

## COGNITIVE DIVERSITY AMONG UPPER-ECHELON EXECUTIVES: IMPLICATIONS FOR STRATEGIC DECISION PROCESSES

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*Diversity among executives is widely assumed to influence a firm's strategic decision processes, but empirical research on this linkage has been virtually nonexistent. To partially fill the void, we drew upon three separate studies to examine the impact of executive diversity on comprehensiveness of strategic decision-making and extensiveness of strategic planning. Contrary to common assumptions of researchers and executives, our results suggest that executive diversity inhibits rather than promotes comprehensive examinations of current opportunities and threats, and inhibits rather than promotes extensive long-range planning. In light of the cumulative research showing that firm performance is related to both comprehensiveness and extensiveness, our results provide evidence for an indirect connection between executive diversity and firm performance. © 1998 John Wiley & Sons, Ltd.*

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### INTRODUCTION

Interest in executive diversity has surged in recent years. Among researchers fueling this surge, many have argued that higher levels of diversity lead to executive creativity, more effective executive decision-making, and more positive organizational outcomes (Bantel and Jackson, 1989). Other researchers, however, have argued that higher levels of executive diversity result in less communication among executives, less effective executive decision-making, and less positive organizational outcomes (O'Reilly, Snyder, and

Boothe, 1993). Empirically, research has not produced consistent support for either of these positions (cf. Bantel and Jackson, 1989; Glick, Miller, and Huber, 1993; Jackson *et al.*, 1991; Michel and Hambrick, 1992; Murray, 1989; O'Reilly *et al.*, 1993; Smith *et al.*, 1994; Wiersema and Bantel, 1992, 1993).

One possible explanation for the disappointing empirical results is that researchers have focused on demographic diversity rather than cognitive diversity. Demographic diversity typically is not hypothesized to have direct effects on processes or outcomes, but is hypothesized to have indirect effects through cognitive diversity (Glick *et al.*, 1993). Thus, it may be that the effects of demographic diversity are too weak to be detected consistently. Further, demographic diversity may not actually affect cognitive diversity, and there-

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fore may not have any important effects on processes or outcomes. The linkage between demographic diversity and cognitive diversity is assumed to exist by most researchers (e.g., Smith *et al.*, 1994; Wiersema and Bantel, 1992), but recent evidence suggests that the linkage may not exist. Glick *et al.* (1993), for example, found that diversity assessed in terms of demographic features of executives did not correlate with diversity assessed in terms of cognitive features.

A second possible explanation for the disappointing results applies to studies of organizational outcomes: the mediating effects of process variables have not been examined in most studies of executive diversity and organizational outcomes. Instead, most researchers (e.g., Bantel and Jackson, 1989; Wiersema and Bantel, 1992) have simply related diversity to outcome variables such as organizational innovation and profitability. It may be that diversity's effects on ultimate outcome variables are too weak to be detected consistently, particularly in cross-sectional studies.

The purpose of the current research is to theoretically and empirically examine the linkage between cognitive diversity and two strategic process variables. By focusing on cognitive as opposed to demographic diversity, we address the first possible explanation for the disappointing previous results, and we move towards the cognitive construct of paradigm heterogeneity highlighted by Hambrick (1994). By focusing on process variables that may mediate between diversity and organizational outcomes, we address the second possible explanation. To the extent that cognitive diversity is found to influence the two strategic process variables, evidence will have been provided for an indirect diversity–profitability linkage because the two process variables we investigate have repeatedly been found to influence firm profitability.

## COGNITIVE DIVERSITY, COMPREHENSIVENESS, AND EXTENSIVENESS

### Definitions

Comprehensiveness of strategic decision processes and extensiveness of strategic planning are important strategic process variables. Comprehensiveness, the process variable hypothesized most

often as an intervening variable in discussions of executive diversity and firm performance, is defined as the extent to which an upper-echelon executive group utilizes an extensive decision process when dealing with immediate opportunities and threats (Fredrickson and Mitchell, 1984). Behavioral indicators of the level of comprehensiveness include the extent to which brainstorming sessions occur, the number of alternative solutions that are seriously considered, and the extent to which quantitative analyses are conducted. The amount of investigatory work carried out to handle an immediate situation is the key. It must be emphasized that comprehensiveness pertains to the absolute amount of investigatory activity rather than investigatory completeness *per se*.<sup>1</sup>

Extensiveness of strategic planning is defined as the extent to which an upper-echelon executive group utilizes a substantial planning process to formulate long-term goals and strategies for the firm. The same behavioral indicators relevant for comprehensiveness are relevant for extensiveness, but rather than examining those indicators in the context of current problem-solving for immediate opportunities and threats, they are examined in the context of long-term planning (e.g., brainstorming over a response to an immediate threat pertains to comprehensiveness whereas brainstorming over where the firm as a whole should be in 10 years pertains to long-term planning). As with comprehensiveness, it must be emphasized that extensiveness of planning pertains to the absolute amount of activity rather than completeness *per se*.

As pointed out above, extensiveness and comprehensiveness differ in terms of their foci: adapting to and shaping the long-term future as opposed to solving today's problems. For example, a firm might not engage in 3-, 5-, or 10-year planning that encompasses all or most of

<sup>1</sup> Completeness differs from amount of activity in that completeness is amount of activity divided by total possible activity. If the amount of investigatory activity found in strategic decision-making is the *same* for a small firm in a simple industry and a larger firm in a more complex industry, then completeness is *higher* for the small firm (where, in theory, the total possible investigatory activity is smaller due to the simpler context). Since total possible activity for a given situation is very difficult to determine, and since theoretical arguments relating diversity and decision-making apply most clearly to amount of activity rather than true completeness (see arguments in the text), our focus on amount of activity seems appropriate.

the firm (low extensiveness), but it may attack comprehensively a strategic problem that just arose regarding availability of raw materials for one of its product lines (high comprehensiveness). Miller and Toulouse (1986), Priem, Rasheed and Kotulic (1995), and others have made the same basic distinction we are making between extensiveness and comprehensiveness.

Comprehensiveness and extensiveness have both been found to impact firm profitability. For comprehensiveness, some research has suggested that a large amount of investigatory activity in handling immediate opportunities and threats is harmful for firms in turbulent industries (i.e., Fredrickson and Mitchell, 1984), but most empirical research has suggested positive effects for firms in turbulent industries and null effects for firms in stable industries (see Bourgeois and Eisenhardt, 1988; Glick *et al.*, 1993; Miller and Toulouse, 1986; and Priem *et al.*, 1995). Similarly, research findings related to long-term planning and performance have been mixed over the years, but two recent meta-analyses (Boyd, 1991; Miller and Cardinal, 1994) provide strong evidence that extensiveness of strategic planning positively influences firm performance, especially in turbulent industries.<sup>2</sup>

Cognitive diversity is defined in terms of differences in beliefs and preferences held by upper-echelon executives within a firm. More specifically, cognitive diversity refers to variation in beliefs concerning cause-effect relationships and variation in preferences concerning various goals for the organization (Miller, 1990). Such variation underlies differences in perspectives that tend to endure through time. Because variation in enduring beliefs and preferences tends to create disagreements when specific strategic issues are being considered (see, for example, Lant, Milli-

ken and Batra, 1992), cognitive diversity probably influences both comprehensiveness and extensiveness. The direction of the effects of cognitive diversity, however, is unclear, with some arguments suggesting positive effects while others suggest negative effects. Arguments suggesting positive effects are more prevalent and are presented first.

