

FIRM AND INDUSTRY AS DETERMINANTS OF EXECUTIVE PERCEPTIONS OF THE ENVIRONMENT

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This study examines variation in top executives' environmental perceptions within firms and within industries. More specifically, we investigate how industry and organizational membership affect top executives' perceptions of five environmental attributes. Results indicate that significant homogeneity of perceptions exists within firms and also within industries. Approximately 40 percent of the variance in individual top-level executives' perceptions of aspects of their respective organization's environment is explained by their organizational and industry membership. Implications of the findings for strategic management and organization theory and for future research are presented. © 1998 John Wiley & Sons, Ltd.

Commonality of views about a firm's environment among a firm's top managers is frequently discussed, but there is little empirical evidence to validate the notion. We do not know whether homogeneity of perceptions within top management teams (TMTs) is more imaginable than real—an assumed executive team property corresponding to what 'common sense' says should be the case. Further, if there is within-firm commonality of views concerning the environment, we do not know whether this might not actually be an industry effect. The purpose of the research reported here is to assess the degree of homogeneity in executives' perceptions within firms and within industries and to compare organizational vs. industry membership as explanations of the relative proportion of agreement about organizational environments.

One of the most compelling reasons to examine the homogeneity of top managers' environmental perceptions within firms and within industries

relates to competitive advantage. First, at the firm level, the degree of agreement within a top management team affects the firm's performance through its influence on strategy formulation (Dess, 1987; Hodgkinson and Johnson, 1994; Priem, 1990), in particular because it affects the nature and duration of decision making and decision implementation (Hickson *et al.*, 1989; Lant, Milliken, and Batra, 1992). Disagreement within the TMT concerning the environment can prompt or delay information gathering and scanning processes, increase or decrease information sharing and processing, delay strategic decisions and subsequent actions, and, in these or other ways, can lead to either higher or lower organizational performance (Bourgeois, 1980, 1985; Dess and Keats, 1987; Eisenhardt, 1989; Kotha and Nair, 1995). Given the critical role of top managers as shapers of organizational decisions, actions, and, consequently, performance (Dean and Sharfman, 1996; Hambrick, 1989; Johnson, 1992), investigation of variations in top managers' perceptions of the environment is important for enhancing our understanding of strategic decision processes, firm actions, and organizational outcomes.

Moving to the industry level, if perceptions

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within an industry or subpopulation of organizations inhabiting the same environment are universally shared, no single organization is at an advantage due to its unique understanding of the environment (Barney, 1986). However, if environmental perceptions vary across organizations in an industry, firms that do not share the common perception and therefore undertake 'uncommon' actions either may achieve an advantage over competitors or may perform less well if their actions are incongruent with the environment. Commonality of environmental perceptions within industries may be beneficial if it prompts the coordination of interorganizational behaviors, collective action, and coalition processes (Abrahamson and Fombrun, 1992; Hirsch, 1975) that influence the success and survival of industries and their member firms. Alternatively, homogeneous perceptions may be harmful if they blind an industry to important competitive threats (Halberstam, 1986; Zajac and Bazerman, 1991).

THEORY DEVELOPMENT AND HYPOTHESES

Two opposing theoretical arguments prevail. Some scholars argue that executives in different organizations perceive the same environment differently, due to differences among their organizations' structures and processes (e.g., information systems) (Hodgkinson and Johnson, 1994; Starbuck, 1975; Weick, 1979). In contrast, other scholars argue that a variety of social processes induce common perceptions within and among subpopulations of organizations inhabiting the same environment (Aldrich and Pfeffer, 1976; Boyd, Dess, and Rasheed, 1993; Huff, 1982; Porac, Thomas, and Baden-Fuller, 1989). Few, if any, empirical studies have tested the net effect of the factors included in these contrasting lines of reasoning. Given that organizational actions are based in part on top managers' perceptions of their organization's environment, our ability to analyze, understand, and predict organizational actions and performance may be seriously constrained unless we recognize and account for differences in these perceptions. The major purpose of the study reported here is to shed light on this issue by examining variation in top managers' perceptions of organizational environments, and, in particular, the extent to which these per-

ceptions are explainable by managers' membership in a particular firm's top management team or by participation in a particular industry.

Before developing the arguments associated with our hypotheses, it is important to clarify our use of the term top management team (TMT). Following Bourgeois (1985), Dess (1987), and Fredrickson and Iaquinto (1989), we define the TMT as the chief executive and those managers considered by the chief executive to be members of his or her TMT. As a further clarification, we use the term to mean the CEO, COO, and the upper-level managers representing different functional areas. This management team structure may be representative of the type found, for example, in single-sector firms, autonomous subsidiaries, or autonomous divisions of larger firms. This is in contrast to what Hambrick (1994) argues should more appropriately be called the 'top management group', i.e., the CEO, the COO, and the firm's top managers of its semiautonomous divisions serving different markets or products, as in multidivisional firms. Anticipating subsequent discussion, we note here that our data base is composed of single-sector firms or autonomous business units, and thus it lends itself to the study of TMTs as we use the term.

Commonality of perceptions within organizations and differences of perceptions across organizations

Three theoretical arguments lead to the prediction that top managers within a firm will perceive their firm's environment similarly, and will perceive it differently than will top managers from other organizations. Two arguments relate to organizational uniqueness, one to social information processes.

Organizational uniqueness

Every organization has a unique history. As a result, every organization has had unique learning experiences (Huber, 1991; Sitkin, 1992). Some of its learning becomes embedded in its processes (Nelson and Winter, 1982; Walsh and Ungson, 1991). Because histories and learning vary across organizations, the specific natures of processes, such as selection and socialization, also vary across organizations; every organization is unique in the specifics of the selection and socialization

processes experienced by its TMT members. Since selection and socialization affect top managers' views (Louis, 1980; Starbuck, 1993), and given that the specifics of these processes vary across organizations, it is reasonable to expect similar ways of perceiving (and subsequent similarity of perceptions) among managers within a particular organization. Thus a firm's particular history affects its selection and socialization processes, and these in turn constrain ways of perceiving and ultimately constrain the variety of perceptions held across the members of its TMT (Jablin, 1997).

