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Strategic Decision Processes: Critical Review and Future Directions

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This article develops an integrative framework of strategic decision processes based on a review of the past literature. The framework incorporates environmental, organizational, and decision-specific antecedents of process characteristics, and their process and economic outcomes. Key empirical studies are reviewed in the context of the framework and major patterns and contradictions are identified. Based on this review, useful implications for theory building, research methods and managerial practice are identified and several directions for future research are presented.

Research in strategic management has often been classified into two broad categories: research dealing with issues of strategy content and research on the process by which strategy is created and implemented. However, an examination of the body of research over the last two decades points to the domination of the research agenda by content issues. Extensive theoretical and empirical work has been undertaken in strategy content on topics such as portfolio management, diversification, acquisitions and mergers, divestments, product-market choices, and the alignment of firm strategies with environmental characteristics. On the other hand, process issues have received relatively less attention. However, currently there is renewed interest in process research, along with an increased awareness of the critical interrelationships between content and process issues (Huff & Reger, 1987). However, as suggested by Mintzberg and Waters (1985, p. 269), "More research is required on the process of strategy formation to complement the extensive work currently taking place on the content of strategies; indeed, we believe that research on the former can significantly influence the direction taken by research on the latter (and vice versa)."

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Why has strategy process research lagged behind research on strategy content? We believe that this lag can be partly attributed to the fact that unlike process researchers, content researchers benefited from the early development of integrative models by researchers such as Ansoff (1965), Andrews (1971), Hofer and Schendel (1978), and Porter (1980). These models not only helped provide content researchers with a common vocabulary, but also provided direction and consensus on underlying theoretical and empirical questions. In contrast, the absence of such integrative models has resulted in process research remaining fragmented, characterized by limited cumulative theory building and empirical testing. Further, the problems involved in identifying, observing, and measuring process variables add to the difficulties in conducting process research.

While the strategy process research covers a broad range of issues, this article focuses on strategic decision processes, an area of research that deals with the question of how strategic decisions are made in organizations. Although considerable progress has been made in this area in recent years, as Mintzberg and Waters (1985) note, such progress can, at best, be described as modest. In addition, the body of research is characterized by a number of apparent contradictions. For example, the performance implications of comprehensiveness in decision processes are still not clear, with studies finding both negative (e.g., Fredrickson & Mitchell, 1984) and positive (e.g., Eisenhardt, 1989) performance effects of comprehensive decision processes in rapidly changing environments. This points to the need for an integrative model that can link the various aspects of strategic decision processes and provide us with the means to understand the commonalities and inconsistencies across various studies.

This article addresses the above and is organized as follows. First, based on a careful examination of the theoretical and empirical literature on strategic decision processes, we develop a parsimonious, integrative framework. In addition to identifying key process characteristics, the framework identifies key antecedent and outcome variables associated with the decision process, including the interrelationships among them. Second, this article utilizes this framework to review and synthesize past research on strategic decision processes along four distinct research streams. In doing so, we identify the crucial patterns, contradictions and gaps in extant research. Finally, this article suggests several useful directions for future research. These suggestions address implications for theory building, methodology, and managerial practice.

An Integrative Framework of Strategic Decision Processes

Theoretical models of strategic decision processes and classificatory schemes have been suggested by Allison (1971), Chaffee (1985), Mintzberg (1973), Lyles and Thomas (1988), and Hart (1992). These models, which attempt to depict and explain the process of strategic decision making, reflect different conceptions of organizations. They range from "rational" models that present the image of an integrated, well-coordinated decision making body, making reasoned choices from clearly defined alternatives (e.g., Andrews, 1971; Ansoff, 1965) to political/behavioral models in which decisions are viewed as an outcome of bargaining and negotiations among individuals and organizational subunits with conflicting perceptions, personal stakes and unequal power (Narayanan & Fahey, 1982; Pettigrew, 1973; Tushman, 1977). Quite obviously, these models differ substantially in terms of their underlying assumptions about the decision context and the characteristics of the decision process.

Although the various strategic decision process models differ in many important respects, a careful review of such models allows us to draw certain broad conclusions regarding the factors that influence the decision process. First, given that strategic decisions are made in the context of an organization's environment, the process by which such decisions are made and their characteristics are influenced by environmental attributes such as uncertainty and complexity. Second, organizational conditions such as the internal power structure, past performance, past strategies, and the extent of organizational slack have a significant impact on the process. Since these factors may vary across firms within an industry, strategic decisions often follow different patterns in different organizations. Third, even within a single organization, the process can vary across decisions because of differences in decision-specific factors such as the impetus for the decision, the urgency associated with the decision, the degree of outcome uncertainty, and the extent of resource commitment. In other words, contextual antecedent factors, namely, environmental, organizational, and decision-specific factors significantly influence strategic decision process characteristics.

The three sets of factors described above influence strategic decision processes which can be described in terms of process characteristics such as the duration of the process (Schilit & Paine, 1987), the degree of rationality and comprehensiveness (Fredrickson, 1984, 1985), the amount of political activity (Welsh & Slusher, 1986), and the extent of individual/sub-unit involvement in the decision process (Duhaime & Baird, 1987). Decision process characteristics, in turn, help determine process outcomes such as the timeliness or speed of the decision (Eisenhardt, 1989), the level of commitment from individual and organizational units (Carter, 1971), and the extent of organizational learning (Dutton & Duncan, 1987). Process characteristics as well as process outcomes influence economic outcomes such as ROI or ROA and, sales or profit growth (Eisenhardt & Bourgeois, 1988; Fredrickson & Mitchell, 1984). Hence a comprehensive model of strategic decision processes must include not only the process characteristics and their antecedents but also their economic and non-economic outcomes.

The interrelationships identified above have been depicted in the form of an integrative strategic decision process framework (Figure 1). In addition to helping integrate antecedent and outcome variables associated with strategic decision process characteristics, the framework serves as a useful analytical scheme to review and synthesize past empirical research on strategic decision

