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THE ROLE OF MANAGERIAL LEARNING AND INTERPRETATION IN STRATEGIC PERSISTENCE AND REORIENTATION: AN EMPIRICAL EXPLORATION

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This study uses a managerial learning framework to build and test a model of the decision-making process that drives decisions to strategically reorient an organization. The model examines the effects of past performance, managerial interpretations, and top management team characteristics on the likelihood of strategic reorientation in two distinct environmental contexts. The results indicate that poor past performance, environmental awareness, top management team heterogeneity, and CEO turnover increased the likelihood of reorientation. There are some differences in the ways in which these variables affect reorientation across the two environmental contexts. Poor past performance was more strongly associated with reorientation in the stable environment than in the turbulent environment. The tendency to make external attributions for poor performance outcomes decreased the likelihood of reorientation in the turbulent environment, but not in the stable environment.

INTRODUCTION

Managers have the difficult task of navigating their organizations through an uncertain and changing environment. One of the most basic strategic decisions top-level managers make is whether to persist with their current strategic orientation or to alter an organization's strategic course. Although persistence frequently improves an organization's efficiency, it can also lead to failure when there are major shifts in an organization's environmental context. Achieving long-term success requires the ability to emphasize efficiency at certain times while maintaining the flexibility to change strategic direction (Thompson, 1967).

However, deciding when to persist and when to change is difficult because there is often uncertainty about the future state of the environment and about the relationships between managers' actions and organizational outcomes (Hall, 1984; March and Olsen, 1976; Masuch, 1985; Miller and Friesen, 1980). Further complicating managers' strategic decision making efforts is the fact that there are often structural (Hannan and Freeman, 1984), political (Greenwood and Hinings, 1988; Pettigrew, 1987), and psychological (Milliken and Lant, 1991) pressures to persist with past strategies.

Major changes in an organization's strategic direction often are attributed to visionary, trans-

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formational leadership (Bennis and Nanus, 1985; Tushman, Newman, and Romanelli, 1988; Tichy and Ulrich, 1984) or to managers' rational analysis of environmental threats and opportunities (Schendel and Hofer, 1979). Although many researchers acknowledge that executives' perceptions and interpretations play an important role in these choices (e.g., Tushman and Romanelli, 1985), the precise mechanisms by which these interpretations influence decisions to persist or change have not been fully specified or examined.

The purpose of our research is to examine how past performance, managerial interpretations of their experience, and top management characteristics influence the likelihood of strategic reorientation in different environmental contexts. Thus, this research attempts to follow the suggestions of Pettigrew (1987) and others (Greenwood and Hinings, 1988; Laughlin, 1991) to pursue studies of strategic transformation that include elements of history, context, and process (Pettigrew, 1987). In this paper, we apply a managerial learning framework to build and test a model of the decision-making process that drives strategic transformation.

Organizational learning models typically have several common characteristics. First, managers are assumed to set concrete performance goals to which they compare performance outcomes. It is hypothesized that these goals are a function of past performance (Lant, 1992) and competitor performance (Herriot, Levinthal, and March, 1985; Levinthal and March, 1981; Levitt and March, 1988). Second, the discrepancy between goals and performance provides a signal of success or failure to which managers attend in an attempt to simplify the task of interpreting their experience (Cyert and March, 1963; Lant, 1992; Levinthal and March, 1981) and to guide future behavior (Lant, 1992). Third, performance relative to goals and managerial interpretations of their experiences influence the likelihood of organizational change (Levitt and March, 1988; March and Olsen, 1976; Lant and Mezias, 1992).

The managerial learning framework we develop and test in this paper examines the roles of past performance and managerial interpretations in influencing the likelihood of strategic reorientations. In addition, since managers typically do not make major strategic decisions in isolation, but rather as part of a top management team (Hambrick and Mason, 1984), we examine the role of top management team characteristics in the managerial learning process. Finally, we examine whether industry context influences how past performance, managerial interpretations, and top management team characteristics affect the likelihood of strategic reorientations.

Patterns of strategic reorientation

Punctuated equilibrium models of strategic change (Miller and Friesen, 1980; Tushman and Romanelli, 1985) assert that organizations experience long periods of strategic persistence punctuated by short periods in which major changes occur in strategic direction and supporting structures and systems. Tushman and Romanelli (1985) refer to periods of strategic persistence as convergent periods and to occurrences of major changes in strategic direction as reorientations. Miller and Friesen (1980) use the terms momentum and revolution to describe these concepts. Convergence is defined as a period of equilibrium characterized by 'relatively long time spans of incremental change and adaptation which elaborate structures, systems, controls, and resources toward increased coalignment' (Tushman and Romanelli, 1985: 173). Reorientations are characterized by 'simultaneous and discontinuous shifts in strategy, the distribution of power, the firm's core structure, and the nature and permissiveness of control systems' (Tushman and Romanelli, 1985: 179).

A key contribution of this literature is the recognition that because of the need to maintain a fit between an organization's strategy and other key elements of its design (e.g. structure, power systems, control systems), major changes in strategy are likely to be accompanied by changes in other key elements of an organization's design. Thus, the terms reorientation and revolution are well chosen as they capture the magnitude of changes that must be made to change an organization's strategic direction.

One reason why organizations may go through long periods of convergence punctuated by short bursts of change is that organizations experience tremendous persistence forces that make both the recognition of a need for change and its implementation difficult:

> As webs of interdependent relationships with buyers, suppliers, and financial backers

> strengthen and as commitments to internal participants and external constituencies are elaborated into institutionalized patterns of culture, norms, and ideologies, the organization develops inertia, a resistance to all but incremental change (Tushman and Romanelli, 1985: 177).

Still lacking in this research approach, however, is a detailed specification and examination of the processes through which convergence and reorientation occur (Pettigrew, 1987). This study focuses on this gap in the literature by exploring how elements of managerial experience affect the likelihood of organizational reorienation. The set of variables we examine is derived from an organizational learning perspective.

The influence of managerial learning on the likelihood of strategic persistence and reorientation

Managerial learning involves managers' attempts to develop an understanding of the connections between their actions and an organization's outcomes, as well as the role that an organization's environmental context plays in influencing these action-outcome linkages. Historically, the organizational learning literature has emphasized the process of trial-and-error learning, where actions associated with positive outcomes are repeated, and actions associated with negative outcomes are not repeated (Cyert and March, 1963; Levinthal and March, 1981; March and Olsen, 1976; March and Simon, 1958). Recent work on organizational learning has suggested that even complex patterns of organizational stability and change may be outcomes of simple trial-and-error learning. This work suggests that when organizations experience successful performance they will maintain the status quo and exhibit convergence; when unsuccessful performance provides sufficient equivocal experience, organizations can undergo a learning process that leads to reorientation (Lant and Mezias, 1992; Levitt and March, 1988).

We argue that managerial learning is a more complex process than that implied by simple trial-and-error learning. There are many factors in an organizational setting that make accurate learning difficult. Environmental change and uncertainty may make it difficult for managers to accurately interpret their past performance outcomes and to predict the effects of environmental changes on an organization. (Levitt and March, 1988; March and Olsen, 1976). For example, persistence with a previously successful strategy can yield poor performance outcomes when there are major changes in an organization's environment. Similarly, changing strategies can yield poor performance outcomes if the environmental changes to which an organization is reacting are short-lived or misinterpreted. In addition, managers have a limited capacity to process information (Kiesler and Sproull, 1982; March and Simon, 1958) and they operate in organizational contexts that are often characterized by organizational and psychological pressures to persist with prior strategies (Milliken and Lant, 1991). For example, managers who are the architects of past strategies may be reluctant to acknowledge the validity of information that signals the failure of their strategies (Kiesler and Sproull, 1982). They may also tend to be systematically biased in how they attribute causes of an organization's performance outcomes. The tendency to attribute failures to external and temporary phenomena (Ford, 1985; Ford and Baucus, 1987) may short-circuit organizational learning and, thereby, lead to a high likelihood of persistence even in the face of evidence that a strategy has not yielded good performance outcomes in the past. The cumulative effect of these various persistence forces is to make convergence extremely likely and strategic reorientation extremely unlikely.

