

Making Sense of the Environment: The Role of Perceived Effectiveness

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This manuscript develops and explores two ideas: (1) that perceptions of environmental uncertainty are after-the-fact rationalizations used by decision makers to explain strong or weak effectiveness assessments, and (2) that different contexts motivate different sense-making outcomes. The findings, based on a sample of senior decision makers from 34 firms in two industries, suggest that assessments of effectiveness and perceptions of environmental uncertainty are related through decision makers' sense-making efforts. The manuscript also addresses the limitations and implications of these results.

KEY WORDS: decision making; environmental uncertainty; perceived effectiveness; sense-making.

INTRODUCTION

Environments and effectiveness have been theoretically connected since organizations came to be viewed as open systems (Katz & Kahn, 1966; Thompson, 1967). A major mechanism used to explain this connection has been the concept of perceived environmental uncertainty (PEU) which describes the state where individuals do not have the information necessary to make accurate predictions due to conditions which exist in the environment (Milliken, 1987).

In both the strategic management (e.g., Hambrick, 1983; Miller, 1988) and organization theory (e.g., Lawrence & Lorsch, 1969; Duncan, 1972) literatures, the connection between perceived environmental uncertainty

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and effectiveness is typically explained using ideas from contingency theory. Contingency theory assumes that the environment poses certain information processing, resource or legitimacy demands on the organization. These demands, in turn, are either met or not met through the organization's structure, strategy or some combination of the two, leading to different levels of organizational effectiveness. In this framework, researchers generally treat environmental uncertainty as an independent variable in causal models of organizational effectiveness.

This paper departs from this traditional view by suggesting that perceptions of environmental uncertainty, rather than effectiveness, may be the variable to be explained in exploring the relationship between perceptions of environmental uncertainty and effectiveness. In particular, it is argued that perceptions of environmental uncertainty may be related to decision makers' attempts to rationalize or understand the level of effectiveness that they perceive their firm or unit has achieved (Milliken, 1990). This proposition rests on the assumption that PEU and effectiveness are related through the interpretive or sense-making activities of organizational members. Consistent with the assumptions of social constructionist theories (Berger & Luckmann, 1967) as applied in organizational settings, it is argued that decision makers creatively and actively make sense of the world they live in by attending to salient cues (Weick, 1979; Louis, 1980; Daft & Weick, 1984; Smircich & Stubbart, 1985). In particular, it is argued that one critical cue for these sense-making activities is a decision maker's perception of how well their unit or organization is performing. It is a view that is consistent with the growing understanding of how decision makers interpret their environments, and addresses the need to discover more about these perspectives (Daft & Weick, 1984; Schwenk, 1988; Stubbart, 1989; Isabella, 1990).

This paper begins with a general justification for the sense-making perspective. It then develops hypotheses about a set of conditions that are expected to strengthen or weaken the perceived effectiveness-perceived uncertainty relationship if this sense-making perspective applies in organizational settings. The paper develops and tests hypotheses using a sample of managers from 17 firms in the airlines and 17 firms in the corrugated shipping container industries. The paper concludes with a discussion of theoretical and research implications. We pay particular attention to the implications of our findings for decision making in the airlines firms in our sample. Data for this study were gathered in 1984–1985, the eve of the major bankruptcies, mergers, and acquisitions which ultimately followed the deregulation of the U.S. airlines industry (Only Braniff and Continental had filed for bankruptcy before that time and names such as Eastern, Frontier, Republic, Western, Ozark, Piedmont, and others

could still be found at major U.S. airports). We believe that our findings may provide additional insight to understanding patterns of airline survival and failure in the 1990s.

LINKING EFFECTIVENESS AND PEU

There are several factors that can motivate decision makers to use interpretations of an organization's or subunit's performance to form impressions of conditions that exist in the environment. First, both internal and external constituents frequently ask organizational decision makers to measure and explain their unit's performance. Thus, effectiveness evaluations are often made salient by established reporting routines and stakeholders' inquiries about the unit's success relative to past performance, the performance of other units in the same organization or the performance of competitors. The frequency of demands for such performance "reports" or updates suggests that inferences about effectiveness are routine ingredients for making inferences about the conditions in a decision-maker's world, such as the general state of the environment.