The unique history of an organization is likely to contribute in another way to the commonality of perceptions within a TMT. Part of a firm's history is composed of events that occurred in its environment, such as the arrival of a new competitor. Some of these events, particularly significant events in the recent past, may have been observed by several of the TMT members and influenced in similar ways these members' perceptions of certain aspects of their organization's environment (e.g., environmental stability or complexity). Thus there are two ways in which each organization's unique history might lead to common views in a TMT: it might influence selection and socialization processes and therefore influence how selected and socialized TMT members perceive, and it might include a set of environmental events that were observed by multiple members of the TMT and perceived similarly.

Social information processing

Of course the events that TMT members observe, or hear about, are not perceived identically. However, another process, social information processing, causes initially differing perceptions to become more homogeneous. The task interdependence of TMT members, their (sometimes) physical proximity, and their (sometimes) social attractiveness, individually and in combination cause TMT members to interact and oftentimes to communicate about their organization's environment.

Social information processing theory (Fulk *et al.*, 1987; Salancik and Pfeffer, 1978) suggests that one's views are not solely a function of what we personally observe or learn, but are also a function of what others cause us to believe. The

views of others are especially likely to be influential in ambiguous settings such as those typically encountered by top managers. Thus, beliefs about the firm's environment may be, in part, consequences of sensemaking discussions concerning past organizational performance (McCabe and Dutton, 1993; Milliken and Lant, 1991) or other organizational issues (e.g., Daft and Weick, 1984; Gioia, 1986; Weick, 1995). Individually and collectively, the above three arguments cause us to hypothesize that:

Hypothesis 1: The perceptions of TMT members concerning their organization's environment are more similar within organizations than across organizations.

It is important to note that empirically testing Hypothesis 1 is not simply an exercise in validating the obvious. Whatever forces there may be for common views to develop within TMTs may not be strong enough to overcome forces for dissensus. One source of dissensus is the requisite functional diversity of TMT members. Diversity of current functional responsibilities would likely lead to different TMT members observing, or receiving information about, different environmental sectors, thus becoming informed about different 'organizational environments' (Starbuck, 1975). A second source of dissensus might be diversity in functional backgrounds. It has long been believed that different functional backgrounds lead to different cognitive biases among managers (e.g., Dearborn and Simon, 1958; Hodgkinson and Johnson, 1994; Walsh, 1988). Aside from these two systematic effects on dissensus, there are undoubtedly many other idiosyncratic factors such as personal demographic differences that lead individual managers to differ in the lenses they use when perceiving their organization's environment (e.g., Bunderson and Sutcliffe, 1995). It may well be that in combination such systemic and idiosyncratic factors would overwhelm the forces leading to Hypothesis 1, and would cause these forces to be neither statistically nor practically significant.

Commonality of perceptions within industries

It seems reasonable to believe that some of the same factors that homogenize views within TMTs also homogenize views within an industry,

although to a lesser degree. Hambrick (1982), Huff (1982), Starbuck (1975), and others (e.g., Porac *et al.*, 1989; Spender, 1989) have also noted the likelihood of shared perceptions of the environment across firms within industries as a consequence of a number of factors, including hiring personnel from within the industry (Aldrich and Pfeffer, 1976), interorganizational communications arising from executives' participation in training programs, conventions, and professional associations (Starbuck, 1975), and borrowing ideas from business, trade, or other professional publications (Aldrich and Pfeffer, 1976). In addition, to the extent that perceptions are influenced by practices, institutional theory would support the idea that perceptions would be more similar within industries than across industries (Dimaggio and Powell, 1983). In view of the above, we hypothesize that:

Hypothesis 2. The perceptions of TMT members concerning their organization's environment are more similar within industries than across industries.

Of course, every organization has a unique external environment; even organizations within the same industry have environments unique to themselves. As Boyd *et al.* (1993: 215) point out, for example, within the semiconductor industry 'Intel's and Advanced Micro Devices' competitive environments differ simply because Intel does not have to compete against itself (Intel), whereas AMD does.' It is important, then, to recognize that the industry effect noted in Hypothesis 2 may be weak, or may be overwhelmed by the effect noted in Hypothesis 1.

METHOD

Researchers have investigated managerial perceptions of business environments using a variety of methods ranging from simple procedures such as asking informants to list their competitors to more sophisticated procedures such as network analyses (Porac *et al.*, 1995) and multivariate analysis of questionnaire items (Dess and Davis, 1984). One family of methods popular in recent years includes cognitive mapping methods such as the repertory grid and multidimensional scaling (Daniels, de Chernatony, and Johnson, 1995;

Reger, 1990), taxonomic interview methods (e.g., Calori, Johnson, and Sarnin, 1994; Hodgkinson and Johnson, 1994; Porac *et al.*, 1989, 1995), and interactive interview methods (e.g., Eden, 1988), all of which have been used to reveal managerial mental models of the perceived structure and dynamics of their firm's competitive environment. Studies conducted in these veins have investigated managers' mental models across rival firms (e.g., Reger, 1990; Porac *et al.*, 1995), managers' causal beliefs concerning environmental conditions (Huff, 1990), and have examined the nature and extent of cognitive consensus and diversity concerning environments within particular organizations (e.g., Hodgkinson and Johnson, 1994; Johnson, 1992) or within single industries (e.g., Porac *et al.*, 1989).

The study presented here contrasts with this work in that it is concerned with discovering the extent to which industry and organizational membership affect differences or similarities in how executives perceive particular aspects of their competitive environment. Specifically, we were interested in understanding a part of the 'content' or overall meaning of executives' environmental maps, rather than the configuration of the many elements of these maps (see Calori *et al.*, 1994).

There are numerous ways to describe the aspects (i.e., content) of a firm's environment. For example, environments have been characterized by organizational theorists in terms of their sectors (e.g., economic, regulatory, technical, social), stakeholders (customers, competitors, suppliers), and attributes (e.g., instability, munificence, complexity, hostility, controllability). Industrial economists, on the other hand, have characterized environments in terms of industry characteristics such as concentration of market power, entry barriers, changes in demand, or changes in product characteristics. We studied TMT perceptions of the environmental characteristics of volatility, munificence, complexity, hostility, and controllability. We examined multiple characteristics in order to gain insight into the robustness and generalizability of our findings. We chose these particular characteristics for three reasons.

