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**MAKING SENSE OF THE ENVIRONMENT
THE ROLE OF PERCEIVED EFFECTIVENESS**

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MAKING SENSE OF THE ENVIRONMENT:
THE ROLE OF PERCEIVED EFFECTIVENESS

This manuscript develops and tests the idea that the sense-making process used by decision makers to construct levels of uncertainty in their environments is strongly influenced by their assessments of how well their unit or organization is performing. In addition, the research tests the idea that this relationship is stronger when managers are involved in nonroutine decisions, when they are in an organization that has performed poorly, or where the organization's performance record is volatile. The findings, based on two different samples of decision makers from 34 firms in two industries support the claim that assessments of effectiveness and perceptions of environmental uncertainty are strongly related through decision makers' sense-making efforts. Limitations and implications of these results are discussed.

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 strategic management (e.g., Hambrick, 1983; Miller, 1988) and organization theory (e.g., Duncan, 1972; Lawrence and Lorsch, 1967), the typical explanation for the connection between perceived environmental uncertainty and effectiveness is a functional one. It 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, resulting in different levels of organizational effectiveness. Assuming this type of relationship, researchers typically treat environmental uncertainty as one of several independent variables in causal models of organizational or sub-unit effectiveness.

The position taken in this paper departs from these views by exploring the relationship between perceptions of environmental uncertainty and effectiveness using an interpretive as opposed to functional paradigm (Burrell & Morgan, 1979), and treating perceptions of environmental uncertainty, rather than effectiveness, as the variable to be explained. In particular, the paper tests the proposition that perceptions of environmental uncertainty are 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 activities of organizational members.

Consistent with the assumptions of social constructionist theories (Berger & Luckman, 1967) as applied in organizational settings, we argue that decision makers creatively and actively make sense of the world they live in by attending to salient cues (Louis, 1980; Smircich & Stubbart, 1985; Weick, 1979). In particular, we argue that one such critical cue for these sense-making activities is a decision maker's perception of how well he/she believes their unit or organization is performing.

This paper begins with a general justification for the sense-making perspective, and develops hypotheses about a set of conditions that should strengthen or weaken the perceived effectiveness-perceived uncertainty relation. The hypotheses are replicated using two samples 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.

Linking Effectiveness and PEU

There are several factors that 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, decision makers are frequently asked to measure and report on their unit's or organization's performance. Thus effectiveness evaluations are often made salient by established reporting routines and stakeholders' inquiries about 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 are critical 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), Salancik and Meindl (1984), and Staw, McKechnie and Puffer (1983) 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)) and sociologists (e.g., social accounts theory (Scott & Lyman, 1968)) that individuals use features of the situation (e.g., effectiveness assessments) to guide interpretations of the world in which they exist and to assign allocations of blame. Interpretations of the environment are just one outgrowth of these inferential, justification and interpretive processes.

Two arguments can be developed which 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 based on motivational processes derived from self presentational (Baumeister, 1982) or impression management (Goffman, 1952) pressures that operate on decision makers 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 dissociates the self from bad performance. The second argument, which employs a less motivational and more cognitive explanation, is based on a simple logic that many decision makers apply to make sense of their effectiveness assessments - 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). If a decision maker can blame the situation on the environment by constructing it as highly uncertain, then he/she can account for the effectiveness gap while, at the same time, maintaining a more positive self image and some sense of control (Salancik & Meindl, 1984). 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 for others that accounts for this less-than-satisfactory performance, while doing minimal damage to their public image of effectiveness and control.

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 the simple assertion that, when an organization or unit in which a decision maker sits 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 stable and predictable, 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; Milliken, 1990).

In contrast, where decision makers believe that their unit or organization is doing poorly, they become much 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" becomes subject to greater

doubt and they construct the environment 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, less knowable and less certain.

Together, these two arguments lead to the first hypothesis to be tested here:

H1: There is a direct, inverse relationship between assessments of effectiveness and perceived environmental uncertainty. Decision makers who perceive unit effectiveness as low, will see the environment as more uncertain.

MODERATING CONDITIONS

We can extend the logic developed above by positing that different contexts create different motivating conditions for decision makers to construct their environments in a particular way. More specifically, it will be argued that when the context in which a decision maker exists is more unstable, there will be an even stronger negative relationship between perceptions of uncertainty and perceptions of effectiveness. The context for a decision maker is unstable under at least three conditions: (1) when decision situations are non-routine; (2) when objective organizational performance is poor; and/or (3) when period to period performance is volatile.

