Westphal et al, 1997).

The influence of local networks has been established, but its precise nature is less clear. Managers are more likely to imitate competitors in their locality (Greve, 1998), but regional networks disseminate isomorphic practices less quickly than interlocking

directorates (Davis and Greve, 1997). I conjecture (see 7.2.3 below) that local networks, because they are more likely to foster close social ties, may also give rise to isomorphic decisions based on the desire for legitimation or on role models within the social network (Abrahamson and Rosenkopf, 1997).

This study finds no support for the conjecture (H3) of DiMaggio and Powell (1983) that field structuration, as evidenced by industry concentration, is a driver of isomorphic decision-making.

7.2.3 The perceived value of the precise practice

My findings support the idea that a highly significant factor in the decision as to whether or not to copy another organisation's practice is the availability of information as to the value of the practice in question. The value of two types of information have been established in prior research: firstly, the degree of legal or state pressure to adopt that practice and the magnitude of the resource penalties for non-adoption (Tolbert and Zucker, 1983; Baron et al, 1986; Dobbin et al, 1993); secondly the existence of resource penalties for non-adoption and/or of incentives for adoption, deriving from non-governmental sources such as stock markets (see Table 3.2 for examples).

One of the main contributions of this study is to clarify the respective contributions made by information relating to the relating to the likely economic benefits from adopting a practice and the legitimacy conferred by so doing. This study has found several phenomena that can be explained by the decision makers' desire to emulate economic benefits perceived elsewhere, but not by the desire for legitimation. In particular, the findings in relation to H4a and H4b, where the relationship between foreknowledge and frequency of isomorphic decisions was positive for some types of decision and negative for others, can easily be explained if in terms of managers digesting the different types of information and making conscious strategic choices as to whether to emulate or not.

It fits much more awkwardly with the view of isomorphic behaviour as fuelled by the desire for legitimation. In order to explain these results, one would need to postulate that certain types of decision conferred more legitimacy than others, and were therefore more likely to be imitated, whereas imitation of other types of decision diminished legitimacy. There are, however, absolutely no grounds for believing that, in the BRANDMAPS simulation, marketing mix decisions differed in any way from salesforce effort or compensation decisions in terms of importance or conferred

legitimation – indeed, part of the didactic purpose of the exercise was to show how every type of marketing decision was important.

There are no findings for which the reverse is true i.e. that they are better explained by legitimation than by a search for economic benefits. The support for H8, which shows isomorphic behaviour is more common amongst poorer performing firms, is equally explicable in terms of the managers of those firms deriving legitimation from imitation of established practices or information from the success or failure of those practices. The lack of association between isomorphic pressures and isomorphic activity is, if anything, more pronounced for pressures based on legitimation (pressure to be the best performing group and to conform to instructors' expectations) than it is for pressures based on information (pressures to emulate other groups or successful real-life companies).

My review of empirical studies of isomorphism in Chapter 3 found no studies in which behaviour attributed to the desire for legitimation could not equally be explained by reference to resource dependency and the desire for replication of economic benefits. These two causes, particularly the second, are also consistent with isomorphism's being a conscious strategic choice, as was concluded from the empirical work of Oliver (1988) and Kraatz and Zajac (1996).

Thus, my findings, taken in combination with earlier empirical work, suggest that, at least for certain types isomorphic behaviour, such as the pre-institutional marketing practices simulated in this study, the role of legitimation has been overplayed by theorists. This conclusion is compatible with recent empirical work on institutionalisation (Greenwood et al, 2002; Sherer and Lee, 2002), which has shown how, even in highly institutionalised fields such as accountancy and law, legitimation of a practice by a prestigious organisation, while certainly acting as an enabler of that practice's wider adoption, does not necessarily lead to its becoming universal. The desire for legitimation within one's immediate community may well figure as an element to be maximised in the personal utility function of certain organisation members. Individual managers may thus feel themselves subject to isomorphic pressures, as reported in the tests for H9-H11. However, such pressures at the group level are disrupted by cognitive and political processes within the organisation, particularly since different organisational members may form conflicting views as to the likely role model (Haunschild and Miner, 1997). Thus, in the absence of resource

dependency or economic efficiency grounds for action, isomorphic pressures may not play a role in determining whether or not a decision is isomorphic with that of a competitor (H7).

The concept of legitimation retains some power in explaining how industries grow (Hannan and Freeman, 1977). For example, the entry of IBM, with all its might and prestige, into the PC industry in 1981 gave the cachet of respectability to that product in the eyes of consumers and producers alike. The transition of the PC industry from the introductory to the growth phase can be dated almost precisely to that event. But this simply removed a barrier to the purchase of the PC from the minds of consumers. People felt content to buy a PC now that IBM had signalled that the product was to be no mere toy or fad. However, they did not buy PCs to gain legitimacy with IBM or their peers – they bought them because they wanted to run Lotus 1-2-3.

The desire for legitimation is most plausible as a motivating factor when it relates to practices that are to be enacted within the community which confers legitimacy. It may be a factor, therefore, in determining how practices spread from one part of an organisation to another, or which top managerial initiatives are adopted at lower levels in an organisation (Haberberg, 2002). Legitimation, however, may play only a minor, enabling part in the spread of practices between organisations unless, I conjecture, the following three conditions are met: top managers are part of a close-knit, probably local, community, such as local Rotary Clubs or regional elites (Davis and Greve, 1997); top managers are powerful enough to enforce their views upon the rest of their organisation without political interference (implied by the findings of Westphal and Zajac, 2001); and the practice has high visibility and low combinatorial complexity, so that the TMT can easily monitor its implementation.

