# **OWNER PERCEPTIONS AND SCANNING OF ENTREPRENEURIAL**

# **ENVIRONMENTS IN THE U.S. AND INDIA**

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### Abstract

We extend the Western strategic management literature on environmental scanning to the entrepreneurial context by surveying business owners in two countries. Specifically, using the framework of Daft, Sormunen and Parks (1988), we test how perceived environmental uncertainty in seven environmental sectors and information accessibility influence scanning frequency of venture owners in the U.S. and India, two dissimilar entrepreneurial settings. Overall, entrepreneurs in India scan more frequently than do U.S. entrepreneurs, and the perceived rate of environmental change and accessibility of information are associated with their scanning. In the U.S., only perceived information accessibility prompts scanning. These results, which depart from inferences drawn from samples of managers in the Western literature, offer potential for extending scanning theory by cross-culturally broadening the theoretical nexus between organization theory, strategy and entrepreneurship in more fully understanding scanning behavior.

Key Words: entrepreneurship, scanning, strategy

The literatures of organization theory and strategic management are replete with discussion of the influences of environmental complexity and volatility on organization decision-making, structure and maintenance (e.g., Child, 1972; DiMaggio & Powell, 1983; Hannan & Freeman, 1989; Lawrence & Lorsch, 1967; Miles & Snow, 1978; Pfeffer & Salancik, 1978). Turbulent environmental conditions often create organization-environment maladjustment, a dilemma which requires that managers act to regain congruence between the organization and the new environmental conditions (cf. Bluedorn, Johnson, Cartwright, & Barringer, 1994). Daft and Weick (1984) and Kiesler and Sproull (1982) describe similar complex processes of gathering information about the environment, analyzing and interpreting the results, and taking action that enables organizational adaption. The first step in this complex interpretive process is environmental scanning, the search mechanism by which managers identify important events and trends outside their organizations (Farh, Hoffman, & Hegarty, 1984; Hambrick, 1982). Because of the importance of scanned information in activities such as establishing goals and selecting primary strategies (Dess, 1987), scanning is an indispensable activity in the strategic management process (Fahey & Narayanan, 1986; Hambrick, 1981a; Schneider & De Meyer, 1991).

Scholars have also recognized the crucial role of environmental scanning in the process of entrepreneurship. Fundamentally, entrepreneurship entails recognizing opportunities for economic value creation, marshaling the requisite resources, and devising organizations and systems to create or capitalize on market asymmetries in order to create value. To be effective, the entrepreneur must first identify asymmetries that can be exploited to create market disequilibria, an activity that should be informed by vigilant assessment of the environment. Given that the entrepreneurial firm is typically resource-constrained and lacks a formalized scanning system (cf. Lang, Calantone, & Gudmundson, 1997), the entrepreneur's scanning behavior may differ from that of a manager. The possibility of scanning differences between entrepreneurs and managers is consistent with the caution necessary in generalizing results produced from studies of large organizations to the small firm in general (Robinson & Pearce, 1984), and to their scanning activities in particular (Pearce, Chapman, & David, 1982).

Several entrepreneurship studies have examined environmental scanning, but tend to be descriptive, and primarily focused on the sources of information utilized by entrepreneurs and small business managers (e.g., Arbuthnot, Slama, & Sisler, 1993; Brush, 1992; Cooper, Folta, & Woo, 1995; Hartman, Tower, & Sebora, 1994; Johannessen & Dolva, 1995; Kaish & Gilad, 1991; Kinsey, 1987; Pineda, Lerner, Miller, & Phillips, 1998; Shafer, 1991; Smeltzer, Fann, & Nikoliasen, 1988). Yet, the frequency of scanning activity, a central issue in the strategic management literature, has been addressed in only two studies in the entrepreneurship domain. Specifically, Brush (1992) provided descriptives on the scanning frequency (i.e., never, periodically, continuously) of owner/managers in new manufacturing ventures, but did not test potential predictors of scanning frequency. Mohan-Neill tested the influence of the firms size and age on scanning activities in the remote and immediate sectors. Importantly, neither tested the influence of how perceptions of the environment influenced scanning frequency.