The overwhelming logic that underlies these moderating conditions is similar to the arguments that have already been developed. This logic can be

derived from sociological studies of social interaction that substantiate the importance of creating a sense of normalcy or stability to conduct everyday interaction in organizations (Goffman, 1952; Mills, 1940). This sense of normalcy depends on sustaining a consistent set of meanings that inform how events and actions are interpreted by others (Berger & Luckman, 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 - because the tasks themselves are nonroutine (Perrow, 1967), because the objective performance of the organization is poor, or because the organizational performance record is highly volatile - creates additional motivation to see much certainty in the environment 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. Unstable conditions make interactions more problematic than in 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 extreme negative relationship between effectiveness and perceptions of uncertainty.

This general logic leads to four additional hypotheses:

H2: For decision makers involved in tasks that are nonroutine, there will be a stronger negative relationship between assessments of unit effectiveness and perceptions of environmental uncertainty.

H3: For decision makers working for organizations where objective performance is low, there will be a stronger negative relationship between assessments of effectiveness and perceptions of environmental uncertainty.

H4: For decision makers working for organizations that have volatile performance records, there will be a stronger negative relationship between assessments of effectiveness and perceptions of environmental uncertainty.

H5: The inverse relationship between assessments of effectiveness and perceptions of environmental uncertainty will be stronger under conditions of low objective performance and volatile performance, than under conditions of low objective performance or volatile performance alone.

METHODS

These hypotheses were tested using two different samples of decision makers drawn from thirty-four organizations in the airlines and container industries. As explained shortly, these particular industries were selected because inter-industry comparisons were likely to yield subsamples of individual decision makers facing significantly different levels of perceived environmental uncertainty and performance volatility. At the same time, intra-industry comparisons were likely to result in a meaningful range of objective organizational performance and individual perceptions of organization effectiveness. Obtaining such contrasts, of course, was crucial to studying

the relationships of interest in this research. The two industry design also allowed us to look at the relationships of interest within each industry, which had the effect of controlling several sources of variance not of interest to the present research objectives and which may have a significant impact on individual decision makers' sense-making activities.

Sample of Firms

Using criteria established by Lawrence and Lorsch (1969), two industries at opposite ends of their stable/dynamic, certain/uncertain scales were identified. Like Lawrence and Lorsch (1969), producers of corrugated shipping containers were selected to represent a stable, more certain environment. Domestic passenger airlines were selected to represent a dynamic, uncertain environment. Data for this study were gathered in the mid 1980's when the volatility created by airline deregulation was extremely high, making it a classic example of the uncertain environment defined by Lawrence and Lorsch.

Using the membership list of the major trade association in each industry, a total of twenty-five major airlines and twenty-four large container producers were contacted. 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, seventeen firms from each industry participated in this research. Although non-response did not affect the results reported here, 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, however, 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

Although a number of organizational characteristics strongly influence how individuals in any organization view the world around them - e.g., the external environment, size, technology and structure (Aldrich, 1979) - there are also a number of factors at the individual level - including differences in self-concept, cognitive structures and personal experience - which lead to important differences in the process by which individuals make sense of the environment (Kretch et al., 1962; Scott & Mitchell, 1976). Since these differences may be quite considerable, perhaps offsetting or even overwhelming any organization level influences, perceptions of environmental uncertainty and organization effectiveness were measured at the individual level of analysis throughout this research. Such a choice ensures that both the individual and organization level influences on the sense-making processes employed by the organizational decision makers studied here were captured.

A snowballing technique (e.g., Spekman & Stern, 1979) was employed to identify appropriate individual respondents within each organization studied. Initial contact was made with each firm through a brief introductory letter, addressed to the organization's top manager, explaining the basic research purpose and requirements. After a two week period, a follow-up call was made to each respondent to explain the research objectives in greater detail and to seek an agreement to participate. If successful, a personal site visit was arranged to explain the questionnaire's mechanics, to identify other

appropriate individual participants within each organization and to distribute the necessary materials.

Roughly forty percent of the initial individual contacts saw no need for a personal visit and the research process was explained over the telephone, after which questionnaires were mailed to identified personnel for completion and return. In only one case did this procedure result in an unusable set of questionnaires.