The perceived economic benefits to be derived from the practice in question, on the other hand, figure more prominently in the final model of isomorphic decision-making. Strong information, indicating the practice will be effective across a broad range of organisations and contexts, is likely to lead to its widespread adoption, as with the M-form organisation. Weaker information will have unpredictable effects, depending on the nature of the decision being taken, and may stimulate either widespread imitation or the development of differentiated alternatives (Deephouse, 1999). I discuss the effect of the nature of the decision in more detail in section 7.2.4.

7.2.4 The effects of the properties of the decision

Three aspects of the nature of the decision appear to influence isomorphic behaviour: combinatorial complexity, visibility and the type of practice involved, although the evidence for the second of these is only indirect, and development of a theory to understand the last poses considerable difficulties.

The present study provides initial evidence that isomorphism becomes less likely, the greater the degree of combinatorial complexity within the practice. Sufficient similarities may be observable between small numbers of firms across particular combinations of practices for cluster analysis to establish the existence of strategic groups (e.g. McGee, Thomas and Pruett, 1995; Flavián, Haberberg and Polo, 1999, 2002). However, as I shall discuss in more detail in section 7.3.1, the findings of this study indicate the degree to which total isomorphism at the level of a business strategy is improbable. If it does not occur in a simulated situation where decision-makers can (and do) gain near-perfect knowledge of a competitor's marketing mix, then it is surely improbable in real-life situations where the information is less precise, less comprehensive and more difficult to obtain.

For reasons to be discussed in section 7.5.1, it was not possible in this study to test the effects of the visibility of a decision to top management. Isomorphism has been observed in earlier research for both decisions with low visibility (Levitt and Nass, 1989) and those with high strategic prominence – see Table 3.1 for examples. There is thus no clear evidence as to the extent to which it will affect the relative frequency of isomorphic versus non-isomorphic decisions, although I have argued, following Greve (1998a), that high visibility will promote isomorphism. The contribution of this study has been to offer indirect evidence in this area; as I as discussed in section 7.1.5, if decision ambiguity is excluded as a possible cause of the anomalous findings of Oliver (1988), as my findings in respect of H5 suggest they should be, then low decision visibility remains as the most plausible cause. But it should be noted that isomorphism did occur between the organisations observed by Oliver in her 1988 study; she merely found that it did not correlate significantly with measures of embeddedness. The implication is therefore that lack of visibility in a decision interferes with the effect of embeddedness in the institutionalisation of practices within an organisational field.

Lack of visibility is also likely to affect the motives for opting for an isomorphic decision. For mundane operational decisions, such as the majority of those analysed during the BRANDMAPS exercise or in Levitt and Nass' (1989) study of the choice of

textbook content, the desire to emulate benefits seen elsewhere is likely to be the prime motive for imitation, with economies relating to search costs (Rao et al, 2001) also a relevant factor. Because there are so many of these decisions and the decision process is not exposed to the same level of scrutiny as those taken by the board, it will be rare for them to affect the allocation of resources to the organisation and so resource dependency considerations are unlikely to loom large. These same factors, together with the possible desire to minimise search costs, means that such decisions are unlikely to be reopened without good reason, so that inertia will have a strong influence on the degree of isomorphism found in them.

High profile transitions (see section 3.6.4.1) with low combinatorial complexity will, on the other hand, be susceptible to close scrutiny and monitoring by both top management and interested external stakeholders. Resource dependency and, where other conditions are met, legitimation considerations are thus likely to be strong influences on the degree of isomorphism in such decisions. These may add force to information cascades (Rao et al, 2001) and pressure top managers into adopting practices for whose effectiveness there is scant evidence, resulting in the faddish adoption (Strang and Macy, 2001) of initiatives like TQM (Westphal et al, 1997) or imitation of market moves (Haveman, 1993; Greve, 1998a) that are later abandoned (Greve, 1998a). Consultants (DiMaggio and Powell, 1983; Abrahamson, 1996) may also stimulate such information cascades and isomorphic behaviour.

The preliminary evidence from this study, in particular the findings in respect of H4b, is that there do exist certain decisions, or classes of decisions, that are unlikely to be imitated – where the reaction of decision-makers to information regarding a practice is the seeking of a non-isomorphic alternative. Unfortunately, there is no evidence to date as to which attributes render a decision more rather than less likely to be imitated. This study does not offer evidence that the ambiguity inherent in a decision is one such attribute.

It is possible that no simple cause and effect relationships exist, or that attributes that influence imitation will be context-specific. The theoretical dividing line between what can be copied and what cannot is extremely thin. Some scripts (Barley and Tolbert, 1997) coalesce into institutions that spread from organisation to organisation, while others coalesce into routines (Nelson and Winter, 1982) whose tacit nature renders them inimitable. Further research is needed to clarify this issue.