While executive choice of sources of information to be scanned is of interest to both the fields of

strategy and entrepreneurship, models in mainstream strategic management, which include environmental perceptions, appear further advanced in explaining the variance in scanning behavior. Empirical evidence from the strategy literature, however, is limited in its generalizability to entrepreneurship because the strategy studies have primarily focused on managers in medium-sized firms. Moreover, most of these studies have been conducted in the United States, although a few managerial scanning studies have been conducted in non-Western contexts (e.g., Elenkov, 1997; Ghoshal, 1988; Hoffman & Hegarty, 1985; Sawyerr, 1993), including Johannessen and Dolva's (1995) study of Norwegian small firm managers' scanning in Russia. Yet, none of the environmental scanning studies in entrepreneurship appear to have used samples of owners from outside the U.S. Thus, there are two important gaps in extant scanning theory in entrepreneurship: explaining the variance in entrepreneurs' scanning behavior, and extending research to the international arena.

Given the limited examination of entrepreneurial scanning frequency in general, and the paucity of non-Western studies of entrepreneurial scanning behavior, our purpose is twofold: 1) to test the prevailing strategic management scanning theory in the entrepreneurial context, and 2) to examine the cross-cultural generalizability of the resulting inferences. Using the conceptual and measurement framework of Daft, Sormunen and Parks (1988), including their focus on strategic uncertainty, we examine the linkage between environmental perceptions and scanning frequency of entrepreneurs in the U.S. and India. This approach offers the opportunity to extend scanning theory by focusing on the entrepreneurial context, thereby extending the fields of strategy and entrepreneurship. Moreover, culture influences perceptions of environmental factors (Bluedorn, et al., 1994; Miller, 1993; Sallivan & Nonaka, 1988; Schneider & De Myer, 1991) and subsequent strategy formulation (O'Shaughnessy, 1985; Schneider, 1989). Thus, Western theories of scanning may not be universal, and require reassessment in other contexts. India, where decision makers are plagued by uncertainty emanating from political and economic instability as the country transforms from a state-dominated to a more market-oriented economy, provides an ideal contrast to the U.S. In fact, India typifies the type of environment in which DiMaggio and Powell (1983) urged the testing of Western models, one where political ideologies and social traditions differ markedly from the West. Thus, we believe that the exploratory investigation of entrepreneurial scanning in these two countries holds promise for theoretical contribution by assessing organization-environment relations of the entrepreneurial firm, by broadening the inferences in strategic management to entrepreneurial scanning, and by determining cross-country variations in scanning behavior.

## **THEORY & HYPOTHESES**

# Firm Age and Scanning

In a study of small firms in the U.S., Mohan-Neill (1995) found that age of the firm is positively related to scanning frequency. Older firms have a higher frequency of scanning in both remote and immediate forms of marketplace information. Older firms also utilize formal methods of data collection more frequently than do younger firms. Perhaps these findings can be explained by increased experience, resources and data processing capabilities in firms as they age. Thus, we predict the same relationship to hold in our U.S. and Indian samples.

*Hypothesis 1: In both the U.S. and India, older entrepreneurial firms will scan more frequently than will younger firms.* 

# **Environmental Uncertainty and Scanning**

Duncan (1972) defined the environment as all of the relevant factors outside the organization's boundaries that are incorporated into organizational decision-making. Environmental uncertainty arises from an individual's perceived inability to predict the organization's environment, typically due to dynamism and complexity (Dess & Beard, 1984; Duncan, 1972), and should lead to greater amounts of time and resources spent on environmental scanning and forecasting (Milliken, 1987). Scanning is particularly important because environmental issues are often ambiguous (Aldrich, 1979; Dutton, Fahey, & Narayanan, 1983), entail perceptions of environmental conditions and require interpretation (Daft & Weick, 1984; Smircich & Stubbart, 1985) for issue diagnosis. These perceptions of the environment, as opposed to objective environmental conditions, determine managerial decision making (Anderson & Paine, 1975; Bourgeois, 1980; Boyd, Dess, & Rasheed, 1993; Child, 1972; Daft & Weick, 1984; Dutton & Duncan, 1987; Miles, Snow, & Pfeffer, 1974; Starbuck, 1976).