A second reason that assessments of effectiveness may be related to environmental interpretations is that these assessments act as important sources of feedback information that prompt decision makers' causal sense-making activities. Bettman and Weitz (1983), Staw, McKechnie and Puffer (1983), and Salancik and Meindl (1984) have demonstrated this phenomenon in their analysis of organizational performance and the management of meaning as revealed in annual reports. Their studies are a natural extension of the claim made by psychologists (e.g., attribution theory: Kelley, 1967; Weiner, 1971) and sociologists (e.g., social accounts theory: Scott & Lyman, 1968) that individuals often use the features of a given situation (such as effectiveness assessments) to guide their interpretations of the world in which they exist and to assign allocations of blame. Interpretations of the environment are one of several possible products of these inferential, justification, and interpretive processes.

Two arguments suggest that decision makers who view their firm or unit as ineffective, will see their organization's environment as more uncertain. The first argument is drawn from ideas about motivational processes that are based on self-presentational (Baumeister, 1982) or impression management (Goffman, 1952) pressures that decision makers feel in organizations. These pressures suggest that decision makers will exert effort to create and maintain a public self that associates themselves with good unit or organizational performance, but disassociates the self from bad performance. The second argument is based on a simple logic that many decision makers apply to make sense of their effectiveness assess-

ments—good performance suggests a decision maker knows what he/she is doing.

Maintaining a Positive Social Image Through Account Making. When a unit or organization is performing poorly in a decision maker's eyes, he/she feels the need to explain or provide an account for this less than ideal situation (Hewitt & Hall, 1973). One possible response is to blame the situation on the environment by constructing it as highly uncertain, thus accounting for the effectiveness gap while, at the same time, maintaining a more positive self-image and some sense of control (Salancik & Meindl, 1984). Psychologists who study individuals' causal sense-making processes use an information processing argument to explain this relationship. These researchers typically argue that individuals will attribute successful outcomes to themselves as "causes," while attributing unsuccessful outcomes to outside or external sources (Weiner, 1971). Organizational theorists have expanded this logic suggesting that social and political pressures add to the attribution logic, encouraging individuals to attribute ineffectiveness externally, and effectiveness internally in order to maintain a positive and viable social and political image (Staw et al., 1983). Perceived ineffectiveness may be seen as evidence of not knowing how to deal with the environment, i.e., not being in control (Pfeffer, 1981; Sutton & Callahan, 1987). However, if decision makers construct the environment as complex and unstable, then they have a reasonable explanation to offer others that explains a less-than-satisfactory performance, while doing minimal damage to their public image of effectiveness and control. Thus based on both an attribution and image enhancement logic, perceived effectiveness is expected to be negatively correlated with environmental uncertainty.

Environments Look Different When Succeeding vs. Failing. The second argument that posits a negative relationship between effectiveness assessments and perceptions of environmental uncertainty is based on an idea that, when a decision maker's organization seems to be doing well, individuals assume that they, and those around them, know what they are doing. These assumptions translate into a view of the environment as predictable and stable, i.e., certain. In addition, it has been argued that decision makers in successful organizations may be less vigilant, and therefore may not notice some of the complexity or instability in the world around them (Dutton & Duncan, 1987; Starbuck & Milliken, 1988; Milliken, 1990).

In contrast, where decision makers believe that their unit or organization is doing poorly, they may become more tentative about how to deal with problems, how to discriminate good from bad decisions, and how changing conditions will affect their decisions and those of others. In other words, in a context where performance is judged as less-than-ideal, decision

makers' understandings of the "way things work around here" are subject to much graver doubts and thus less firmly held, with decision makers seeing the environment around the organization as much more uncertain. In contrast to the account-making perspective, this logic for connecting assessments of effectiveness with perceptions of uncertainty makes no claims about decision makers' desires to account for poor performance. It simply suggests that assessments of effectiveness either confirm or disconfirm decision makers' sense that they know what they are doing. Where effectiveness is judged as high, managers conclude that they know what they are doing, and thus the environment looks relatively certain and comprehensible. However, where effectiveness is low, the environment appears significantly less clear, and less certain.

MODERATING CONDITIONS

Different contexts create different motivating conditions for decision makers to construct their environments in a particular way (Daft & Weick, 1984; Milliken, 1990) and it is argued here that organizational or decision conditions that create instability will affect the strength of the relationship between perceptions of unit effectiveness and perceived environmental uncertainty. Specifically, it is argued that the greater the instability of the context in which a decision maker functions, the more negative will be the relationship between the decision maker's perceptions of uncertainty and perceptions of effectiveness. We explored this logic by focusing on two conditions that should contribute to such instability: (1) when objective organizational performance is poor, and (2) when the environment is volatile.