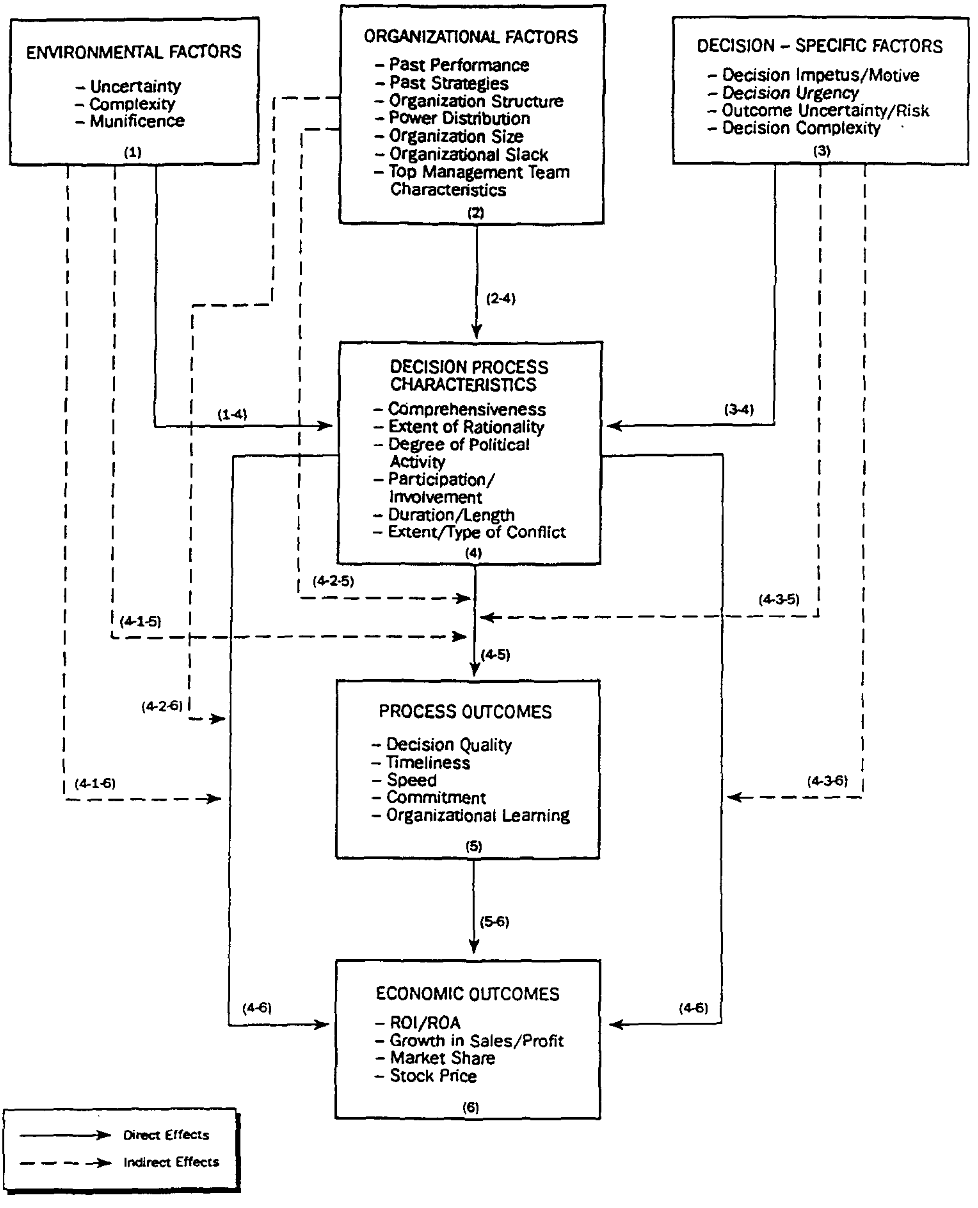

Figure 1. Strategic Decision Processes: An Integrative Framework

processes. As noted by Ginsberg and Venkatraman (1985, p. 422), "... an analytic review scheme is necessary for systematically discerning patterns from a widely differing set of studies and evaluating the contributions of a given body of research." Moreover, the framework constitutes a well-specified model which can help guide future research.

The framework of Figure 1 identifies three sets of antecedent factors: environmental factors, organizational factors, and decision specific factors, and two sets of outcomes: process outcomes, and economic outcomes. In our review of the empirical research, we refer to research examining the three antecedent factors as Streams I, II, and III respectively. The framework also postulates relationships between decision process characteristics and outcomes (Stream IV). It is important to note that our definition of the strategic decision process subsumes all the different phases in the strategic decision process identified in earlier studies such as problem/issue identification, alternative generation, evaluation, and selection (Fredrickson, 1984; Mintzberg, Raisinghani, & Theoret, 1976). While a few studies have examined how strategic decision process characteristics differ across different phases (Fahey, 1981; Nees, 1983; Schilit, 1987), the focus of these studies has not been on the strategic decision process as a whole. Our focus is on the characteristics of the strategic decision process as a whole rather than on the characteristics of individual phases.

Stream I research (Links 1-4, 4-1-5, and 4-1-6) pertains to the relationship between environmental factors and strategic decision process characteristics. The key issue addressed in this stream is how environmental factors (e.g., environmental complexity or uncertainty) influence strategic decision process characteristics (e.g., the extent of rationality and comprehensiveness). On the other hand, Stream II research (Links 2-4, 4-2-5, and 4-2-6) has primarily examined how organizational factors such as organizational size, past strategies and performance, structure, top management team characteristics, and organizational slack influence decision process characteristics. Research in Stream III (Links 3-4, 4-3-5, and 4-3-6) has addressed the relationships between decision-specific factors such as decision urgency, decision impetus, decision complexity, and outcome uncertainty, and process characteristics. Many of the studies in each of these streams also examine the moderating role of the antecedent factors on the relationships between decision process characteristics and their performance outcomes. The last research stream identified through this framework is Stream IV (Links 4-5, 4-6, and 5-6) which examines relationships between strategic decision process characteristics and process/economic outcomes. In the following section, we review key studies as well as emerging patterns and contradictions in each stream. Within each stream, studies are classified and reviewed along the different links identified in Figure 1.

Review of Past Empirical Literature

A systematic search was undertaken to identify empirical studies published between 1981 and 1992 which examined at least one of the links identified in Figure 1. In other words, studies which primarily sought to describe or classify decision processes based mostly on process characteristics without considering either the antecedent or outcome variables are not included in the review (e.g., Cray, Mallory, Butler, Hickson & Wilson, 1988; Nutt, 1984). Each study was then classified by one of the authors along four key dimensions: sample, data sources and methods, measures of key variables, and major findings. The classification was independently verified by co-authors for the purpose of validity and consistency.

Stream I: Environmental Influences

Environmental factors, as previously discussed, exert a significant influence on strategic decision process characteristics. Several studies have attempted to capture environmental influences on decision processes either in terms of environmental attributes such as uncertainty or in terms of one or more specific industry context(s). Studies belonging to this stream can be broadly classified into two groups based on the underlying theoretical specification of relationships examined: (1) those which examine the direct environmental influences on process characteristics (Link 1-4) and, (2) those which focus on the moderating role of the environment in the relationship between process characteristics and performance outcomes (Links 4-1-5 and 4-1-6). In a majority of the studies that we reviewed, the exact theoretical specification was rarely made explicit, leaving us to make inferences about the specification implicitly used by the authors. Studies representative of Stream I research are reviewed in Table 1.[1]

Link 1-4: Relationships Between Environmental Factors and Decision Process Characteristics

The influence of an organization's environment on its strategic decision process characteristics has been the subject of a limited number of studies (e.g., Jemison, 1981; Shrivastava & Grant, 1985). Fredrickson (1985) found that decision processes in situations characterized by environmental threats rather than opportunities were characterized by greater comprehensiveness. Shrivastava and Grant (1985) also found that differences in environmental and organizational conditions led to variations in decision process characteristics. Miller, Droge, and Toulouse (1988) found product innovation to be an important aspect of response to uncertainty, which in turn led to greater rationality in the firm's decision making process. However, the small number of studies in this link does not permit us to make any meaningful generalizations.

Links 4-1-5 and 4-1-6: Environment as a Moderator of the Relationship between Decision Process Characteristics and Process/Economic Outcomes

Studies in these links have attempted to establish some prescriptive relevance for strategic decision making research by investigating the relationship between decision process characteristics and process/economic outcomes (e.g., Bourgeois, 1985; Fredrickson & Mitchell, 1984; Fredrickson, 1984, 1985). A review of studies in these links reveals that they have focused primarily on one environmental dimension, namely, the extent of environmental uncertainty defined in terms of either stability (e.g., Fredrickson, 1984, 1985; Fredrickson & Iaquinto, 1989) or velocity (e.g., Bourgeois & Eisenhardt, 1988; Eisenhardt, 1989). Bourgeois and Eisenhardt (1988) and Eisenhardt (1989), for example,

Table 1. Stream 1: Environmental Influences on Strategic Decision Processes

Study/Links	*Sample*	*Data Sources/ Methods*	*Measures*	*Major Findings*
Jemison (1981) 1-4 (2-4)	124 senior executives from 15 firms in 3 industries	Survey questionnaires, multiple respondents	*Environmental Factors* 3 boundary spanning roles *Organizational Factors* 5 types of power bases *Decision Process Characteristic* Departmental influence	Environmentally derived sources of strategic decision making have a greater association with departmental influence than organizationally derived sources.
Fredrickson & Mitchell (1984) 4-1-5	109 executives in 27 firms	Structured interviews, questionnaires utilizing decision scenarios	*Environmental Factor* Stability/instability *Decision Process Characteristic* Comprehensiveness *Performance* ROA, % of sales growth	Negative relationship between comprehensiveness and performance in unstable environment. Relationship holds for both measures of performance.
Fredrickson (1984) 4-1-5	152 executives in 38 firms	Structured interviews, questionnaires utilizing decision scenarios	*Environmental Factor* Stability/instability *Decision Process Characteristic* Comprehensiveness *Performance* ROA, % of sales growth	Positive relationship between comprehensiveness and performance (ROA) in a stable environment. However, no significant relationship is observed when performance is operationalized as sales growth.
Fredrickson (1985) 1-4 (2-4)	321 MBA students and 116 upper-middle level executives	Laboratory study, questionnaires	*Environmental Factors* Opportunity, threat *Organizational Factors* Past performance *Decision Process Characteristic* Comprehensiveness	MBA students were more comprehensive when recommending actions in response to environmental threats and poor performance than to environmental opportunities and excellent performance. Similar results were not observed in the case of executives.