### Arguments suggesting positive effects

At least three arguments suggest that cognitive diversity positively influences comprehensiveness and extensiveness. The first of these concerns disagreements as a basic resource. When there are many disagreements surrounding an immediate opportunity or threat, or a long-range plan, upper-echelon executives as a group and as individuals are aware of more issues, more ways of viewing each issue, and more alternative courses of action (Bantel and Jackson, 1989; Lant *et al.*, 1992; Wiersema and Bantel, 1992). Once aware of the range of issues and options, the upper-echelon group can discuss them, commission relevant analyses, hire consultants for help in areas of weak knowledge, and so on. If there are few or no disagreements at the outset, upper-echelon executives are less likely to consider a wide range of issues and options because they simply would not think of many of them. As Lant *et al.* point out, disagreements can 'result in more extensive discussion of strategic options, more learning opportunities, and, thereby, reduce the likelihood of a groupthink-type phenomenon occurring' (1992: 591).

The second argument is a simple argument put forth by Fredrickson and Mitchell (1984), Glick *et al.* (1993), and others. This argument concerns costs. When there are many disagreements in strategic decision-making, upper-echelon executives are more likely to expend the resources necessary for more analyses, more consultants, and more discussions. In other words, the need to resolve disagreements or at least partially reconcile divergent positions in order to move forward leads to a greater willingness to expend the resources necessary for high comprehensiveness and extensiveness. When there are few disagreements, executives will not feel a need to expend such resources.

The third argument suggesting positive effects is more complex than the preceding two argu-

<sup>2</sup> In published research relevant to the linkage between comprehensiveness and firm performance, operational definitions (i.e., measures) have consistently been focused on absolute amount of investigatory activity rather than completeness *per se* (see, for example, Fredrickson, 1984; Miller and Toulouse, 1986; and Priem *et al.*, 1995). Constitutive definitions, however, have sometimes been focused more on true completeness (e.g., Fredrickson, 1984). In published research relevant to the linkage between extensiveness of planning and firm performance, operational definitions have typically been focused on amount of activity (or amount of formal activity) rather than completeness *per se* (see Miller and Cardinal, 1994). Differences in terminology in the planning-performance literature, however, have obscured this consistency. Extensiveness is perhaps a reasonable unifying term.

ments. This third argument suggests that disagreements affect upper-echelon cohesion. Cohesion, in turn, is expected to affect comprehensiveness and extensiveness. Thus, cohesion is expected to mediate partially the effects of cognitive diversity on comprehensiveness and extensiveness.

Cohesion is defined as the extent to which upper-echelon executives like one another and stick up for each other (see O'Reilly, Caldwell, and Barnett, 1989). It is related to Hambrick's (1994) concept of behavioral integration. Social psychological arguments related to interpersonal attraction and inferred evaluations (see Condon and Crano, 1988) suggest that cognitive diversity negatively influences cohesion. Through a process of inferred evaluation, individuals assume that a person who agrees with them also likes them. This process combined with the frequent observation that individuals tend to like those who like them (Aronson and Worchel, 1966; Condon and Crano, 1988) yields the expectation of a negative relationship between cognitive diversity and upper-echelon cohesion. Stated more simply: 'individuals will feel closer to and identify with persons who share similar beliefs and values' (Wagner, Pfeffer, and O'Reilly, 1984: 77).

The second part of this diversity-process argument relates cohesion and strategic processes. Specifically, the second part of the argument suggests that cohesion negatively affects comprehensiveness and extensiveness. The principal reason for expecting cohesion to negatively affect comprehensiveness and extensiveness concerns a desire for amicable relations among cohesive executive teams. Amicable relations can be disrupted by many of the tactics that promote comprehensive decision-making and extensive planning processes, such as playing devil's advocate and insisting on consulting outsiders to confirm or disconfirm beliefs held by other team members. Within cohesive executive teams, ideas put on the table early are more likely to go unchallenged and uninvestigated. In contrast, executives in teams that are not cohesive are more likely to challenge opinions put forth by their colleagues. These executives are more likely to encourage debate and initiate investigations designed to uncover flaws in their colleagues' reasoning.

Consistent with this reasoning, Janis has argued that extremely high levels of cohesion can lead to groupthink—'a deterioration of mental efficiency, reality testing, and moral judgment that results from

in-group pressures' (1972: 9). Group members are thought to value group membership to the point where fear of ostracism and fear of membership loss result in conformity and unquestioned acceptance of ideas from an early decision contributor or from a group leader. Particularly problematic is the fact that the group as a whole often refuses to seek or accept input from outsiders.

In summary, cognitive diversity is believed by many to negatively affect cohesion and cohesion is believed to negatively affect comprehensiveness and extensiveness, resulting in an overall positive linkage between diversity and comprehensiveness and an overall positive linkage between diversity and extensiveness. This cohesion argument combined with the resource and cost arguments presented earlier provides strong support for the popular expectation that cognitive diversity positively affects comprehensiveness and extensiveness. For further theoretical support of the positive effects position, see Finkelstein and Hambrick (1996: 146–147).

### Arguments suggesting negative effects

Although the most popular perspective suggests positive effects, there are two arguments suggesting cognitive diversity negatively affects comprehensiveness and extensiveness. First, diversity often implies disagreement over strongly held preferences and beliefs that will not be compromised. Thus, extensive decision-making may lead to head-butting rather than to issue resolution (Glick *et al.*, 1993). If so, one or a few executives may quietly address strategic issues behind the scenes while not opening up the process to others. In such situations, existing executive diversity would not have a chance to cause further analyses or debates. Second, cognitive diversity often implies that different people will use their own specialized languages, images, and stories to communicate with each other. As numerous researchers (e.g., Daft and Lengel, 1986) have suggested, such differentiation can lead to communication failures. To the extent that communication failures occur, one or a few executives may quietly address strategic issues behind the scenes.