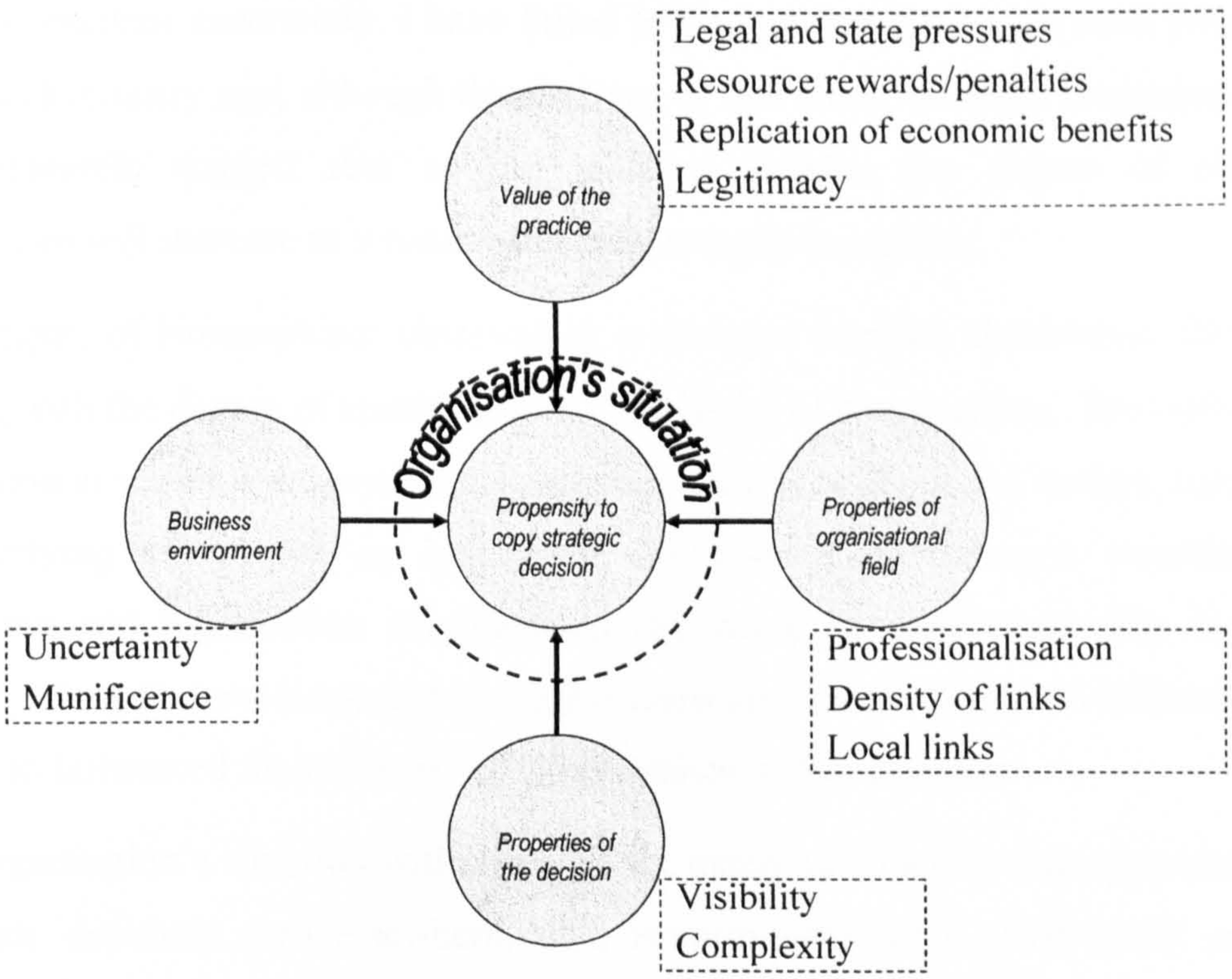
7.2.5 The effects of the organisation's situation and internal properties

This research has consistently failed to find support for hypotheses relating to the impact of cultural factors on isomorphic pressures or of isomorphic pressures on isomorphic decisions. I discuss the implications of this for strategic decision making theory in section 7.3.2. For the purposes of the model proposed here, there is evidence only for the organisation's situation, in terms of its performance, as an influence on isomorphic decision making, with poor performance in an organisation rendering its members more likely to make isomorphic decisions. The possible reasons for this have been discussed in section 7.1.8.

7.2.6 Theoretical conclusions

In this sub-section, I summarise the main conclusions from this study, in the form of a final model of isomorphic decision-making, set out in Figure 7.2.

Figure 7.2 Isomorphic strategic decision-making – a model



Decision makers derive information about a practice from within their organisational field. Earlier research has established that the degree of professionalisation of that field, the density of linkages within it and the extent of local linkages are all positively

associated with propensity to copy a strategic decision observed within that field. This study has failed to find support for a link between that propensity and field structuration, expressed as industry concentration.

The value of the practice will affect the decision as to whether or not to adopt it. Prior research has established that the degree of state and legal pressures to adopt and the resource incentives or penalties for so doing will influence the decision. This study suggests that, in the absence of those influences, legitimation plays a lesser role in the isomorphic decision than prevailing, neo-institutional theory holds to be the case, and more economically rational considerations a greater one. These latter derive from the likely economic returns from adoption, as deduced from returns believed to have been achieved by earlier adopters, and the saving in search costs from isomorphism.

Prior research has suggested that a munificent environment will reduce incentives to adopt a practice insofar as it reduces resource constraints upon an organisation. The study suggests that increased dynamism in the environment will result an increased propensity to emulate decisions seen elsewhere, as organisations seek ways of adjusting to the concomitant uncertainty. I have failed to find an association between propensity to copy and industry age, although the findings of this study, taken in conjunction with earlier research, suggest that as the industry matures the degree of observed isomorphism will increase as a result of inertia in decision-making.

The degree of isomorphism observed in a strategic decision diminishes, this study suggests, with the degree of combinatorial complexity of that decision. The visibility of the decision at senior management, I conjecture on the basis of past studies, influences the underlying reason for an isomorphic decision, with economic considerations diminishing and legitimation consideration increasing in importance with increased visibility. I found no evidence that the ends-means ambiguity inherent in different types of decision influenced the incidence of isomorphism in that decision.

The organisation's situation will influence the extent to which its managers are likely to emulate decisions seen elsewhere, with isomorphism being most likely amongst poorly performing firms. I found no support for any association between the organisation's cultural attributes – its degree of politicisation and its strategic intent – and isomorphism.

7.2.7 Methodological conclusions

This study has shown that laboratory-based quasi-field studies based, like this one, on business-like simulated environments, can make a valuable contribution to the investigation of strategic decision making in general and isomorphic behaviours in particular. The simulated environment has demonstrated its value in permitting a particular decision to be associated unambiguously with a given time period and/or contingent condition. It has enabled the examination of 42 discrete industry situations (seven industries in six separate time periods) in the context of a single, compact study; it is doubtful whether H1, H2 or H3 could have been tested in any other way.