The dominant logic that underlies the proposed moderating effects is rooted in sociological studies of social interaction that substantiate the importance of creating a sense of normalcy or stability to conduct everyday interaction in organizations (Mills, 1940; Goffman, 1952). This sense of normalcy depends on sustaining a consistent set of meanings that inform how events and actions are interpreted by others (Berger & Luckmann, 1967).

For key decision makers in organizations, this sense of stability is critical for maintaining an image of effective leadership (e.g., Pfeffer, 1981; Sutton & Callahan, 1987) and where decision makers are held accountable for the actions of others, creating an image of stability and effectiveness is an ongoing social pressure (Tetlock, 1985). In addition, the desire to enhance one's own image by being associated with an organization whose image is positive, reinforces the premium put on stability in a given context (Sutton & Callahan, 1987). The existence of instability in a context—which may derive from any number of factors, including poor "objective" organ-

izational performance or a volatile industry context—creates additional motivation to see environmental certainty when the organization is performing well, as managers and other key decision makers attempt to reinforce their image of effective leadership. In contrast, when these same conditions tend to make one's world more unstable but the organization is perceived as performing poorly, decision makers are motivated to see the environment as less interpretable and more uncertain to account for, or explain, this poor performance. In other words, unstable conditions make a decision-maker's positive image more difficult and problematic to sustain than more stable conditions, exciting decision makers to "repair the breaks and restore the meaning" (Hewitt & Stokes, 1975, p. 1). One way that this meaning is restored is by constructing conditions as complex and changing, which helps to "account" for the stress or disruption that the decision maker is experiencing. These constructions, which help to create a sense of stability for the decision maker, empirically produce a more negative relationship between effectiveness and perceptions of uncertainty, which may be measured by the strength of the correlation between these two factors. This general logic leads to the following hypotheses:

Hypothesis 1. For decision makers working in organizations where objective performance is low, the relationship (correlation) between perceived effectiveness and perceived environmental uncertainty will be more negative than for decision makers working in organizations where objective performance is high.

Hypothesis 2. For decision makers working in volatile, unpredictable environments, the relationship (correlation) between perceived effectiveness and perceived environmental uncertainty will be more negative than for decision makers working in less volatile environments.

METHODS

We tested these correlational hypotheses using a sample of senior managers drawn from 34 organizations in the airlines and container industries. As explained shortly, the study focused on these two industries because we expected inter-industry comparisons to yield subsamples of individual decision makers facing significantly different levels of perceived environmental uncertainty and environmental volatility. At the same time, intra-industry comparisons were likely to yield a meaningful range of objective organizational performance and individual perceptions of organization effectiveness. These industry contrasts were crucial to studying the relationships of interest in this research.

Sample of Firms

Using criteria established by Lawrence and Lorsch (1969), we identified two industries thought to be at opposite ends of their stable/dynamic, certain/uncertain scales. We selected producers of corrugated shipping containers to represent a stable, more certain environment while domestic passenger airlines were selected to represent a dynamic, uncertain environment. Confirming these choices, there were significant differences between the two industries in terms of both sales and earnings instability (Dess & Beard, 1984; Wholey & Brittain, 1989) for the 5-year period (1979-1983) immediately preceding data gathering for this study. (Data were gathered in 1984-1985 as part of a larger study of organizational buying behavior. Some of these data have been previously discussed in McCabe (1987, 1990).)

Using the membership list of the major trade association in each industry, we contacted a total of 25 major airlines and 24 large container producers. This group represented all airlines operating a minimum of ten medium size jet aircraft and container producers operating a minimum of five converting plants. Ultimately, 17 firms from each industry participated in this research. Participating firms were generally somewhat smaller and more profitable than non-participants. In the container industry, these differences were not significant (mean revenues of \$528 million and 3.8% return on sales for respondent firms and revenues of \$620 million and a 1.6% return on sales for non-respondents). In the airlines industry, the difference in revenues was significant ($p < .05$) with the mean revenue for respondents (\$1.0 billion) significantly lower than non-respondents (\$2.3 billion). However, return on sales of 1.0% for non-respondents did not significantly differ from the -0.5% average return for non-respondents. Revenue differences between responding and non-responding firms reflect difficulties in gaining access to senior personnel in the larger firms.