### Hypotheses

To summarize, several arguments suggest that cognitive diversity has positive effects and several

arguments suggest that cognitive diversity has negative effects on comprehensiveness and extensiveness. Despite the counter arguments, we initially adopted the most popular perspective and hypothesized that:

*Hypothesis 1: Cognitive diversity positively influences comprehensiveness of strategic decision-making.*

*Hypothesis 2: Cognitive diversity positively influences extensiveness of strategic planning.*

### Control variables

Our purpose is to examine the impact of cognitive diversity on comprehensiveness and extensiveness. It is not our goal to develop a complete model of causal factors related to strategic decision-making. Nonetheless, to control for factors that may play a major role in determining comprehensiveness and extensiveness, we included variables other than cognitive diversity in our empirical work. Specifically, *a priori*, we included environmental turbulence and firm size. These variables have appeared with great frequency in previous discussions of factors that may influence strategic decision-making (e.g., Capon, Farley, and Hulbert, 1987; Fredrickson and Iaquinto, 1989; Fredrickson and Mitchell, 1984; Grinyer, Al-Bazzaz and Yasai-Ardekani, 1986; Kukalis, 1989; Lindsay and Rue, 1980; Mintzberg, 1973; Odom and Boxx, 1988). With respect to the impact of size, it may be that larger organizations, because of greater complexity, have more comprehensive, extensive strategic processes. Further, large size and its attendant complexity also may lead to more diverse upper-echelon management groups, thereby creating a spurious connection between diversity and strategic processes. With respect to turbulence, it may be that organizations facing higher turbulence have more comprehensive, extensive strategic processes because of the higher levels of change and uncertainty that must be handled. Further, turbulent environments may lead to more diverse upper-echelon management groups within organizations, thereby creating a spurious connection between diversity and strategic processes. These theoretical positions certainly are not the only positions that could be put forth, but they

do indicate the importance of controlling for size and turbulence.

## METHODS AND RESULTS

The results of a single study are affected by the particular research methods used in that study, and they may also be affected by sampling error (for an excellent discussion of these issues, see Hunter and Schmidt, 1990). Thus, the results of a single study must always be viewed cautiously as validity and generalizability are not assured. One method of partially overcoming these problems involves incorporating multiple studies in a single research effort. Researchers (e.g., Brockner *et al.*, 1993; Simons, 1993) adopting such replicated designs (Hunter and Schmidt, 1990) allow for richer assessments of the validity and generalizability of their research findings. Accordingly, three different studies were used to test our hypotheses.

### Study 1

#### Sample

Chief executive officers of 315 firms were asked to include their firms in this study. Thirty-eight agreed to do so. The 38 chief executives led firms in a wide variety of industries, including aircraft engine manufacturing, oil well drilling, and air transportation. The participation rate of 12 percent is fairly low, but not inconsistent with many other studies of this type. The 315 firms were selected by randomly sampling firms that (1) were nondiversified and that (2) were listed in Moody's published materials (i.e., Moody's *Industrial Manual*, *OTC Manual*, and *Transportation Manual*). Nondiversified firms were selected for reasons unrelated to the present work.

#### Data and measures

Data were collected from chief executive officers through a four-page questionnaire. Two dimensions of *cognitive diversity* were assessed: diversity among executives concerning preferred goals for the firm (i.e., preference diversity) and diversity among executives concerning the nature of cause-effect relationships (i.e., belief diversity). Overall cognitive diversity was an aggregation of

the two dimensions. Although we did not expect empirical differences for the two dimensions, we made the distinction between preference diversity and belief diversity because there is a long-standing tradition in organizational research that distinguishes between normative beliefs (which underlie preference diversity) and cause-effect beliefs (which underlie belief diversity) (see, for example, Sproull, 1981). We used four diversity questionnaire items, two of which were associated with preference diversity and two of which were associated with cause-effect belief diversity (see Appendix 1). When assessing cause-effect belief diversity, a single domain was focused upon: determinants of long-term organizational viability. The long-term viability domain was utilized because upper-echelon executives probably have well-developed beliefs concerning variables that may influence viability and because one or more executives probably raise long-term viability as an important issue each time an immediate opportunity or threat is being considered or a strategic plan is being developed (Miller, 1990). Our four questionnaire items were based on items previously utilized by Georgopoulos (1965) and Van de Ven and Ferry (1980), and they were part of the CODE study questionnaires (see Glick, Huber, Miller, Doty, and Sutcliffe, 1990, and Huber and Glick, 1993).

*Comprehensiveness* was assessed through three questionnaire items (see Appendix 1). These items were used by Fredrickson (1984), Fredrickson and Iaquinto (1989), and Fredrickson and Mitchell (1984) in their validity check procedures. They found these items to be very highly correlated with their other measures of comprehensiveness, which in turn were significantly related to firm performance.<sup>3</sup>

*Extensiveness* was assessed by asking each chief executive to select the statement that best

described his/her firm's approach to strategic planning (see Appendix 1). The first listed statement was indicative of a lack of formal strategic planning (coded as 1), the second statement was indicative of moderately extensive planning (coded as 2), and the third statement was indicative of extensive planning (coded as 3).<sup>4</sup> The three statements were developed by Robinson and Pearce, who provided evidence of some convergent validity by finding chief executives' statement choices to be associated with a separate scale item focused on the fundamental feature of strategic planning: the emphasis placed on 'formulating goals and targets to be achieved in the competitive environment' (1983: 199). Similar approaches and statements have been successfully used by Lindsay and Rue (1980), Odom and Boxx (1988), Pearce, Robbins, and Robinson (1987), and others.

*Turbulence* was assessed through four questionnaire items (see Appendix 1). These items were adapted from items used by Miller (1983, 1988, 1991; Miller and Droge, 1986; Miller, Droge, and Toulouse, 1988). *Size* was assessed as the number of full-time employees in a firm (using the log of size rather than size itself did not alter our findings).

## Results

Interitem reliability estimates, means, standard deviations, and correlations are presented in Table 1. Reliability estimates range from acceptable (0.62) to very good (0.84), with an average of 0.73.

In the first set of regression analyses, comprehensiveness was regressed onto cognitive diversity, turbulence, and size. As shown in Table 2, the results suggest that overall cognitive diversity negatively affects comprehensiveness ( $p < 0.01$ ). This finding is counter to our expectation and counter to the most popular perspective on diver-

<sup>3</sup> As noted earlier, we are focusing on simple amount of investigatory activity rather than completeness *per se*. Given this focus, we were a bit concerned that a few of the terms used in the Study 1 measure (e.g., 'comprehensive') might lead chief executives to think in terms of completeness (see Appendix 1). We believe, however, that chief executives focused on simple amount of activity when providing data. In Fredrickson's work (Fredrickson, 1984; Fredrickson and Mitchell, 1984), executive responses to the measure we use here were very highly correlated with responses to other measures that did not contain terms such as 'comprehensive' and that were clearly focused on amount of activity. Thus, available previous evidence indicates informants focus on simple amount of activity when using the measure in question.

<sup>4</sup> The extensiveness measure is focused on the output of the planning process (see Appendix 1). The assumption we make is that an extensive plan is the result of an extensive planning process; i.e., that an extensive plan is the result of a large amount of investigatory activity. The measure does not provide clear information concerning completeness of planning (e.g., we do not know how many long-range objectives were considered relative to the total number of objectives that were theoretically possible for a particular firm), but this is not an issue as we only needed a general indication of amount of investigatory activity.