(*continued*)

Table 1. (Continued)

Study/Links	*Sample*	*Data Sources/ Methods*	*Measures*	*Major Findings*
Bourgeois (1985) 4-1-5 (4-6)	20 nondiversified firms, 99 responses (multiple respondents from each firm including CEO)	Interviews, questionnaires, secondary sources	*Environmental Factors* Volatility, perceived environmental uncertainty (PEU) *Decision Process Characteristic* Consensus *Economic Outcomes* ROTA, growth in net earnings, EPS, return on sales and capital	Consensus on PEU and goals together lead to poor economic performance. Congruence between PEU and volatility is positively related to performance. Diversity in environmental perceptions and goals related positively to performance, but only when it occurs in conjunction with congruence between PEU and volatility.
Fredrickson & Iaquinto (1989) 1-4 (2-4)	45 firms from 2 industries, 159 executives including CEO's (multiple respondents)	Interviews, questionnaires utilizing decision scenarios	*Environmental Factor* Stability/instability *Organizational Factors* Change in size, change in executive team intrafirm tenure, executive team continuity *Decision Process Characteristics* Comprehensiveness, change in comprehensiveness *Economic Outcomes* Average after tax return on assets adjusted for extraordinary items	Relationships found in the two 1984 studies continue to hold. Changes in organizational size, executive team-tenure, and level of team continuity were positively associated with changes in comprehensiveness. Comprehensiveness exhibited considerable inertia. Also, significant across-industry differences were found in comprehensiveness.
Levitt & Nass (1989) 1-4	10 college textbook publishers	Structured, open-ended interviews with editors	*Environmental Factor* External influences *Decision Process Characteristics* Routinization	Decision making processes in textbook publishing conform with garbage can model, but the decisions themselves tend to be uniform across firms due to coercive, mimetic, and normative forces.

(*continued*)

Table 1. (Continued)

Study/Links	*Sample*	*Data Sources/ Methods*	*Measures*	*Major Findings*
Judge & Miller (1991) 4-1-6 (4-2-6) (4-5)	10 biotechnology firms 12 hospitals, and 10 textile firms	Interviews with CEO's and other top executives, primary data	*Environmental Factor* Environmental velocity *Organizational Factors* Organization size, board experience *Decision Process Characteristics* Comprehensiveness *Process Outcomes* Decision speed *Economic Outcomes* Profitability, sales growth	Number of alternatives simultaneously considered is positively associated with decision speed in all environments. Decision speed leads to higher performance only in high-velocity environments. Greater board experience does not always lead to faster decisions.

examine the effects of different process characteristics on both process outcomes and economic outcomes. The findings of studies belonging to this stream are, however, somewhat contradictory. For example, studies by Fredrickson (1984), Fredrickson and Mitchell (1984), and Fredrickson and Iaquinto (1989) indicate that comprehensive strategic decision processes are associated with superior economic performance in stable environments and inferior performance in unstable environments. In contrast, Eisenhardt (1989) found that effective strategic decisions in high velocity environments, though made within a short time duration, are characterized by comprehensiveness. Judge and Miller (1991) found that comprehensiveness is positively associated with decision speed (a process outcome), although it led to higher economic performance only in high velocity environments. This contradiction may be partly attributable to the role of organizational factors, such as power distribution and information processing systems, which were included in Eisenhardt's studies, but not in Fredrickson's. Moreover, in a later study, Fredrickson and Iaquinto (1989) found significant differences in the levels and types of comprehensiveness across industries. This suggests that, along with organizational factors, industry factors play a crucial moderating role in the relationship considered in Stream I. These studies also highlight the need to consider important interaction effects between environmental and organizational factors while studying the performance effects of decision processes. Thus, not only do different combinations of environment and strategic decision process characteristics have different performance effects, but within a given environment, different combinations of decision processes and organizational contexts may also give rise to different performance implications.

Our review of Stream I studies also reveals certain important gaps in the empirical literature. For example, most previous studies have focused on one aspect of the environment, namely, uncertainty or rate of change. However, there are two other critical aspects of a firm's operating environment, namely, complexity (the number of elements and their interconnectedness), and munificence (the resource support provided by an environment) which have received relatively little attention. The degree of environmental complexity in a firm's operating environment directly impacts the amount and nature of information that has to be processed by decision makers (Schwenk, 1984; Thomas, 1984). This, in turn, affects strategic decision process characteristics such as comprehensiveness, rationality, and duration. Research on cognitive processes (Schwenk, 1984; 1988) suggests that high environmental complexity may lead to greater use of cognitive simplification processes such as selective perception, heuristics and biases, and the use of analogies. These cognitive simplification processes, in turn, affect the strategic decision process by potentially restricting the range of strategic alternatives considered and the information used to evaluate alternatives. Techniques developed in social and cognitive psychology such as cognitive mapping (Axelrod, 1976), may help researchers understand how decision makers assess interrelationships among environmental factors, which factors they consider important, and how they arrive at particular choices.

In addition to environmental complexity, munificence may also influence strategic decision processes. Munificence refers to an environment's capacity to provide resources which support the organization (Dess & Beard, 1984). Organizations in munificent environments are less likely to be penalized for poor or suboptimal decisions than those in non-munificent environments. Thus, decision processes suited to munificent environments may be inappropriate for less munificent ones. However, as our review indicates, past research provides very little direction on questions related to environmental complexity and munificence in spite of their important normative implications for managers. Further, interactions among the three aspects of the environment also need to be examined. For example, uncertain environments that are also munificent (e.g., high growth industries in initial stages of industry evolution) are very different from uncertain environments which are far less munificent (e.g., mature industries with declining demand or increasing competition). Hence, the performance effects of comprehensiveness are likely to be different across these environments.

Finally, at a broader level, strategic decision process research has paid very little attention to the cultural and institutional context within which the organization is embedded. These contextual factors have significant implications for process characteristics such as participation, consensus, and conflict. For example, consensual decision making is more common among Japanese firms than among U.S. firms primarily because of the high emphasis placed on consensus by the Japanese culture.

Stream II: Organizational Influences

Characteristics of strategic decision processes are subject to a variety of organizational influences. Key organizational factors include structure, past performance, and top management team (TMT) characteristics. Studies belonging to this stream can also be classified into two broad groups: (1) those examining the direct influence of organizational factors on process characteristics (link 2-4), and (2) those viewing organizational factors as moderating the relationship between process characteristics and process/economic outcomes (links 4-2-5 and 4-2-6). Studies belonging to Stream II are presented in Table 2 and discussed below.

Link 2-4: Relationships Between Organizational Factors and Decision Process Characteristics

Studies in this stream have mostly focused on two sets of organizational factors: power distributions within the decision-making group (Eisenhardt, 1989; Jemison, 1981; Shrivastava & Grant, 1985) and structural aspects such as formalization, integration, and decentralization (Miller et al., 1988). Several theoretical arguments have been made which indicate how these two organizational factors influence strategic decision processes. Provan (1989) argues that managerial perceptions and enactment of the environment are heavily influenced by power distribution within an organization. Powerful individuals and departments are likely to determine the identification of

Table 2. Stream 2: Organizational Influences on Strategic Decision Processes

Study/Links	*Sample*	*Data Sources/ Methods*	*Measures*	*Major Findings*
Shrivastava & Grant (1985) 2-4 (1-4)	61 senior executives from 31 firms in diverse industries, computerization decisions	Interviews, organizational records	No a-priori measures/constructs; several organizational, environmental and process characteristics derived from post-facto analysis	Four models of strategic decision making can be identified: managerial autocracy, systemic bureaucracy, adaptive planning, and political expediency. Each is characterized by different organizational and environmental conditions, process characteristics, and outcomes.
Welsh & Slusher (1986) 2-4	40 professional colleges (decision about selection of a dean)	Questionnaires and interviews	*Organizational Factors* Task specialization, faculty heterogeneity, centralization, consensus, interdependence *Decision Process Characteristic* Political activity	When interdependence is low, increasing consensus leads to more political activity among faculty members.
Duhaime & Baird (1987) 2-4	91 divested units in mail study, 56 personal interviews in Fortune 500 firms	Mail survey, personal interviews	*Organizational Factor* Unit sales as a percent of total firm sales (measure of unit size) *Process Characteristic* Unit manager's involvement	Managers of smaller units generally had greater involvement in the decision process than did managers of larger units. Business unit size is an important issue in divestment decision-making.
Miller (1987) 2-4	CEOs, VPs or general managers of 97 firms (multiple respondents)	Questionnaires	*Organizational Factors* Structure: integration, decentralization, complexity *Process Characteristics* Rationality, assertiveness, interaction *Economic Outcomes* Self reported scores on relative profits, growth in income & ROI	Organizational structures and strategy-making processes must be complementary to ensure good performance. Formal integration was found to be positively related to rationality and interaction in strategy making. Decentralization showed a weak positive association with interaction and assertiveness.