Data Collection

We made initial contact with each firm through a brief introductory letter addressed to the organization's top manager, explaining the basic research purpose and requirements. After a 2-week period, we contacted each individual via a follow-up phone call to explain the research objectives in greater detail and to seek an agreement to participate. If successful, additional respondents were identified by asking the initial, and subsequent, contacts to identify other senior managers knowledgeable about two important strategic decision processes within their organization—the purchase of printing presses and inks in the container industry and the purchase of aircraft and fuel in the case of the airline industry. About 70% of the de-

cision makers contacted at this stage eventually completed the appropriate questionnaires. For the airlines population, this group generally consisted of members of the president's staff. Of the 40 individuals comprising the airlines sample, 30 held the title of Vice-President, and were typically direct reports of the president, while the remaining ten held the title of manager or director. The most common titles of respondents (and their frequency) were: VP-Operations (9), VP-Controller (6), VP-Marketing and Sales (5), VP-Customer Service (4), and VP-Purchasing (4). The 52 managers comprising the corrugated container senior management sample included the top manager of the corrugated business unit in 11 cases, 11 regional general managers, seven plant general managers, five regional VPs, five functional VPs, and 13 individuals at the director/manager level. These individual decision makers were the unit of analysis employed in testing our hypotheses.

Measures

All of the measures employed in this study were based on instruments used in previous research.

Perceived Environmental Uncertainty. Conceptualization and measurement of perceived environmental uncertainty (PEU) was based on Duncan (1972) with the modifications suggested by Sathe (1974). Duncan's 12-item instrument purports to measure three elements of uncertainty: lack of information, inability to predict outcomes, and inability to predict how environmental factors will affect success or failure. Each respondent was asked to assess the frequency with which these elements of uncertainty were experienced in decision making in their organization. A copy of the perceived environmental uncertainty instrument used in this research is included in the Appendix.

A principal components factor analysis of the uncertainty data confirmed the presence of the three dimensions suggested by Duncan. His four-item lack of information scale emerged as a clear factor (Cronbach's $\alpha = 0.6$) and was retained. However, there was some cross-loading of items between the subscales designed to measure inability to predict outcomes and to predict how environmental factors will affect success or failure. To achieve the most parsimonious solution we collapsed these two scales into a single six-item factor (Cronbach's $\alpha = 0.7$), which was simply labeled inability to predict.

Environmental Volatility. Considerable debate exists concerning appropriate measures for characterizing environmental uncertainty and volatility (e.g., Tosi et al., 1973; Bourgeois, 1985). However, the choice of a measure to be used in this research was simplified by the desire to measure *unpredictability* of performance and correspondingly less concern with the

concepts of objective uncertainty or instability. For example, change which is volatile but predictable may not significantly hinder the ability of decision makers to make sense of their environments and convince others that they remain in control. However, change which lacks any predictable pattern is clearly problematic to the sense-making activities of a decision maker. Therefore, we used the unpredictability measure proposed by Wholey and Brittain (1989) to characterize volatility in this research. The specific measure used was "the R^2 for sales (or other resources) regressed on sales lagged 1 year. A high R^2 indicates that a prior year's sales predicts current year's sales" (1989, p. 872) Indices were calculated based on 5 years of sales and earnings data (1979–1983).

Perceived Effectiveness. The existing literature (e.g., Dowst, 1981) and pre-testing in the airlines and container industries identified eight factors important to decision makers in the major buying tasks studied in this research—aircraft and fuel for airlines and major capital equipment and printing inks for the container firms. Decisions concerning these purchases represent some of the most important resource allocation (aircraft and capital equipment) and operating (fuel and inks) decisions made by these firms. Utilizing 5-point scales, we asked respondents to rate the importance of each of the eight factors and then to rate their firm's effectiveness in dealing with each factor. We used the importance ratings as weighting factors to develop a composite perceived effectiveness measure (Dowst, 1981; Cronbach's alpha = 0.79).

Objective Performance. Following the approach of Bourgeois (1985), we calculated five measures of performance (i.e., return on total assets, growth in earnings per share, net earnings and capital, and the improvement in profit margins) for the period 1979–1983 and then factor analyzed them. A single factor, accounting for 60.3% of the total variance, was extracted as a composite measure of objective performance. This factor contained nearly equal weightings of three of the performance variables: net earnings, EPS, and return on sales.

Data Analysis

The analytical scheme employed for hypothesis testing was based on simple correlation techniques. Analysis of the effectiveness-perceived uncertainty relation was performed separately for organizations achieving high vs. low levels of objective performance (Hypothesis 1). To assess the strength of the uncertainty-effectiveness relationship under different moderating conditions, we compared the correlations between perceived effectiveness and perceived environmental uncertainty for decision makers in organizations (airlines) competing in a context characterized by high lev-

els of unpredictability vs. organizations (container manufacturers) competing in a context characterized by low levels of unpredictability (Hypothesis 2).