Table 1. Interitem reliabilities, means, standard deviations, and correlations among variables for Study 1

Variable	Interitem Reliability	Mean	S.D.	1	2	3	4	5	6
1. Comprehensiveness	0.84	11.82	3.96						
2. Extensiveness		1.82	0.73	0.21					
3. Overall cognitive diversity	0.81	11.53	3.56	-0.49**	-0.30†				
4. Preference diversity	0.74	6.05	1.99	-0.50**	-0.42**	0.91***			
5. Belief diversity	0.63	5.47	1.93	-0.39*	-0.13	0.91***	0.66***		
6. Size		2108.80	5286.70	0.05	0.38*	-0.11	-0.13	-0.06	
7. Turbulence	0.62	18.11	4.68	0.03	-0.06	-0.02	-0.01	-0.03	-0.11

N = 38

†  $p < 0.10$ ; \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ Table 2. Comprehensiveness and extensiveness regressed onto cognitive diversity and control variables<sup>a,b</sup>

Variable	Comprehensiveness			Extensiveness		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Overall cognitive diversity	-0.541** (0.167)			-0.055† (0.031)		
Preference diversity		-0.993** (0.299)			-0.139* (0.054)	
Belief diversity			-0.793* (0.325)			-0.040 (0.060)
Size	0.000 (0.000)	-0.000 (0.000)	0.000 (0.000)	0.000* (0.000)	0.000* (0.000)	0.000* (0.000)
Turbulence	0.012 (0.128)	0.016 (0.127)	0.014 (0.135)	-0.004 (0.024)	-0.004 (0.023)	-0.003 (0.025)
Intercept	17.83	17.55	15.86	2.42	2.64	1.98
Multiple R	0.49*	0.50*	0.39	0.47*	0.54**	0.40
Adjusted R <sup>2</sup>	0.17*	0.18*	0.08	0.15*	0.22**	0.08

<sup>a</sup> Table entries are unstandardized regression coefficients; standard errors are in parentheses.<sup>b</sup> N = 38†  $p < 0.10$ ; \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ 

sity. Apparently the counter arguments supporting the negative effects of diversity may be more valid than the dominant arguments.

To investigate whether diversity related to goals is more important than diversity related to cause-effect beliefs, the overall cognitive diversity scale was split into subscales representing preference diversity and belief diversity. Because the subscales were highly correlated ( $r = 0.66$ ), two separate regression analyses were conducted. In these analyses, preference diversity but not belief diversity was found to have a significant negative effect (see Table 2, and note that belief

diversity had a significant coefficient but its overall regression model was not significant).

In the second set of regression analyses, extensiveness was regressed onto cognitive diversity and the control variables. As shown in Table 2, the results are consistent with the comprehensiveness results in suggesting that overall cognitive diversity negatively affects extensiveness ( $p < 0.10$ ). The results are also consistent in suggesting that preference diversity is important while belief diversity is not (see Table 2). Apparently, disagreements over preferred goals for the firm are much more difficult to deal with in

the context of strategic decision-making than are disagreements concerning cause–effect beliefs.

## Study 2

### Sample

Chief administrators of 198 Texas hospitals were asked to include their hospitals in this study. One-hundred and six of the contacted administrators agreed to help. The high participation rate of 54 percent is probably attributable to the participation request being made on the letterhead of a university with high status in the state of Texas. The 198 Texas hospitals were randomly selected from a list of hospitals published by the American Hospital Association.

### Data and measures

Data were collected from chief administrators through a four-page questionnaire. The measures used in this study were slightly modified versions of the measures used in Study 1. Modifications were made to focus the measures on the hospital sector. Also, the turbulence measure was expanded from four to eight items, and 5-point scales rather than 7-point scales were used for comprehensiveness, cognitive diversity, and turbulence.

### Results

Interitem reliability estimates, means, standard deviations, and correlations among the variables are presented in Table 3. The reliability estimates

range from acceptable (0.65) to excellent (0.90), with an average of 0.83.

In the first set of regression analyses, comprehensiveness was regressed onto cognitive diversity, turbulence, and size. As shown in Table 4, the results suggest that cognitive diversity has little impact on comprehensiveness. This finding is counter to our earlier finding, and may be the result of industry differences; i.e., it may be that diversity has important effects in business firms but not in hospitals. In hospitals, it may be the case that variables such as private vs. government ownership, contribution of federal reimbursement programs, and urban vs. rural setting are much more important determinants of comprehensiveness than is cognitive diversity. A second possibility is that sampling error in the population of hospitals led to the insignificant results in this particular study.

In the second set of regression analyses, extensiveness was regressed onto cognitive diversity and the control variables. Consistent with Study 1, the results suggest that overall cognitive diversity has a negative effect on extensiveness ( $p < 0.05$ , see Table 4). Also consistent with Study 1, the results suggest that preference diversity has important effects while belief diversity does not (see Table 4).

## Study 3

### Sample

The chief executives (e.g., presidents, general managers, and division vice-presidents) of 396 strategic business units were contacted by phone

Table 3. Interitem reliabilites, means, standard deviations, and correlations for Study 2

Variable	Interitem Reliability	Mean	S.D.	1	2	3	4	5	6
1. Comprehensiveness	0.85	9.24	2.39						
2. Extensiveness		1.79	0.73	0.32***					
3. Overall cognitive diversity	0.90	8.58	3.18	-0.15	-0.26**				
4. Preference diversity	0.84	4.30	1.60	-0.12	-0.31**	0.93***			
5. Belief diversity	0.89	4.29	1.80	-0.16†	-0.19†	0.94***	0.74***		
6. Size		682.70	1167.90	0.30**	0.31**	-0.10	-0.05	-0.13	
7. Turbulence	0.65	27.80	4.53	0.04	0.15	-0.04	-0.01	-0.06	0.08

$N = 106$

†  $p < 0.10$ ; \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$



Table 4. Comprehensiveness and extensiveness regressed onto cognitive diversity and control variables<sup>a,b</sup>

Variable	Comprehensiveness			Extensiveness		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Overall cognitive diversity	-0.092 (0.071)			-0.053* (0.021)		
Preference diversity		-0.155 (0.140)			-0.133* (0.040)	
Belief diversity			-0.163 (0.126)			-0.059 (0.038)
Size	0.001** (0.000)	0.001** (0.000)	0.001** (0.000)	0.000** (0.000)	0.000** (0.000)	0.000** (0.000)
Turbulence	0.004 (0.050)	0.006 (0.050)	0.003 (0.050)	0.019 (0.015)	0.020 (0.014)	0.019 (0.015)
Intercept	9.52	9.35	9.48	1.61	1.70	1.41
Multiple <i>R</i>	0.32*	0.32*	0.32*	0.40***	0.44***	0.36**
Adjusted <i>R</i> <sup>2</sup>	0.08*	0.07*	0.08*	0.14***	0.17***	0.11**

<sup>a</sup> Table entries are unstandardized regression coefficients; standard errors are in parentheses.