First, the environmental attributes investigated here are central to theories that account for the effect of environments on firm actions and outcomes. Specifically these particular environmental attributes have been shown to hold important implications for organizational actions and have

played a key role in strategic management research where performance is the dependent variable. Instability, for example, has been found to be a critical determinant of strategy, structure, and outcomes (Keats and Hitt, 1988) and of interactions between TMT structure and firm performance (Keck, 1997; also see Duncan, 1973). Keats and Hitt (1988) found that environmental instability exerted a significant negative effect on diversification, divisionalization, and operating performance. Environmental munificence and complexity have been found to affect strategic choices designed to capitalize on environmental opportunities (Keats and Hitt, 1988). Perceptions of environmental controllability and hostility may affect the propensity toward change (Dutton and Jackson, 1987; Jackson and Dutton, 1988; Johnson, 1992), the magnitude of change (Jackson and Dutton, 1988), and the specific types of changes undertaken by executives (Thomas, Clark, and Gioia, 1993). Second, examining these more macro attributes enabled us to make cross-organizational and cross-industry comparisons—comparisons not possible had we used firm-specific environmental elements. Third, each of the attributes has been studied in other theoretical contexts by organizational science and strategic management researchers, thus increasing the possible usefulness of our work as connections to or extensions of the work of others.

Data collection

The organizations studied were business segments drawn from a diverse set of industries at the 4-digit SIC level and included both manufacturing and service firms. (To avoid being repetitious and to fit particular contexts, in the remainder of the paper we will sometimes use as interchangeable the terms business segments, firms, and organizations.) All organizations in the sample were either independent single-sector firms, autonomous subsidiaries, or autonomous divisions, as contrasted with multidivisional firms. We selected a random sample of business segments from Standard and Poors' Compustat data base using a two-step stratified procedure. First, we stratified the population of business segments in the data base along industry lines and then randomly selected a sample of industries subject to the constraint that each industry selected included at least 20 business segments (e.g.,

firms). Second, we randomly selected a sample of 20 individual firms within each industry.

In some cases, a business segment may correspond to activities occurring in several different industries. Therefore, the Compustat data base cannot always be linked to a single business unit with an autonomous structure and administrative unit operating in an identifiable industry which would make the segment unusable for this research. To screen out these units, calls were made to each firm to assure that each had more than 25 employees and two levels of management, and that each unit was a single-sector firm, an autonomous subsidiary, or an autonomous division of a larger firm, operating in a single industry. The final sample included 502 firms in 35 industries, or approximately 14 firms per industry.

The first author contacted all 502 chief executives, first by letter and then by telephone, and asked if they and their top management team would participate in the study by completing a mailed questionnaire. One hundred and one top executives agreed by telephone to participate in the study. All potential participants were assured that the information they provided would be treated confidentially. In addition, if the top administrator agreed to participate, he or she was asked to complete and return a form identifying the members of the top management team (i.e., those executives considered by the chief executive to be members of his or her top management team). Questionnaires were subsequently sent to the top executives and the managers whom they identified. Over 370 managers in 89 firms provided complete or partial questionnaire data; however, in some firms only one informant completed and returned the questionnaire. Since data from multiple informants in each organization were necessary to test the hypotheses, these firms could not be included in the data analysis. Thus, the sample for this study consists of data from 307 top management team members in 58 organizations drawn from 19 industries (see Table 1).

Measures

All dependent environmental variables were assessed with questionnaire items adopted or developed from previous studies. To refine the questionnaire, semistructured interviews lasting from 1 to 2 hours were conducted with nine

Table 1. SIC code, industry activity, and number of firms participating by industry

SIC code	Industry activity	Number of firms participating
1389	Providing oil and gas field services	3
2621	Manufacturing paper	3
2631	Manufacturing paperboard	2
2821	Manufacturing synthetic resins, plastics, and elastomers	5
2836	Production of bacterial and virus vaccines and analogous products	3
2899	Manufacturing chemical preps	4
3312	Manufacturing steel	3
3576	Manufacturing data communication products	5
3585	Manufacturing cooling and heating equipment	3
3679	Manufacturing electronic components	5
3724	Manufacturing aircraft engines and engine parts	2
3949	Manufacturing sporting and athletic goods	2
4512	Furnishing scheduled air transportation	3
4955	Furnishing environmental services	2
5045	Distributing of computers and peripheral equipment	2
5065	Distributing of electronic parts	3
6153	Furnishing credit to business enterprises	4
8071	Providing professional analysis/diagnostic services	2
8711	Providing professional engineering services	2

executives in six firms located in different parts of the country. During the interviews, executives were asked about the face validity of the questions. This panel and 22 other top executives (in the same firms) completed a pretest of the instrument. In addition to completing the pretest, informants were asked to evaluate the clarity of the questions, and to provide feedback in regard to the meaningfulness of the language used in the questions. Minor changes were made to the questionnaire based on the informants' feedback and analysis of the pretest data. The measures described below met the standard criteria for scale development (DeVellis, 1991; Mulaik, 1972).

The data for the items were factor analyzed using exploratory factor analysis to examine support for the *a priori* scales. Kaiser's criterion with varimax rotation was applied. Five *a priori* factors emerged from the data, with 25 items loading unambiguously on the primary factor. We also conducted a confirmatory factor analysis (CFA) on these data using the maximum likelihood method and also found support for the *a priori* factors. As Table A1 shows, the estimated loadings have the expected positive sign, all are statistically significant at the $p < 0.05$ level (two-tailed test), and the standardized factor loadings

are typically large enough (> 0.4) to provide confidence that they are indeed measuring common latent constructs. In addition, as noted above, the composite reliability of the measures falls at or above the generally acceptable criterion of 0.6.