RESULTS AND DISCUSSION

Hypothesis 1 suggested that decision makers operating in organizations achieving low vs. high levels of objective performance would exhibit a stronger inverse relationship between perceived uncertainty and perceived effectiveness as these decision makers strive to rationalize or explain their relatively poorer performance. As shown in Table I, the data produced the expected result in the container industry—there was a strong, significant relation between perceived effectiveness and lack of information (LOI) and inability to predict (IP) for organizations achieving lower objective performance, and substantially weaker relations within the higher performing segment. The difference between the correlations in the low and high objective performance conditions is significant in the case of the inability to predict dimension of uncertainty ($p < .05$), but is not statistically significant in the case of lack of information ($p < .15$). Although the pattern of expected relationships existed in the lower performing airlines group, the results in the higher performing segment are somewhat surprising—in the expected direction, but stronger than predicted and not statistically different from the lower performing group.

Hypothesis 2 explored whether decision makers in an environmental context characterized by high levels of volatility would exhibit a stronger inverse relationship between perceived uncertainty and perceived effective-

Table I. Perceived Uncertainty–Perceived Effectiveness Relationship
Controlling for Objective Performance

Source of uncertainty	Sample	Objective performance	<i>r</i>	<i>p</i>	<i>N</i>
		level			
Lack of information	Air	Low	−0.84	.0001	16
		High	−0.57	.01	18
	Container	Low	−0.52	.01	26
		High	−0.24	NS	24
Inability to predict	Air	Low	−0.87	.0001	16
		High	−0.79	.0001	18
	Container	Low	−0.47	.01	26
		High	−0.00	NS	24

ness than decision makers in less volatile environmental contexts. The first task was to confirm that the airline industry did exhibit higher levels of unpredictability during the 1979–1983 period. This was done by calculating the Wholey and Brittain (1989) sales and earnings predictability coefficients for each firm in the sample, using this data to calculate mean coefficients for each industry, and then comparing the level of predictability *between* the industries using a simple *t*-test. As expected, for both sales ($t = 4.805, p < .0001$) and earnings ($t = 3.635, p < .0005$), the airline industry was significantly less predictable than the corrugated shipping container industry.

To explore Hypothesis 2, we examined the PEU-effectiveness relationship within each industry context and, as shown in Table II, we found the expected results. Although the relationships are significant in each analysis, the results are significantly stronger in the less predictable (more volatile) airlines industry ($p < .01$ for sales predictability and $p < .001$ for earnings predictability), supporting Hypothesis 2.

However, if firms are segmented within each industry on the basis of sales and earnings predictability, the PEU-effectiveness relationships reveal patterns which require some explanation. First, as shown in Tables III and IV, similar results are obtained looking at *within* industry comparisons using either sales predictability or earnings predictability as the moderating variable. In general, we consistently find the predicted relationship in the container industry (i.e., a stronger PEU-effectiveness relationship among those firms exhibiting the greatest degree of sales or earnings unpredictability). The differences between the high and low predictability conditions show some degree of statistical significance in all cases except for the inability to predict dimension for sales volatility. These results lend further support to the pattern of relationships suggested by Hypothesis 2 and the general logic developed in this paper.

The results for the airlines industry, however, present a very different picture. Although we see the predicted difference for the lack of informa-

Table II. Perceived Uncertainty–Perceived Effectiveness Relationship Controlling for Industry

Source of uncertainty	Industry	<i>r</i>	<i>p</i>	<i>N</i>
Lack of information	Airlines	–0.71	.0001	34
	Container	–0.33	.012	50
Inability to predict	Airlines	–0.79	.0001	34
	Container	–0.26	.036	50

Table III. Perceived Uncertainty–Perceived Effectiveness Relationship Controlling for Sales Predictability

Source of uncertainty	Sample	Sales predictability	<i>r</i>	<i>p</i>	<i>N</i>
Lack of information	Air	Low	–0.67	.003	17
		High	–0.69	.001	17
	Container	Low	–0.39	.03	24
		High	0.00	NS	24
Inability to predict	Air	Low	–0.95	.0001	17
		High	–0.72	.0005	17
	Container	Low	–0.14	NS	24
		High	–0.10	NS	24

Table IV. Perceived Uncertainty–Perceived Effectiveness Relationship Controlling for Earnings Predictability