<sup>b</sup> *N* = 106

† *p* < 0.10; \* *p* < 0.05; \*\* *p* < 0.01; \*\*\* *p* < 0.001

and asked to participate in this study along with their upper-echelon executive teams. Seventy-nine agreed to participate (20%). After the chief executive had committed to participating in the study, participation by individual members of the upper-echelon team was exceptionally high, with 82 percent of mailed surveys being completed and returned in the typical business unit. The 396 business units were random selected from 71 industries that had been chosen so as to maximize variance on three industry variables: industrial stability, predictability, and munificence. Maximizing variance on these variables was important for another study (see Glick *et al.*, 1993). This procedure resulted in a variety of industries being represented in the final sample (e.g., gold and silver mining, medical equipment rental and leasing, motor home manufacturing, metal can manufacturing). Data were also collected from six organizations during a pilot of the questionnaire. The final instrument was identical to the pilot-tested instrument, so these six organizations were included in the analyses, yielding a total sample of 85.

#### Data and measures

*Cognitive diversity* was assessed in two ways. First, the same four scale items and perceptual

key informant methodology (Glick, 1985; Seidler, 1974) from Studies 1 and 2 were used. In this study, however, each executive within a strategic business unit rated the level of diversity among the unit's executives, rather than only the CEO rating the level of diversity. The responses from executives within the same business unit were averaged to arrive at an aggregate score for the business unit as a whole.

Second, the two components of cognitive diversity (preference and belief diversity) were more objectively assessed by asking each executive for his/her preferences and cause-effect beliefs and analytically constructing a measure of diversity based on the within-firm variances. *Preference diversity* was assessed by asking each respondent to rate the importance of 17 operative goals taken from a competing values model of organizational effectiveness (see Appendix 2, and see Dess, 1987, and Quinn and Rohrbaugh, 1983). For each business unit in the sample, coefficients of variation were calculated for each of the 17 items. Each coefficient indicates the extent to which upper-echelon executives within a business unit disagree over the importance of a given goal. Following factor analysis and other scale development techniques (see Miller, 1990; and Glick *et al.*, 1993), these 17 measures were summarized into preference diversity concerning (1) human

resource goals, (2) system-maintenance goals, and (3) profit goals.

*Belief diversity* was measured by asking each executive to rate the efficacy of 22 business tactics that might affect the long-term profitability of the business unit. The list of business tactics was based on the work of Porter (1980) and Robinson and Pearce (1988) (see Appendix 2). Executives were asked how positively or negatively each of the business tactics would influence long-term profitability in their strategic business units. Similar to preference diversity, coefficients of variation were calculated for each business unit, factor analyzed, and then summarized into a smaller set of dimensions. The final dimensions of belief diversity reflected diversity concerning the efficacy of (1) maintaining flexibility, (2) low cost vs. differentiation tactics, (3) innovativeness, and (4) advertising.

*Comprehensiveness* was assessed through five questionnaire items (see Appendix 2). These questionnaire items were developed by Ogilvie and Glick (1990) and were used in the CODE study (see Glick, Huber, Miller, Doty and Sutcliffe, 1990; and Huber and Glick, 1993). The five new items rather than the three items from Studies 1 and 2 were used because we believed that the five new items were less complex, and therefore easier for executives to complete. Because all executives within a strategic business unit were asked the same questions about comprehensiveness, responses from executives within the same business unit were averaged to arrive at aggregate comprehensiveness data for the business unit. The second strategic process variable, *extensiveness*, was not measured in this study.

*Turbulence* was assessed archivally through Standard and Poor's Compustat II industry-segment data file. The two components of turbulence (instability and unpredictability) were measured based on operational definitions of Dess and Beard (1984) and Wholey and Brittain (1989). These two components were combined to yield a measure of turbulence. For further details, see Glick, Ogilvie, and Miller (1990). *Size* was assessed as the number of employees in the strategic business unit.

### Previous analysis

The data underlying our third study have been previously analyzed and the results reported (see

Glick *et al.*, 1993). We extended the earlier work in two important ways. First, we examined the effects of diversity assessed perceptually with key informants and objectively with coefficients of variation, rather than only objectively. This is important in that it allowed us to directly compare the results of two substantially different methodological approaches. Second, we added important control variables. In our earlier work, only the objective diversity variables were used as predictors of comprehensiveness. Adding control variables resulted in belief diversity having a different impact.

### Results

Interitem reliability estimates, means, standard deviations, and correlations among the variables are presented in Table 5. The interitem reliability estimates for the multi-item scales ranged from acceptable (0.60) to excellent (0.93), with an average of 0.75. Interrater reliability analyses were conducted for each measure where multiple executives within a business unit had been asked to rate an attribute of the upper-echelon team or organization (i.e., where multiple executives within a business unit had acted as key informants and their responses had been averaged). These analyses produced highly statistically significant results, with the ANOVA-based ICC (1, *k*) coefficients being 0.50, 0.47, 0.46 and 0.40 for comprehensiveness and the three perceptual key-informant diversity measures (overall cognitive diversity, overall preference diversity, and overall belief diversity) (see Shrout and Fleiss, 1979, for a discussion of intraclass correlation analyses and see Glick, 1985, for a discussion of using these coefficients with a key informant methodology). Although these interrater coefficients are not as strong as we would like them to be, they are comparable to those found in many other studies, and the strong results of this study suggest they are adequate.

In the first set of regression analyses, comprehensiveness was regressed onto cognitive diversity measured through key-informant ratings (i.e., perceptually assessed diversity). As shown in Table 6 (Model 1), the results suggest that overall cognitive diversity has a substantial negative impact on comprehensiveness. This finding is counter to our original hypothesis, but consistent with our finding for business firms in Study 1.