Perceived instability reflects the degree to which managers reported the environment as unstable. Instability was assessed originally with nine Likert-type questionnaire items on 7-point scales based on the work of Duncan (1973) and Bourgeois (1985). Four items were eliminated after factor analysis revealed low loadings. The coefficient alpha for the scale was 0.71. *Perceived munificence* reflects the degree to which top managers reported the availability of resources in the environment as growing (or declining) which is indicative of the extent to which the environment is supportive of sustained stability or growth for the organization and its competitors in the same industry. Munificence was assessed originally through seven questionnaire items developed by the author, based on the work of Glick *et al.* (1990). One item was eliminated after factor analysis revealed a low loading. The alpha for the scale was 0.88. *Perceived complexity* (alpha = 0.60) reflects the degree to which top managers view the environment as complex. Complexity

was assessed originally with five items based on the work of Dess and Beard (1984), but one item was eliminated because of a low factor loading. *Perceived hostility* was defined as the extent to which top managers characterize their environment as hostile. Hostility was assessed with five questionnaire items adapted from Thomas and McDaniel (1990) ($\alpha = 0.84$). *Perceived controllability* reflects the extent to which managers characterize their environment as controllable or uncontrollable and was assessed with five questionnaire items based on the work of Thomas and McDaniel (1990) ($\alpha = 0.84$). The questionnaire items used in creating the dependent measures (as well as the items eliminated after factor analysis) are included in the Appendix.

As argued earlier, we expect that top managers' views concerning their organization's environment are likely to be a function of the firm and the industry in which the manager is employed. The variable used to predict the similarity/dissimilarity of the views of TMT members in the same organization was membership on a particular organization's TMT. Because organizations are nested within industries, and because top managers' participation in a particular industry could affect their views concerning their organization's environment, we also determined the particular industry in which the TMT member participated. The Compustat-II data base enabled us to categorize all firms, and thus all TMT members, by industry at the level of the 4-digit SIC.

ANALYSES AND RESULTS

Firm characteristics

Three hundred and seven top executives in 58 organizations drawn from 19 industries provided complete questionnaire data. The number of questionnaires received per organization ranged from 2 to 13 with a mean of 5 questionnaires completed per organization. We received questionnaires from 94 percent of the top executive team members in the organizations included in the analysis. The size of the participating firms ranged from 95 to 6323 employees, and averaged 1125 employees with a standard deviation of 1351. The median number of employees was 690. Approximately 63 percent of the organizations were involved in manufacturing activities while

the remaining 37 percent were involved in service activities. Sixty-one percent of the organizations in the sample were independent single-sector firms; the remainder were autonomous subsidiaries or autonomous divisions of multidivisional firms operating in a single industry.

Chi-square analyses were conducted to assess a possible response bias and to determine whether the firms ultimately providing data for the study were representative of the sample of firms asked to participate. In terms of size and type of activity (i.e., service vs. manufacturing), the firms participating in the study were not statistically significantly different from those asked but not participating.

We also examined the correlations among the variables. The dependent measures were only slightly correlated with each other, with one exception. Hostility and controllability were negatively correlated at $0.58 (p < 0.01)$.

Does commonality exist?

A nested random-effects ANOVA was used to test the model. A nested random-effects ANOVA was used, rather than a two-way ANOVA, because informants from a particular organization could be 'assigned' only to the industry of their organization. In addition, the nested random-effects ANOVA estimates the different components of variance and tests for their significance (SAS, 1990; Snedecor and Cochran, 1976). Bartlett's test indicated that heteroskedasticity was not a problem.

Recall that each of the 307 TMT members assessed five dependent variables: environmental instability, munificence, complexity, hostility, and controllability. The result of the MANOVA associating the five dependent variables simultaneously with organizational membership and industry membership was significant ($p < 0.01$) and encouraged us to proceed with the ANOVAs. The results of the five individual ANOVAs are shown in Table 2. With respect to Hypothesis 1, organizational/TMT membership was a predictor of the informant's perceptions of his or her organization's environment for all five environmental characteristics. This result provides very strong support for existence of common perceptions within TMTs about their organization's environment. With respect to Hypothesis 2, the industry in which the informant's organization

was nested was a significant ($p < 0.01$) or marginally significant ($p < 0.10$) predictor for the instability, munificence, and complexity dimensions, but not for the hostility or controllability dimensions. The results shown in Table 2 lead to the conclusion that there is a significant commonality in top managers' environmental perceptions within organizations and within industries. Further, the results suggest that similarity of views exists in organizations beyond that which exists in industries.

DISCUSSION, LIMITATIONS, AND CONCLUSIONS

This study was motivated by two observations. First, homogeneity in how managers perceive attributes of their firm's environments has important consequences for industries and their member firms—even though scholars differ as to whether these consequences are beneficial or harmful. Second, there has been relatively little empirical research exploring the extent of perceptual homogeneity within firms and within industries. This study's findings indicate that significant homogeneity of perceptions among TMT members exists within industries and within firms.

Limitations

Some limitations to the study are worth noting before proceeding with the discussion. First, all of the firms included were based in the United States and each operated in a single business sector. Thus the generalizability of the findings

may be limited to this domain. Also, our sample included independent firms, autonomous subsidiaries, and autonomous divisions of multidivisional firms. Future studies with larger samples could investigate the possibility that the results could vary across these contexts. As studies are conducted with different conditions, this study can serve as a point of comparison. Second, the approach taken in this study provides a snapshot of perceptions of the more macro aspects of the environment—perceptions that the literature suggests influence strategic choices. Our approach adds to the growing body of work in this area by validating some untested assumptions and providing baseline data regarding the extent to which executives' environmental perceptions are influenced by industry and organizational membership. However, as one anonymous reviewer pointed out, particular elements of the environment, such as key rivals or specific signals of the next technological trajectory, may have greater influence on any particular choice than do the more general environmental attributes studied here. Certainly, there is a need to develop midrange theories as well as to investigate the explanatory power of more general theories.

Discussion

We found that managers' perceptions of the five attributes of organizational environments are affected strongly by their affiliation with a particular firm's TMT (organization), and, for some environmental attributes, also by their industry. The findings are strong in terms of both statistical significance and the proportion of variance

Table 2. Analysis of variance (nested model): The effects of organization and industry on TMT members' perceptions of environmental attributes

Source	Instability	Munificence	Complexity	Hostility	Controllability
Industry ^b	2.69** ^a (0.22)	2.99** (0.31)	1.59+ (0.16)	0.83 (-)	1.14 (-)
Organization within industry ^c	1.52* (0.15)	2.42*** (0.19)	2.11** (0.21)	2.90*** (0.29)	2.98*** (0.28)
Model R^2	0.37**	0.50***	0.37**	0.38***	0.42***

^aF-statistics are reported. Values in parentheses are the proportion of variance explained when the F-statistic is statistically significant.