Within these thirty-four firms, two different samples of decision makers were identified. The first sample consisted of members of the senior management group in each organization. Respondents for this sample were identified by asking our initial, and subsequent, contacts to identify other senior managers involved in the strategy making process within their organization. About 70% of the decision 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 forty individuals comprising the airlines sample, thirty 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 & Sales (5), VP-Customer Service (4) and VP-Purchasing (4). The fifty-two managers comprising the corrugated container senior management sample included the top manager of the corrugated business unit in eleven cases, eleven regional general managers, seven plant general managers, five regional VP's, five functional VP's and thirteen individuals at the director/manager level. These managers were used to test hypotheses one, three, four and five.

The second sample, which was used primarily to study the impact of task routineness on the effectiveness-PEU relationship (H2), consisted of individuals involved in two major purchasing decisions in each firm - aircraft and jet fuel for the airlines in our sample and printing presses (a major capital item) and printing inks for producers of corrugated containers. The appropriate individuals for this sample were identified by our initial and subsequent contacts as individuals playing an important role in the buying task process for the four buying tasks under study. At this stage, almost 80% of the individuals contacted completed the necessary questionnaires. As in our sample of senior managers, the response rate was strongly influenced by the fact that the approval of the senior manager in the organization (or his designee) had been obtained and the awareness of each respondent that other members of the organization were participating in this research. A total of twenty-seven individuals, primarily high level purchasing, engineering and operations personnel, comprised the aircraft sample while twenty-eight individuals, primarily purchasing and administrative personnel, comprised the jet fuel sample. The corrugated container sample included thirty-five individuals - primarily engineering, purchasing and operations personnel - involved in buying printing presses and twenty-five individuals - typically purchasing and lower level operations personnel - involved in the purchasing of printing inks.

Measures

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

Perceived Environmental Uncertainty. Conceptualization and measurement of perceived environmental uncertainty (PEU) was based on Duncan (1971) with the modifications suggested by Sathe (1974). Duncan's 12-item instrument measures

three elements of uncertainty: lack of information, inability to predict outcomes, and inability to predict how environmental factors will affect success or failure. We asked each respondent to assess the frequency with which these elements of uncertainty were experienced in decision making in their organization. To focus respondents on the same issues, they were asked to consider major organizational buying decisions in assessing environmental uncertainty (Cronbach's alpha = 0.74). A copy of the perceived environmental uncertainty used in this research is reproduced in the Appendix.

Performance Volatility. The volatility index of Tosi et al. (1973) was used to measure sales and earnings performance volatility. Indices based on five years of sales and earnings data (1979-1983) were calculated by simply dividing the standard deviation of the appropriate five years of data by its mean.

Perceived Effectiveness. The existing literature (e.g., Dowst, 1981) and pre-testing in our two 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; some of the most important resource allocation (aircraft and capital equipment) and operating (fuel and inks) decisions made by the sample firms. Utilizing five point scales, respondents were asked to rate the importance of each of the eight factors and then to rate their firm's effectiveness in dealing with each factor. The importance ratings were used as weighting factors to develop a composite perceived effectiveness measure (Dowst, 1981; Cronbach's alpha = 0.79). A copy of the actual instrument used in this research is reproduced in the Appendix.

Objective Performance. Although various composite measures of objective performance are available (e.g., Bourgeois, 1985), it is not clear that

individual decision makers in organizations use such composite assessments in their simple sense-making activities. This is of particular concern with individuals lower in the hierarchy such as the purchasing and operations personnel who comprised the printing ink buying task sample studied in this research. To address this concern, a very simple and direct objective measure of performance - return on sales (ROS) - was utilized. Not only is such a measure likely to be readily understood by the respondents, it also reflects the parameters that most of these respondents deal with on a daily basis - sales and costs. Since the objectives of these individuals are likely to be framed in terms of either or both of these parameters, they should serve as important cues in their sense-making activities and assessments of organization performance.

Data Analysis

The analytical scheme proposed for testing Hypotheses 1 through 5 was straightforward. For Hypothesis 1, we computed a simple correlation coefficient for the effectiveness-perceived uncertainty relationship. A correlation analysis of the effectiveness-perceived uncertainty relation was performed separately for routine vs. nonroutine tasks (Hypothesis 2), for organizations achieving high vs. low levels of objective performance (Hypothesis 3), and for organizations experiencing high vs. low levels of performance volatility (Hypothesis 4), in order to compare the strength of the uncertainty-effectiveness relationship under different moderating conditions. Hypothesis 5 was tested in an identical manner except that four cells were created and compared by dividing the sample population into quadrants based on objective performance and performance volatility rankings.