(*continued*)

Table 2. (Continued)

Study/Links	*Sample*	*Data Sources/ Methods*	*Measures*	*Major Findings*
Segev (1987) 2-4 (4-2-5)	133 MBA students	Laboratory experiment, questionnaires	*Organizational Factors* Strategic type: prospectors, analyzers, defenders and reactors *Decision Process Characteristics* Strategy making mode: entre-preneural, adaptive and planning *Economic Outcomes* Market shares, profitability measures	Strong associations between strategic types and strategy making modes. Fit between strategic type and mode associated with higher market share for prospectors.
Eisenhardt & Bourgeois (1988) 4-2-5 4-2-6 (5-6)	8 firms in microcomputer industry (multiple informants)	Interviews, questionnaires, secondary sources	*Organizational Factor* Centralization of power *Decision Process Characteristics* Political behavior, conflict, stability of alliances *Process Outcomes* Decision speed *Economic Outcomes* CEO's ranking relative to other firms in industry, sales growth, return on sales	Politics arise from power centralization. Politics is organized into stable coalitions based on demographic characteristics. Politics within top management teams are associated with poor firm performance (both in economic and process outcomes).
Bourgeois & Eisenhardt (1988) 4-2-5 4-2-6 (5-6)	4 decisions in 4 microcomputer firms (Multiple informants)	Interviews and questionnaires	*Organizational Factor* Centralization of power *Decision Process Characteristics* Comprehensiveness, newness of alternatives tried *Process Outcomes* Decision speed *Economic Outcomes* Market acceptance of product, sales and profitability	In high velocity environments, successful firms do comprehensive analysis but make quick decisions, have powerful CEO's & TMT's, and seek risk and innovation but execute safe, incremental implementation.

(continued)

Table 2. (Continued)

Study/Links	*Sample*	*Data Sources/ Methods*	*Measures*	*Major Findings*
Miller, Droge, & Toulouse (1988) 2-4 (1-4)	CEOs, VPs or general managers in 77 firms (multiple respondents)	Questionnaires	*Organizational Factors* Structure: integration, formalization, centralization, CEO need for achievement *Environmental Factor* Uncertainty *Decision Process Characteristic* Analysis, interaction	Extent of analysis and interaction in strategic processes are positively influenced by CEO need for achievement, structural formalization and integration.
Eisenhardt (1989) 4-2-5 4-2-6 (5-6)	8 firms in microcomputer industry (multiple respondents)	CEO interviews, semistructured interviews with each member of a firm's top management team, questionnaires, and secondary sources.	*Organizational Factor* Centralization of power *Decision Process Characteristics* Consensus, real-time information, multiple simultaneous alternatives, two-tier advice process *Process Outcomes* Decision speed, number of alternatives considered, integration among decisions, commitment to decisions *Economic Outcomes* Sales growth and profits, CEO self reports	Fast decision makers in high velocity environments use more information, consider more alternatives, use counselors, and pursue active conflict resolution strategies. Decisions based on this pattern of behaviors lead to superior performance.
Langley (1990) 2-4	In-depth analysis at senior levels in three organizations, eight/ten recent strategic issues	80 interviews with senior managers, analysts, professionals and line managers	*Organizational Factors* Three structural types (machine bureaucracy, professional bureaucracy, adhocracy) *Decision Process Characteristic* Formal analysis	Patterns in decision making processes and the use of formal analysis related to organizational structure, leadership style and the nature of issues faced by the organization.

(*continued*)

Table 2. (Continued)

Study/Links	*Sample*	*Data Sources/ Methods*	*Measures*	*Major Findings*
Hitt & Tyler (1991) 2-4 (1-4)	CEO's, senior VP's, and VP's from 65 firms	Policy capturing using questionnaire	*Organizational Factors* Executive characteristics such as age, education, experience, cognitive complexity and risk propensity *Environmental Factor* Industry type *Decision Process Characteristics* Use of rational models	Industry and executive characteristics affect the choice of decision models used to evaluate target firms in strategic acquisition decisions.
Floyd & Wooldridge (1992) 2-4	259 middle managers in 25 firms	Interviews with top and middle-level executives, company documents, survey questionnaires	*Organizational Factors* Strategic type—prospectors, defenders, analyzers *Decision Process Characteristics* Four measures of middle management involvement: championing, facilitating, synthesizing, implementation	Managers in prospector firms reported (a) significantly greater levels of championing activity than managers in defender firms, and (b) significantly greater levels of facilitating and implementation activity than managers in both analyzers and defenders.

problems and issues (Dutton & Jackson, 1987), the type and extent of information used, and the criteria used to evaluate alternatives (Shrivastava & Grant, 1985). Similarly, organizational structure can influence information flow (Bower, 1970; Fahey, 1981), as well as the extent of analysis and interaction at different organizational levels (Miller et al., 1988).

Research relating other organizational factors such as past strategies, past performance, and TMT characteristics to strategic decision processes is limited. Exceptions include studies by Fredrickson (1985), which examined the role of past performance, and Fredrickson and Iaquinto (1989) which examined the effects of changes in organizational size and top management team characteristics on decision process comprehensiveness. In other studies exploring this link, Fahey (1981) and Shrivastava and Grant (1985) examined a wide range of organizational factors through case studies but did not identify the specific effects of these factors except in terms of general propositions. Segev (1987), using laboratory and field experiments, found significant associations between a firm's strategic orientation and strategy making modes. More recently, Floyd and Wooldridge (1992) found systematic differences in the type and extent of middle management involvement across Miles and Snow's strategic types.

Links 4-2-5 and 4-2-6: Organizational Factors as Moderators of the Relationship between Decision Process Characteristics and Economic/Process Outcomes

Although a number of empirical investigations have been undertaken on the moderating role of organizational factors in the relationship between decision process characteristics and performance outcomes, consistent patterns with meaningful implications for practitioners are yet to emerge. There are important differences in the findings between studies which do not examine outcomes (link 2-4) and those which do (links 4-2-5 and 4-2-6). For example, Shrivastava and Grant (1985) suggest that formal structures and power centralization are associated with rationality in decision making processes, lower degree of political activity and sub-unit involvement, and quicker decisions. Similarly Miller et al. (1988) and Miller (1987) found positive relationships between structural formalization and integration and also between the extent of rationality and integration in strategic decision processes. Both these studies focused on the relationships between organizational factors and decision process characteristics but did not explicitly examine the outcome implications. In contrast, Eisenhardt (1989) and Eisenhardt and Bourgeois (1988) found that in rapidly changing environments, power centralization is associated with a higher degree of political activity (thus, less rationality) within the top management team and poorer economic performance. In other words, alternative power distributions and structures may affect strategic decision processes differently in different environments and the outcome effects of different structure/power and strategic decision process combinations may also vary across different environments.

The review of Stream II studies points to several organizational factors which, though theoretically meaningful, have received little or no attention in past research. These include the role of organizational slack, top management team characteristics, and past strategies and performance. Also, our review indicates that past research in this link has predominantly used contingency theories to study relationships. This is appropriate since these studies primarily focus on structure and power. However, other theoretical arguments may be needed to explore the role of the underresearched organizational factors in the future. In particular, theories of group decision making and cognition which emanate from a social psychological perspective of decision making are relevant. Bateman and Zeithaml (1989) used the psychology literature on escalation and decision framing to study the effects of past performance and organizational slack on the divestment decision. While their study focused on the content rather than the process of decision making, interesting parallels can be drawn. For example, favorable past performance and high organizational slack can create positive decision frames, and high levels of decision maker confidence which, in turn, can lead to a limited examination of new alternatives, limited information search, and less comprehensive, but faster decision processes. Cognitive simplification processes such as illusion of control, and selective perception, which can restrict the range of strategic alternatives considered, may be associated with favorable past performance and the presence of organizational slack. In a similar vein, the strategic history of an organization, as evidenced in its past strategies, has a strong influence over its current strategic choices (Mintzberg et. al., 1976). Past strategies can be a key source of organizational inertia (Tushman & Romanelli, 1985) and often explain why organizations exhibit momentum in the same direction (Miller & Friesen, 1980). Thus, past strategies can limit the consideration of new alternatives and build escalating commitment to an ongoing course of action.