The simulated environment also enables the researcher to control certain environmental contingencies, such as munificence, and to conduct simultaneous studies of decision making under different industry and market conditions, and for different types of decision. This has enabled me to investigate conjectures regarding the effects on isomorphic behaviour of industry concentration and uncertainty between ends and means that have remained unvalidated for two decades since the publication of DiMaggio and Powell's (1983) paper.

It has also permitted an examination of decision-making in a new industry without any of the normal problems of left truncation of data. The method used here to examine patterns in isomorphic decision-making over time could equally be employed, in an appropriately designed simulation or game, to see how other facets of managerial decisions, such as product and process innovation, evolve over time, and whether they do follow the patterns laid down in commonly used life cycle models.

One caveat is that this study should be replicated with other groups of students. A number of frequently cited results in areas such as consensus research have as their basis experiments, performed on quite small samples of university students, which do not appear to have ever been validated by other researchers in other universities, or even with other cohorts from the same establishment. Chemists or botanists would never be satisfied with such a state of affairs.

7.3 Implications for theory

7.3.1 Implications for institutional views of isomorphism

Since the publication of DiMaggio and Powell's seminal (1983) paper, institutional theory and isomorphism have been strongly linked in the literature: isomorphism is

widely viewed as an institutional phenomenon, and the most prominent set of testable propositions emerging from institutional theory are those relating to isomorphism.

More recently, however, institutional theorists have begun to place less emphasis on isomorphism as the phenomenon of interest (Dacin et al, 2002), and the findings of this study support this change in emphasis. My findings from this study, if they can be substantiated, challenge DiMaggio and Powell's (1983) view of isomorphism between organisations in a number of ways.

DiMaggio and Powell begin their celebrated discussion of the topic by asking "why there is such startling homogeneity of organizational forms and practices." (1983: 148). I have already argued, in section 3.6.4, that this homogeneity is illusory, based upon a simplification of the phenomena under review to high level of generality and a low level of combinatorial complexity. The findings of this study, that isomorphism decreases as combinatorial complexity increases, support this view.

Isomorphism can be seen in isolated, high level practices. For example, large firms tend have adopted the multi-divisional form, although there are some notable and successful exceptions, such as Canon (Ghoshal and Bartlett, 1998), and other firms, such as IBM, have moved beyond the M-form to newer, more flexible forms of organisation (Galbraith, 1998), which have yet to be widely emulated. But the investigation of H6 has clearly illustrated how unlikely it may be for such similarities to be perpetuated across more than one or two practices. Isomorphism is not to be observed in the combinatorially complex, richly interwoven fabric of practices that make up an organisation's cultural web (Johnson, 1987) or its marketing or business strategy. GE, Marconi and Siemens, Amazon, HP and Dell all have, or had, multi-divisional structures – but it is highly doubtful whether this contributes even a marginal degree of homogeneity to the way in which those organisations, or their products, are experienced by their employees, suppliers or customers. Indeed, differences in the implementation of the multi-divisional structure by competing computer manufacturers were clearly manifested in the design of their finished products (Christensen, 1997).

Secondly, the data from this study throw some doubt on the extent to which isomorphic decisions are predominant or predictable – in other words, the existence of an "iron cage" constraining organisational decision-making in every context. By the most generous definition, approximately one-third of all decisions taken in the final six periods of the BRANDMAPS simulation were isomorphic. If one removes the

perpetuated decisions and considers only "newly minted" isomorphisms, the proportion, still using a generous definition, falls to one-fifth, and that proportion diminishes over time. This is, admittedly, a munificent environment, but it is one where participants are confused, under time pressure, aware of what their tutors want[16] and under pressure to do well[17]. I know (from one of its members) of a group from another cohort on the same programme, which "played" another business game by copying exactly the moves made by a group that had come out on top in an earlier exercise. In short, there is every reason to suppose that the BRANDMAPS participants would deploy isomorphic decisions where they found utility in so doing – but they did not. And, as has already been argued in section 7.1.4, for certain types of decision they were more likely to deploy information regarding competitors' practices to differentiate themselves than to copy them.

While it would not be possible, without further research, to identify specific examples of types of practice that are unlikely to be the subject of inter-organisational imitation, this study constitutes preliminary evidence that such types of practice exist. Or it may simply be that, in any given context, there will be one group of practices that are likely to be emulated, and a second group where knowledge of competitors' actions is more likely to lead to differentiation than to imitation, but that as the context changes practices may move between those two groups.

Thirdly, the mechanism postulated by neo-institutional theory for the spread of practices between organisations is not supported by this study. As I have shown above (7.2.1), in this synthesised environment, legitimation does not appear to play an essential role in provoking managers to copy their peers, and economic rationality is more fundamental to isomorphic behaviour than Meyer and Rowan (1977) or DiMaggio and Powell (1983) would allow. The lack of support for H2 casts doubt on whether isomorphic behaviour varies with the degree of structuration of a field, as DiMaggio and Powell (1983) propose, and the lack of clear support for H7 also means that there is, as yet, no evidence that isomorphic pressures, be they based upon legitimation or any other motive force, actually play any role in determining which decisions are isomorphic.

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[16] 50% of the class gave at least one score of 5 or above to the question "Our decisions are what our tutors would expect us to do"

[17] 88% of the class gave at least one score of five or above to the statement "There is a lot of pressure to be the best-performing group"

Taken together with the evidence reviewed in section 3.6.4.1 to the effect that isomorphism is observable for a wide variety of practices at differing stages of institutionalisation, the findings of this study therefore lead me to challenge the idea that isomorphic decisions are predominantly a manifestation of institutionalisation. I conclude, rather, that for a wide variety of phenomena, the spread of practices through an organisational population occurs for reasons other than those postulated by institutional theory – principally, the economically rational desire to emulate benefits perceived elsewhere whilst containing search costs. As I have pointed out in section 7.2.1, imitation for those reasons, together with an inertial disinclination on the part of managers to revisit past decisions, would lead gradually to the same convergence in practices between firms postulated by institutional theory. However, the mechanism is somewhat different to that suggested by institutional theorists, and implies no substantive difference between the objectification and sedimentation phases other than the number of adopters.