Table 5. Interitem reliabilities, means, standard deviations, and correlations for Study 3

Variable	Interitem Reliability	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Comprehensiveness	0.87	23.94	4.20														
2. Overall cognitive diversity	0.93	10.97	3.56	−0.33**													
3. Preference diversity	0.88	5.61	1.99	−0.32**	0.97***												
4. Belief diversity	0.84	5.36	1.71	−0.31**	0.96***	0.85***											
<i>Preference diversity in terms of:</i>																	
5. Human resource goals	0.86	105.42	45.58	−0.28*	0.31**	0.29**	0.31**										
6. System maintenance goals	0.60	67.58	27.78	−0.01	0.25*	0.24*	0.25*	0.05									
7. Profitability goals	0.71	29.64	14.40	−0.10	0.11	0.11	0.10	−0.12	0.05								
<i>Belief diversity in terms of:</i>																	
8. Maintaining flexibility	0.67	0.00	2.33	−0.21†	0.20†	0.20†	0.19	0.21†	0.18	0.20†							
9. Low costs vs. differentiation	0.61	121.83	35.75	0.08	−0.22†	−0.20†	−0.24*	−0.19	0.10	0.03	0.10						
10. Innovativeness	0.64	54.16	19.75	−0.01	0.19	0.21†	0.17	0.20†	0.22†	0.02	0.10	0.11					
11. Advertising	0.66	0.00	1.73	0.24*	−0.04	−0.05	−0.02	0.00	0.43***	0.02	0.10	0.13	0.26*				
12. Size		3074.60	7069.44	−0.04	−0.17	−0.18†	−0.14	−0.21†	−0.02	0.10	−0.11	0.03	−0.04	0.03			
13. Turbulence	0.71	−18.00	5.16	−0.29**	0.06	0.06	0.06	0.17	−0.00	−0.12	0.09	−0.11	0.04	−0.08	−0.07		
14. Executive tenure		5.06	3.28	0.33**	−0.10	−0.12	−0.06	−0.19	0.14	0.21†	0.10	−0.04	−0.01	0.43***	0.09	−0.06	
15. Executive age		46.88	6.27	0.15	−0.01	−0.00	−0.03	−0.21†	0.03	0.23†	−0.05	0.13	0.12	0.30*	0.19	−0.20	0.59***

*N* = 70 for correlations involving the objective diversity variables, executive tenure, and executive age. *N* = 85 for other correlations.

†  $p < 0.10$ ; \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$

Table 6. Comprehensiveness regressed onto cognitive diversity and control variables<sup>a,b</sup>

Variable	Model 1	Model 2	Model 3	Model 4	Model 5
Overall cognitive diversity	-0.390** (0.120)				
Preference diversity		-0.683** (0.215)			
Belief diversity			-0.765** (0.250)		
<i>Preference diversity in terms of:</i>					
Human resource goals				-0.020* (0.010)	
System maintenance goals				-0.007 (0.015)	
Profitability goals				-0.052† (0.030)	
<i>Belief diversity in terms of:</i>					
Maintaining flexibility					-0.460* (0.185)
Low costs vs. differentiation					0.012 (0.012)
Innovativeness					0.003 (0.023)
Advertising					0.237 (0.281)
Size	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)
Turbulence	-0.228** (0.081)	-0.230** (0.082)	-0.229** (0.082)	-0.183* (0.078)	-0.173* (0.078)
Executive tenure				0.474** (0.160)	0.512** (0.176)
Executive age				-0.074 (0.085)	-0.120 (0.088)
Intercept	24.33	23.86	24.11	26.08	22.46
Multiple R	0.44***	0.44***	0.43***	0.54**	0.54**
Adjusted R <sup>2</sup>	0.17***	0.16***	0.15***	0.21**	0.20**

<sup>a</sup> Table entries are unstandardized regression coefficients; standard errors are in parentheses.

<sup>b</sup>  $N = 85$  for Models 1, 2, and 3.  $N = 70$  for Models 4 and 5.

†  $p < 0.10$ ; \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$

Further, both components of our perceptual key-informant diversity variable had negative effects (see Models 2 and 3 in Table 6).

In the second set of regression analyses, comprehensiveness was regressed onto the three objective measures of preference diversity and the four objective measures of belief diversity. For these analyses, the sample size fell from 85 to 70, as we only used business units where most or all of the executives had supplied objective preference and belief data (we received less than 60% of the executive questionnaires from each of nine business units, and we sought only chief

executive input from another six of the 85 business units). The coefficients of variation described earlier are only meaningful if most or all team members within a given organization have supplied data. Also, because a majority of executives within each of the 70 organizations had supplied data, we could construct meaningful within-organization averages for the personal characteristics of tenure and age (each executive participating in our third study had been asked for information concerning tenure and age). Thus, we were able to include average *executive-team tenure* and average *executive age* as additional con-

trol variables. Numerous researchers (e.g., Hambrick and Mason, 1984; Wiersema and Bantel, 1992) have argued that average executive tenure and/or age have an impact on strategic decision processes.

The results of the regression analyses suggest that preference diversity concerning human resource goals and preference diversity concerning profit goals negatively impact comprehensiveness (see Table 6). The results also suggest that belief diversity concerning the efficacy of maintaining flexibility negatively impacts comprehensiveness (see Table 6). Thus, analyses based on more objectively oriented measures of diversity yielded the same results as our earlier analyses based on perceptual ratings of diversity. The results of our objective analyses, however, suggest which specific domains of cognitive diversity are most likely to have strong effects.

## DISCUSSION

As noted earlier, the most popular perspective on diversity suggests that high levels of diversity promote comprehensive analyses of immediate opportunities and threats and extensive long-range planning. This popular perspective evolved from psychological research on group problem-solving (Bantel and Jackson, 1989), and is reflected in many applied investigations of problem-solving (see, for example, Janis, 1972). This perspective, however, appears to have shortcomings. In particular, it does not properly accommodate the problems that high levels of diversity cause with respect to communication, integration, and political behavior. As noted in our earlier discussion, these problems can lead to the avoidance of comprehensive decision-making and extensive planning. In light of our empirical results, these problems apparently are overwhelming any positive effects that diversity may have in terms of promoting comprehensiveness and extensiveness.

### Linkages to firm performance

The primary purpose of the work reported here was to synthesize theoretical arguments focused on executive diversity and process variables, and to test the resulting hypotheses. By examining the connection between diversity and two process variables that had previously been found to influ-

ence performance, we were attempting to make progress on two fronts. First, we were attempting to show that cognitive diversity has consistent and important effects on key process variables. Second, we were attempting to generate evidence supportive of the claim that executive diversity indirectly impacts performance. Our results, combined with the results of previously published comprehensiveness–performance studies and extensiveness–performance studies (e.g., Miller and Cardinal, 1994), provide substance to the claim that executive diversity indirectly influences firm performance (in a negative fashion, see Figure 1).

### Implications for research

Our findings have several implications for researchers. One such implication concerns the most popular perspective on cognitive diversity. In short, this perspective requires adjustment. As discussed above, this perspective appears to be inadequate for explaining the effects of cognitive diversity because it does not properly accommodate the problems high levels of diversity cause with respect to communication, integration, and political behavior. These problems appear to be overwhelming any positive decisional effects of high diversity in executive groups. Even so, strategic management researchers should not conclude that high levels of cognitive diversity must necessarily harm executive decision-making and firm performance. Instead, they should search for or develop methods to overcome the problems and more effectively utilize the advantages of cognitive diversity. As our findings indicate, such methods are not in wide use today.

A second implication is that cognitive diversity rather than demographic diversity may be the most fruitful arena for research. Researchers have produced many insignificant findings when investigating executive demographic diversity. In contrast, we found significant negative effects for cognitive diversity in most cases.