RESULTS

As predicted in Hypothesis 1, the existence of a strong, inverse relation between perceived environmental uncertainty and perceived effectiveness was supported as evidenced by a simple Pearson correlation coefficient of -0.35 (p<.001) in the sample of senior managers studied here (N=83). An even stronger relation (r=-0.67, p<.001) was observed in the sample of personnel involved in key buying tasks (N=112).

Hypothesis 2 predicted a stronger inverse relationship between perceived uncertainty and perceived effectiveness for individuals involved in nonroutine vs. routine buying tasks. Although the expected result was obtained (r=-0.71 for nonroutine tasks, r=-0.62 for routine tasks), the difference between these correlation coefficients is not statistically significant. However, it is not clear that combining inks and jet fuel into one group (routine) and printing presses and jet aircraft into a second (nonroutine) completely captures both the industry and task nuances that may exist in this sample. Indeed, as shown in Table 1, the results obtained by segmenting the sample into the two industries studied are somewhat more encouraging. However, again statistical significance is not achieved. One should remember, however, that Fisher's z' transformation, which tests for such differences, is very sensitive to sample size and the sample utilized in this case may be too limiting to provide a definitive test. Indeed, in the current case a difference of over 0.4 would be required between any two coefficients to establish a significant difference at the 0.05 level.

Insert Table 1 About Here

Hypothesis 3 tested the prediction that decision makers operating in organizations achieving low vs. high levels of objective performance (ROS)

would exhibit a stronger inverse relationship between perceived uncertainty and perceived effectiveness as these decision makers strive to rationalize or explain this relatively poorer performance. The expected result was obtained as a strong uncertainty-effectiveness relation was observed for individuals (N=41) in low performance situations ($r=-0.49$, $p<.001$), while individuals in high performance situations (N=42) failed to exhibit any significant relation between uncertainty and effectiveness ($r=-0.13$). Using the Fisher z' transformation this result was significant at $p<.10$.

Hypothesis 4 tested the prediction that high levels of performance volatility will lead to a stronger inverse relation between perceived uncertainty and perceived effectiveness. Again, the expected result was obtained. Individuals in organizations exhibiting a high degree of sales volatility (N=43) showed a very significant perceived uncertainty-perceived effectiveness relationship ($r=-0.46$, $p<.01$) while those in less volatile performance situations (N=39), as measured by fluctuations in sales, exhibited a non-significant relationship ($r=-0.22$). Although these differences are barely significant ($p<.20$), a more significant difference ($p<.10$) was observed in the case of earnings volatility. Here, individuals in firms with high earnings volatility (N=44) exhibited a significant perceived uncertainty-perceived effectiveness relation ($r=-0.48$, $p<.001$), while those in organizations with low performance volatility (N=38) exhibited a small and non-significant relation ($r=-0.14$).

The sample population was segmented on the basis of both objective performance (ROS) and performance volatility to test Hypothesis 5, which posited the existence of an additive effect between these variables, where the strongest relation between perceived uncertainty and perceived effectiveness would occur under conditions of both high volatility and low objective

performance. As shown in Table 2, we obtained the expected result. Cell 4, the condition of high volatility and low performance, exhibits the strongest perceived uncertainty-perceived effectiveness relationship, significantly stronger than either cells 1 or 2 and larger than that in cell 3. Although a Chow test of the four coefficients (Hanushek and Jackson, 1977) to test the equality of the set of regression lines across the four cells only approaches significance ($F=1.474$, $p<.20$), this is due in large part to the higher than expected size of the coefficient in cell 3.

 Insert Table 2 About Here

Although the expected result is also obtained using earnings volatility, the Chow test is not significant.

ADDITIONAL ANALYSES

The results of our analysis provide some interesting insights into the sense-making processes of organizational decision makers, but also raise several challenging questions. First, the data do clearly suggest that decision makers construct their own images of organizational reality (e.g., perceived uncertainty) based on perceptions of effectiveness; objective performance and performance volatility serve as important moderating factors in this process. The results do not, however, unravel the relative moderating roles played by uncertainty and performance nor do they address the relative roles played by the organization's past performance or the organization's performance relative to competition as important referents in the overall sense-making process. However, the two industry design of the present research offers some potential in this regard and also allows us to address the obvious question of whether the findings reported here are driven by relationships that exist across industries, within industries, or both.