The application of a learning perspective to an examination of patterns of strategic persistence and change recognizes that managers act on interpretations of their experience and that these interpretations are likely to be systematically influenced by pressures inside an organization towards persistence with past strategies. However, certain organizational and environmental factors may enhance an organization's capacity for learning, and thus, counteract these persistence forces. For example, the characteristics of a top management team are likely to influence both managerial interpretations and the likelihood of strategic change. Nystrom and Starbuck (1984) argue that turnover of top-level managers facilitates the unlearning of old routines, thereby increasing the probability of strategic change. Empirical evidence suggests that top management change may be associated with an increased probability of strategic reorientation (Virany,

Tushman, and Romanelli, 1992). In addition, there is evidence that the heterogeneity of the top management team is associated with higher levels of strategic change (Bantel and Jackson, 1989; Wiersema and Bantel, 1992); Milliken and Lant (1991) have suggested that more heterogeneous teams are less vulnerable to psychological pressures to persist with past strategies. Further, the context within which managers learn may affect the likelihood of strategic change by influencing what and how they learn and the interpretations they make. An organization's context may also influence the relative importance of other variables, such as past performance, on managers' decisions to persist or change.

RESEARCH MODEL

Figure 1 summarizes the model we will test in this study. We will begin by discussing our expectations regarding overall rates of reorientation and convergence, and how these are affected by the environmental context. We will then examine how past performance, characteristics of a top management team, and managerial interpretations of their environmental context and their past performance outcomes affect the relative frequency of reorientation. Finally, we will complete our discussion of the model by exploring the effects of past performance on managerial interpretations and top management team characteristics.

We begin with the premise that, in general, organizations are more likely to converge than reorient. This prediction is based on the argument that organizations experience strong persistence forces, arising from structural inertia (Hannan and Freeman, 1984; Tushman and Romanelli, 1985), expectations of external constituencies (Hannan and Freeman, 1984; DiMaggio and Powell, 1983), inertia of strategic commitment and power distributions (Pettigrew, 1987; Pfeffer, 1981; Staw, 1981), and various psychological forces that influence managerial interpretations (Milliken and Lant, 1991).

Hypothesis 1: Organizations are more likely to converge or persist with their strategic direction than to undergo strategic reorientations.

The effect of environmental context on rates of reorientation

Many theorists argue that organizations survive by 'fitting' their strategies and structures to the nature of the industry context they face (Burns and Stalker, 1961; Lawrence and Lorsch, 1969; Porter, 1981; Terreberry, 1968). Thus, one would expect that the likelihood of strategic reorientation to vary across industry contexts, with such change being more common in turbulent environments than in stable ones. Further, an organizational learning perspective would suggest that the application of organizational routines (March, 1981) in a rapidly changing and uncertain environment can produce experiences that are not easy to explain within the current interpretive scheme of the organization (Lant and Mezias, 1992). Thus, a historically turbulent environment is likely to mitigate the strength of internal persistence forces by providing managers with many equivocal experiences and opportunities for learning about the role of the environmental context in determining organizational outcomes (Levitt and March, 1988; Milliken and Lant, 1991). Managers whose past experience has been in an environment with constant change are more likely to expect change, to remain vigilant for changes, and to devote resources to environmental scanning; consequently, they might be less likely to underestimate the significance of environmental changes. While we expect that there will be substantial individual firm variation within industry contexts, and that reorientation will be more infrequent than convergence in general, we expect that, on average, rates of reorientation will be higher in turbulent industries than in stable industries.

Hypothesis 2: Organizations in volatile or turbulent environments are more likely to exhibit strategic reorientation than organizations in stable environments.

The managerial learning process and the likelihood of reorientation

This section develops hypotheses about how past performance, top management team characteristics, and managerial interpretations of their environment and their past performance out-

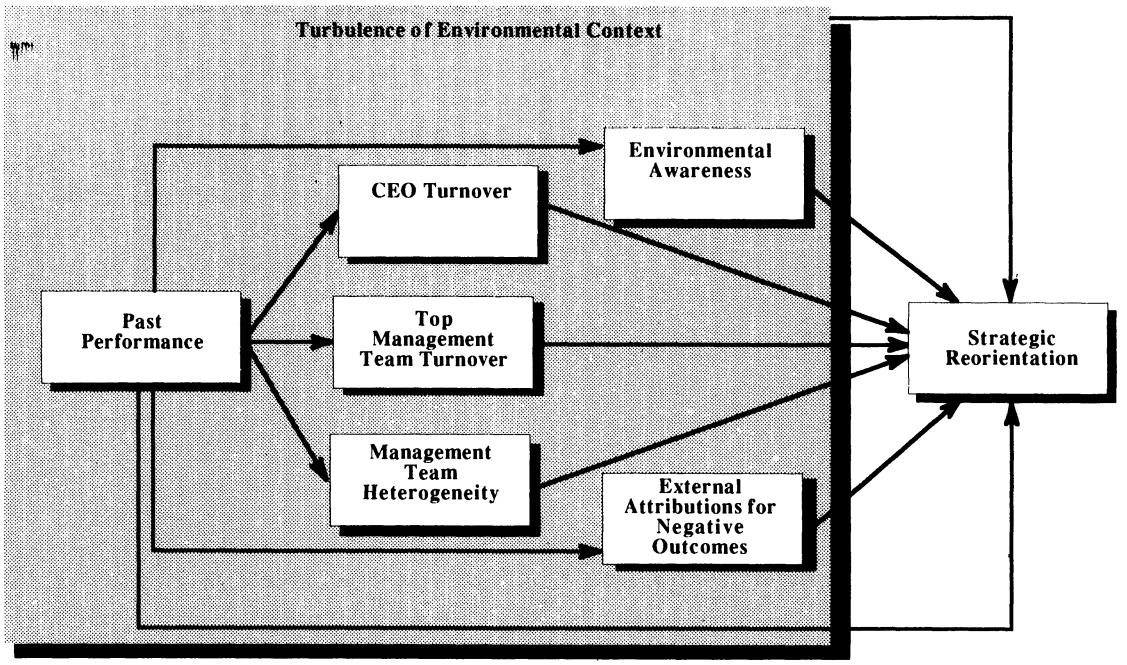

Figure 1. A managerial learning model of strategic reorientation

comes affect the relative frequency of reorientation.

The role of an organization's past performance outcomes

Past performance is a major explanatory variable in most models of organization learning (Cyert and March, 1963; Lant and Mezias, 1992; Levinthal and March, 1981). An organization's past performance provides feedback about the relative effectiveness of an organization's chosen strategy. The discrepancy between performance and goals is a crucial part of a manager's experience because it provides a signal that is used to guide future behavior (Lant, 1992). Tushman and Romanelli (1985) argue that a sustained period of poor performance is one of the most potent forces counteracting the strong persistence pressures organizations face. Poor performance calls into question the effectiveness of an organization's prior strategy and interpretive scheme (Greenwood and Hinings, 1988), particularly among external constituents such as an organization's shareholders or creditors. To the extent that managers are learning from their experience, failure should increase the likelihood of changes in strategic direction. In addition, external constituents can be expected to pressure an organization to change following periods of poor performance. Thus, organizations that have performed poorly are more likely to reorient than organizations that have experienced success with their prior strategy (Fombrun and Ginsberg, 1990; Ginsberg, 1988). Although it is difficult to determine exactly how organizations and their constituencies set target levels of performance, it seems reasonable to assume that organizations and constituencies are likely to compare an individual organization's performance to the average performance in that organization's industry (Levinthal and March, 1981).

> *Hypothesis 3: An organization's past performance relative to the industry average will be inversely related to the likelihood of strategic reorientation.*

However, because of the inherent difficult in learning accurately and because of the persistence forces that act on organizations, we expect even poor performers to be more likely to persist than to change strategic direction. Thus, while poorly performing companies will be more likely to

reorient than successful ones, we expect that the frequency of reorientations even among poor performers will be lower than the frequency of persistence.

The role of managerial interpretations

A key factor in organizational learning is managerial interpretations of cause and effect relationships. Interpretive models of strategic decision making (Bateman and Zeithaml, 1989; Daft and Weick, 1984; Dutton and Duncan, 1987; Thomas and McDaniel, 1990) emphasize the idea that managers are information processors who must not only interpret information about an organization's environment but who must also interpret information about an organization's past performance outcomes and their likely causes. We hypothesize that these interpretations influence the likelihood of strategic reorientation.