^b(n = 19)

^c(n = 58)

+p < 0.10; *p < 0.05; **p < 0.01; ***p < 0.001. N = 307

explained. The first finding, that managers' perceptions are affected by their firm affiliation, supports the thinking of a number of scholars who assert that individuals within a particular organization come to view the world similarly as a consequence of selection and socialization processes, observation, and other social and sensemaking processes (e.g., Hambrick and Mason, 1984; Hodgkinson and Johnson, 1994; Starbuck and Milliken, 1988). The second finding, that industry also plays a role, suggests that perceptions are not completely idiosyncratic to a particular organization, but also are affected by cognitive and social processes that combine to induce a common perception within a subpopulation of organizations. Hiring practices, training, imitation, and observation and communication practices within a particular industry may explain the common perceptions across organizations within the industry (Aldrich and Pfeffer, 1976; Hambrick and Mason, 1984; Huff, 1982). These results are important because they validate some commonly held, but largely untested, assumptions about the effects of firm and industry on executives' perceptions of their environment.

It is interesting to note that, while organizational membership explained a significant amount of the variation in perceptions of all five characteristics of the environment, membership in an industry explained variation in perceptions for only three of these characteristics (instability, munificence, and complexity, but not for the hostility or controllability attributes). One possible explanation for this finding hinges on situational strength and the strength of the salient cues. Mischel (1977) distinguished between strong and weak situations. Strong situations engender clear meanings, lead everyone to construe particular events the same way, and induce uniform expectancies regarding appropriate response patterns. Weak situations, on the other hand, do not engender clear meanings or uniform expectancies concerning desired behaviors, which means different people are inclined to interpret weak events or situations differently and are likely to be inclined to respond differently. Situational strength is related to what researchers in social cognition refer to as the 'salience' of a stimulus (Fiske and Taylor, 1991). A stimulus is salient when it has properties that make it more likely to be noticed. Situational strength is important because, as Bruner (1957) argued, the more complex or

ambiguous the stimulus, the more the perception is determined by what is already 'in' the subject and the less by what is in the stimulus. If the cues distinguishing environmental instability, munificence, and complexity are stronger than those distinguishing hostility and controllability, we would expect there to be more commonality of perception both within firms and within industries about these three environmental attributes. This would account for our findings.

Lending support to this explanation, Jackson and Dutton's work (1988) suggests that environmental hostility and controllability are characterized by weak cues. This suggests there will be less commonality in perceptions of these environmental attributes. In addition, it may be that the arousal-inducing nature of perceived environmental hostility and controllability causes these variables to be subjected to high levels of intraorganizational social information and sensemaking processing. The fact that the organization-level effect on these two attributes is very large supports this line of reasoning. This large organization-level effect may cause whatever actual differences there may be on these attributes across industries to have, relatively speaking, no effect.

The finding that hostility and controllability are less uniformly perceived across TMTs within the same industry is important for strategic management researchers. Managerial assessments of environmental hostility and controllability—rather than assessments of instability, munificence, and complexity—are often the basis for strategic actions. In fact, a growing body of evidence suggests that the framing of environmental conditions in terms of controllability and hostility is an important motivating mechanism both directly and indirectly because such framing helps to focus behavioral commitments and predisposes or retards the initiation of certain types of adaptive organizational responses (Dutton and Jackson, 1987; Eisenhardt, 1989; Ginsberg and Venkatraman, 1992; Johnson, 1992). Thus, an important source of competitive advantage or disadvantage may hinge on how top executives assess their firm's environment on these dimensions.

Besides adding to the growing body of work on managerial cognition and the role of group cognition and consensus in influencing strategic management processes (especially strategic diagnosis and strategy formulation, e.g., Eden and Huxham, 1988, Hodgkinson and Johnson, 1994,

Porac *et al.*, 1989; Reger, 1990), this study adds to the literature on organizational information processing. We note that recent work in organizational information processing has focused heavily on cognition and construction, viewing organizations as sensemaking and learning systems (e.g., Sutcliffe, 1997; Walsh, 1995; Weick, 1995). The results of this study suggest that learning processes in organizations can lead directly or indirectly to remarkably similar beliefs among top managers.

Directions for future research

Future studies could build on or extend the results of this study in several ways. First, studies should more systematically examine the performance implications of common perceptions of the environment. More specifically, studies focused on the direct and indirect effects of collective interpretations on firm and industry responses and responsiveness are needed to provide insights about the timeliness of response and the dynamics of competitive advantage. As noted earlier, homogeneity of perceptions may be beneficial or harmful both to firms and to industries. Studies linking performance consequences with mediating processes (e.g., responsiveness), for example, may provide insights into how and why firms and industries overlook, ignore, or otherwise miss important environmental signals of impending change (Johnson, 1988), or why firms and industries do or do not import and adopt new ideas or innovations.

Another avenue to explore would be to uncover industry-level factors that affect homogeneity and the associated management processes. Factors such as industry-level discretion (Abrahamson and Hambrick, 1995), issues related to power, and network processes (e.g., Porac *et al.*, 1995) may be important influences on commonality of perceptions within industries (and also within firms). More specifically, researchers could examine how network location (e.g., centrality), density, transaction patterns, and the tightness or looseness of coupling within industries affect perceptual homogeneity, and, in turn, how these perceptions subsequently influence industry and firm performance. Finally, it would be informative to more carefully tease out the organizational factors and processes that affect not only the commonality of managers' perceptions of the

environment, but also those that affect the extent to which perceptions are congruent with actual conditions (e.g., Sutcliffe, 1994). Although some conceptual works have examined these issues (see for example, Starbuck and Mezias, 1996), there is a need for more empirical work.

Conclusion

We began with the observation that there has been a substantial use of the concepts of consensus or commonality of managerial perceptions concerning the environment in organizational research. Notwithstanding this fact, there have been few attempts to determine empirically the extent to which top managers' perceptions of organizational environments are explainable by membership in a particular firm's TMT or by participation in a particular industry. We found strong evidence that a significant level of commonality about the perceived environment exists within TMTs, and also across top managers in the same industry. Pertinent to this fact is the observation of Thorngate (1976) and Weick (1979) concerning the trade-offs across generality, parsimony, and accuracy as attributes of a theory or empirical result. The breadth of the sample used in this study ensures a rather high level of generality and with just two explanatory variables the model tested scores well on parsimony. Nevertheless, the model does not seem to sacrifice much accuracy, given that it explains a significant amount of the variance in the dependent variables. As a consequence, the study seems well suited to contribute to the literature on strategic management and organizational processes and outcomes.