My findings also suggest one further refinement to institutional theory. Much of the discussion in subsections 7.1.9-11 is predicated upon the observation that the different types of isomorphic pressure behave as separate constructs rather than facets of a single phenomenon, as suggested by DiMaggio and Powell (1983). Evidence for this lies in their different sensitivities to the various control variables (see 6.10.4). Furthermore, the regression coefficients of the five independent variables used in this part of the study take different signs depending, on which of the four isomorphic pressure variables is the dependent one. In short, each of the four variables behaves individually and has different influences. Again, a definitive conclusion along these lines would have required a larger number of readings and better operationalisations of the constructs. It is possible, for example, that the differing behaviour of MIMIN and MIMEX is an aberration stemming from a rogue set of readings for MIMIN which, as already noted, follows an unusual distribution.

7.3.2 Implications for strategic decision making theory

The findings of this study, taken together with prior research, have implications for the relationship between perception and behaviour in SDM.

One strand of SDM theory places a considerable emphasis upon the limitations of human perception and their implications for managerial and organizational cognition (e.g. Cyert and March, 1963; Kiesler and Sproull, 1982; Eden and Spender, 1998). A

related strand emphasises the uncertain relationship between decision and action (Weick, 1979; Mintzberg and Waters, 1990; Hendry, 2000). A third strand, discussed in section 2.2.3, emphasises the role, for good or ill, of the political process in organizational decision making. Researchers have presumed that a better understanding of cognitive and political processes will lead a better understanding of SDM. The inconclusive findings of other researchers, such as those investigating the link between consensus and performance (West and Schwenk, 1996), pose a challenge to this presumption. My study, in its failure to find a clear connection between perceived pressures to act isomorphically and isomorphic action, offers reinforcement to that challenge.

Preconceptions about rationality in decision making appear to lie at the heart of this issue. Theorists considering political and cognitive factors in strategic decision making (including, hitherto, this author – see Haberberg and Rieple, 2001) have often concluded that it was correct to downplay or even completely discount the role of economic rationality. My observations in this study, however, are not supportive of such a conclusion, but rather of a view that those unpredictable and imperfect processes may, over time and viewed across a population of organisations, converge upon predictable and rational outcomes.

Economists have observed that, while not all individuals may behave consistently as profit maximisers, the profit maximisation model retains a high degree of predictive power (Hirshleifer and Hirshleifer, 1998). Similarly, the empirical studies supporting contingency theories of organisation (Hofer, 1975; Pennings, 1975, 1987; Bourgeois, 1984) indicate a level of predictability of behaviour across populations of organisations, in directions that can be justified by performance gains from greater efficiency and/or superior ability to react to particular environments. The support found in the present research for an association between industry dynamism and isomorphic behaviour (H2) is a case in point.

The results of the present research are compatible with managers reacting heedfully to a given context even in the absence of conscious cognitive links between that context and a particular reaction. In this case, although there were no evidence of a relationship between performance and perceived pressures pressures to mimic behaviour in the industry (the MIMIN variable in the test of H9), there was a statistically significant association between performance and isomorphic action (H8). Weick's famous dictum,

"how can I know what I think until I see what I do?" has usually been taken to imply that decision-makers will not necessarily, or even typically, act rationally even in the aftermath of rational analysis. The implication of what I have observed here, however, is that the reverse may sometimes be true – that they may act rationally in the absence of even boundedly rational cognition.

One explanation would be that, even in a small organisation such as these student groups, the differences between individual and organisational perceptions are coming into play. These have been observed in other contexts, including differences between individual and organisational learning (Hedberg, 1981; Kim, 1993) and between intended and realised strategies (Mintzberg and Waters, 1985). In order for isomorphic pressures to translate into isomorphic action, group members must agree, not just upon the need to emulate another group, but also on which practices to emulate and which firm constitutes the appropriate role model. However, different models present themselves (Haunschild and Miner, 1997), and in the absence of effective consensus about the appropriate target, isomorphism may not occur other than through accidental imitation.

Managerial intuition may thus be inherently more rational than the underlying decision processes. The spectacular case studies of decisions distorted by groupthink (Janis, 1982), politics and power (Pettigrew, 1973; Pfeffer, 1992) may not, after all, be completely typical of organisational decision making. Burgelman's (1994, 1996) studies of Intel's exit from the computer memory business are examples where commitment to an established business and intensive political activity failed to prevent, and may have contributed to, a firm's taking a correct, but difficult, decision, and gaining the broad-based consent needed to implement it successfully.

7.3.3 Isomorphism, risk, uncertainty and ambiguity

Although their interpretation poses difficulties, a number of the results extend our understanding of the role played by risk, uncertainty and ambiguity in stimulating isomorphic behaviour: the findings on the relationship of perceived isomorphic pressures (H4) and of isomorphic behaviour (H7) with performance; the positive association between environmental uncertainty and isomorphic behaviour (H3) and the lack of association between decision ambiguity and proportion of isomorphic decisions (H10).

If isomorphic behaviour is a means of reducing risk, then the lack of association between performance and isomorphic pressures, and the clear positive association between poor performance and the incidence of isomorphic decisions, are both difficult to reconcile with the findings of researchers in behavioural economics (e.g. Kahneman and Tversky, 1979) and strategic management (Bateman and Zeithaml, 1989; Greve, 1998b). Those findings indicate that people are more inclined to take risky decisions to retrieve a loss and tend to avoid them where there is a danger of dissipating gains.