Interpretations of the environment. Tushman and Romanelli (1985: 178) suggest that a major force for organizational change occurs when 'major changes in competitive, technological, social and legal conditions of the environment ... render a prior strategic orientation, regardless of its success, no longer effective.' However, in order for such organization–environment incongruencies to create the needed momentum for change, managers must be paying sufficient attention to their environment to recognize such changes. When managers fail to notice important environmental changes, they are unlikely to make needed adjustments to an organization's strategy or structure (Meyer, 1982; Pfeffer and Salancik, 1978; Terreberry, 1968). Thus, the more managers are aware of changes in their environmental context, the more likely they are to make strategic reorientations.

> *Hypothesis 4: The more aware managers are of environmental changes, the greater the likelihood of strategic reorientation.*

In addition, we expect that within the subset of poorly performing organizations, those whose managers are aware of environmental changes will be more likely to reorient than those whose managers appear to lack such an awareness.

Attributions for poor performance. Researchers have also suggested that the nature of the attributions managers make for their recent performance history may be an important determinant of their strategic decisions (Ford and Baucus, 1987; Milliken and Lant, 1991). Managerial attributions are important in a learning framework because they identify managers' causal thinking about the determinants of an organization's performance outcomes. Prior research suggests that managers' attributions for the organization's previous performance may be biased, such that poor performance outcomes are attributed to external events and good performance outcomes are attributed to the organization's strategy (Clapham and Schwenk, 1991; Salancik and Meindl, 1984; Staw, McKechnie, and Puffer, 1983).[1] We predict that firms that exhibit attribution biases will be less likely to change strategies. In particular, we hypothesize that managers who make external attributions for poor performance outcomes will be less likely to decide to change strategies. We believe this is the case because making external attributions for failure short-circuits the process of learning from experience; it prevents managers from learning about the impact of their behavior on organizational outcomes. If managers perceived that their actions led to poor organizational performance, they would learn to change these actions. However, if they attribute poor performance to factors beyond their control, this important lesson may be preempted.

> *Hypothesis 5: The more managers make external attributions for poor performance outcomes, the lower the likelihood of strategic reorientation.*

[1] Evidence of such biases from public documents such as annual reports introduces the possibility that such statements reflect managers' attempts to manage external impressions and appear in control of the firm, rather than their true beliefs about the causes of their performance. To the extent that managers' attributions in publicly available documents reflect their true beliefs, we would expect that the greater the attributional bias, the lower the likelihood of reorientation. If the attributional statements made in such documents are largely attempts at impression management, then we would expect a positive association between attributional bias and strategic reorientation by the logic that the more serious a performance downturn is perceived to be, the more managers may feel a need to both manage impressions and to change strategies. We concur with Clapham and Schwenk (1991) that attributional statements in public documents reflect managers' causal beliefs.

In addition, we expect that within a subset of poorly performing organizations, those whose managers make external attributions for poor performance outcomes will be less likely to reorient, despite their poor performance, than those whose managers do not exhibit this external attribution bias.

The role of top management team characteristics

Top management team heterogeneity. Several researchers (e.g., Hambrick and Mason, 1984; Tushman and Romanelli, 1985) have argued that the composition of a top management team will affect the strategy formulation process. Specifically, the diversity of backgrounds and ages represented on a top management team have been hypothesized to affect the likelihood of innovation and the likelihood of strategic change (Bantel and Jackson, 1989; Katz, 1982; Tushman and Romanelli, 1985; Wagner, Pfeffer, and O'Reilly, 1984; Wiersema and Bantel, 1992). The heterogeneity of a top management team is likely to influence strategy formulation through its effect on the diversity of perspectives brought to bear on strategic questions. Such a diversity of perspectives can create disagreements and equivocal experiences that result in more extensive discussion of strategic options, more learning opportunities, and thereby, reduce the likelihood of a groupthink-type phenomenon occurring (Janis, 1982). The more diverse the perspectives that are surfaced, the greater the possibility that managers will consider strategic reorientation as an option. Further, functional diversity is likely to be inversely related to the amount of support that exists for the *status quo*.

Hypothesis 6: The greater the heterogeneity of a top management team with respect to functional backgrounds, the higher the likelihood of strategic reorientation.

CEO and top management team turnover. Although heterogeneity in the top management team may mitigate persistence pressures, a management team that has shared similar experiences still may be subject to biases in their interpretations which result in strategic persistence. Experimental evidence suggests that groups as well as individuals are subject to various decision making biases (Argote, Seabright, and Dyer, 1986; Bateman and Zeithaml, 1989). Actual turnover in the membership of the top management team, therefore, may be necessary for reorientation to occur (Virany *et al.*, 1992).

Nystrom and Starbuck (1984) suggest that top management team turnover is one of the most effective ways of breaking down an organization's natural inclination to persist with prior strategies. Introducing a new top management team, they argue, enables poorly performing organizations to engage in the 'unlearning' processes that are necessary for strategic reorientations to occur. One reason why top management team change may be such an important factor in mitigating organizational persistence forces is that the newly appointed managers were not the architects of the prior strategy and so they have a lower level of psychological investment in the strategy (Milliken and Lant, 1991). Tenured managers of unsuccessful organizations, in contrast, may have more resistance to change because the experience of poor performance outcomes may trigger psychological persistence forces such as making external attributions for poor performance outcomes, escalation of commitment, and threat-rigidity responses (e.g., Staw, 1981; Staw, Sandelands, and Dutton, 1981).

Hypothesis 7: CEO and top management turnover will be associated with an increased likelihood of strategic reorientation.

The effects of past performance on top management team characteristics and managerial interpretations

In this section, we will explore the potential effects of past performance on top management characteristics and managerial interpretations. While theories of trial-and-error learning predict that poor performance feedback will be associated with a high likelihood of change, we predict that the effects of performance feedback may be considerably more complex. We predict that performance feedback will also indirectly influence the probability of strategic change through its effects on factors such as top management team characteristics and managerial interpretations. Hypotheses 8 through 12 make specific predic-

tions about the possible effects of past performance on top management team characteristics and managerial interpretations.

CEO and top management team turnover. One reason why poorly performing companies may be more likely to reorient than successful ones is that poor performance is likely to be associated with a greater probability of CEO and top management team turnover (Allen, Panian, and Lotz, 1979; Brown, 1982; Osborn, Jauch, Martin, and Glueck, 1981), both of which tend to mitigate persistence forces and increase the likelihood of reorientation.

Hypothesis 8: Past performance will be inversely associated with CEO turnover; high past performance will decrease the likelihood of CEO turnover, and low past performance will increase the likelihood of CEO turnover.

Hypothesis 9: Past performance will be inversely associated with top management team turnover; high past performance will decrease the likelihood of top management team turnover, and low past performance will increase the likelihood of top management team turnover.

Top management team heterogeneity. Poor performance may not only cause change in the individuals on the top management team; it may also affect the mix of skills and experience on the team. Poor performance may lead the CEO and the other top managers to believe that the organization lacks certain types of skills and experience on the top management team. Thus, they may act to put individuals on the team who increase the heterogeneity of the team.

Hypothesis 10: Past performance will be inversely associated with top management heterogeneity; high past performance will be associated with low levels of top management team heterogeneity, and low past performance will be associated with high levels of top management team heterogeneity.

Thus far, we have predicted that poor performance, CEO and top management turnover, and heterogeneity will increase the likelihood of reorientation and that poor performance will increase CEO and top management turnover and heterogeneity. It follows that the effects of poor performance on top management turnover and top management heterogeneity will subsequently increase the likelihood of change. However, past performance might also have an indirect effect on the likelihood of reorientation through its effects on managerial interpretations. As suggested by Hypotheses 11 and 12, the effect of performance on managerial interpretations will subsequently decrease the likelihood of reorientation.

Environmental awareness. An organization's recent performance history is likely to affect the level of awareness managers have about an organization's environmental context. In particular, poor performance is likely to reduce the resources available for environmental scanning. Further, a recent period of poor performance may preoccupy managers and cause them to redirect cognitive energy that might otherwise by devoted toward environmental scanning towards solving the immediate performance crisis (Bourgeois, 1985). On the other hand, high levels of past performance will provide the resources that are necessary for environmental scanning and analysis. Thus, we predict that past performance will be positively related to managers' level of awareness of their environmental context; higher levels of past performance increase environmental awareness, while lower levels of past performance decrease environmental awareness.