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REFERENCES

- Abrahamson, E. and C. J. Fombrun (1992). 'Forging the iron cage: Interorganizational networks and the production of macroculture', *Journal of Management Studies*, **29**, pp. 175-194.

- Abrahamson, E. and D. C. Hambrick (1995). 'Attentional homogeneity in industries: The effect of discretion', working paper, Columbia University.
- Aldrich, H. and J. Pfeffer (1976). 'Environments of organizations', *Annual Review of Sociology*, **2**, pp. 79–105.
- Barney, J. B. (1986). 'Strategic factor markets: Expectations, luck and business strategy', *Management Science*, **32**, pp. 1231–1241.
- Bourgeois, L. J. (1980). 'Performance and consensus', *Strategic Management Journal*, **1**(3), pp. 227–248.
- Bourgeois, L. J. (1985). 'Strategic goals, perceived uncertainty and economic performance in volatile environments', *Academy of Management Journal*, **28**, pp. 548–573.
- Boyd, B. K., G. G. Dess and A. M. Rasheed (1993). 'Divergence between archival and perceptual measures of the environment: Causes and consequences', *Academy of Management Review*, **18**, pp. 204–226.
- Bruner, J. S. (1957). 'On perceptual readiness', *Psychological Review*, **64**, pp. 123–152.
- Bunderson, J. S. and K. M. Sutcliffe (1995). 'Work history and selective perception: Fine-tuning what we know', *Academy of Management Best Papers Proceedings*, pp. 458–464.
- Calori, R., G. Johnson and P. Sarnin (1994). 'Ceo's cognitive maps and the scope of the organization', *Strategic Management Journal*, **15**(6), pp. 437–457.
- Daft, R. L. and K. W. Weick (1984). 'Toward a model of organizations as interpretation systems', *Academy of Management Review*, **9**, pp. 284–295.
- Daniels, K., L. de Chernatony and G. Johnson (1995). 'Validating a method for mapping managers' mental models of competitive industry structures', *Human Relations*, **48**, pp. 975–991.
- Dean, J. W. and M. P. Sharfman (1996). 'Does decision process matter? A study of strategic decision-making effectiveness', *Academy of Management Journal*, **39**, pp. 368–396.
- Dearborn, D. C. and H. A. Simon (1958). 'Selective perception: A note on the departmental identification of executives', *Sociometry*, **21**, pp. 140–144.
- Dess, G. G. (1987). 'Consensus on strategy formulation and organizational performance: Competitors in a fragmented industry', *Strategic Management Journal*, **8**(3), pp. 259–277.
- Dess, G. G. and D. W. Beard (1984). 'Dimensions of organizational task environments', *Administrative Science Quarterly*, **29**, pp. 52–73.
- Dess, G. G. and P. S. Davis (1984). 'Porter's (1980) generic strategies as determinants of strategic group membership and organizational performance', *Academy of Management Journal*, **27**, pp. 467–488.
- Dess, G. G. and B. W. Keats (1987). 'Environmental assessment and organizational performance: An exploratory field study', *Academy of Management Proceedings*, pp. 21–25.
- DeVellis, R. F. (1991). *Scale Development: Theory and Applications*. Sage, Newbury Park, CA.
- Dimaggio, P. W. and W. W. Powell (1983). 'The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields', *American Sociological Review*, **48**, pp. 147–160.
- Duncan, R. B. (1973). 'Multiple decision-making structures in adapting to environmental uncertainty', *Human Relations*, **26**, pp. 273–291.
- Dutton, J. E. and S. Jackson (1987). 'Categorizing strategic issues: Links to organizational action', *Academy of Management Review*, **12**, pp. 76–90.
- Eden, C. (1988). 'Cognitive mapping', *European Journal of Operational Research*, **36**, pp. 1–13.
- Eden, C. and C. Huxham (1988). 'Action-oriented strategic management', *Journal of the Operational Research Society*, **39**, pp. 889–899.
- Eisenhardt, K. M. (1989). 'Making fast strategic decisions in high-velocity environments', *Academy of Management Journal*, **32**, pp. 543–559.
- Fiske, S. T. and S. E. Taylor (1991). *Social Cognition*. McGraw-Hill, New York.
- Fredrickson, J. W. and A. L. Iaquinto (1989). 'Inertia and creeping rationality in strategic decision processes', *Academy of Management Journal*, **32**, pp. 516–542.
- Fulk, J., C. Steinfield, J. Schmitz and J. Power (1987). 'A social information processing model of media use in organizations', *Communication Research*, **14**, pp. 529–552.
- Ginsberg, A. and N. Venkatraman (1992). 'Investing in new information technology: The role of competitive posture and issue diagnosis', *Strategic Management Journal*, Summer Special Issue, **13**, pp. 37–53.
- Gioia, D. (1986). 'Conclusion: The state of the art in organizational social cognition: A personal view'. In H. Sim and D. Gioia (eds.), *The Thinking Organization: Dynamics of Organizational Social Cognition*. Jossey-Bass, San Francisco, CA, pp. 336–356.
- Glick, W. H., G. P. Huber, C. C. Miller, D. H. Doty and K. M. Sutcliffe (1990). 'Studying changes in organizational design and effectiveness: Retrospective event histories and periodic assessments', *Organization Science*, **1**, pp. 293–312.
- Halberstam, D. (1986). *The Reckoning*. Avon, New York.
- Hambrick, D. C. (1982). 'Environmental scanning and organizational strategy', *Strategic Management Journal*, **3**(2), pp. 159–174.
- Hambrick, D. C. (1989). 'Guest editor's introduction: Putting top managers back in the strategy picture', *Strategic Management Journal*, Summer Special Issue, **10**, pp. 5–16.
- Hambrick, D. C. (1994). 'Top management groups: A conceptual integration and reconsideration of the "team" label'. In B. M. Staw and L. L. Cummings (eds.), *Research in Organizational Behavior*, Vol. 16. JAI Press, Greenwich, CT, pp. 171–214.
- Hambrick, D. C. and P. A. Mason (1984). 'Upper echelons: The organization as a reflection of its top managers', *Academy of Management Review*, **9**, pp. 193–206.
- Hickson, D. J., R. J. Butler, D. Cray, G. R. Mallory and D. C. Wilson (1989). 'Decision and organization-processes of strategic decision making and their explanation', *Public Administration*, **67**, pp. 373–398.
- Hirsch, P. M. (1975). 'Organizational effectiveness and the institutional environment', *Administrative Science Quarterly*, **20**, pp. 327–344.