Daft et al. (1988) proposed that only when perceived uncertainty (complexity and rate of change) was deemed important to the firm's goal attainment would the phenomenon actually create strategic uncertainty, and would result in increased levels of environmental scanning. According to Daft et al. (1988), strategic uncertainty compels seeking information and diagnosing environmental conditions, and thus, predicts scanning behavior, both in scope and frequency. Their results, in conjunction with those of Auster and Choo (1993), provide support for the theory that high levels of perceived strategic uncertainty will lead

to an increase in scanning frequency across environmental sectors, at least among managers from North American firms. Daft et al.'s (1988) research was replicated by Sawyerr (1993), and extended by Elenkov (1997) and May, Stewart and Sweo (forthcoming) in non-Western contexts characterized by significant political and economic transition. Sawyerr (1993) found that Nigerian managers increased scanning frequency in response to increased perceptions of strategic uncertainty in four of seven environmental sectors. Elenkov (1997) failed to find support for the proposed strategic uncertainty-scanning relationship in Bulgaria. May et al. (forthcoming) found that strategic uncertainty, by itself, did not prompt scanning in Russian executives.

#### **Scanning Frequency in Two Entrepreneurial Contexts**

Precipitated by radical change in political and economic systems of the former Soviet bloc, India has been in the throws of macroeconomic reform since 1991. The opening of the Indian economy has heightened the level of competition from both foreign and domestic firms. Bureaucratic regulations which burdened businesses have been stripped away, and many older companies have lost their market leadership to new, more efficient entrants. Economic, political and socio-cultural foundations have been shaken as India has experienced four changes in its central government within five years. In its nuclear sparring with neighboring Pakistan, the government of India ostracized itself from much of the international community, and raised concerns about the long-term viability of India's reforms. As further evidence of the lack of outsider confidence, the International Monetary Fund and Standard & Poors' have issued dire warnings to India to reduce its fiscal deficit, which is estimated to be as high as 12% of GDP. Moreover, the Indian government's borrowing from its domestic banks has risen sharply, from \$3.1 billion in 1994-1995 to \$7 billion in 1998-1999 (Lefkovitz, 1999). Despite its unpredictable government, high poverty rates and low literacy levels, India has a growing middle class, and another 30 million households earning at least 60,000 rupees (\$1,400) per year, which is a significant sum in India (Far Eastern Economic Review, 1999). The environmental turbulence that has shaken India's established bureaucracy has opened the way for a new class of entrepreneurial participation in India's economic reincarnation. (Mitra & Pingali, 1999).

Relative to India's entire national framework being in flux, the United States has enjoyed a comparatively stable period of sustained economic growth and prosperity for most of the 1990s. Although punctuated by brief periods of disruption, such as the impeachment proceedings against the President and the financial market crash of August/September 1998, the U.S. environment has been marked by high levels of consumer confidence, a record number of successful new venture start-ups, and flat small business failure rates (*The State of Small Business*, 1997). The revolution in technology has brought rapid change in business systems, but the opportunities generated by technological innovation appears commensurate with the accompanying competitive threats. In light of these circumstances, we view the U.S. environment as being less uncertain relative to the Indian environment, and expect these conditions to be reflected by differences in the scanning frequencies of entrepreneurs in the two countries.

*Hypothesis 2: Entrepreneurs in India will scan the environment more frequently than will entrepreneurs in the U.S.* 

# **Environmental Perceptions and Scanning Frequency**

While Western studies of environmental scanning have supported the relationship between strategic uncertainty and scanning frequency, the results of non-Western studies are inconclusive (Elenkov, 1997; May et al., forthcoming; Sawyer, 1993). May et al. (forthcoming) argued that the divergence in findings between the Western and non-Western research on scanning might lie in the unique situational characteristics of transitional environments. May et al. (forthcoming) surmised that one potentially important factor for explaining scanning activity, which has been largely excluded from strategic management research since the early 1980s, is the construct of perceived information accessibility. O'Reilly (1982) provided evidence for the importance of accessibility as a determinant of information usage for managerial decision making, and Culnan's (1983) results indicated that the frequency of usage of essentially all information sources is positively related to the perceived accessibility of the source.