Hypothesis 11: Past performance will be positively associated with managers' environmental awareness.

Attribution bias. Substantial research has demonstrated that individuals in general (Fiske and Taylor, 1984), and managers specifically (Bettman and Weitz, 1983; Staw, *et al.*, 1983), tend to make internal attributions for positive outcomes and external attributions for negative outcomes. Research also suggests that external attributions are common after periods of poor performance (Salancik and Meindl, 1984; Staw, *et al.*, 1983). The desire to avoid dissonance (Festinger, 1957) may cause managers to seek excuses or external explanations for their

failures, particularly when they are responsible for the strategies that are associated with failure. Thus, we expect that the motivation to make external attributions for negative outcomes will increase when the overall performance outcomes of an organization are poor.

Hypothesis 12: Past performance will be inversely associated with the likelihood that managers will make external attributions for any negative performance outcomes an organization has experienced; low past performance will increase the likelihood that managers will make external attributions for negative performance outcomes, and high past performance will decrease the likelihood that managers will make external attributions for negative performance outcomes.

Thus, the effects of past performance on environmental awareness and external attributions will work against the direct effect of past performance on the likelihood of reorientation. While trial-and-error learning predicts that poor performance will increase the likelihood of change, the effects of poor performance on managerial interpretations may generate actions that inhibit change.

THE EMPIRICAL STUDY

Sample

We chose to study firms from two industries that differed significantly in their degree of turbulence in order to investigate possible differences in the process of strategic reorientation across different contexts. The furniture industry represents a stable environment and computer software represents a turbulent environment. The difference in the degree of turbulence was verified using the coefficient of variation on sales (Tosi, Aldag, and Storey, 1973). Firms were chosen based on their SIC code classification; this classification was verified by both the COMPUSTAT Industrial Data Base and Securities and Exchange Commission records. All firms in the sample are publicly held. Firms with fewer than 2 years of past performance data were excluded from the sample. This selection process yielded 40 furniture companies and 63 computer software companies. A sample of 40 computer software firms was randomly chosen from the 63.[2]

Data sources

Performance data were gathered from the COMPUSTAT Industrial Data Base. Interpretation variables, CEO and top management team variables, and the measure of reorientation were obtained through content analysis of 10K and annual reports.[3] All content coding was conducted by two coders in order to check for reliability. Intercoder reliability before discussion was 88 percent, on average; prior work using content analysis to study organizational strategy suggests that this is an acceptable level of intercoder reliability (Jauch, Osborn, and Glueck, 1980; Miller and Friesen, 1984). Any points of disagreement were discussed until the coders reached agreement.

Operational definitions

The major dependent variable in this study is strategic reorientation. Tushman and Romanelli (1985) define reorientation as change in four critical organizational dimensions: business strategy, organizational structure, power distribution, and control systems. Operationally, Virany *et al.* (1992) define reorientation as change in at least three of these dimensions: fewer than three changes is considered evidence of convergence. We define strategic reorientation somewhat differently. First, since we are interested specifically in *strategic* reorientations, we define strategic reorientation as a change in business strategy coupled with change in other key organizational dimensions. Thus, a change in business strategy is a necessary but not sufficient condition for strategic reorientation. Second, because we believe that the number of changes chosen to distinguish between convergence and reorientation is somewhat arbitrary, for most of the research propositions we use a measure of reorientation that reflects a count of the number

[2] The use of equal sized samples reduces the possible effects of heteroscedasticity when conducting tests for structural differences between samples (Johnston, 1984).

[3] CEO and top management team variables that were missing from the 10K reports were obtained either from direct contact with a company spokesperson or from the Dun and Bradstreet Reference Book of Corporate Managements.

of organizational dimensions that changed in the same time period that strategy changed.

We looked for change over a 2-year time period, from 1984 to 1986. Variables were coded in both time periods; a change was coded if the variable in 1986 had changed from 1984. The choice of a window of time within which to look for evidence of strategic reorientation is, admittedly, somewhat arbitrary. We chose a relatively short time period in order to reflect the expectations of punctuated equilibrium theorists about the longitudinal pattern of these changes. These theorists argue that the organizational dimensions composing reorientation change simultaneously; thus, reorientations occur in relatively short time periods (Tushman and Romanelli, 1985).

10K reports provided information about the types of domain navigation strategies (Bourgeois, 1980) each firm used to compete in their chosen product/market domain, such as low price, high quality, service, delivery time, etc. In a pretest of our content coding procedures, we determined that there were 13 identifiable strategies that the companies in our samples used to compete in their industries.[4] We coded all the strategies a company mentioned as a means of competing. A company was coded as having changed strategies when they either did not mention a strategy they had indicated in 1984, or when they mentioned a new strategy that had not been indicated in 1984. Although the addition or deletion of a mention of one method of competition from a 10K may not seem significant, the routinized nature of 10K report writing suggests that even a single change in strategy is likely to be significant. In comparing a company's 10K reports from year to year, there is a large amount of overlap in the content and language of the 10K. It appears that the content of the 10K changes only when the information that was provided in previous 10Ks would no longer be accurate.

Although there are limitations in a content analysis approach to measuring organizational strategies (Jauch *et al.*, 1980; Miller and Friesen, 1984), such as the lack of consistent availability of information that reflects the constructs of interest and a lack of internal consistency across coders, we believe that these factors are not major limitations in the current study. First, because the filing of 10K reports is regulated by the Securities and Exchange Commission, requirements regarding the information that must be contained in the 10K report are specific. Firms are required to list the characteristics of their business strategy: 'The principal methods of competition (e.g., price, service, warranty or product performance) shall be identified ...' (U.S. Securities and Exchange Commission: 7). Thus, the type of information provided is consistent across firms. Second, given that this information is required by law, and is monitored by the Securities and Exchange Commission, we expect that the information regarding competitive strategies is valid as well as reliable. Finally, our level of intercoder reliability (88%) provides evidence of consistency in coding.

Change in organizational structure was coded when there was evidence of a major change in structure, such as a change from a functional to a divisional organization, between the 1984 and 1986 10K reports. The Securities and Exchange Commission also requires that firms describe their 'form of organization' (U.S. Securities and Exchange Commission: 5) in the 10K report. Change in control systems was coded when there was evidence of new control systems being put into place or of old systems being changed. Examples of control systems include inventory control and management information systems. Change in power distribution was measured as the proportion of change in functional backgrounds, such as finance, marketing, manufacturing, or research and development, represented on the top management team. The distribution of functional backgrounds was conceptualized as reflecting the distribution of power on the top management team; this is based on the assumption that individuals are members of different coalitions depending on their functional background and, thus, the organizational departments that they represent (Cyert and March, 1963). In order to be a component of the reorientation variable, change in power distribution must be recoded to a dummy variable. The choice of a cutoff percentage that qualifies as enough change

[4] We determined that the comprehensive set of strategies mentioned by firms in our sample were: low price, product quality, quality of customer service, delivery time, responsiveness to unique customer needs (e.g., willingness to customize products), innovation, unique product characteristics, growth, sales volume, market share, advertising, distribution, and breadth of product range.

to matter is somewhat arbitrary. We chose the cutoff of 25 percent or more change in the representation of functional backgrounds on the top management team; we thought that this level of change was sufficient to make a significant difference in the coalitions that were represented on the top management team.[5]

This study includes three categories of independent variables: past performance, managerial interpretations, and top management team characteristics. The specific performance measure used in the analysis was return on assets. While there may be problems with using return on investment measures to set future objectives for the organization, it 'is a valid technique for measuring past profitability' (Dearden, 1987: 84). Further, since we are concerned with managers' interpretations of their performance relative to competitors, we need to use a measure of past performance that managers actually pay attention to in assessing how well they have performed; there is self-report evidence that return on assets is used in this way (Edwards, 1986). Also, as noted by Dearden (1987), a return on investment measure does allow a company to 'compare profitability among organizations' (Dearden, 1987: 85).[6] Finally, Wiersema and Bantel (1992), in a study that examined the relationship between past performance and strategic change, also used return on assets as an independent variable.