To do this, the uncertainty-effectiveness relationship was examined within each of the two industries studied. For example, looking at the moderating effect of performance (ROS), we obtain the expected result in the container industry - a strong, significant relation ($r=-0.50$, $p<.01$) for organizations achieving higher performance ($N=24$) and the lack of any significant relation ($r=-0.03$) for the lower performing segment ($N=24$) - a difference significant at $p<.10$. However, although we observe the expected relation in the higher performing airlines group ($r=-0.54$, $p<.01$, $N=18$), the result in the lower performing segment ($r=-0.44$, $p<.05$, $N=17$) was somewhat surprising - in the expected direction, but stronger than predicted and clearly not statistically different from the the higher performing group. Similar results were also obtained looking at within industry results using either sales or earnings volatility as the moderating variable. In the case of sales volatility, the result was not even in the predicted direction for the airlines sample - $r=-0.71$, $p<.01$, $N=13$ for the less volatile performers vs. $r=-0.26$, $p<.20$, $N=18$ for the more volatile segment - and yet the difference was significant at $p<.05$. In the container industry, on the other hand, we once again saw the predicted result - $r=-0.58$ for the more volatile segment and $r=-0.02$ for the more stable, a difference also significant at the .05 level. Similar results were obtained in the container industry using earnings volatility - $r=-0.44$ vs. $r=-0.11$, a difference significant at $p<.15$. In the airlines industry, we once again see the expected result in the more volatile segment ($r=-0.57$, $p<.05$, $N=14$) and a stronger-than-predicted relation in the less volatile segment ($r=-0.43$, $p<.10$, $N=17$).

At first glance, of course, this consistently unexpected result is somewhat confusing and discouraging. However, closer examination of the data suggests the strong relation observed in the more stable airlines segments

might be quite logical and actually the more appropriate result. As we expected, when the airline industry was chosen for this research, the performance of the airlines in our 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 group, the new environment was threatening, challenging, unpredictable and unfriendly and this was reflected in the objective performance and volatility data gathered here. For example, in the case of performance (ROS), the mean ROS for container firms was 6.9%, while the airlines in our sample achieved a return of only 2.1%, a difference significant at the .01 level. Although the differences between the high and low performing firms within each industry was also significant, as one would clearly expect, it is interesting to look at the mean profile of the less stable container firms (ROS = 4.4%, sales volatility = .119 and earnings volatility = .996) vs. the more stable airlines segment (5.2% ROS, .127 sales volatility and .999 earnings volatility). In light of these very small and insignificant differences, it is not surprising that the uncertainty-effectiveness relationships observed in the unstable container and stable airlines segments are quite comparable across each of the moderating conditions studied. One explanation is that each group's sense-making process is 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 any dramatic changes in the normal dynamics of the container industry and that overall performance did not differ 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 would clearly explain the 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 was apparently the most salient comparative cue available for explaining or rationalizing performance, this was 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 suggested that survival and creating/maintaining some degree of stability was a primary task of management - a desire to return to some sense of the normalcy which had been characteristic of the industry "in the good old days." Under the circumstances, it is not surprising that all members of the industry, not just those experiencing greater instability, would exhibit the strong inverse perceived uncertainty-perceived effectiveness relationship characteristic of the sense-making process of an individual trying to rationalize or explain a level of volatility and 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 clearly be to convince significant stakeholders that they were still in control. Such a condition helps to explain several results here: (1) the stronger-than-expected uncertainty-effectiveness relation observed in the more stable airlines segment; (2) the relatively small differences between the stable and unstable airlines segments; and (3) the higher than expected

uncertainty-effectiveness relation reported for the low volatility-high performance cell shown in Table 2 (our test of Hypothesis 5) since this cell consisted largely of airlines organizations. Under any circumstances, there still seems to be clear support for the interpretive view that the sense-making processes used by organizational decision makers to construct levels of uncertainty in their environments is strongly influenced by their assessments of how well their unit or organization is performing.

GENERAL DISCUSSION AND CONCLUSIONS

While this research is not the first to uncover empirical support for the interpretive paradigm, 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, this research 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. In contrast, the measures used for this research are very different. No one 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 show a definite pattern suggests these accounts and rationalizations are deeply

internalized, and that these managers' views of reality are tied to objective conditions of high volatility and poor performance.

Indeed, the results of the analyses from both samples of decision makers, in both industries studied, provide support for the general hypothesis that perceptions of organizational effectiveness are important cues for decision makers in making sense of the environment. In addition, this relationship is more pronounced when decision makers find themselves in contexts that are unstable - when tasks are nonroutine, when objective organizational performance is low relative to a meaningful peer or referent group, or when performance is volatile - and is most pronounced when low relative performance occurs in combination with either of the other factors.