Source of uncertainty	Sample	Earnings predictability	<i>r</i>	<i>p</i>	<i>N</i>
Lack of information	Air	Low	–0.57	.009	18
		High	–0.83	.0001	16
	Container	Low	–0.41	.02	24
		High	–0.20	NS	24
Inability to predict	Air	Low	–0.78	.0001	18
		High	–0.79	.0001	16
	Container	Low	–0.65	.0003	24
		High	–0.17	NS	24

tion dimension in the case of earnings predictability ($p < .10$), there is virtually no detectable difference for the lack of information dimension for sales predictability or the inability to predict dimension for earnings predictability, and in the case of the inability to predict dimension for sales predictability, the difference is strongly significant ($p < .01$), but in the direction opposite of that predicted. At first glance, these unexpected results are somewhat confusing. However, closer examination of the data

suggests the strong relationships observed in all segments of the airlines industry might be quite logical. As expected when the airline industry was chosen for this research, the performance of the airlines in the sample during the period 1979–1983 was both poor and volatile by historical standards, as every major airline in the country was learning to cope with an extremely complex and dynamic environment after years of orderly, regulated, “profit protected” growth. For *all* of these airlines, whether they were in the higher or lower performance or volatility (predictability) group, the new environment was threatening, challenging, unpredictable, and unfriendly and this was reflected in the objective performance and predictability data. For example, in the case of performance, the mean return on sales for container firms in the 1979–1983 period was 6.9%, while the airlines in the sample achieved a return of only 2.1%, a difference significant at the .01 level.

Not surprisingly, if we divide the firms in each industry into low and high performing segments (using the median ROS value), we find a significant difference between these segments within each industry. However, it may be more instructive to look at the mean profile of the *less* stable container firms (ROS = 4.4%, sales predictability coefficient = .614) vs. the *more* stable airlines segment (5.2% ROS, sales predictability = .546). Looking at these small and insignificant differences, helps explain why the uncertainty–effectiveness relationships observed in the unstable container and stable airlines segments are quite comparable across each of the moderating conditions.

One explanation for these findings is that individuals’ sense-making processes in each industry group are being driven by a different set of referents. Although the general economy experienced a major recession early in the period studied, personal interviews with respondents suggest that 1979–1983 did not produce substantive change in the normal dynamics of the container industry and that overall performance did not depart greatly from historical trends. Under these circumstances, one of the primary referents decision makers would use in the sense-making processes described here would be their performance and/or volatility *relative* to other members of the container industry. This assumption is consistent with the pattern of significant findings observed when looking at the moderating effects of performance and volatility on individual sense-making processes within the container industry. Since relative performance seemed to be the most salient comparative cue available for explaining or rationalizing performance, this could be the primary cue utilized by decision makers in their sense-making activities as reflected in the results reported here.

In the airlines industry, by contrast, current performance relative to past performance was far more salient than relative performance vs. competition at the time the perceived uncertainty–perceived effectiveness data

were gathered for this research. Indeed, personal interviews with respondents at the time of data collection suggested that survival and creating/maintaining some degree of stability was a primary managerial task—a desire to return to some sense of the normalcy which had been characteristic of the industry “in the good old days.” Under these circumstances, it is logical that *all* members of the industry, not just those experiencing greater relative instability, would exhibit the strong inverse perceived uncertainty–perceived effectiveness relationship characteristic of the sense-making process of an individual trying to rationalize a level of environmental volatility and organizational performance for which they had no historical referent. Their efforts to repair this “break” would likely far overshadow any relative comparison to competition. One of the key objectives of their sense-making activities would be to convince significant stakeholders that they were still in control. This logic helps to explain both the stronger-than-expected uncertainty–effectiveness relationship observed in the more stable airlines segment and the relatively small differences between the stable and unstable airlines segments. This interpretation is also consistent with the thesis that organizational decision makers use individual assessments of how well their unit or organization is performing to construct levels of uncertainty in their environment.

Identification of the individual airlines comprising the less stable and more stable sales volatility segments of this industry provides additional insight into the relationships observed. Without exception, the firms comprising the high volatility segment in the airlines industry were new industry entrants or medium size regional airlines, with explicitly stated, aggressive growth goals in the new environment of deregulation. Although sales were changing significantly for members of this group in the 1979–1983 period as reflected in the volatility calculations, this volatility was welcomed by these firms; it represented significant sales growth which was the *raison d’être* of their strategies in this period. Airlines falling into the low sales volatility segment, on the other hand, were generally large regional or national carriers for whom sales volatility in this period indicated a general instability in sales, even sales losses in some cases. For these well-established airlines, even this modest volatility apparently created great perceived uncertainty which is reflected in the measures used. These results suggest that volatility measures alone may provide somewhat misleading results and, underlining the basic premise of this research, that a deeper understanding of factors influencing the managerial mind set (in this case *both* historical and current performance) is required to understand how decision makers rationalize the effectiveness of their firms and convert these rationalizations into assessments of environmental uncertainty.