Return on assets data were collected for the 5-year period from 1980 through 1984. Consistent with a learning perspective, we assumed that managers would compare their performance to a relevant reference point or target level of performance (Levinthal and March, 1981; March, 1988). We used the median return on assets in the industry as the relevant reference point. Thus, we assessed each firm's deviation from the industry median in each of the five years. We then took a weighted average of these deviations over time. Our basis for using a weighted average of performance also derives from the literature on organizational learning, which suggests that aspirations are updated over time as an exponentially weighted average of past performance (Levinthal and March, 1981). Thus, recent periods are weighted more heavily.

Managerial interpretations of the environment were coded from the 1986 10K and annual reports. The specific variable created was an indication of whether or not a firm mentioned changes or their expectations of changes in environmental contingencies. A firm's managers were coded as being aware of environmental contingencies if they indicated explicitly that they had observed or were predicting a specific change in their organization's environment. For example, the following statement from one of the firms in our sample was coded as indicating an awareness of environmental contingencies: 'As a result of these competitive pressures and technological changes, data processing has become increasingly important to financial institutions who must offer new services and increase the efficiency and profitability of their existing products and services.'

Attributions for past performance were obtained from content analysis of the management discussion in the 10K reports and the president's letter in the annual reports in 1986. We coded each mention of a performance outcome as being positive or negative. We then coded the reason given for that outcome as being internal or external. The external attribution bias was coded as present when a company made external attributions rather than internal attributions for poor performance outcomes. For instance, the following statement was coded as an external attribution for a poor performance outcome: 'The deteriorating margins resulted, in part, from pricing pressures caused by the economic recession.' Our measure is similar to the one used by Clapham and Schwenk (1991).

CEO and top management team turnover were measured in the period 1982–84. A change in the CEO was coded when the CEO or President changed within the given time period. Individuals were considered members of the top management team when they were listed as an executive officer. Change in the top management team was measured as a percentage variable. The

[5] While Virany *et al.* (1992) follow Tushman and Romanelli (1985) conceptually in terms of their definition of reorientation, empirically, they do not include a measure of power distribution in their operationalization of reorientation. Thus, there is no empirical precedent for choosing a cutoff level of change.

[6] We also examined the performance measures of operating margin and earnings per share. Results using operating margin are similar to those using return on assets; results using earnings per share frequently differ. This is not surprising since both return on assets and operating margin are measures used internally by managers, while earnings per share is a measure monitored by external constituents (Edwards, 1986).

heterogeneity of the top management team across functional areas was measured using Blau's (1977) measure of heterogeneity. Both Bantel and Jackson (1989) and Murray (1989) have used this formula to measure top management heterogeneity.[7]

The rationale for our choice of years in which to measure past performance, managerial interpretations, and top management team characteristics can be seen by referring to Figure 1. We expect that past performance will affect managerial interpretations, top management team characteristics, and strategic reorientations; thus performance is measured prior to these variables. We further expect that top management characteristics might affect managerial interpretations. Thus, we measure CEO turnover, top management team turnover, and top management team heterogeneity in 1984, and the managerial interpretation variables in 1986.

RESULTS

Table 1 presents descriptive statistics for both industries. Tables 2a and 2b present Spearman correlation coefficients for the variables examined in the hypotheses. Hypothesis 1 predicts that, in general, organizations will be more likely to persist with past strategies than to reorient.[8] Table 3a shows the relative frequencies of strategic reorientation and convergence for the entire sample. Seventy-one percent of the firms were classified as converging, while only 29 percent were classified as reorienting. Hypothesis 2 predicts that organizations in turbulent environments are more likely to reorient than organizations in stable environments. This pattern can be seen in the contingency table in Table 3b, which compares the relative rates of strategic reorientation in the furniture and software industries. Approximately 85 percent of the furniture firms were classified as converging, vs. 15 percent that were classified as reorienting. In the software industry, 58 percent of the firms converged, vs. 42 percent that reoriented. The Chi-square test indicates that software firms were significantly more likely to reorient than furniture firms.

Hypotheses 3–7 explore the impact of past performance, managerial interpretations, and top management team characteristics on the likelihood of reorientation. Strategic reorientation is a count variable of the number of organizational dimensions that have changed. For this type of dependent variable, Maddala (1983) recommends a Poisson regression model. In addition, tests for structural differences in the constants and slope coefficients across the two industries are conducted using the dummy variable technique suggested by Johnston (1984). This procedure is similar to testing for interaction effects between the industry and each of the independent variables.[9] The difference is that these tests not only determine if the effect of an independent variable is different across the two industries, but also provide separate coefficient estimates for each industry. Table 4 presents the separate sets of coefficients for each industry and a test for significant differences across the two industries. Table 5 presents the coefficients based on combined samples for variables that did not have significantly different effects on reorientation across the two industries.

Hypothesis 3 predicts that organizations with performance below the industry average will be more likely to reorient than those that have above average performance. This hypothesis is supported in both industries. Table 4 shows that the coefficient on past performance is negative and highly significant in the furniture industry, and negative and somewhat smaller in the software industry. The coefficients are significantly different across the two industries. In the pooled anlaysis shown in Table 5, the standardized coefficient of past performance in the furniture industry is approximately twice as large as the coefficient in the software industry. Although

[7] The precise calculation is $1 - \Sigma p_i^2$, where p_i is the proportion of the top management team in each functional area.

[8] For Hypotheses 1 and 2, a company was coded as having reoriented if there was a change in strategy that was accompanied by changes in at least two out of three supporting organizational dimensions: structure, power systems, or control systems.

[9] The model that we have built is suggestive of a causal model with direct and indirect effects of performance. However, the categorical and dichotomous nature of many of our variables precludes an application of path analysis. Further, there are trade-offs between path analysis and structural change analysis. The structural change analyses we have conducted allows us to assess the interaction of industry context with the independent variables in the model; path analysis cannot accommodate these interaction effects (Pedhazur, 1982).

Table 1. Descriptive statistics

Variable	Mean furniture	Standard deviation furniture	Mean software	Standard deviation software
Strategic reorientation	1.00	1.39	1.94	1.37
Past performance	0.000	0.02	−0.05	0.24
CEO turnover	0.32	0.47	0.18	0.39
Top management turnover	0.36	0.29	0.35	0.25
Heterogeneity	0.61	0.25	0.62	0.23
Environmental awareness	0.67	0.48	0.75	0.44
External attributions	0.46	0.51	0.31	0.47

poor performers are more likely to reorient than good performers, we also predicted that the rate of reorientation among poor performers would be less than their rate of convergence. We find support for this prediction. In the furniture industry, 23 percent of poor performers were classified as reorienting vs. 77 percent that were classified as converging. In the software industry, 42 percent of poor performers were classified as reorienting vs. 58 percent that were classified as converging.

Hypothesis 4 predicts that those firms whose managers indicate an awareness of environmental changes will be more likely to exhibit reorientation. This prediction is supported in both industries. The coefficients are not significantly different between the two industries, and thus a coefficient based on the pooled sample is given in Table 5. This coefficient is positive and highly significant. We also expected that poorly performing companies whose managers indicated an awareness of environmental changes would be more likely to reorient than poorly performing companies whose managers do not indicate this awareness. We find support for this prediction within the subsample of poorly performing firms. The number of reorienters among failing firms that indicated an awareness of potentially important environmental changes (40%) was significantly greater than the number of reorienters among failing firms that did not indicate environmental awareness (18%), ($z = 1.28$; $p < 0.05$).[10]

Hypothesis 5 predicts that organizations whose managers tend to make external attributions for negative outcomes will be less likely to reorient.[11] In the furniture industry, the coefficient is positive but not significant. The effect in the software industry is significant and negative as predicted. The coefficients are significantly different across the two industries. Table 5 indicates the separate coefficients for this variable in the pooled analysis; the direction and significance of the coefficients in each industry are the same as in Table 4. We also predicted that Hypothesis 5 would hold true for the subsample of failing firms. We do not find this to be the case. In the furniture industry, failing firms that made external attributions for poor performance outcomes were, in fact, more likely to reorient than failing firms that did not make external attributions ($z = 1.28$, $p < 0.05$). This result is consistent with an impression management argument. There is no significant difference in the rate of reorientation between failing software firms that either made external

[10] This test compares proportions in two populations when the data scale is nominal.