One of the main reasons why researchers have focused their attention on demographic rather than cognitive diversity is that demographic data can be easily obtained through archival sources, or through a very easy to complete questionnaire. In order to obtain rich cognitive data concerning goals and cause–effect beliefs, lengthy interviews or lengthy questionnaires must be administered

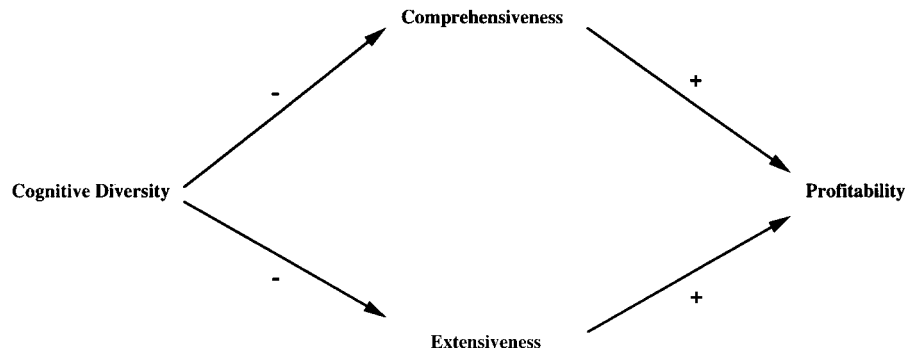


Figure 1. Diversity–profitability causal model

to each executive or at least to most of the executives in a given firm. It may be, however, that lean cognitive data are sufficient, and that cognitive diversity is much easier to study than previously thought. Our findings suggest that perceived executive diversity measured through a few questions asked only of the chief executive is a reasonable proxy for actual cognitive diversity among executives. We found that obtaining perceptions of cognitive diversity from the chief executive yielded the same results as obtaining objective data from each executive and creating diversity measures from those data. Thus, although definitely preferable, it appears that collecting rich data from each upper-echelon executive is not always required. Chief executives seem to understand and be able to accurately describe their upper-echelon groups.

### Cautionary notes

Despite our use of three separate studies based on 229 organizations, several cautionary notes are in order. The first such note concerns our definition of an upper-echelon group. We defined an upper-echelon group as all executives who report to the chief executive officer or chief operating officer. Thus, marginal executives who do not strongly impact strategic decision processes were included in our definition, and were included in the group of executives our diversity measures were focused upon. This is problematic because the inclusion of executives who have little impact on decisions creates noise in the diversity data and reduces the strength of findings.

The second cautionary note concerns our measure of extensiveness. Unlike our measures of comprehensiveness, which are focused on the

process of handling current opportunities and threats, our measure of extensiveness is focused on the output of the planning process rather than the process itself. The assumption was made that an extensive plan is the result of an extensive planning process. To the extent that our assumption is in error, our results related to extensiveness may mean something other than what we take them to mean.

The third cautionary note concerns the cross-sectional nature of our work. With a cross-sectional approach, we cannot be certain of causal direction. Consistent with the causal reasoning we put forth earlier in the manuscript, we have assumed that diversity influences comprehensiveness and extensiveness. It may be, however, that comprehensiveness and extensiveness influence cognitive diversity. It may be that high comprehensiveness and extensiveness result in low cognitive diversity.

This possibility of reverse causality can be challenged on the grounds that preferences and beliefs underlying executives' ongoing organizational perspectives may be difficult to alter in the context of strategic decision-making. One reason is that strategic issues by their very nature are unstructured and ambiguous: 'almost nothing is given or easily determined' (Mintzberg, Raisinghani, and Theoret, 1976). Given the high level of ambiguity, discussions and analyses are often inconclusive and therefore are unlikely to alter the schemas (i.e., cognitive structures) underlying an executive's general, ongoing preferences and beliefs. Any schemas that are altered probably will be those that are specific to a particular decision (e.g., schemas underlying favored alternatives for a particular strategic decision rather than the more enduring schemas underlying ongoing

ing preferences concerning more abstract organizational goals). Research from the field of behavioral decision theory offers support for this reasoning. This research suggests that information search bias, confirmation bias, and other biases often lead people to see that which is consistent with their prior thinking (see Bazerman, 1994).

A second reason the schemas underlying ongoing preferences and beliefs may be difficult to alter is that organizational and personal factors driving these schemas tend to be fairly stable. An upper-echelon executive's functional background, for example, tends to be stable and may have an impact on preferences and beliefs. Daft and Lengel note that a 'person trained as a scientist may have a difficult time understanding the point of view of a lawyer. A common perspective does not exist. Coding schemes are dissimilar' (1986: 564). Supporting this line of reasoning, Melone (1994) recently found that financial executives and development executives differed in how they viewed the same information. Earlier work by Dearborn and Simon (1958), Lawrence and Lorsch (1967), and others also supports this line of reasoning.

Although the above discussion suggests that reverse causality is not highly likely, it is important to note that the potential for reverse causality does not call into question one of our more interesting findings: the most popular perspective in our field holds that diversity promotes comprehensiveness and extensiveness (i.e., cognitive diversity has positive effects) but we found negative correlations and regression coefficients.

## CONCLUSION

It is tempting to conclude that high levels of cognitive diversity should be avoided in executive groups. Although plausible and perhaps valid, this conclusion is premature. Further research is needed to determine whether high levels of diversity can be managed better than they are currently being managed. It may be that Maier (1967) was correct several decades ago: disagreement in a group can be either an asset or a liability depending upon how the group leader handles the diversity. The bottom line appears to be that high levels of cognitive diversity can be very problematic and cognitive diversity currently is not being dealt with effectively in most organizations.

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## APPENDIX 1: QUESTIONNAIRE ITEMS FOR STUDY 1

### Cognitive diversity<sup>a</sup>

How strongly do members of the top management team agree or disagree with each other about . . .

- |   | We strongly disagree | We strongly agree |
|---|----------------------|-------------------|
| a. the best way to maximize the firm's long term profitability?         | 1 2 3 4 5 6 7        | 1 2 3 4 5 6 7     |
| b. what the firm's goal priorities should be?                           | 1 2 3 4 5 6 7        | 1 2 3 4 5 6 7     |
| c. the best way to ensure the firm's long-run survival?                 | 1 2 3 4 5 6 7        | 1 2 3 4 5 6 7     |
| d. which organizational objectives should be considered most important? | 1 2 3 4 5 6 7        | 1 2 3 4 5 6 7     |

### Comprehensiveness

Some firms are very comprehensive when making important, non-routine decisions. Other firms are very non-comprehensive when making such decisions. Both approaches can be very effective. Please indicate how comprehensive your firm is by answering the following questions.