Conversely, studies in entrepreneurship have placed relative importance on addressing the effects of resource constraints on small firms. Matthews and Scott (1995) and Mohan-Neill (1995) indicate that resource constraints may be a primary factor in limiting entrepreneurial scanning of environmental information. The availability of information and managers' knowledge of how and where to get information may play a critical role in determining the amount of scanning that occurs (Callahan & Cassar, 1995; Masten, Hartman, & Safari, 1995). Moreover, small business owners frequently suffer from under-developed intelligence gathering and analytic skills (Stoica & Schindehutte, 1999). Pineda et al. (1998) found that small business managers tend to use the most readily available information, even if it is not necessarily the optimal information on which to base a decision.

In an attempt to test the influence of information accessibility on scanning frequency, Auster and Choo (1993) included accessibility in their conceptual framework for explaining scanning behavior among Canadian managers of large publishing and telecommunications firms. Their results, however, did not support the proposed relationship between perceived accessibility of information and scanning mode frequency. Given the inconclusive evidence on the antecedents of scanning, Bluedorn et al. (1994) encouraged researchers to consider accessibility of information as a potential moderator in future studies of environmental scanning.

In scanning studies conducted in developing nations, Elenkov (1997) noted that Bulgarian managers underutilized certain information resources because they lacked the knowledge necessary to handle complex business documentation and management information systems. Similarly, Sawyerr (1993) indicated in her study of Nigerian executives that two of the characteristic features of developing countries are the lack of systematic information sources and the absence of social and political infrastructures necessary to support scanning.

Given that India shares a similar tradition of state control, further complicated by a culture of high power distance (Hofstede, 1980), low literacy rates and lack of a streamlined market infrastructure, we would expect information accessibility to be potentially important in explaining the frequency of scanning among Indian entrepreneurs. We also expect the perceived accessibility of information to influence the scanning frequency of U.S. entrepreneurs, but more from a resource constraint perspective, primarily time and money. Thus, in keeping with the aforementioned rationale, and the evidence presented by May et al. (forthcoming) concerning the conditioning effect that perceived source accessibility has on the relationship between strategic uncertainty and scanning, we propose an extension of the Daft et al. (1988) model to include an interaction between strategic uncertainty and source accessibility for Indian and U.S. entrepreneurs, such that entrepreneurs who perceive high levels of strategic uncertainty, and believe that the information they need is accessible, will be more likely to expend time and resources on scanning activities than will executives who sense a high level of strategic uncertainty, but do not perceive that they have access to affordable, pertinent information.

*Hypothesis 3. Higher levels of perceived strategic uncertainty will be associated with higher levels of scanning frequency among entrepreneurs in both Indian and the U.S.* 

Hypothesis 4. The interaction of strategic uncertainty and perceived source accessibility will be positively related to the scanning frequency of Indian and U.S. business owners.

# **RESEARCH METHODOLOGY**

# Sample and Data Collection

To create a cross-country sample for the study, we surveyed executives in the U.S. and India from July through October, 1999. The Indian sample is comprised of executives from the Gujarat region in northern India. We selected this region because it is one of the most highly industrialized states in India, accounting for 12.65% of the gross industrial output of India, and 10.23% and

16.07% of the factory facilities and productive capital, respectively. The region's 1600 km coastline is home to 40 ports and more than 125,000 small-scale businesses (Ministry of Industry, India, 1998).

While Gujarat enjoys a level of prosperity not shared by all areas of India, it has not been immune to the turbulent changes driven by radical reform in the 1990s. The Gujarati people's lack of confidence in the central government has been exacerbated by the effects of a devastating cyclone in 1998 and the political turmoil associated with Pakistan during 1999. Gujarat is a state that borders Pakistan, and communal riots erupted in the region during the summer of 1999 when Pakistan tested its nuclear weapons. Business activities in the region were interrupted again in late 1999 when the ruling government of Pakistan was overthrown in a military coup.