[11] The pattern of attributions among the firms in our sample is consistent with the results of other studies of attribution bias in organizational settings (e.g. Staw, *et al.*, 1983); managers tend to make internal attributions for positive performance outcomes and external attributions for negative performance outcomes. There does not appear to be a significant difference in the pattern between firms that were classified as successful firms and those that were classified as failing firms. Rather, the pattern appears to depend on the nature of the specific performance outcome being explained. In the furniture industry, 63 percent of the successful firms and 75 percent of the failing firms made internal attributions for positive outcomes; 53 percent of the successful firms and 70 percent of the failing firms made external attributions for negative outcomes. In the software industry, 71 percent of the successful firms and 67 percent of the failing firms made internal attributions for positive outcomes; 53 percent of the successful firms and 50 percent of the failing firms made external attributions for negative outcomes.

Table 2a. Furniture industry: Spearman correlation coefficients

	Reorientation	CEO turnover	External attributions	Environmental awareness	Top management turnover	Heterogeneity
CEO turnover	0.324 (0.038)					
External attributions	0.297 (0.046)	0.250 (0.068)				
Environmental awareness	0.229 (0.100)	−0.216 (0.100)	0.240 (0.074)			
Top management turnover	0.008 (0.483)	0.286 (0.045)	−0.086 (0.313)	−0.062 (0.362)		
Heterogeneity	0.184 (0.152)	−0.161 (0.167)	−0.193 (0.120)	−0.119 (0.235)	0.089 (0.303)	
Past performance	−0.603 (0.000)	−0.364 (0.012)	−0.183 (0.133)	0.145 (0.180)	−0.102 (0.277)	0.192 (0.118)

NOTE: Significance levels in parentheses.

Table 2b. Software industry: Spearman correlation coefficients

	Reorientation	CEO turnover	External attributions	Environmental awareness	Top management turnover	Heterogeneity
CEO turnover	0.062 (0.362)					
External attributions	−0.373 (0.015)	0.209 (0.110)				
Environmental awareness	0.380 (0.011)	−0.061 (0.356)	−0.182 (0.148)			
Top management turnover	0.249 (0.082)	0.211 (0.105)	0.183 (0.158)	0.068 (0.344)		
Heterogeneity	0.311 (0.037)	−0.085 (0.312)	−0.247 (0.083)	0.163 (0.168)	0.299 (0.040)	
Past performance	−0.139 (0.209)	0.356 (0.013)	0.061 (0.364)	0.325 (0.020)	−0.068 (0.344)	0.225 (0.091)

NOTE: Significance levels in parentheses.

attributions or did not. Interestingly, it is successful software firms where external attributions make a difference. Successful software firms that make external attributions for poor performance outcomes are less likely to reorient than successful software firms that do not make external attributions for poor performance.

Hypothesis 6 predicts that firms with more heterogeneous top management teams will be more likely to reorientation. In Table 4, we see that this hypothesis is supported. The coefficients for each industry are not significantly different. Table 5 presents the coefficient on the pooled sample, which is significant in the predicted direction. Hypothesis 7 predicts that organizations with CEO and top management team turnover will have higher rates of reorientation. Table 4 indicates that the coefficient for CEO turnover in the furniture industry is positive but not significant. In the software industry, the coef-

Table 3a. Relative frequency of reorientation

	No reorientation	Reorientation
Number of firms	49	20
Percentage of firms	71%	29%

(based on entire sample)

Table 3b. Relative frequency of reorientation by industry

Count row percent	No reorientation	Reorientation
Furniture	28	5
	84.8%	15.2%
Software	21	15
	58.3%	41.7%

Chi-squared = 5.88; $p = 0.015$

ficient of CEO turnover is positive and significant. There is no significant difference between the coefficients for the two industries. Table 5 presents the coefficient for the pooled sample, which is significant in the predicted direction. The coefficient for top management team turnover is not significant in either industry, or in the pooled analysis in Table 5.

Hypotheses 8–12 explore the impact of past performance on managerial interpretations and top management team characteristics. The results of testing these hypotheses appear in Tables 6 and 7.

Hypotheses 8 and 9 predict that poor performance will be associated with CEO and top management team turnover. Table 6 presents the logistic regression analysis for the CEO turnover dummy variable. Structural change analysis indicated that the coefficients across the two industries were different; thus, two separate coefficients are reported. The results suggest, however, that past performance does not have a significant impact on CEO turnover in either industry. Table 6 also presents the ordinary least squares regression analysis for top management team turnover. The coefficients for the two industries are not significantly different; the coefficient for the pooled industries is marginally significant in the predicted direction.

Hypothesis 10 predicts that poor performance will tend to increase the heterogeneity of the top management team. Table 6 presents the ordinary least squares regression for this hypothesis test. The coefficients for the two industries were not significantly different; the coefficient based on the pooled sample is not significant.

Hypothesis 11 explores the effect of past performance on managers' environmental awareness. The result of this hypothesis test is presented in Table 7. Since environmental awareness is a dummy variable, the hypothesis test is based on a logistic regression. Structural change analysis indicated that the coefficients were not significantly different across the two industries. Thus, this hypothesis test is based on the pooled sample. Hypothesis 11 predicts that good organizational performance will increase managers' environmental awareness. The coefficient of past performance is positive and significant as predicted.

Hypothesis 12 explores the effect of past performance on the tendency to make external attributions for poor performance outcomes. The logistic regression results for the pooled sample are presented in Table 7. We hypothesize that

Table 4. Poisson regression analysis of the determinants of strategic reorientation by industry

	Furniture industry		Software industry		Difference between industries
Independent variable	Standardized coefficient	*T*-ratio	Standardized coefficient	*T*-ratio	*T*-ratio
Constant	−3.969	−2.846**	−2.912	−2.388*	0.571
Past Performance	−0.639	−4.347**	−0.335	−2.293*	3.419**
Environmental awareness	0.576	2.282*	0.603	2.474**	−0.018
External attributions	0.196	1.354	−0.192	−2.213*	−2.336*
Heterogeneity	0.688	1.824*	0.653	1.821*	−0.067
CEO Turnover	0.171	1.157	0.207	2.152*	0.455
Top Management Turnover	−0.165	−0.920	0.099	0.912	1.275

$N = 59$, *p < 0.05, **p < 0.01, Chi-squared = 47.993**

Table 5. Poisson regression analysis of the determinants of strategic reorientation pooled across industries

Independent variable	Standardized coefficient	*T*-ratio
*Constant—furniture	−4.171	−4.285**
*Constant—software	−2.761	−2.979**
*Past performance—furniture	−0.593	−3.708**
*Past performance—software	−0.277	−2.216*
Environmental Awareness	0.550	3.459**
*External attributions—furniture	0.166	1.226
*External attributions—software	−0.175	−2.060*
Heterogeneity	0.312	2.627**
CEO turnover	0.225	2.132*
Top management turnover	0.004	0.042

$N = 59$, Chi-squared = 55.171**, *$p < 0.05$, **$p < 0.01$
(*Separate coefficients are reported for variables with significantly different coefficients as determined in Table 4 @ $p < 0.05$).

poor performance will increase the likelihood that managers will make external attributions for negative outcomes; however, the coefficient of past performance is not significant.

DISCUSSION

In this research, we built and tested a model of the determinants of strategic reorientation that was derived from past research on strategic change (Fombrun and Ginsberg, 1990; Virany *et al.*, 1992) as well as from the literature on organizational learning processes (Argyris and Schon, 1978; Cyert and March, 1963; Lant and Mezias, 1992; March and Olsen, 1976; March and Simon, 1958). The process of strategy formulation, we argued, is fundamentally a process of managerial learning that is affected by an organization's performance history, the nature of an organization's context, and managers' interpretive or sense-making processes. Our findings support prior organizations research, which suggests that organizations are more likely to persist with their past strategic orientations than to reorient, due to structural inertia (Hannan and Freeman, 1984) and other persistence forces (Miller and Friesen, 1980; Milliken and Lant, 1991; Tushman and Romanelli, 1985). Our results also suggest that firms in our sample differed in their likelihood of reorientation as a function of their industry context, past performance, managerial interpretations, and top management team characteristics.