There are two possible explanations. One alternative is that underperformance was not experienced as a loss, and so did not trigger the risk-seeking behaviour expected by behavioural economists. Since there were only two instances of quarterly net losses among the 28 observations used for this study, it was not possible to test whether loss-making groups behaved differently from the sample at large. However, the finding of Greve (1998b) – that risky change is more likely when performance falls below aspirations, even when this does not involve actual losses – renders this explanation unlikely.

A second, and more likely, alternative is that the participants did not, in fact, associate isomorphism with risk reduction, but with uncertainty reduction. The association between poor performance and isomorphic decisions could then be explained as simply a reaction by members of underperforming groups to the information that competitors' decisions were producing superior outcomes, so that by mimicking them they could increase the likelihood of improving the results from certain practices. It may be that no high-payoff options presented themselves for these practices, or that risk-seeking behaviour will be favoured for other practices where such options are available.

The copying of competitors' strategies thus becomes a means of reducing the uncertainty associated with the adoption of a particular practice, but does not affect choices between risks, whose assessment involves both uncertainties and anticipated performance outcomes. This theory is supported by the association found (H2) between environmental uncertainty and the proportion of isomorphic decisions. Managers react to increased uncertainty in the environment – manifested, in this case, through increased variability in market size – by taking action to reduce uncertainty inherent in the decisions taken, and they do so across the range of their decisions. This implies an upper bound on managers' total appetite for uncertainty.

Viewed in this light, the lack of evidence of association between decision ambiguity and proportion of isomorphic decisions (H5) can be explained. At first sight, it appears to be an anomalous result. The tests of hypotheses H3 and H4 have shown that managers treat varying types of decision differently when it comes to isomorphic decisions. In the light of the conclusions of the previous paragraph, the degree of uncertainty or ambiguity inherent in different types of decision would seem to be a logical axis along which to discriminate between decisions for which isomorphism would be favoured and those for which it would be eschewed.

One possible explanation is that uncertainty and ambiguity are handled by increasing the proportion of isomorphism across the full range of decisions. However, when it comes to determining which particular types of decision are more likely to be copied than others, uncertainty is not the determining factor. Rather, it is dominated by other attributes, perhaps including the expected payoff associated with different types of decision, which then come into play.

7.4 Implications for praxis and public policy

The number of instances in which a manager specifically wishes to encourage or constrain isomorphic behaviour within their field is limited. It is rarely clear whether isomorphic behaviour is objectively preferable to non-isomorphic (Deephouse, 1999). What my research also implies is that for a given practice, it may not be possible to predict whether advertising an organisation's decisions within its field will lead to imitation or to the direct opposite. Thus, there will be few occasions when decision makers have both a clear need and a clear opportunity to incite imitation of practices by their peers.

7.4.1 Emerging industries

One such occasion arises during the introductory phases of an industry, when the existence of common standards and practices can assist the industry in achieving legitimation in the eyes of customers and of suppliers of capital and other key inputs. However, such standardisation is in conflict with the natural tendency of entrepreneurs in new industries to seek out innovative and distinctive products and practices. Differentiation is seen as the natural path to competitive advantage in this phase of the life cycle (Porter, 1980).

My model of isomorphic decision making implies that a far-sighted manager, looking to cultivate the preconditions for industry growth, should be looking to stimulate some measure of intervention in the industry. This might come from limited state intervention to set legally enforceable standards, or from a powerful sponsor with substantial financial resources and the desire to use them to shape an emerging industry. For example, Kleiner Perkins, a Californian venture capital firm, committed resources to bringing management practices in internet start-ups to acceptable standards (Warner, 1998).

The far sighted manager might also highlight the uncertainty-limitation benefits of isomorphic strategies in a dynamic environment. Such arguments would be unlikely to find favour with entrepreneurs in a risk seeking community, but they would be listened to by providers of capital anxious to limit their avoidable risk exposure.

Finally, it would be advantageous to express the practices to be emulated in the form of easily understood initiatives of low combinatorial complexity, to enable monitoring or policing by the sponsoring authority and by the management of the adopting firms.

7.4.2 Mature industries

Within a firm in a mature industry, on the other hand, the managerial challenge would be the opposite one of sustaining innovation in processes (Porter, 1980) and products (Baden-Fuller and Stopford, 1992). This implies discouraging isomorphic decisions taken solely on the grounds of inertia and search cost limitation, and encouraging, even forcing, people to consider a broader range of options. Initiatives such as Business Process Engineering (Hammer and Champy, 1993) are directed at doing precisely this, but have a high failure rate (Economist, 1994) and may be difficult to sustain over long timescales.

One appropriate move would be to expand the network within which decision makers are embedded, thus giving them a wider range of role models. Such measures are already advocated as a way of enhancing absorptive capacity (Cohen and Levinthal, 1990). Managers might also devote resources to increasing the availability of information regarding the organisation's own practices and, in a large firm, making best practice widely available. Such recommendations are compatible with recent thinking on best practice in knowledge management (Davenport, De Long and Beers, 1998; Ghoshal and Bartlett, 1998). It would also be appropriate to enhance the organisation's capacity to test new ideas, by streamlining procedures and installing appropriate

software, in order to reduce the search costs associated with new internal practices *vis à vis* those for other firms' established practices.

7.4.3 Public policy implications

The model in Figure 7.1 has a number of practical implications for policymakers who will, from time to time, wish to disseminate practices, such as those relating to equal opportunities and corporate governance, into both public and private sector organisations.

The most important point is that measures that appeal only to the desire for legitimation are unlikely to succeed. Exhortation, the "bully pulpit" or public sector beacons of good practice or centres of excellence are unlikely to succeed unless they are backed up with either legal sanctions, resource rewards for adopters or the credible threat of withdrawal of resources, such as public sector contracts, from non-adopters. Even where they are backed up with credible information as to the economic value of the practice, such legitimation based measures may be insufficient, as is shown by the slow take up of e-business practices by the UK public and private sectors, in the face of repeated government exhortations.