- Hodgkinson, G. P. and G. Johnson (1994). 'Exploring the mental models of competitive strategists: The case for a processual approach', *Journal of Management Studies*, **31**, pp. 525–551.
- Huber, G. P. (1991). 'Organizational learning: The contributing processes and the literatures', *Organization Science*, **2**, pp. 88–115.
- Huff, A. S. (1982). 'Industry influences on strategy reformulation', *Strategic Management Journal*, **3**(2), pp. 119–131.
- Huff, A. S. (1990). *Mapping Strategic Thought*. Wiley, Chichester.
- Jablin, F. M. (1997). 'Organizational entry, assimilation and exit'. In F. M. Jablin and L. L. Putnam (eds.), *Handbook of Organizational Communication* (2nd ed.). Sage, Thousand Oaks, CA, forthcoming.
- Jackson, S. E. and J. E. Dutton (1988). 'Discerning threats and opportunities', *Administrative Science Quarterly*, **33**, pp. 370–388.
- Johnson, G. (1988). 'Rethinking incrementalism', *Strategic Management Journal*, **9**(1), pp. 75–91.
- Johnson, G. (1992). 'Managing strategic change: Strategy, culture and action', *Long Range Planning*, **25**, pp. 28–36.
- Keats, B. W. and M. A. Hitt (1988). 'A causal model of linkages among environmental dimensions, macro organizational characteristics and performance', *Academy of Management Journal*, **31**, pp. 570–598.
- Keck, S. L. (1997). 'Top management team structure: Differential effects by environmental context', *Organization Science*, **8**, pp. 143–156.
- Kotha, S. and A. Nair (1995) 'Strategy and environment as determinants of performance: Evidence from the Japanese machine tool industry', *Strategic Management Journal*, **16**(7), pp. 497–518.
- Lant, T. K., F. J. Milliken and B. Batra (1992). 'The role of managerial learning and interpretation in strategic persistence and reorientation: An empirical exploration', *Strategic Management Journal*, **13**(8), pp. 585–608.
- Louis, M. R. (1980). 'Surprise and sense-making: What newcomers experience in entering unfamiliar organizations', *Administrative Science Quarterly*, **25**, pp. 226–251.
- McCabe, D. L. and J. E. Dutton (1993). 'Making sense of the environment: The role of perceived effectiveness', *Human Relations*, pp. 623–643.
- Milliken, F. J. and T. K. Lant (1991). 'The effect of an organization's recent performance history on strategic persistence and change: The role of managerial interpretations'. In P. Shrivastava, A. Huff and J. Dutton (eds.), *Advances in Strategic Management*, Vol. 7. JAI Press, Greenwich, CT, pp. 129–156.
- Mischel, W. (1977). 'The interaction of person and situation'. In D. Magnusson and N. S. Endler (eds.), *Personality at the Crossroads: Current Issues in International Psychology*, Erlbaum, Hillsdale, NJ, pp. 333–352.
- Mulaik, S. A. (1972). *The Foundations of Factor Analysis*. McGraw-Hill, New York.
- Nelson, R. R. and S. G. Winter (1982). *An Evolutionary Theory of Economic Change*. Harvard University Press, Cambridge, MA.
- Porac, J. F., H. Thomas and C. Baden-Fuller (1989). 'Competitive groups as cognitive communities: The case of Scottish knitwear manufacturers', *Journal of Management Studies*, **26**, pp. 397–416.
- Porac, J. F., H. Thomas, F. Wilson, D. Paton and A. Kanfer (1995). 'Rivalry and the industry model of Scottish knitwear producers', *Administrative Science Quarterly*, **40**, pp. 203–227.
- Priem, R. (1990). 'Top management group factors, consensus and firm performance', *Strategic Management Journal*, **11**(6), pp. 469–478.
- Reger, R. K. (1990). 'Managerial thought structures and competitive positioning'. In A. S. Huff (ed.), *Mapping Strategic Thought*. Wiley, Chichester, pp. 301–309.
- Salancik, G. R. and J. Pfeffer (1978). 'A social information processing approach to job attitudes and task design', *Administrative Science Quarterly*, **23**, pp. 224–253.
- SAS (1990). *SAS/STAT User's Guide*. SAS Institute, Cary, NC.
- Sitkin, S. B. (1992). 'Learning through failure: The strategy of small losses'. In B. M. Staw and L. L. Cummings (eds.), *Research in Organizational Behavior*, Vol. 14. JAI Press, Greenwich, CT, pp. 231–266.
- Snedecor, G. W. and W. G. Cochran (1976). *Statistical Methods*, (6th ed). Iowa State University Press, Ames, IA.
- Spender, J. C. (1989). *Industry Recipes: The Nature and Source of Managerial Judgment*. Basil Blackwell, Cambridge, MA.
- Starbuck, W. H. (1975). 'Organizations and their environments'. In M. Dunnette (ed.), *Handbook of Organizational Psychology*. Rand McNally, Chicago, IL, pp. 1069–1123.
- Starbuck, W. H. (1993). 'Keeping a butterfly and an elephant in a house of cards: The elements of exceptional success', *Journal of Management Studies*, **30**, pp. 885–921.
- Starbuck, W. H. and J. M. Mezias (1996). 'Opening Pandora's box: Studying the accuracy of manager's perceptions', *Journal of Organizational Behavior*, **17**, pp. 99–117.
- Starbuck, W. H. and F. J. Milliken (1988). 'Executive's perceptual filters: What they notice and how they make sense'. In D. Hambrick (ed.), *The Executive Effect: Concepts and Methods for Studying Top Managers*. JAI Press, Greenwich, CT, pp. 35–66.
- Sutcliffe, K. M. (1994). 'What executives notice: Accurate perceptions in top management teams', *Academy of Management Journal*, **37**, pp. 1360–1379.
- Sutcliffe, K. M. (1997). 'Organizational environments and organizational information processing'. In F. Jablin and L. Putnam (eds.), *Handbook of Organizational Communication* (2nd ed.). Sage, Beverly Hills, forthcoming.
- Thomas, J. B., S. M. Clark and D. A. Gioia (1993). 'Strategic sensemaking and organizational performance: Linkages among scanning, interpretation, actions and outcomes', *Academy of Management Journal*, **36**, pp. 239–270.