A research team from Rajasthan University, in cooperation with researchers from two U.S. universities, collected data for this project. The sample was drawn from the Directory of the Confederation of Indian Industries (CII) for the Gujarat region. A total of 108 out of 150 contacted Indian executives agreed to participate in the study. Subsequently, a member of the research team personally contacted each of the consenting executives, and oversaw the completion of the survey. We discarded eight responses because of missing data, 43 because they were managers rather than owners, and two firms which exceeded the maximum number of employees, 500. Thus, our final usable Indian sample consists of 55 subjects, all male, ranging from 21 to 71 years of age, with an average age of 43.7 years. The 55 firms represented a cross section of six broad industry categories, with the majority being from manufacturing. The firms ranged in age from just founded to 32 years of operation, and averaged 13.6 years of operation.

During the same time period, members of the U.S. research team used a similar personal contact approach to collect data from U.S. executives. We selected firms from a listing of Dallas- Fort Worth, Texas businesses, and from the Directory of Texas Manufacturers. We chose the latter source, in part, because it was the sampling frame used by Daft, et al. (1988). During the 1990s, the economy of the Dallas - Fort Worth (DFW), Texas metroplex has experienced an expansion that exceeds the growth rate of the U.S. economy. While unemployment figures at the national level have dropped to near 4 %, unemployment in the DFW area has hovered near 2% for the past three years. The DFW metroplex is one of the fastest growing high technology centers in the nation, ranking third in the U.S. in high technology employment (North Texas Commission, 1999). Recently voted as the top city in the U.S. for doing business by *Fortune* magazine, Dallas provides a fertile ground for new venture start-ups (Fisher, 1999).

Of 150 individuals contacted in the U.S., 104 agreed to participate in the study. We purged five responses due to incomplete data, 52 because they were managers rather than owners, and two firms which had more than 500 employees. Thus, our final sample of 45 U.S. business owners is comprised of 41 males and 4 females, ranging in age from 28 to 64 years, with an average age of 45.7 years. The firms ranged in age from just founded to 51 years of operation, and averaged 12.07 years of operation. As with the Indian sample, the firms represented diverse industries, but the majority were manufacturing firms. In both countries, all of the firms had less than 500 employees, and generated sales levels in U.S. dollar terms that would meet the U.S. Small Business Administration guidelines for classification as a small firm (Small Business Administration, 1998). Thus, our operating definition of an "entrepreneur" is a primary owner of a small firm who is actively engaged in daily managerial responsibilities in that firm.

There are several benefits which accrued from the sampling technique. First, the rate of response

estimated by the Indian team was approximately 72% percent, and in the case of the U.S., was 69%. Given that the response rate of the typical mail survey is 10% to 12% (Hambrick, Geletkanycz, & Fredrickson, 1993), the degree of participation by respondents in India and the U.S. minimizes concern with non-response bias relative to the usual mail survey. Not only did the use of personal, same-culture contact increase the response rate, the approach may have also facilitated more forthright responses to the survey questions. Finally, the sampling strategy produced firms from a variety of industries, an outcome in keeping with Hambrick's (1981b) recommendation for extending scanning research.

# Variables and Instrumentation

Measurement equivalency is a central issue in cross-cultural research (Riordan & Vandenberg, 1994). Given that there are measurement equivalency concerns associated with using scenario-based instrumentation outside of the country of origin (Buchko, 1994; Ireland, Hitt, Bettis, & de Porras, 1987), we followed the measurement framework of Daft et al. (1988), Sawyerr (1993) and May et al. (forthcoming) in developing an instrument that directly measured the perceived rate of change, complexity and importance of seven environmental sectors (political/legal, competition, economic, socio-cultural, technology, customer/market and resources) on a five-point Likert scale. We provided definitions of rate of change as "the frequency and speed of change that you see in the trends, issues and conditions in each environmental sector," complexity as "the number and diversity of events occurring in environmental sectors outside the operations of your company," and importance as "how important do you consider each environmental sector to be in accomplishing your company's

goals." We calculated the strategic uncertainty variable by using the same method as Daft et al. (1988) and Sawyerr (1993): strategic uncertainty = (rate of change + complexity) \* importance.

We also asked the respondents to evaluate the accessibility of each information mode on a fivepoint Likert scale adapted from Culnan (1983) (5 = extremely accessible to 1 = not very accessible at all), resulting in a four-item measure of total perceived accessibility. Accessibility was defined as "the ease with which you can acquire this information at reasonable to no cost, and the extent to which you are readily aware of where to get the information."