Secondly, professionalisation of the field will assist in dissemination of practices. However, professional legitimation cannot be relied upon to outweigh the effects of resource dependency, and in particular perverse incentives deriving from resource allocation algorithms. Recent cases in point from the UK public sector include: teachers assisting primary school pupils with tests whose outcomes will determine schools' positions in published league tables, and so influence pupil intake and school income for the following year; and health service departments hiring co-ordinators and other staff that they do not regard as necessary, in order to capture the associated funding.

A final point is that, as with the emerging industry practices considered in section 7.4.1, the practices in question need to be of low combinatorial complexity for ease of monitoring. While there are some precedents for isomorphism being imposed at high levels of detail – in the French education system, famously, identical lessons take place at identical times in schools throughout the land – these occur only at considerable costs in terms of central administration and loss of freedom and initiative at the level of the individual organisation.

7.5 Limitations

This study has a number of limitations, some of which relate to imperfections in the execution and some of which are inherent in its design.

To begin with the problems resulting from execution, the internal and external validity of the study suffer from its having been executed with a single, small sample from a single cohort. The sample size in terms of groups is at the very lower limit of what can be judged to be acceptable from papers published in good quality refereed journals. The study would clearly have benefited from having been repeated with one or more cohorts, preferably spanning more than one institution, to gain a variety of data points and guard against bias introduced by the idiosyncrasies of a single sample, albeit one spanning two MBA cohorts that are taught largely separately. It would also have gained from having been run with several games of different durations, to gain a better picture of the effects of industry age and to see whether the effects observed in period 8 of the simulation reported upon here were due to endgaming or were the beginning of a new phase in groups' decision making.

The small sample size also left the results susceptible to bias from the actions of a single team. If one of the seven groups had consistently behaved in a manner that rendered its decisions trivial or perverse, or if it were simply composed of such idiosyncratic individuals that they were totally unrepresentative of the managerial population at large, then some 15% of the data from this study would have been compromised – enough to distort the findings. The analysis I have undertaken in establishing the internal validity of the study variables (section 5.4), together with the observations I undertook of groups' decision processes, offer reassurance, however, that such distortion has not occurred.

The availability of more data points would also have allowed tests of the sensitivity of the outcomes to variations in the ways in which the variables are operationalised. For example, it would be desirable to see whether looking at the coefficient of variation of market size over four or more periods, rather than three, affects the outcome of the test of the association between isomorphic behaviour and environmental uncertainty.

A further possible limitation of this research comes from the use of X^2 to test H4 and H8. In order for this test to be valid, the decision to copy or not copy another group in any period must be independent of similar decisions taken in earlier periods. This clearly is not valid for dataset 1, where certain decisions are the perpetuations of earlier

ones. However, I have already argued (5.3.4) that there is considerable evidence that groups approached each quarter as a separate event. Thus, for the other datasets, in which all isomorphic decisions are deliberate changes of direction, the independence assumption is likely to be valid.

A further limitation is that it was not possible to discover who it was that the laggard firms were emulating. My attempts to operationalise this were stymied by the fact that in many cases there were several possible candidates for the originator of a particular practice. Several of these might be counted as successful, depending upon the performance measure used and whether success was measured in terms of the overall game or the market in which the practice in question was being emulated. This observation is consistent with the findings of Haunschild and Miner (1997) that firms managers may draw upon a variety of role models. However, it also implies that there is a danger that earlier studies (Haveman, 1993; Burns and Wholey, 1993), which measured just a single characteristic, such as profit or prestige, of the organisations that emerged as models, may have over-simplified the situation.

The reliability of the findings regarding H9-H11b, as already mentioned, is hampered by the small number of data points and the use of single item measures for the key constructs. These are likely to have contributed, for example, to the irregular distribution of the MIMIN variable, which limited the validity of the only significant regression model in which it appeared and may have contributed to the paucity of significant associations found between that variable, in particular, and the independent variables in this part of the study. Any replications of this study should naturally address these flaws.

With hindsight, I would have been better advised to have focused the questionnaire earlier on a smaller number of constructs, each with a greater variety of items, to improve internal validity. It might also have been advisable to have shortened the questionnaire to a point where it could have been administered weekly, rather than fortnightly, in order to increase the number of data points. I should have used an earlier, test run of the questionnaire to improve the agreement within the different scales, rather than focusing, as I did, simply on ensuring that discriminant validity was adequate.

The small sizes of the participant groups must be taken into account when reviewing the measurements of political behaviour, since politics may only be properly observable where resource dependency considerations come into play and in larger groups.

Simulations such as BRANDMAPS provide "a realistic group-decision making context, but not a realistic organization context" (Keys and Wolfe, 1990: 324) and it may be that observing and measuring political interactions in such a context was never a realistic aim.

Subject self-presentation effects may also have hindered the measurement of this political behaviour variable. When, during a pilot study, I attempted to operationalise variables relating to power asymmetries and leadership styles within groups, I was unable to gain a sufficient range of responses to achieve adequate discriminant validity. Although power asymmetries were clearly visible when I observed the groups at work, no respondent was prepared to concede, even anonymously, that their group procedures were failing to match the egalitarian and participatory democracy that the students appeared to perceive as the ideal. Similar desires to appear democratic and fair may have influenced students' responses to the political behaviour questionnaire items.

The compressed time frame of the simulation enabled a large number of observations to be taken in a relatively short period but, like Oliver (1988), I have to record the possibility that the study time-frame was not long enough for true isomorphic behaviour to emerge. It may be that true institutions and patterns of isomorphism do not emerge until years of real time have elapsed. By observing behaviour in a benign environment in which there were no binding state, legal or resource constraints, I have gained some insights into the influence of such constraints on isomorphic behaviour, but it is possible that patterns of behaviour observed in their absence would not occur in real life.