CONCLUSIONS

While this research is not the first to uncover empirical support for a sense-making view of environments, it does provide empirical evidence from a unique perspective. As noted earlier, much of the existing support for the sense-making/performance linkage is based on explanations contained in annual reports. However, unlike these attribution studies, the research reported here is not based on such formal explanatory accounts. Senior managers carefully tailor annual reports to suit a specific purpose, taking time to prepare them, seeking the advice of others, and couching performance in terms relative to prior performance and that of competition. In general, they are carefully constructed statements that may not reflect any one individual's view of events. The measures used for this research are very different. None of our respondents was asked to explain performance, respondents were assured of confidentiality, there was no implied link between uncertainty and effectiveness as different questionnaires were used to measure these constructs, no mention was made of objective performance or volatility, and, in general, respondents had no basis for positioning their answers to provide accounts or rationalizations for performance. The fact that their responses often show the expected pattern supports the idea that these accounts and rationalizations are internalized, and that these managers' views of reality are further impacted by contextual conditions of high volatility and poor performance.

The results of the analyses in both industries studied provide support for the general hypothesis that perceptions of organizational effectiveness may be important cues for decision makers in making sense of their environment. In addition, this relationship is particularly pronounced when decision makers find themselves in contexts that are unstable, e.g., when objective organizational performance is low relative to a meaningful peer or referent group or when performance is unpredictable.

The results are consistent with the research of Milliken (1990), who has shown that perceptions of organizational effectiveness are related to decision makers' perceptions of uncertainty. Although this relationship was just a small part of Milliken's research, she found that college administrators who viewed their institutions as less effective also believed that a particular demographic trend would affect them less, and were less certain that their organization could effectively respond to the trend. Milliken's study is important as it specified what dimension of uncertainty (state, response, or effect) was most strongly related to perceptions of effectiveness. The research reported here adds to her findings by suggesting that the relationship may hold across perceptions of general environmental uncertainty (and not only in making sense of a particular issue or event),

and in suggesting the relationship is more pronounced in unstable as opposed to stable contexts.

The results from this study encourage additional conceptual and empirical treatment of the processes that account for how individuals interpret an organization's environment. With few exceptions (e.g., Meyer, 1982; Milliken, 1990; Thomas & McDaniels, 1990), there is very limited data on how environments are constructed. While organization theory and strategic management researchers typically assume that patterns of strategy and patterns of structure are related to how environments are perceived (e.g., Duncan, 1972; Galbraith, 1973), far less attention has been devoted to treating environmental constructions as the variable to be explained. The results from this study suggest that part of the answer may lie in individuals' judgments of how well or how poorly the organization is doing, as well as the instability of the context in which an individual decision maker finds him or herself. In addition, the more in depth explanation of the contrasts in the performance of firms in the airlines and container industries suggests that the referents used to judge performance are sensitive to patterns of historical performance of firms in an industry and possibly other factors. Thus, our *ad hoc* interpretation of the pattern of relationships in the airlines industry suggests models of decision makers' sense-making efforts must consider the referents that are salient in a particular firm and industry setting in order to accurately capture the way the sense-making logic operates.

In this regard, it is interesting to look at the eight airlines in our sample who "survived" the deregulation of the U.S. airlines industry vs. the nine who have not. During the 6 years of deregulation preceding data gathering for this study, the eight survivors' share of the U.S. market remained flat at 34% (declining somewhat in the earlier years and rebounding slightly in the latter part of the period). In contrast, the nine non-survivors' grew their combined share from 10% in 1978 to 18% in 1984. Surprisingly, while one could argue that the managers in the former group, who have just spent 6 years "standing still," would perceive their performance to be significantly poorer than those managers who led their organizations to substantial market share gains, this was not the case. Indeed there was no significant difference in the perceptions of uncertainty and effectiveness between the two groups. This may be even more surprising when one considers the fact that by the end of 1987 all but one of the non-survivors had disappeared from the industry. The low perceptions of uncertainty and high levels of perceived effectiveness found among non-survivors may have placed too much weight on past performance (their early increases in market share) and too little on current conditions (the fact that financial losses were beginning to build). They were able to explain (and ignore?) these expanding losses by appeals to their recent successes. Survivors, on the

other hand, seemed to be keying in on the fact that initial share losses had been won back and profits were at least stabilizing. For them, current conditions were probably paramount in their assessments.