Because scanning frequency is a more valid approach to measuring scanning than hours devoted to the task (Farh et al., 1984), we measured the frequency of scanning (ranging from "daily" to "less than once a year") across the seven environmental sectors for each of the four different information modes: impersonal external, personal external, impersonal internal and personal internal. The final portion of the survey included questions about the individuals and their firms so that we could control for potential demographic confounds.

We calculated Cronbach alpha reliability estimates for the four main predictor variables, as follows: Rate of Change: India - .56, U.S. - .63; Complexity: India - .54, U.S. - .66; Importance: India - .75, U.S. - .57; Accessibility: India - .71, U.S. - .72; Scanning Frequency - .93 in each country.

While in the lower range, the reliabilities of .50 to .60 meet the standard proposed by Nunnally (1967) for exploratory research.

# **Control variables**

Several demographic variables have the potential to affect perceptions and strategic activities. Accordingly, we collected information on the age, years of formal education (Hambrick & Mason, 1984) and functional career background (Hambrick & Mason, 1984; Keegan, 1974) of the respondents. We also asked the respondents to identify their firm's primary industry group (Daft et al., 1988; Duncan, 1972; Fahey & King, 1977), number of employees, annual revenues and the year in which their organization was founded so that we could test for scanning differences according to these demographics. These questions also ensured that the respondents' firms met the criteria for inclusion in the study, as described earlier.

### RESULTS

We present means, standard deviations (s.d.) and correlations for all of the primary constructs in each of the two countries in Tables 1a and 1b. As expected, significant correlations exist among some of the constructs of primary interest. Given that strategic uncertainty is a combination of perceived rate of change, complexity and importance, the aggregate construct is significantly related to its components, as are the main effect variables with the interaction term. As subsequently discussed, the hierarchical data analytic technique alleviates concerns about the effects of multicollinearity on the resulting estimates.

Variables	Mean	S.D.	1	2	3	4	5	6
1. Rate of Change	22.78	3.33						
2. Complexity	23.42	3.35	.62***					
3. Importance	24.35	3.94	.47***	.54***				
4. Strategic Uncertainty	1137.93	288.78	.74***	.79***	.91***			
5. Accessibility	15.33	3.04	02	03	.04	.02		
6. SU x Accessibility <sup>b</sup>	17462.58	5849.11	.56***	.60***	.74***	.80***	.61***	
7. Scanning	21.52	4.37	.46**	.28	.38**	.44*	.44**	.62***

TABLE 1a
<b>Descriptive Statistics and Correlation Matrix for Indian Sample</b> <sup>a</sup>

 $^{a}N = 55$ 

<sup>b</sup> SU x Accessibility is the multiplicative interaction term between Strategic Uncertainty and Accessibility

\* p < .05

\*\* p < .01

\*\*\* p < .001

Variables	Mean	S.D.	1	2	3	4	5	6
1. Rate of Change	23.00	3.40						
2. Complexity	23.53	3.87	.52***					
3. Importance	25.64	3.43	.49**	.55***				
4. Strategic Uncertainty	1206.07	291.16	.75***	.79***	.90***			
5. Accessibility	15.07	3.47	03	09	.19	.06		
6. SU x Accessibility <sup>b</sup>	18225.80	6108.53	.46**	.48**	.75***	.72***	.71***	
7. Scanning	19.57	4.58	.14	.21	.30*	.27	.73***	.69***

TABLE 1b
Descriptive Statistics and Correlation Matrix for U.S. Sample <sup>a</sup>

 $^{a}N = 55$ 

<sup>b</sup> SU x Accessibility is the multiplicative interaction term between Strategic Uncertainty and Accessibility

\*\* p < .01

\*\*\* p < .001

<sup>\*</sup> p < .05

We tested hypothesis 1, predicting that owners of older firms would scan the environment more often than would younger firms, by regressing scanning frequency on the age of the organization. The results (F = .19; p = .66) did not confirm this expectation. There was no significant firm age influence on scanning, failing to support hypothesis 1. We then tested hypothesis 2, which predicted that Indian entrepreneurs would scan more frequently than would U.S. entrepreneurs, with a one-way ANOVA. The results (F = 4.43; p < .02), indicating significantly higher levels of scanning in the Indian sample, support hypothesis 2.