Table 6.

Logistic regression analysis of CEO change

Independent variable	Standardized coefficient	*T*-ratio
Constant	−1.107	−3.653**
Past performance—furniture	−0.014	−0.016
Past performance—software	8.504	1.509

$N = 77$, Chi-squared = 4.224, **$p < 0.01$
(Furniture and software coefficients are significantly different)

OLS regression analysis of TMT turnover pooled across industries

Independent variable	Standardized coefficient	*T*-ratio
Constant	0.345	10.896**
Past performance	−0.155	−1.323+

$N = 73$, $F = 1.749$, +$p < 0.10$, **$p < 0.01$

OLS regression analysis of TMT heterogeneity pooled across industries

Independent variable	Standardized coefficient	*T*-ratio
Constant	0.615	22.454**
Past performance	0.055	0.476

$N = 77$, $F = 0.227$, **$p < 0.01$

Table 7.

Logistic regression analysis of environmental awareness pooled across industries

Independent variable	Standardized coefficient	*T*-ratio
Constant	1.090	4.019**
Past performance	6.004	2.198*

$N = 79$, $^{*}p < 0.05$, $^{**}p < 0.01$, Chi-squared = 9.318**

Logistic regression analysis of attributional bias pooled across industries

Independent variable	Standardized coefficient	*T*-ratio
Constant	−0.457	−1.899^{+}
Past performance	0.304	−0.626

$N = 74$, $^{+}p < 0.10$, Chi-squared = 0.397*

The determinants of strategic reorientation

Industry context

Our results suggest that although the tendency to converge occurred in both stable and volatile industry contexts, it was significantly more pronounced in the stable industry context. This finding is in keeping with the logic of contingency theorists who argue that organizations survive by 'fitting' their strategies and structures to the nature of their environmental context.

Past performance

We also found, as we had hypothesized, that although a history of poor performance increased the likelihood of changes in an organization's strategic orientation, the majority of poorly performing companies in our sample persisted with their past strategic orientations despite negative performance feedback. In addition, past performance had a significantly larger effect on reorientation in the furniture industry than in the software industry. One reason may be that the signalling value of past performance differs across different environmental contexts. In a relatively stable environment, such as the furniture industry, past performance over a 5-year period may be a relatively valid indicator of the effectiveness of a firm's strategic orientation. Therefore, a period of poor performance would be a strong signal of the need to consider reorientation as a means to achieve a performance turnaround. In a turbulent environment, however, past performance may be a less valid indicator of the long-term effectiveness of the current strategic direction. These firms may weigh the validity of the past performance signal against other information, such as environmental forecasts and trends. In addition, the computer software industry was at an early stage in its industry life cycle during the time period in which we collected data. Such a rapidly growing, immature industry may exhibit greater instability in performance outcomes than a mature industry such as the furniture industry, making past performance a relatively unreliable indicator of future success.

The finding that periods of poor performance (even 5 years worth) may not be sufficient to motivate a strategic reorientation is interesting because it suggests that simple trial-and-error learning models, which predict that organizations will persist when successful and change when past strategies yield poor performance outcomes, may be inadequate for predicting an organization's strategic choices. Trial-and-error models may have to be amended to include a consideration of factors, such as the predominance of persistence pressures, that complicate the learning process in organizational settings.

Managerial interpretations

We believe that a key contribution of our model is its recognition of the role of managerial interpretations in predicting the likelihood of strategic reorientation. Our results indicate that managerial interpretations of their environmental context and of their past performance outcomes are important predictors of the likelihood of strategic reorientation.

Managerial awareness of environmental changes was an extremely significant predictor of the likelihood of strategic reorientation in both industry contexts. Further, we found that within the subsample of firms whose performance was below the industry norm, companies whose managers expressed an awareness of changes in their organization's environment were more likely to reorient than companies whose managers did not indicate such an awareness. The coupling of

this result with the finding that poor performers were more likely to persist than to change suggests that awareness of environmental contingencies may be a necessary factor for motivating change in poorly performing organizations. Although these findings are not especially surprising given the obvious need for managers to attend to environmental contingencies, they do suggest that we need to develop our understanding of the factors that influence managerial perceptions, interpretations, and attention allocation with respect to the environmental context.

Our results also suggest that the attributions managers make about the causes of their poor performance outcomes may be an important predictor of the likelihood of strategic reorientation. However, the effect of the external attribution bias we studied appears to vary by industry. In the software industry, managers who made external attributions for negative performance outcomes were less likely to engage in strategic reorientations. The finding of a negative relationship between attributional bias and change, which we had predicted, is consistent with the interpretive view of the role that causal attributions have in influencing the likelihood of reorientation. To the extent that managers see external forces as the cause of their poor performance, they may be less likely to perceive a need to change their strategies, particularly if they view these changes as temporary (Ford, 1985). In the furniture industry, in contrast, the tendency to make external attributions for negative performance outcomes was not significantly associated with the likelihood of strategic reorientations.

Top management team characteristics

In our effort to explore the factors that influence the likelihood of strategic reorientation, we also examined the effects of top management team characteristics on the likelihood of strategic reorientation. We argued, along with Nystrom and Starbuck (1984), that turnover of managers may enable organizations to unlearn patterns of behavior that are no longer functional, and thus, would increase the likelihood of reorientation. Further, we had anticipated that increased levels of heterogeneity on the top management team would further enable organizational learning and subsequent strategic change. We found that although CEO turnover increased the likelihood of reorientation, top management turnover had no significant effect on reorientation. One possible explanation for the latter finding is that top management team turnover is associated with a greater likelihood of strategic reorientation only under certain conditions. For example, top management turnover may enhance the likelihood of reorientations only when it is accompanied by CEO change. Alternatively, it is possible that it is not turnover *per se* that increases the likelihood that an organization will reorient, but rather, it is only when turnover introduces heterogeneity or fresh perspectives into the top management group that the likelihood of reorientation increases. By this logic, it may be important to look at the effects of turnover on top management team heterogeneity. We found, in fact, that companies with more heterogeneous teams were more likely to reorient than companies with less diverse top management groups, a finding that is consistent with the results of other research (Bantel and Jackson, 1989; Wiersema and Bantel, 1992).

Speculating about processes

The effect of past performance on managerial interpretations

If managers' interpretations of their environment and of the causes of their past performance outcomes are important factors in understanding managers' strategic choices, then it becomes important to try to understand the variables that influence these interpretive processes. Our findings suggest that managers of organizations with a history of good performance were more likely to be aware of the organization's environmental context. We explain the positive effect of past performance on environmental awareness with the argument that companies that are performing well are likely to have more resources to devote to environmental scanning and thus, their managers are more likely to be aware of changes in their organization's environmental context. In addition, managers of poorly performing companies may become preoccupied with attempts to improve the efficiency of their organizations, and thus pay less attention to trends in the environment that may signal potential, but not immediate, problems. Thus, while our results suggest that poor performance

has a direct effect of increasing the likelihood of reorientation, the effect of poor performance on environmental awareness may result in a lowered likelihood of reorientation.

Contrary to our expectations, past performance did not have a significant effect on the tendency to make external attributions for poor performance outcomes. There was a general tendency among firms in our sample to attribute specific outcomes to external causes if the outcome was undesirable.

The effect of past performance on top management team characteristics

Prior research has suggested that poor performance often results in turnover of the CEO and top mangement team (Allen, *et al.*, 1979; Brown, 1982; Pfeffer and Davis-Blake, 1986). We had also speculated that past performance might have an impact on the heterogeneity of the top mangement team as well as on the turnover of individuals. In our study the only significant effect of past performance on top management characteristics was the finding that poor performance was associated with higher levels of top management turnover. Performance did not affect CEO turnover or heterogeneity. One possible explanation for this set of relationships may lie in the respective decision making power of the CEO and the top management team. CEOs may replace individuals on their top management team when their organization experiences poor performance; this replacement of individuals may not, however, result in a mix of individuals that brings a larger variety of experience to the team. This result has an interesting implication when coupled with our earlier finding that top management team turnover alone did not increase the rate of reorientation, while increased heterogeneity of the management team did increase the rate of reorientation. If poor performance increases turnover in the top management team, but does not subsequently increase the heterogeneity of the team, then poor performance does not increase the likelihood of reorientation through its effect on top management team characteristics.