Of course, when generalizing from results based on a cross-sectional study and on data from firms in only two industries, several caveats apply. First, the design of this study prevents a definitive test of the causality implied. In fact, one could argue that the sense-making process does not work in the causal direction suggested here, but rather in the opposite direction, i.e., that managers employ uncertainty as a cue in drawing inferences about performance. This causal pattern is possible and cannot be ruled out by the data presented here. However, senior management typically faces the dilemma of explaining performance as opposed to explaining uncertainty, suggesting that uncertainty judgments would be outputs rather than inputs to this sense-making process. In addition, our study does not allow us to rule out alternative explanations which may account for the negative relationships between perceptions of effectiveness and perceived environmental uncertainty. For example, in future work additional measures of perceptions of key contextual variables (e.g., organizational slack) would allow researchers to rule out possible sources of any spurious relationships between perceived effectiveness and environmental uncertainty.

There are also limitations related to the sample population used in this research—a total of 84 managers from 34 firms in two industries has somewhat limited scope and potential generalizability. In addition, the research focused on a relatively narrow decision set, i.e., major organizational buying decisions. However, these deficiencies point to important areas for future research. Empirical work on a broader scale, using longitudinal data, and research that measures more directly the mediating cognitive and motivational processes that account for this pattern of results are clearly needed.

Although the level of statistical significance associated with some of the individual analyses discussed here is marginal, the consistency of the pattern of results produced in this study cannot be ignored. Across a range of firms in two industries, managers in both line and staff positions seemed to employ a common sense-making logic that used perceptions of firm effectiveness to infer conditions in the environment. In addition, the results suggest that this logic is more dominant in unstable as opposed to stable contexts. In this sense, the research answers the call for organizational research that is context-sensitive “which places the information processor in a social context” (Tetlock, 1985, p. 299). In organizations, the dimensions of context that matter may be those that prompt assessments of organizational effectiveness. Thus, rather than treating organizational effectiveness as the outcome measure of ultimate interest in future research, perhaps it

should be considered a key sense-making cue for organizational members that activates motivational processes (e.g., Bateman & Zeithaml, 1989). In this way, this research opens the door for a wide range of cross-level research that considers how organizational context influences the way individuals think and act in organizations.

APPENDIX. ENVIRONMENTAL UNCERTAINTY QUESTIONNAIRE

Instructions

The following questions assess the uncertainty you experience in decision making as a member of management. They ask what percent of the time you perform various activities in your role as a senior manager. In answering them, we ask you to concentrate on the decisions you make as a member of this profit center’s senior management rather than unique functional issues you deal with as head of your department.

Circle any *one* of the five numbers for each question. The meaning of these numbers is as follows.

	1	2	3	4	5
	Never/seldom (0–20% of the time)	Occasionally (21–40% of the time)	Half the time (41–60% of the time)	Frequently (61–80% of the time)	Usually/always (81–100% of the time)
1. How often are you certain about which methods would be best for dealing with problems that arise in this profit center?					1 2 3 4 5
2. How often do managers in this organization have all the information necessary for making decisions?					1 2 3 4 5
3. How often do changes in social, economic, political or technological conditions directly affect decisions made by management?					1 2 3 4 5
4. How frequently is it difficult to determine whether a decision made by management was a good one?					1 2 3 4 5
5. When dealing with others in this organization, how often are you certain about what they expect of you?					1 2 3 4 5
6. How often are you and other managers certain about how to react to changes in social, economic, political or technological conditions?					1 2 3 4 5
7. As a manager, how often do you encounter new or unusual problems in your job?					1 2 3 4 5
8. How often can you tell whether your actions to deal with changes in social, economic, political, or technological conditions are effective?					1 2 3 4 5
9. How often are managers in this organization in doubt about how to obtain the information needed for making decisions?					1 2 3 4 5
10. How often can you tell whether you have met the expectations of those you deal with as a member of management?					1 2 3 4 5
11. How often is it difficult for managers in this organization to determine whether the method used in dealing with a problem was effective?					1 2 3 4 5

12. How often are you and other managers uncertain about how to act to meet the expectations of those you deal with as decision makers?

1 2 3 4 5

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