We used hierarchical regression analysis to test the remaining hypotheses in order to independently examine the unique effects of each of the environmental perception variables on scanning frequency, a recommended analysis of decomposed effects (Boyd & Fulk, 1996). Also, the technique allows for variance partitioning of correlated independent variables, wherein each equation presents the unique variance explained, thereby eliminating the effects of multicollinearity and increasing the stability of the estimates (Cohen & Cohen, 1983). The effectiveness of the hierarchical procedure in dealing with multicollinearity was confirmed by diagnostics of the regression models, which indicated high tolerance levels for the predictors and acceptable variance inflation factors (Hays, 1994). Additionally, the hierarchical procedure reduces the omnibus risk of committing a Type I error through Fisher's protected *t*-tests at each equation, and maximizes the extraction of causal inference by allowing theory to guide model development (Cohen & Cohen, 1983).

Before specifying and analyzing the hierarchical models of scanning behavior in each country, we first checked the potential confounds for any significant effects. One-way ANOVAs indicated no significant

differences in the age (U.S.: F = .05, p = .83; India: F = .78, p = .38) or the level of education (U.S.: F = .65, p = .42; India: F = .86, p = .36) of the respondents on scanning frequency. Neither were there any differences in scanning frequency according to the means of ownership, i.e., founding, buying, franchising or inheriting the firm (U.S.: F = .28, p = .75; India: F = .45, p = .64). Firm demographics, such as sales (U.S.: F = .32; p = .90; India: F = .44; p = .72) and industry (U.S.: F = 1.03, p = .41; India: F = .96, p = .33) also showed no associations with scanning frequency. In the interest of model parsimony, we excluded these demographic variables from subsequent analysis.

In constructing the hierarchy of analysis for the regressions, we analyzed all possible permutations of the three components of strategic uncertainty (rate of change, complexity and importance). In each case the results were the same. Thus, we present the hierarchical sequence in Table 2 that is most consistent with existing theory, the Daft et al. (1988) formulation of strategic uncertainty, and the concomitant presumptive logic of causality: rate of change, complexity, importance, the composite strategic uncertainty score, perceived accessibility, and the multiplicative interaction term between strategic uncertainty and accessibility, entered after the main effects, as recommended by Cohen and Cohen (1983) and by Jaccard, Turrisi and Wan (1990). In assessing the models, we first analyzed the significance of the fully partialled model, and when significant, tested the significance of each equation in the hierarchy by examining the change in  $R^2$  from the previous to the current equation. The focus of the analysis centers on the direct effects of the variable which has just entered, and the *t*-test for the new variable. Finally, an examination of residuals showed no violations of regression assumptions.

Hierarchical Regression Results from Each Country								
_	U.S.			India				
Variables	В	S.E.	t	В	S.E.	t		
Equation 1								
Constant	15.12	4.72	3.21	7.44	4.03	1.80		
Rate of Change	.19	.20	.95	.61	.17	3.53***		
	$R^2 = .02$ F = .90			$R^2 = .21 F = 12.43 **$				
Equation 2								
Complexity	.22	.21	1.07	.02	.24	.08		
	$R^2 = .05 F = 1.03$			$R^2 = .21 F = 6.08^{**}$				
Equation 3								
Importance	.35	.25	1.42	.25	.17	1.45		
	$\mathbb{R}^2$	$R^2 = .09 F = 1.38$			$R^2 = .25 F = 4.86^{**}$			
Equation 4								
Strategic Uncertainty	01	.03	46	.01	.02	.10		
	$\mathbf{R}^2$	$R^2 = .10 F = 1.06$			$R^2 = .25 F = 3.56*$			
Equation 5								
Accessibility	1.13	.14	7.40***	.64	.17	3.79***		
	$R^2 = .62 F = 12.95^{***}$			$R^2 = .44 F = 6.60^{***}$				
Equation 6								
SU x Accessibility <sup>a</sup>	.02	.04	.43	.01	.01	1.03		
	$R^2 = .63 F = 10.60^{***}$			$R^2 = .45 F = 5.69^{**}$				

TABLE 2	
Hierarchical Regression Results from Each	Country

<sup>a</sup> SU x Accessibility is the Strategic Uncertainty by Accessibility interaction term. Because it is not significant, the fully partialled model is represented in Equation 5.