The results are consistent with the research of Milliken (1990), who has also 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 establishing that the relationship holds 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. It seems, that with few exceptions (e.g., Meyer,

1982; Milliken, 1990; Thomas & McDaniels, 1989), we have very limited data on how environments are constructed. While organization theory and strategic management typically assume that patterns of strategy and patterns of structure are related to how environments are perceived (e.g., Duncan, 1971; 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.

From a practical point of view, we may want to look self reflectively at the environment that we are constructing as evidence of how well or poorly we think our organization or social group is doing. In fact, one cannot help but think of how American spokespersons explain the declining superiority of U.S. firms in a global market as an example of this phenomenon. As objective data substantiating a decline in U.S. dominance continues to accumulate, industry leaders and public policy spokespersons increasingly describe the environment for global competition as more complex and dynamic.

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.

There are also limitations related to the sample population used in this research - a total of 195 managers (divided into two different sub-samples) from thirty-four firms in two industries has somewhat limited scope and potential generalizability. In addition, the research focused on a relatively narrow decision set - 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 motivational processes that account for this pattern of results are clearly needed.

At the same time, we are encouraged by the consistency of the pattern of results produced in this study. 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, our 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, a key aspect of context may be effectiveness. Thus, rather than treating organizational effectiveness as the outcome measure of ultimate interest in our research, perhaps we should consider it 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 the organizational context influences the way individuals think and act in organizations.

Table 1

Perceived Uncertainty - Perceived EffectivenessRelationship Controlling for TaskRoutineness and Industry

		Industry	
		Airlines	Containers
Routineness	Nonroutine	r = -0.60 p < 0.01 N = 24 (Aircraft)	r = -0.75 p < 0.001 N = 35 (Presses)
	Routine	r = -0.49 p < 0.01 N = 28 (Jet Fuel)	r = -0.56 p < 0.01 N = 25 (Printing Ink)

Table 2

Perceived Uncertainty - Perceived EffectivenessRelationship Controlling for ObjectivePerformance and Sales Volatility

		Sales Volatility	
		Low	High
Performance Index	High Performance (ROS)	r = -0.09 p = NS N = 19	r = -0.20 p = NS N = 19
	Low Performance (ROS)	r = -0.44 p < 0.05 N = 24	r = -0.50 p < 0.05 N = 17

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APPENDIXEnvironmental Uncertainty QuestionnaireInstructions

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 to 20% of the time)	Occasionally (21 to 40% of the time)	Half the Time (41 to 60% of the time)	Frequently (61 to 80% of the time)	Usually/Always (81 to 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 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

Perceived Effectiveness Questionnaire

Importance of Factors

The following scale asks you to rate the importance of selected factors in the purchase of _____. Circle the appropriate number.

For example, if delivery is of extreme importance to your organization when purchasing _____, you would circle "5". If, on the other hand, you considered it to be of no importance, you would circle "1". And so on.

<u>Factor</u>	<u>Importance of Factor</u>				
	None	Some	Moderate	High	Extreme
Delivery	1	2	3	4	5
Quality	1	2	3	4	5
Technical Support Provided by Supplier	1	2	3	4	5
Price	1	2	3	4	5
Service	1	2	3	4	5
Financing Terms	1	2	3	4	5
Bidding Compliance	1	2	3	4	5
Flexibility of Suppliers	1	2	3	4	5
Overall Effectiveness	1	2	3	4	5

Buying Effectiveness of Your Organization

Instructions

The following questions ask you to rate the effectiveness of your organization in the purchase of _____ . Circle the appropriate number.

Effectiveness should be equated to how well and how often your organization meets the goals and expectations of senior management in buying _____ .

1	2	3	4	5
Never/Seldom (0 to 20% of the time)	Occasionally (21 to 40% of the time)	Half the Time (41 to 60% of the time)	Frequently (61 to 80% of the time)	Usually/Always (81 to 100%) of the time)

Factor

How Often You Meet Management's Goals On This Criteria

	Seldom	Occasionally	Half-Time	Frequently	Usually
Delivery	1	2	3	4	5
Quality	1	2	3	4	5
Technical Support	1	2	3	4	5
Price	1	2	3	4	5
Service	1	2	3	4	5
Financing Terms	1	2	3	4	5
Bidding Compliance	1	2	3	4	5
Flexibility	1	2	3	4	5
Overall Effectiveness	1	2	3	4	5