Research into the effects of top management team characteristics (such as size, tenure, demography) on strategic decision processes can draw upon theories of group decision making such as polarization (Lamm & Myers, 1978; McGrath, 1984), social comparison (Jellison & Arkin, 1977), and persuasive argumentation (Vinokur & Burnstein, 1974). These theories of intra-group decision processes can constitute relevant theoretical bases for understanding the effects of TMT characteristics on strategic decision processes (Gladstein & Reilly, 1985). An investigation of TMT characteristics, in particular, should provide considerable insight into strategic decision processes. Differences in demographic characteristics of the TMT such as age and tenure (Hambrick & Mason, 1984) and heterogeneity in human capital or managerial resources in terms of expertise and skills (Castanias & Helfat, 1991) may explain important differences in strategic decision processes across firms as well as across decisions within a firm.

Yet another organizational factor that is seldom addressed in the decision process literature is the overall level of risk faced by the firm (as distinct from the uncertainty or risk associated with a specific decision). It is reasonable to assume that an organization facing high levels of risk (such as bankruptcy, competitive failure etc.) may tend to centralize or accelerate decision making. There is also evidence that as firms face more risk, their managers tend to take larger and often unwarranted risks (Figenbaum & Thomas, 1988).

With regard to methodological perspectives, most studies belonging to this link have used field surveys and case studies. Given the number of confounding factors in such settings and the wide variety of factors examined, there are serious concerns of internal validity. In order to improve future theory building, researchers may need to make greater use of laboratory and carefully controlled field settings. These research designs permit the researcher to identify specific effects of each organizational factor while controlling for other factors, as well as possible two-way and three-way interactions (e.g., Bateman & Zeithaml, 1989). Relationships identified in such controlled settings can then be tested among a wide variety of organizations using techniques of stratified sampling which control for one set of factors while varying the others (Harrigan, 1983).

Stream III: Influence of Decision-specific Factors

Table 3 presents our summary of Stream III studies. Our review of the literature within Stream III indicates that relationships between decision specific factors and decision process characteristics have received very limited attention in past research. Only 7 out of the 35 studies reviewed by us belong to this stream. Further, the available body of research is also fragmented. Given the variety in the types of strategic decisions that managers make, there clearly is a need to examine the influence of decision context on process characteristics. Carter's (1971) pioneering study indicated that decision context, defined in terms of level of technical uncertainty, degree of outcome uncertainty, and criticalness to decision makers, has an important influence on process characteristics. In a study of strategic energy management decisions, Fahey (1981) found that the process characteristics were influenced by factors such as degree of criticalness, impetus, and frequency of occurrence. Also, Schilit's (1987) findings suggest that the risk/return characteristics of a decision impact the extent of upward influence exercised by middle level managers. Other decision specific factors that have been identified as influencing process characteristics include decision complexity (Astley, Axelsson, Butler, Hickson, & Wilson, 1982), decision urgency (Pinfield, 1986), decision motive (Fredrickson, 1985; Shrivastava & Grant, 1985), information source (Schilit & Paine, 1987), and problem classification (Volkema, 1986). Further empirical evidence supporting the impact of problem characterization on decision processes and outcomes is available in studies by Cowan (1988) and Dutton and Duncan (1987).

In summary, a review of Stream III studies indicates that it is difficult to draw generalizable conclusions. Three factors are primarily responsible. First, little consensus exists regarding the definition and operationalization of important decision specific factors, leading to loose and inconsistent definitions of key constructs. Further, terms such as decision criticalness, decision urgency, and outcome uncertainty have been used in several studies with little or no attempt to satisfy the requirements of construct validity and reliability. Second, very few studies in Stream III have either controlled for or simultaneously

Table 3. Stream 3: Inlfuence of Decision-Specific Factors on Strategic Decision Processes

Study/Links	*Sample*	*Data Sources/ Methods*	*Measures*	*Major Findings*
Fahey (1981) 3-4 (2-4)	Six multi-divisional firms in diverse industries, strategic energy management decisions in each firm, key executives at corporate and divisional levels	Structured questionnaires, interviews, multiple informants	No a-priori constructs/measures; decision process characteristics derived from observations/ descriptions	Strategic decision processes are characterized by both rational and behavioral/political processes; phases in the process are inter-related, interactive, and often characterized by considerable political activity. Also influenced by degree of criticalness, impetus and frequency of occurrence.
Astley, Axelsson, Butler, Hickson & Wilson (1982) 3-4 (2-4)	150 decision topics analyzed in 30 organizations	Rating of cases by researchers	*Decision Specific Factor* Complexity *Organizational Factor* Cleavage *Decision Process Characteristics* Scrutiny, negotiation, discontinuity, centralization, duration *Process Outcome* Synopticism, anticipation and acceptability	Centralization is high when complexity and political cleavage is high. When decision is simple and without cleavage, decision making process is fast. Negotiation is high when political cleavage is high.
Pinfield (1986) 3-4 (2-4)	A Canadian governmental bureaucratic organization	Participant observation, archival data, interviews	*Decision Specific Factor* Decision urgency *Decision Process Characteristic* Participation *Organizational Factors* Structural arrangements, organizational goals	A partial synthesis of the structured and anarchic decision models can link changes in participation and external variables to decision process.
Schilit (1987) 3-4	60 middle-level managers, 329 strategic decisions	Questionnaires, participant records, single informant	*Decision-Specific Factor* Riskiness/return *Decision Process Characteristic* Upward influence	Upward influence activity more likely in i) low risk/return decisions than high risk/return decisions ii) implementation than formulation iii) private organizations than in public organizations.

(continued)

Table 3. (Continued)

Study/Links	*Sample*	*Data Sources/ Methods*	*Measures*	*Major Findings*
Schilit & Paine (1987) 3-4 (4-3-5)	60 middle-level managers, 329 strategic decisions	Questionnaires, participant records, interviews, single informant	*Decision-Specific Factors* Information source, riskiness, return *Decision Process Characteristics* Duration, coalition activity, conflict, rationality *Process Outcomes* Speed	Higher the riskiness/return, greater is the duration of the process, the use of collaborative and incremental techniques, and the level of coalition activity and negotiation.
Cray, Mallory, Butler, Hickson & Wilson (1991) 3-4	30 firms from diverse industries, 150 strategic decisions	Interviews with multiple key executives in each firm, company documents	*Decision-Specific Factors* Problem complexity, politicality *Decision Process Characteristics* Scrutiny, interactions, duration, centrality, gestation time, process time	Decision type is a reasonable predictor of the type of decision making process. The decision type—decision making process type relationships identified were vortex-sporadic, tractable-fluid, and familiar-constricted.
Butler, Davies, Pike & Sharp (1991) 3-4 (2-4)	3 strategic investment decisions in 3 firms	Semistructured interviews and questionnaires	*Decision-Specific Factors* Uncertainty about objectives and outcome, type of decision complexity, politicality *Organizational Factors* Investment controls, technical ambiguity, strategic ambiguity *Decision Process Characteristics* Computational, judgmental, bargaining, inspirational *Process Outcomes* Satisfaction with process, organizational learning, appropriateness of choice	Perceived effectiveness of the decision influences support for the decision.

examined the influence of environmental and organizational factors. This clearly limits our ability to draw strong inferences or to build theory cumulatively. Finally, studies within this stream have largely ignored process and economic outcomes. While some conclusions can be drawn with respect to how different decision factors influence the decision process, their performance implications remain unexplored. Exceptions to this observation are studies by Schilit (1987) and Schilit and Paine (1987) which indicate that process outcomes such as decision speed are indeed affected by decision characteristics (riskiness) and process characteristics (coalition activity). Perhaps the major contribution of studies in this link is a heightened awareness of the need for closer examination of the interrelationships between decision specific factors and process characteristics.

Stream IV: Performance Effects

Given that performance improvement is at the heart of strategic management (Venkatraman & Ramanujam, 1986), it is not surprising that a number of empirical studies have examined the relationship between process characteristics and performance outcomes. While some of the studies included in our review of Streams I, II, and III do include performance effects, studies classified by us under Stream IV are those which focus not upon environmental, organizational and decision-specific antecedents but upon the relationships between process characteristics and performance outcomes (economic or process or both). As evident from Table 4 more studies in Stream IV have focused on links 4-5 (process characteristics and process outcomes) than on links 4-6 (process characteristics and economic outcomes), and 5-6 (process outcomes and economic outcomes).