SUMMARY

Figure 2 summarizes the results of our study by indicating which relationships in our model were found to be significant, and the direction of these relationships. This research suggests that environmental turbulence, poor performance, CEO turnover, top management team heterogeneity, and managerial awareness of environmental changes are associated with strategic transformation. Managers' explanations of their past performance outcomes also appear to affect the likelihood of reorientation, but the direction of the effect tends to change depending on an organization's environmental context. We also found that poor past performance is associated with a decreased level of environmental awareness and with a greater likelihood of top management team turnover.

CONCLUSIONS AND IMPLICATIONS FOR FUTURE RESEARCH

Our model suggests that organizational learning may be more complex than the trial-and-error process often emphasized in the organizational learning literature (Cyert and March, 1963; Levinthal and March, 1981; March and Olsen, 1976; March and Simon, 1958). Our model considers the role that managers' interpretations of their experience play in influencing a firm's strategic actions in addition to the role played by past performance information. We believe that our finding that managers' level of environmental awareness and attributions for performance outcomes influenced the likelihood of strategic reorientation attests to the importance of developing our understanding of managers' interpretive processes and their antecedents. Further, our model also allows for the recognition that managers may become psychologically invested in the strategies they have designed, creating the tendency to persist with past strategies despite negative performance outcomes. The finding that CEO turnover and top management team heterogeneity increase the likelihood of reorientation suggests that either leadership change or a diversity of perspectives may be necessary to counteract persistence forces. Further, our model suggests that poor performance may have not only a direct effect on the likelihood of strategic reorientation, consistent with the prediction of trial-and-error learning, but also indirect effects that occur through the influence of past performance on manager's interpretations of their

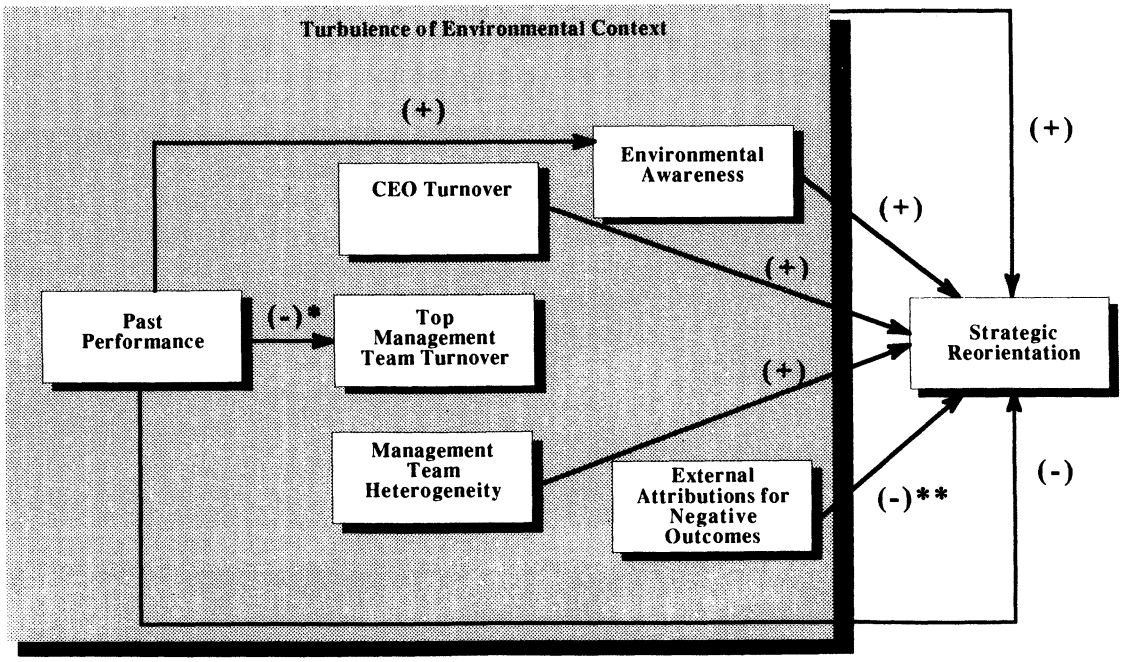

Figure 2. Summary of significant relationships in the model
*Significant at $p < 0.10$; significance level for other relationships is at least $p < 0.05$.
**This relationship is significant in the software industry only.

environment and their past performance results. In particular, our finding that poorly performing firms have lower levels of environmental awareness may be one explanation for the overwhelming persistence of poorly performing firms.

We believe these findings, although preliminary, reinforce the importance of understanding the processes that underlie strategy formulation if we are to understand and predict managers' choices (Bourgeois, 1980; Fredrickson, 1983; Mintzberg, 1978). Specifically, our findings suggest that in order to understand the strategy formulation process, we not only need to have objective information about a firm's performance and environment, but we also need to have data on manager's perceptions and interpretations of this 'objective' information. There is a growing body of work in the strategic mangagement literature that suggests that managers' interpretations matter (Daft and Weick, 1984; Dutton and Duncan, 1987; Ford and Baucus, 1987; Milliken and Lant, 1991). Our findings offer further empirical evidence for this argument. However, our understanding of what factors influence how managers interpret information is limited. For instance, we have only a limited understanding of the factors that influence the degree to which managers perceive contingencies in their environment and interpret these accurately. We also do not fully understand when and why managers will interpret performance information in such a way that they escalate their commitment to prior strategies. Systematic investigation of perception and interpretation can be found in the social and cognitive psychology literatures (e.g., Kahneman, Slovic, and Tversky, 1982; Nisbett and Ross, 1980; Fiske and Taylor, 1984). What is needed is more systematic integration of this empirical research into the strategy literature (e.g., Barnes, 1984; Bateman and Zeithaml, 1989; Dutton, Fahey, and Narayanan, 1983; Schwenk, 1984).

This study has attempted to pursue this integration empirically. Our approach has been to draw extensively from a learning framework, where the effects of history, context, and process are considered key elements in modeling strategic choice. While we include managerial interpre-

tations in our model, this paper does not test an updating process explicitly; such a test would provide more direct evidence of learning. This study allows us to conclude that variables drawn from a learning framework are key to understanding strategic reorientation. We do not know at this point exactly what the pattern of convergence and reorientation will look like over time in response to changes in performance interpretations, and top management characteristics. A longitudinal methodology with repeated measures of all variables would provide a direct test of the updating process. However, given the complexity of measuring constructs such as strategic reorientation and managerial interpretations, obtaining repeated measures of the variables in the model for a large sample of firms would be extremely time-consuming. Other studies that have attempted to measure occurrences of reorientation over time have used only partial indicators of reorientation and have not examined the role that managerial interpretations play in decisions to reorient (e.g., Virany, *et al.*, 1992). We believe that much can be learned from integrating across research studies that ask similar questions with different methodologies. For instance, Garud and Van de Ven (1992), using data from a longitudinal field study of a single organization, have found support for the persistence of action in the face of negative performance feedback and for the importance of such factors as attention and interpretation in mediating the relationship between performance and change. We recommend further integration of studies that examine the role of managerial interpretations with different methodologies.

Another question that is raised by this study is the precise role of environmental context. While we believe we have preliminary evidence that the turbulence of the environment affects the learning process, much more in-depth work is needed that examines which characteristics of environments influence the relative importance of performance feedback, managerial interpretations, and top management team characteristics. It is important for future work to examine other environmental characteristics, such as stage in the industry life cycle, degree of concentration, and level of competition. It is also possible, as is suggested in the institutional literature (DiMaggio and Powell, 1983), that managers' perceptions and interpretations of the actions of competitors and other actors in their institutional environment may affect decisions to strategically reorient as well. Future work could expand on the model we develop by examining managers' perceptions of competitors' actions. The model could be tested in a variety of different industries that differ on the characteristics mentioned above. The model could also be tested using different data sources, such as using interviews or surveys to assess managerial interpretations, instead of secondary sources. A series of studies that tackle these issues would contribute significantly to our understanding of the strategy formulation process. We view this study as a first step in this line of inquiry.

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