- a. A firm that is very comprehensive in *determining the cause* of a major problem might form a special group of several members, make extensive use of outsiders, conduct extensive analyses, allow unlimited expenses, involve people with diverse backgrounds, and consider all possible causes. On the other hand, a very non-comprehensive firm might rely entirely on the ideas and experience of one or two employees. Which of the numbers to the right *best describes* YOUR FIRM's approach?
- Very non-comprehensive                      Very comprehensive  
1 2 3 4 5 6 7
- b. A firm that is very comprehensive in *generating alternatives* to solve an important problem might form a special group, use scheduled meetings, use brainstorming sessions, prepare lists of alternatives, and spend resources to involve outsiders who could help identify all possible alternatives. In a very non-comprehensive firm, one or two employees might simply rely on their experience to identify a satisfactory solution. Which of the numbers to the right *best describes* YOUR FIRM's approach?
- Very non-comprehensive                      Very comprehensive  
1 2 3 4 5 6 7
- c. A firm that is very comprehensive in *evaluating a particular action* might form a special group of employees and outsiders with diverse expertise, set specific criteria, state assumptions, make contingency plans, and conduct extensive analyses that directly compare several alternatives. In contrast, a very non-comprehensive firm might base a decision entirely on the experience and 'feeling' of one or two employees. Which of the numbers to the right *best describes* YOUR FIRM's approach?
- Very non-comprehensive                      Very comprehensive  
1 2 3 4 5 6 7

### Extensiveness

Check the most accurate statement (check only one).

- ☐ Your firm has no written strategic plan covering at least three years into the future.
- ☐ Your firm has a written strategic plan which:
- a. covers at least three years into the future,
  - b. includes the specification of objectives and goals,
  - c. includes the selection of long-range strategies, and
  - d. includes the determination of future resources required.
- ☐ Your firm has a written strategic plan which incorporates all four elements noted above plus:
- a. procedures for anticipating or detecting error in, or failures of, the plan and for preventing or correcting problems on a continuing basis and
  - b. some attempt to account for factors outside the immediate environment of the firm.

### Turbulence<sup>b</sup>

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

	Strongly disagree	Strongly agree
a. Products/services become obsolete very slowly in your firm's principal industry.	1 2 3 4 5 6 7	
b. Your firm seldom needs to change its marketing practices to keep up with competitors.	1 2 3 4 5 6 7	
c. Consumer demand and preferences are very easy to forecast in your firm's principal industry.	1 2 3 4 5 6 7	
d. Your firm must frequently change its production/service technology to keep up with competitors and/or consumer preferences.	1 2 3 4 5 6 7	

<sup>a</sup> All cognitive diversity items were reverse scored.

<sup>b</sup> The first three turbulence items were reverse scored.

## APPENDIX 2: Questionnaire Items for Study 3

### Preference items

A firm cannot pursue all possible goals because resources are limited and because some goals are incompatible with other goals. In your opinion, how important is it for your firm to maximize . . .

	Not very important	Very important
a. dividends distributed to shareholders?	1 2 3 4 5 6 7	
b. growth in assets and reserves?	1 2 3 4 5 6 7	
c. net profit over the coming year?	1 2 3 4 5 6 7	
d. net profit over the next five years?	1 2 3 4 5 6 7	
e. sales growth?	1 2 3 4 5 6 7	
f. recognition as an innovative firm?	1 2 3 4 5 6 7	
g. cost advantages over competitors?	1 2 3 4 5 6 7	
h. employee compensation and benefits?	1 2 3 4 5 6 7	
i. retention of key personnel?	1 2 3 4 5 6 7	
j. employee satisfaction and morale?	1 2 3 4 5 6 7	
k. new product/service offerings?	1 2 3 4 5 6 7	
l. prestige of the firm?	1 2 3 4 5 6 7	
m. market penetration?	1 2 3 4 5 6 7	
n. management development?	1 2 3 4 5 6 7	
o. community service and goodwill?	1 2 3 4 5 6 7	
p. effectiveness of communication among subunits?	1 2 3 4 5 6 7	
q. quality of procedures used in making key decisions?	1 2 3 4 5 6 7	

### Belief items

If your firm were to use the following business tactics, how positively or negatively would each one influence long-term profitability?

	Very negatively	Very positively
a. Pricing below competitors.	1 2 3 4 5 6 7 8 9	
b. Targeting high-price market segments.	1 2 3 4 5 6 7 8 9	
c. Frequently developing new products/services.	1 2 3 4 5 6 7 8 9	
d. Refining existing products.	1 2 3 4 5 6 7 8 9	
e. Providing extensive customer service.	1 2 3 4 5 6 7 8 9	
f. Maintaining or seeking the lowest cost-per-unit in the industry.	1 2 3 4 5 6 7 8 9	
g. Advertising more than the average firm in the industry.	1 2 3 4 5 6 7 8 9	

- |   |                   |
|---|-------------------|
| h. Offering a broad range of products/services.                         | 1 2 3 4 5 6 7 8 9 |
| i. Utilizing extremely strict control procedures.                       | 1 2 3 4 5 6 7 8 9 |
| j. Constantly striving for a more highly trained workforce.             | 1 2 3 4 5 6 7 8 9 |
| k. Building and/or maintaining the firm's name recognition.             | 1 2 3 4 5 6 7 8 9 |
| l. Being innovative in the techniques used to market products/services. | 1 2 3 4 5 6 7 8 9 |
| m. Controlling the distribution of your firm's products/services.       | 1 2 3 4 5 6 7 8 9 |
| n. Investing in strategies to improve raw material procurement.         | 1 2 3 4 5 6 7 8 9 |
| o. Minimizing the use of outside financing.                             | 1 2 3 4 5 6 7 8 9 |
| p. Serving particular geographic regions.                               | 1 2 3 4 5 6 7 8 9 |
| q. Developing and/or maintaining a solid reputation in the industry.    | 1 2 3 4 5 6 7 8 9 |
| r. Forecasting market growth.   | 1 2 3 4 5 6 7 8 9 |
| s. Emphasizing specialty products/services.                             | 1 2 3 4 5 6 7 8 9 |
| t. Being innovative in the way you produce your products/services.      | 1 2 3 4 5 6 7 8 9 |
| u. Maintaining high staffing levels.                                    | 1 2 3 4 5 6 7 8 9 |
| v. Maintaining high inventory levels.                                   | 1 2 3 4 5 6 7 8 9 |

### Comprehensiveness

When confronted with an important, non-routine problem or opportunity, to what extent does you firm . . .

- |   | Not at all    | To a great extent |
|---|---------------|-------------------|
| a. develop many alternative responses?  | 1 2 3 4 5 6 7 |                   |
| b. consider many diverse criteria for eliminating possible courses of action? | 1 2 3 4 5 6 7 |                   |
| c. thoroughly examine multiple explanations for the problem or opportunity?   | 1 2 3 4 5 6 7 |                   |
| d. conduct multiple examinations of any suggested course of action?           | 1 2 3 4 5 6 7 |                   |
| e. search extensively for possible responses?                                 | 1 2 3 4 5 6 7 |                   |