Link 4-5: Relationships between Process Characteristics and Process Outcomes

The relationships between process characteristics and process outcomes (link 4-5) are more direct and are less likely to be confounded by extraneous factors than the relationship between process characteristics and economic outcomes (link 4-6). Timeliness, speed of decision making, acceptability to organizational members, adaptiveness to change, and the extent of organizational learning appear to be useful indicators of strategic decision process outcomes (Quinn & Rohrbaugh, 1983). A stream of research that has focused on link 4-5 relationships consists of several laboratory studies on the relative effectiveness of Dialectical Inquiry (DI) and Devil's Advocacy (DA) on decision performance. While these studies provide some evidence that cognitive conflict induced by DI or DA generally leads to better quality decisions (e.g., Schweiger, Sandberg & Rechner, 1989; Schweiger, Sandberg & Ragan, 1986), there is no conclusive evidence on whether one method is superior to another (Schwenk, 1989). Further, if a broader definition of outcome is adopted, incorporating such factors as "satisfaction with the decision" and "desire to continue to work in the group," the results become even more confusing and inconclusive.

Table 4. Stream 4: Performance Effects of Strategic Decision Processes

Study/Links	*Sample*	*Data Sources/ Methods*	*Measures*	*Major Findings*
Bourgeois (1980) 4-6	CEO's of 12 non-diversified public corporations plus 67 members of their top management teams	On-site interviews, questionnaires	*Decision Process Characteristics* Consensus on industry relevant competitive weapons *Performance* Factor score of ROA, growth in capital, growth in net earnings, growth in EPS, improvement in ROS	Consensus on means leads to higher performance.
Schwenk (1984) 4-5	80 undergraduate students	Laboratory experiment, questionnaires	*Decision Process Characteristics* Decision making approach—Dialectical Inquiry, Devil's Advocacy or Consensus *Process Outcomes* Number of strategic alternatives, number of functional area alternatives, satisfaction with the process	Subjects using DA & DI reported higher satisfaction than those using expert approach. DI worked better with video presentation and DA with written aids.
Schweiger, Sandberg & Ragan (1986) 4-5	120 MBA students	Laboratory experiment, questionnaires	*Decision Process Characteristics* Decision making approach – DI, DA or Consensus *Process Outcomes* Number of assumptions, quality of assumptions and recommendations, satisfaction and desire to continue to work in group, acceptance of group decisions	Quality of recommendations DI & DA > C Quality of assumptions surfaced DI > DA Satisfaction with decision and desire to continue to work in group C > DI & DA
Dess (1987) 4-6	74 members of the top management team of 19 privately held firms in the paints and allied products industry	On-site interviews and mail questionnaires	*Decision Process Characteristics* Consensus on competitive methods *Performance* Sales growth, after tax return on assets, overall firm performance *Controls* Sales	Consensus on methods/strategies is positively related to organizational performance.

Bourgeois & Eisenhardt (1988) 5-6 (4-2-5) (4-2-6)	4 decisions in 4 microcomputer firms (multiple informants)	Interviews and questionnaires	*Organizational Factor* Centralization of power *Decision Process Characteristics* Comprehensiveness, newness of alternatives tried *Process Outcomes* Decision speed *Economic Outcomes* Market acceptance of product, sales and profitability	In high velocity environments, comprehensiveness, decision speed, CEO power, bold strategies, and incremental implementation lead to better performance.
Eisenhardt & Bourgeois (1988) 5-6 (4-2-5) (4-2-5)	8 firms in microcomputer industry (multiple informants)	Interviews, questionnaires, secondary sources	*Organizational Factor* Centralization of power *Decision Process Characteristics* Political behavior, conflict, stability of alliances *Process Outcomes* Decision speed *Economic Outcomes* CEO's ranking relative to other firms in industry, sales growth, return on sales	Politics within TMT's is associated with reduced decision speed and poorer economic performance.
Schweiger, Sandberg & Rechner (1989) 4-5	120 middle and upper-middle level managers from three divisions of a Fortune 500 company	Laboratory experiment, questionnaires	*Decision Process Characteristic* Decision making approach – DI, DA or Consensus *Process Outcomes* Number, validity, and importance of assumptions, quality of recommendations, satisfaction and desire to continue to work with group, acceptance of group decision, critical evaluation, meeting duration	Quality of decisions: DI = DA > C Acceptance of decisions: C > DI = DA Experience in using DI, DA & C reduced time required to reach decision and improved decision quality, critical re-evaluation levels and reactions of group members.

(continued)

Table 4. (Continued)

Study/Links	*Sample*	*Data Sources/Methods*	*Measures*	*Major Findings*
Schweiger & Sandberg (1989) 4-5	120 MBA students	Laboratory experiment, questionnaires	*Decision Process Characteristics* Decision making approach – DI, DA or Consensus *Process Outcomes* Number, validity and importance of assumptions; quality of recommendations *Other* Utilization of individual capabilities	Quality of Recommendations DI & DA > C Quality of Assumptions DI > DA, C DI yields better group performance on all measures, but does not differ substantially from DA in utilization of individual members' capabilities.
Eisenhardt (1989) 5-6 (4-2-5) (4-2-6)	8 firms in microcomputer industry (multiple respondents)	CEO interviews, semistructured interviews with each member of a firm's top management team, questionnaires, and secondary sources.	*Decision Process Characteristics* Consensus, real-time information, multiple simultaneous alternatives, two-tier advice process *Process Outcomes* Decision speed, number of alternatives considered, integration among decisions, commitment to decisions *Economic Outcomes* Sales growth and profits, CEO self reports	Positive relationship between decision speed and economic outcomes in high velocity environments.
Schwenk (1990) 4-5	42 executive MBA students from business and not-for-profit organizations	Questionnaires	*Decision Process Characteristics* Decision making approach – DI, DA or Consensus *Process Outcomes* Quality of decision: overall quality, clarity, aversiveness (i.e., extent to which the process was tense, unpleasant and emotional)	High conflict is associated with high quality in not-for-profit organizations but with low quality in for-profit organizations.
Wooldridge & Floyd (1990) 4-5 5-6 4-6	11 banks and 9 manufacturing organizations	Semi-structured interviews with CEOs and questionnaires from middle-level managers	*Decision Process Characteristics* Participation/involvement *Process Outcomes* Commitment and understanding of strategy *Economic Outcomes* Competitive position, ROA, efficiency, growth rate	Involvement by middle level management in the formation of strategy leads to greater understanding by them and improved economic performance.

Link 4-6: Relationships between Process Characteristics and Economic Outcomes

A number of studies within Stream IV have investigated the relationship between TMT consensus and economic performance. (Dess & Origer, 1987 provide a comprehensive review). As with the relationship between the comprehensiveness of the decision process and economic performance, empirical results in this area are conflicting. While Bourgeois (1980) and Dess (1987) found a positive relationship between consensus and firm performance, Bourgeois (1985) and Grinyer and Norburn (1975) found the relationship to be negative. Priem (1990) provides a possible explanation for the contradictory findings. He suggests that a direct relationship between consensus and performance may be too simplistic and that environmental change may strongly moderate such a relationship. Further, he argues that consensus itself may be the outcome of organizational factors or more specifically, TMT characteristics such as homogeneity and group structure.

While the impact of decision process characteristics on economic outcomes has been of considerable interest to both researchers and practitioners, it must be recognized that several organizational and environmental factors also affect economic performance. As a result, cause-effect relationships are difficult to establish. Additionally, because of model underspecification which characterizes many of these studies, reported relationships are likely to be confounded by factors extraneous to the research question under investigation.

Link 5-6: Relationships between Process Outcomes and Economic Outcomes

As indicated in Table 4, our search identified only four empirical studies pertaining to link 5-6, i.e., the relationship between process outcomes and economic outcomes (Eisenhardt, 1989; Eisenhardt & Bourgeois, 1988; Bourgeois & Eisenhardt, 1988; Wooldridge & Floyd, 1990). Eisenhardt (1989) found a positive relationship between decision speed and performance. The study by Wooldridge and Floyd (1990) examined the relationships between decision process characteristics, process outcomes and economic outcomes. They found that greater participation and involvement by middle level managers in strategy formation resulted in greater commitment and understanding of strategy as well as improved economic performance. Eisenhardt and Bourgeois (1988), and Bourgeois and Eisenhardt (1988) found increased political behavior to be associated with reduced decision speed and poorer firm performance.