This leads naturally to the general issue of interactions between the study variables. This research has been the first to study certain variables and relationships, including the effect of environmental contingencies on isomorphic behaviour, isomorphic pressures and their effect on behaviour, combinatorial complexity, and the effect of the nature of the decision on the outcome of the decision. Accordingly, I have limited the scope of my investigations to simple pairwise associations between constructs. It is quite likely that there will be interactions between these constructs – indeed, the integrated theory of isomorphic behaviour set out above implies this. Sometimes these were observable in the data, as was the case with the correlation between environmental uncertainty and industry age, although this in the end does not appear to have distorted the result. It may also be, for example, that the relationship between isomorphic behaviour and decision type varies according to the dynamism of the market. There may

also be interactions between the different variables – performance, political behaviour and strategic intent – analysed in the tests of H9-H11. I have left the investigation of these interactions for subsequent research.

I have also limited my investigation of the relationships between firm situation and isomorphic behaviour (H8) to the simplest possible test of association between the variables. I have not sought to build detailed regression models, and have thus foregone the opportunity to controlling for attributes such as political behaviour and group diversity.

Finally, this is a laboratory rather than a field study, and there are necessarily limitations on its external validity. Although the participants in this exercise had significant real-world business experience, the management challenges they were confronted were only a subset of those that exercise real managers. The students were not called upon to build consensus outside the confines of their own small team, as would have been necessary in a real corporation, and it will take further research to establish the broader external validity of the findings reported upon here.

That said, Chapter 5 will have made it clear that, in my view, the commonly expressed doubts as to the validity of well-designed laboratory studies are overblown, if not downright spurious. As regards this present piece of research, I contend that, by using a sample of mature students and a realistic simulated business context, I have come as close to a real life situation as it is possible to do while retaining the capability of controlling for variables such as environmental munificence, and of recording precisely the content and timing of decisions and the information on which they were based.

7.6 Suggestions for further research

Aside from simple replications of this study to validate its results, there is scope for similar studies in which duration and other contingent variables are varied to assess their effect. In particular, other studies might assess the effects of differing degrees of environmental munificence, both as a constant background condition and to assess the effect of varying it over time and between markets. A more deliberately experimental approach to the relationship between isomorphic behaviour and industry concentration, in which groups were systematically exposed to industries with different numbers of players and concentrations with other factors held constant, might also yield interesting results.

Studies might also be conducted with different group sizes, to see the effect of larger groups on political behaviour, isomorphic pressures and frequency of isomorphic decisions. Ideally, these would be carried out under conditions in which group deliberations could be watched, so that questionnaire responses regarding group politics could be validated through observation of actual interactions.

The link between isomorphic pressures and isomorphic activity needs to be investigated in more detail, with controls for environmental contingencies and also firm-level contingencies such as TMT diversity and degree of TMT consensus. It needs to be seen whether the link between pressures and action is moderated through hitherto uninvestigated intermediate variables, or whether the two constructs are truly as decoupled as my results have suggested.

Future studies might usefully seek to operationalise independent or control variables for other idiosyncratic aspects of an organisation that have been demonstrated to have some impact on strategic decision making. These might include planning style (Hart and Banbury, 1994; Bailey and Johnson, 1995), leadership styles (Farkas and Wetlaufer, 1996; Goffee and Jones, 2000; Collins, 2001) organisational learning (section 2.2.2) and degree of entrepreneurship (Dess and Lumpkin, 1997; Kuratko, Ireland and Hornsby, 2001; Hitt, Ireland, Camp and Sexton, 2001). It was not possible to operationalise any of these variables during the present study: leadership styles because of subject self-presentation effects discussed in the previous section; learning because, in the absence of improvement objectives set by the groups, measures of organisational learning such as those suggested by Garvin (1993) could not be applied to gauge if learning had taken place; entrepreneurship because of lack of differences in group behaviour on this dimension in the simulated environment in which all were starting from scratch; planning because my observations revealed that the absence of the use by groups of strategy techniques was almost[18] universal, meaning that a variable based upon this would have insufficient discriminant validity

The relationships between the nature of the decision, decision process and decision outcome surely merit further study. An operationalisation of the construct of decision

[18] In my role as the teacher of the techniques in question, I found this a little distressing. In my role as researcher, I could take some comfort in this, as evidence that my presence was not influencing the groups' decision processes. I also attempted to impute rationality to group decisions post hoc, but could find no robust way of distinguishing between irrational decisions, speculative moves, intentional disruption of competitors or information gathering decisions aimed at testing customer preferences or price elasticities.

visibility would be desirable, in order to test the conjectures made in section 7.2.4. Research to verify the existence of practices not naturally susceptible to isomorphism, and to identify their distinguishing characteristics, would also enhance understanding of the balance between sameness and difference in decision-making (Deephouse, 1999).

Lastly, the model in Figure 7.2 needs to be validated and refined through empirical studies, but I believe that these need to deploy more qualitative and ethnographic methods than previous research in this field. The basic idea that embeddedness and isomorphism are connected is surely no longer contentious, and the need for new statistical studies of large populations of organisations, to demonstrate that this result holds for some hitherto uninvestigated species of decision, is slight. Future studies will need to involve some qualitative elements to ascertain the reasons why managers choose to copy or not to copy their peers, how they choose their models and the kinds of decision for which imitation is and is not contemplated. Ideally, they should include some decisions, such as those relating to corporate social responsibility, for which the economic payback is debatable, to see whether isomorphism actually occurs in the absence of economic incentives.

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Appendix 1 – The BRANDMAPS™ Market Model

Extracted from Chapter 6 of CHAPMAN, R. G. (1994b) BRANDMAPS™ The competitive marketing strategy game, 3rd edition; Instructor's Manual. (Englewood Cliffs, NJ: Prentice Hall)

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