- Thomas, J. B. and R. R. McDaniel (1990). 'Integrating strategic issues: Effects of strategy and the information-processing structure of top management teams', *Academy of Management Journal*, **33**, pp. 286–306.
- Thorngate, W. (1976). 'Possible limits on a science of social behavior'. In L. Strickland, K. Gergen and F. Aboud (eds.), *Social Psychology in Transition*. Plenum, New York, pp. 121–139.
- Walsh, J. P. (1988). 'Selectivity and selective perception: An investigation of managerial belief structures and information processing', *Academy of Management Journal*, **31**, pp. 873–896.
- Walsh, J. P. (1995). 'Managerial and organizational cognition: Notes from a trip down memory lane', *Organization Science*, **6**, pp. 280–321.
- Walsh, J. P. and G. R. Ungson (1991). 'Organizational memory', *Academy of Management Review*, **16**, pp. 57–91.
- Weick, K. W. (1979). *The Social Psychology of Organizing* (2nd ed.). Addison-Wesley, Reading, MA.
- Weick, K. W. (1995). *Sensemaking in Organizations*, Sage, Newbury Park, CA.
- Zajac, E. and M. Bazerman (1991). 'Blind spots in industry and competitor analysis: Implications of interfirm (mis)perceptions for strategic decisions', *Academy of Management Review*, **16**, pp. 37–57.

APPENDIX: Questionnaire Items for Variables

Perceived instability

How strongly do you agree or disagree with each of the following statements?

- (1) Customer demand and preferences are relatively stable in your industry ... (2) Your firm must frequently change the way it produces its goods or services in order to be competitive ... (3) The actions of your major suppliers (including materials, equipment, or labor suppliers) change very little from year to year ... (4) The volume of sales for firms in your industry fluctuates very little from year to year ... (5) Your firm frequently changes its technology to keep up with competitors ... (E1)¹ The total value of assets for the firms in your industry varies a lot from year to year ... (E2)¹ Capital expenditures within your firm's principal industry are relatively constant from year to year ... (E3)¹ It is difficult to foresee the actions of your firm's competitors ... (E4)¹ Public/political attitudes toward your industry and its products/services are relatively stable...

Perceived munificence

How accurate are the following statements?

- (6) Demand for the products/services of your principal industry is growing and will continue to grow ... (7) The investment or marketing opportunities for firms in your principal industry are very favorable at the present time ... (8) The

opportunities for firms in your principal industry to expand the scope of their existing products/markets are extremely limited ... (9) In your industry, sales have been growing and are likely to grow ... (10) The total value of assets for the firms within your industry are declining and will continue to decline ... (11) Capital expenditures in your firm's principal industry are growing and will continue to grow ... (E5)¹ Resources for growth and expansion are easily accessible in your industry ...

Perceived complexity

How strongly do you agree or disagree with each of the following statements?

- (12) Your firm faces a complex external environment ... (13) Your firm's external environment is difficult to understand ... (14) Your firm interacts with a large number of different organizations in the production and distribution of its primary products/services ... (15) Your firm produces many different products/services ... (E6)¹ Your firm requires inputs from many different suppliers for the production of its primary products/services ...

Hostility

How strongly do you agree or disagree with the following statements?

- (16) The situations that arise are frequently favorable to the firm ... (17) Most situations are positive for the firm ... (18) The situations the firm encounters present numerous favorable opportunities ... (19) There is a lot to gain from most situations ... (20) Losses and not gains are likely from most situations ...

¹ Indicates that the item was eliminated from the scale after factor analysis.

Controllability

How strongly do you agree or disagree with the following statements?

- (21) Resources are accessible to resolve most

situations ... (22) The firm has the competence to address most situations ... (23) Most situations can be controlled ... (24) The firm manages most situations instead of situations managing it ... (25) The firm's responses are constrained largely by other organizations, groups, or individuals ...

Table A1. Factor analysis results

Item ^a	Factor loading
1. Customer demand and preferences are relatively stable in your industry.*	0.68
2. Your firm must frequently change the way it produces its goods or services in order to be competitive.	0.58
3. The actions of your major suppliers (including materials, equipment, or labor suppliers) change very little from year to year.*	0.48
4. The volume of sales for firms in your industry fluctuates very little from year to year.	0.43
5. Your firm frequently changes its technology to keep up with competitors.	0.45
6. Demand for the products/services of your principal industry is growing and will continue to grow.	0.86
7. The investment or marketing opportunities for firms in your principal industry are very favorable at the present time.	0.68
8. The opportunities for firms in your principal industry to expand the scope of their existing products/markets are extremely limited.*	0.53
9. In your industry, sales have been growing and are likely to grow.	0.87
10. The total value of assets for the firms within your industry are declining and will continue to decline.	0.48
11. Capital expenditures in your firm's principal industry are growing and will continue to grow.	0.60
12. Your firm faces a complex external environment.	0.63
13. Your firm's external environment is difficult to understand.	0.56
14. Your firm interacts with a large number of different organizations in the production and distribution of its primary products/services.	0.41
15. Your firm produces many different products/services.	0.40
16. The situations that arise are frequently favorable to the firm.	0.57
17. Most situations are positive for the firm.	0.78
18. The situations the firm encounters present numerous favorable opportunities.	0.79
19. There is a lot to gain from most situations.	0.70
20. Losses and not gains are likely from most situations.*	0.47
21. Resources are accessible to resolve most situations.	0.62
22. The firm has the competence to address most situations.	0.69
23. Most situations can be controlled.	0.52
24. The firm manages most situations instead of situations managing it.	0.69
25. The firm's responses are constrained largely by other organizations, groups or individuals.	0.57

*The item number corresponds to the items in the Appendix.

*Indicates the item was reverse scored.

(Model statistics: $\chi^2 = 527.68$, d.f. = 242, $\chi^2/\text{d.f.} = 2.18$, GFI = 0.89, RMSEA = 0.057)