In summary, our review of links 4-5, 4-6, and 5-6 suggests that certain important questions have remained unanswered. For example, are there patterns in the relationships between different strategic decision making process characteristics and the extent/type of organizational learning that takes place as a consequence of these processes? If so, what are the performance/outcome implications of these relationships? However, before the relationships between strategic decision processes and organizational learning can be studied, useful indicators of learning need to be developed. A substantial portion of an organization's knowledge base resides in the minds of decision makers involved in the strategy process (Shrivastava & Grant, 1985; Mintzberg, Raisinghani, & Theoret, 1976). Hence, changes in the cognitive maps of the decision makers (Barr, Stimpert, & Huff, 1992) can be valid indicators of the types and extent of changes taking place in the organization's knowledge base. Further, since learning is an ongoing process in organizations, an important issue is whether we should view it as an outcome variable at all. In other words, while the knowledge base resulting from organizational learning is a process outcome, learning itself could be viewed as a continuous organizational process. Shrivastava and Grant (1985) suggest that different types of organizational learning systems support different types of strategic decision making models. For example, formal learning systems such as strategic planning systems and management information systems support adaptive strategic decision making processes. But do different strategic decision making processes contribute differentially to organizational learning? Mintzberg and Waters (1985) argue that comprehensive, deliberate strategic decision making can often hinder strategic learning since messages from the environment tend to get blocked out. On the other hand, strategies which are characterized by emergent/evolutionary processes may keep the organization open, flexible, and responsive. Clearly, more studies which examine links 4-5 and 5-6 are needed to answer these questions.

Conclusions and Implications For Future Research

Based on the preceding review of empirical research on strategic decision processes, several conclusions and implications for future research can be identified. These are discussed in the following paragraphs.

Implications for Theory Building

Strategic decision process research to date has been based on a very rich and diverse theoretical base. Empirical studies have often used more than one theoretical model to study strategic decision processes, resulting in a much richer description of the process than would have occurred with simpler theoretical models. However, as elaborated below, our review identifies several ways to improve future theory building efforts.

Greater utilization of micro theories. A majority of the studies in our review utilized theoretical models which adopt an organizational or macro perspective rather than an individual or micro perspective. This is evident in the number of studies which have utilized contingency theories, rational, socio-political, and organizational process models of decision making. The relatively small number of studies which adopted a more micro view of the decision process typically utilized group decision making theories. Only five studies (Cray et. al., 1991; Butler, Davies, Pike, & Sharp, 1991; Fredrickson & Iaquinto, 1989; Schilit & Paine, 1987; Wooldridge & Floyd, 1990) reflect a combination of the micro and macro perspectives in studying this topic. While a macro perspective is both necessary and useful, strategic process research can benefit greatly from acknowledging the role of the individuals and groups involved in the strategic decision process. In this regard, cognitive psychological theories of decision making (e.g., Axelrod, 1976; Bateman & Zeithaml, 1989; Kahneman & Tversky, 1984) and theories of group decision making (Gladstein & Reilly, 1985) can certainly contribute to a better understanding of the impact of factors such as individual backgrounds, experiences, biases, group composition, and tenure on the strategic decision process. We believe that combining the macro and the micro views of strategic decision making should be particularly useful in both future theory building and theory testing. Some of the specific research questions which can be explored from a micro perspective were identified earlier in our discussion of Streams I and II.

Use of intervening and interactive effects models. Boal and Bryson (1987) identify four different theoretical specifications that are applicable to process research. These are independent effects, moderating effects, intervening effects, and interaction effects. The direct effects of environmental, organizational, and decision specific factors on process characteristics (links 1-4, 2-4, and 3-4) can be represented through an independent effects model. Similarly, studies which have examined links 4-5, 5-6, and 4-6 also use independent effects specification. On the other hand, studies which have examined moderating effects of contextual factors on the relationship between decision process characteristics and outcomes (e.g., links 4-1-5, 4-2-5 and 4-3-5) are based on moderating effects theoretical specifications. However, there are two more theoretical specifications implicit in Figure 1, namely, intervening and interaction effects. In the intervening effects model, contextual factors (such as environment, organization, and decision-specific factors) impact outcomes through their effects on decision process characteristics. Testing this theoretical specification would enable us to identify both direct as well as indirect effects of contextual variables and thereby provide guidelines to managers seeking to intervene in the causal process. In the interactive model, contextual factors interact between themselves and/or with process characteristics to determine outcomes. This would require methodologies such as stepwise regression which permit inclusion of main effects as well as interactive effects. Given the minimal use of intervening and interactive effects specifications in past research, we believe that the testing of such models will provide interesting insights into the influence of contextual factors on strategic decision processes.

Inclusion of multiple antecedents. Theoretically, there is little reason to assume that any one of the three sets of antecedent factors that we have identified in our model is more important than the others. However, our review shows that the majority of studies have limited themselves to addressing only one set of antecedent factors. Although the inclusion of multiple antecedent factors may increase the complexity of research designs, it does provide several promising avenues for further research on the interactions between the three sets of antecedent variables and their performance implications. For example, it can be argued that organizations with certain capabilities may be able to simultaneously achieve speed and comprehensiveness in their decision processes in rapidly changing environments. Such capabilities include the use of real-time information, experienced counselors, and active conflict resolution mechanisms (Eisenhardt, 1989). In fact, it may also help resolve some of the contradictions in the literature. For example, the negative relationship between comprehensiveness and performance in unstable environments observed by Fredrickson (1984) may, in part, be due to a lack of organizational capabilities. Similarly, incremental decision making in stable environments could also be associated with positive performance if such incrementalism is supported by an ongoing learning process. In other words, based on their past experience in a stable environment, managers may know what information is relevant and which alternatives are feasible. Hence, their lack of comprehensiveness in specific decisions may be more than compensated for by their information seeking and processing capabilities. Organizational knowledge bases which reflect an organization's cumulative past experiences can be powerful inputs into the strategic decision process (Shrivastava & Grant, 1985). Organizational knowledge bases can also serve to routinize strategic decision processes in stable environments and to reduce uncertainty in rapidly changing environments.

Yet another potentially fruitful area for future research involves the interaction between outcome uncertainty, a decision-specific antecedent, and environmental uncertainty. Managers can encounter decisions with low degrees of outcome uncertainty in an unstable environment and high-risk decision situations even in relatively stable environments. Very little is known about the impact of such interactions between environmental attributes and decision-specific factors on decision comprehensiveness and decision speed.

Implications for Research Methods

As already discussed, research on strategic decision processes reveals rich theory development. However, far less attention has been paid to methodological rigor. Undoubtedly, the complexity of the topic complicates both data collection and analysis. Our review suggests several useful methodological directions and guidelines for future research in this area. These are discussed in the following paragraphs.

Greater attention to construct validity. As noted earlier in our review of Stream III studies, empirical studies have often been plagued by a multiplicity of definitions and operationalizations. This is especially true with respect to decision-specific antecedent factors and strategic decision process characteristics. Relatively little attention has been paid thus far to issues of construct validity and reliability. The use of single-item measures in field studies and surveys as well as post-facto description of measures by researchers not only make comparisons across studies difficult but also raises questions about the internal validity of the findings. Our review indicates that very few studies make use of multi-item measures or provide tests for scale reliability and validity. This is a shortcoming which needs to be addressed in future research. Greater attention to construct validity could potentially lead to narrower scope for any particular study. Individual studies can meaningfully focus on specific parts or links within the framework developed in this article without necessarily sacrificing relevance. Collectively, such studies may yield better insights about the strategic decision process. In other words, it is possible to achieve both rigor and relevance within reasonable limits.

Multiple respondents and decision scenarios. A number of studies in the past have relied on survey questionnaires and single respondents for collection of data. This can lead to a variety of problems. First, questionnaires are subject to respondents' varying interpretations and cognitive orientations and do not establish whether the context is strategic (Fredrickson, 1986). Second, the perceptions of a single individual, notwithstanding the person's organizational status, may not reflect organizational reality and may be tainted by common method variance. For example, Wolfe and Jackson (1987) in their study found a severe lack of agreement among participants about the nature and details of their own strategic decisions. They found that subjects disagreed more than half the time on even the most basic elements of their strategic decisions. This suggests that it is necessary to validate data obtained through survey questionnaires by using other data sources (Huber & Power, 1985). Content analyses of transcripts of actual processes, cross-check of recall data, and multiple concurrent self reports can be used in conjunction with survey questionnaires to overcome problems of respondent bias and distortions (Wolfe & Jackson, 1987).

The use of decision scenarios as a research methodology also holds considerable promise (Fredrickson, 1986). As demonstrated in studies by Fredrickson and his colleagues, scenarios based on detailed industry knowledge allow the creation of strategic contexts, while providing respondents with standardized stimulus. Scenarios can be tailored to different industry contexts. Moreover, multiple scenarios, when used in a single study, can enable researchers to achieve internal validity as well as generalizability. Scenarios also permit the use of multiple respondents, multi-item indicators of research constructs, and construct development techniques which maximize both agreement within firms and between-firm variance (Fredrickson, 1986). Finally, scenarios can also be used to assess cross-sectional and temporal variances by administering them to the same set of respondents at different points in time and thereby assessing causal patterns of relationships over time. Scenarios appear to combine some of the advantages of controlled laboratory studies (i.e., high internal validity through controlled stimulus) with those of field studies (i.e., realism and generalizability). For this reason, they offer a promising data collection method for future studies.

Methods to represent individual decision processes. As we noted earlier, research on strategic decision processes can benefit by adopting an individual or micro perspective. This in turn would require the use of methodologies appropriate for the study of individual level decision making. A methodology that could be particularly useful in this respect is metric conjoint analysis (Priem, 1992). Conjoint analysis has been widely used in the marketing and psychology literatures and is especially appropriate for capturing decision maker's theories-in-use, given that managers often have only a poor understanding of their own decision policies. Yet another methodology that holds considerable promise for the study of individual decision processes is a procedure that is commonly referred to as policy-or judgement-capturing. Recent studies which have used this methodology include Hitt and Tyler (1991) and Keats (1991). The use of policy-capturing methodology enables the researcher to obtain an accurate representation of actual decision-making behavior, especially the specific structure of the models used by managers to arrive at strategic decisions.

Use of real-time, longitudinal methods. Cross-sectional studies which pool strategic decisions across multiple contexts have been commonly used in past research. In order to obtain a better understanding of causal relationships (both degree and direction) between contextual variables, process characteristics and outcomes, research on strategic decision processes needs to make greater use of longitudinal data collection methods. According to Van de Ven (1992) such studies are best undertaken on a real-time basis. In real-time longitudinal studies (e.g., Garud & Van de Ven, 1992), researchers record the timing and other characteristics of events and activities as they occur within the organization through regularly scheduled and intermittent real-time observations. This also entails the observation of key committee meetings, decision events, and informal interviews and discussions with key participants in the decision process. Van de Ven and Poole (1989, 1990) detail the steps involved in implementing a real-time, longitudinal research design to study innovation processes. Garud and Van de Ven (1992), and Van de Ven and Polley (1992), illustrate the methodology of event sequence analysis to examine process models of internal corporate venturing and trial and error learning. Observations from these studies are equally applicable to the study of strategic decision processes and offer considerable potential as a useful methodology to understand how relationships between context, process, and outcomes unfold over time. More importantly, they provide relevant and practical research tools to simultaneously examine multiple links within the context of the framework presented in Figure 1.

Exploration of curvilinear relationships. Much of the empirical research in the strategy area has traditionally relied on linear models and linear estimation techniques. However, relationships among most of the commonly used constructs are linear only within relatively narrow ranges. For example, it may be possible to resolve the apparent contradiction between the findings from Fredrickson's and Eisenhardt's studies by exploring the existence of possible non-linear relationships among environmental uncertainty, comprehensiveness, and performance. It is possible that comprehensiveness leads to better performance up to a certain level of environmental uncertainty as evidenced by a positive relationship in Eisenhardt's studies. But beyond this level of uncertainty, the additional costs of information gathering and analysis may exceed the incremental benefits, resulting in a negative relationship between comprehensiveness and performance (as found in Fredrickson's study). This also suggests the need to measure environmental characteristics using continuous rather than dichotomous measures (e.g., stable vs. unstable). The use of continuous measures would enable an assessment of the point in the U-shaped curve where the relationship changes direction.

Testing of intervening and interactive effects models. We had earlier discussed the need to develop and test intervening and interactive theoretical specifications of the framework of Figure 1. Past research has typically used bivariate, zero-order and partial correlations, and analysis of variance techniques while testing main effects and moderating effects. However, more complex analytic methods will be needed to assess relationships within intervening and interactive model specifications. Such techniques include path analysis (Wright, 1960; Ginsberg & Venkatraman, 1992), hierarchical regression analysis (Arnold, 1982), and structural equation modelling (Miller et al., 1988). Path analysis, for example, can be used to assess the relative importance of direct and indirect effects of antecedent factors on process outcomes by including their intervening effects on decision process characteristics. Likewise, hierarchical regression can be used to include two-way and three-way interactions between the three sets of antecedent factors with strategic decision process characteristics as dependent variables.

The relationships presented in Figure 1 can also be tested through structural equation modelling, wherein process characteristics can be included as both endogenous and exogenous variables. As endogenous variables, process characteristics would be determined by environmental, organizational, or decision-specific antecedent factors. However, they would also serve as exogenous variables which affect process and economic outcomes along with environmental, organizational, or decision-specific antecedents. These relationships could then be assessed through a system of simultaneous, structural equations. Thus, multiple links could be examined within the same study.

Implications for Managerial Practice

Research on strategic decision processes has been mostly descriptive in its orientation. An understanding of strategic decision processes in terms of their antecedents and outcomes should ultimately lead to guidelines that can be directly incorporated into managerial practice.

Greater attention to prescriptive relevance. Although a number of studies have examined the economic and process outcomes of strategic decision processes, they provide limited guidance for managerial practice. Two general conclusions seem to emerge from our review. First, the performance effects of strategic decision processes are context specific. Environmental and organizational factors have independent as well as interaction effects, but unequivocal patterns are hard to establish. Second, processes which induce intra-group cognitive conflict appear to improve decision quality, but it is unclear whether such processes also improve other process outcomes such as decision speed and commitment. While strategic process research so far has made considerable progress with respect to achieving descriptive accuracy, unfortunately, it seems that progress towards attaining prescriptive relevance has been somewhat limited. For example, although research to date has been very productive in terms of describing how and why decision process characteristics vary between different contexts, it tells us little about whether one set of characteristics is more effective than another or the conditions under which such effectiveness can be realized. It also fails to tell us whether decision processes account for significant variance in performance, economic or otherwise. As suggested by Bateman and Zeithaml (1989), research should help in identifying and explicating relationships which are not obvious to managers. To the extent that the outcome effects of strategic decision processes are both non-obvious and extremely complex, studies which examine these links are likely to have considerable practical significance.

Broader conceptualization of outcomes. To a large extent, variables used to capture outcomes in the strategic decision process research reflect the economic orientation of content researchers. This raises the disturbing question of whether economic measures of performance are the only legitimate outcome variables or whether they reflect the biases imposed by the researcher's cognitive framework (Reger, 1988) and/or data availability. A broader conceptualization of process effectiveness which incorporates both process-related as well as economic performance-related measures (Venkatraman & Ramanujam, 1986) will be more meaningful in the context of strategy process research. Also, given the variety of organizational and environmental influences on economic performance, cause-effect relationships are much harder to assess in the case of economic outcomes than in the case of process outcomes. In addition, it is also unclear whether economic outcomes are the only outcomes valued by top managers and other decision makers. Other issues of relevance to managers are the possibilities of trade-offs among different outcomes, their potential benefits, and their long-term and short-term effects. These and several other related questions reflect the need for greater attention to performance implications of strategic decision processes and are likely to be very meaningful from the point of view of practicing managers.

Identification of organizational capabilities. In addition to the above, enhancing the prescriptive relevance of strategy process research would also require greater attention to the role of organizational capabilities. For example, what organizational capabilities help executives make faster and better decisions and how can organizations develop such capabilities? Eisenhardt's (1989) study identifies the role of organizational capabilities such as the ability to process real-time information, resolve conflicts and use decision counselors in enabling executives to make speedy, comprehensive and effective decisions in rapidly changing environments. However, such studies that attempt to identify the nature of organizational capabilities associated with effective decision making are rare in extant literature.

Conclusion

In conclusion, our review indicates that considerable work has been undertaken in the past decade focusing on the antecedents and outcomes of strategic decision processes. A rich theoretical and empirical research base already exists, although there has been little cumulative theory building. We hope that the systematic review undertaken in this article and the several areas for future research identified therein will enable researchers to build upon extant literature more meaningfully. Future research into the antecedents and outcomes of strategic decision processes should strive to achieve the multiple objectives of being theoretically sound, methodologically rigorous and practically meaningful. We hope that the framework proposed in this article and the critical review undertaken based on that framework constitute a meaningful step in that direction.

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Notes

1. The results of our review are presented in Tables 1 through 4. The tables and the review are organized in terms of the four major research streams. Below each study we provide the link which was the primary focus of the study. Where a study examined additional links as well, they are listed within brackets. Three studies which focused equally on more than one linkage appear in more than one table.

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