\* p < .05\*\* p < .01\*\*\* p < .001

Hypothesis 3 posited that higher levels of perceived strategic uncertainty would be related to higher levels of scanning frequency in both countries. The results, indicating that the composite strategic uncertainty construct did not prompt scanning in either country, fails to support this hypothesis. In fact, none of the components of strategic uncertainty prompted scanning in the U.S. In India, rate of change was the only significant predictor of scanning, at an alpha of .05. Hypothesis 4 predicted that scanning would be more frequent when strategic uncertainty was high and the source of information was perceived as more accessible. This hypothesis was not supported. While accessibility had significant influence as a main effect on scanning in both countries, it did not condition the influence of strategic uncertainty on scanning in either country.

After finding that perceived rate of change influences scanning frequency among Indian entrepreneurs, we conducted a post hoc test for a possible interaction effect between perceived rate of change and perceived accessibility on scanning frequency. This post hoc analysis showed no support for this interaction effect among Indian business owners (B = -.96, t = -.85, p = .20). Thus, we conclude that perceived rate of change and perceived accessibility influence scanning frequency in Indian entrepreneurs in the form of main effects only. Moreover, perceived source accessibility is the only variable in our proposed model which drives the scanning frequency of U.S. entrepreneurs.

# DISCUSSION

Our primary purposes were to test Western environmental scanning theory, specifically the strategic uncertainty framework posed by Daft et al. (1988), in the entrepreneurial context, and to determine if there

were important cross-cultural differences in entrepreneurial scanning behavior. The entrepreneurial setting in the U.S., while challenging, is characterized by relatively stable environmental conditions, but entrepreneurs in India must deal with a much more uncertain decision making scenario, created by significant industrial transition. Thus, we believed that a comparison of entrepreneurial scanning behaviors in the two countries might afford insight that would extend scanning theory. The results suggest that the scanning behaviors of entrepreneurs differ from those of managers, and although there are similarities, the scanning behaviors of entrepreneurs in India differ from their U.S. counterparts.

Indian entrepreneurs, confronted with more environmental change, appear to scan more frequently than do U.S. entrepreneurs. This outcome is predicted, at least indirectly, by Western scanning theory, which indicates that increased perceived uncertainty will prompt more active scanning. Notably, there were no demographic influences on scanning frequency in either country. The finding that the age of the firm did not influence scanning behavior in either country contrasts with the findings of Mohan-Neill (1995), who found that executives in older firms scan more frequently than do those in younger ones. Perhaps the difference lies in the measurement of organizational age. We measured organizational age as a continuous variable, while Mohan-Neill (1995) categorized the sample into firms less than five years old, and firms older than 20 years, and compared the differences across several sources of environmental information.

In terms of the influence of perceptions of the environment on scanning behavior, the results from the study are inconsistent with previous findings regarding the scanning behavior of managers. Rate of change (Bourgeois, 1985; Duncan, 1972; Lindsay & Rue, 1980) and complexity (Boyd & Fulk, 1996) have been

supported as antecedents of scanning frequency. Moreover, Daft et al. (1988) indicated that rate of change and complexity alone are insufficient for explaining scanning frequency without considering the importance of the environmental sectors. Nevertheless, none of these environmental perceptions prompted scanning by U.S. entrepreneurs. Notably, the importance of the information to the firm's success had no effect on level of scanning frequency, a conclusion which appears to conflict with the findings of Pineda et al. (1998). Their results showed an increased level of information search activity among small business managers when the relative importance placed on a particular decision increased, but they focused on specific decision areas, not perceptions of sector importance per se. In this study, contrary to Daft et al. (1988), strategic uncertainty did not prompt entrepreneurs in either country to scan. In fact, only the perceived accessibility of information emerged as a significant predictor of scanning in our sample of U.S. entrepreneurs. In India, perceived accessibility of information, in addition to perceived rate of change, precipitate scanning. There are several plausible explanations as to why the scanning behaviors of entrepreneurs in this study are different from those previously reported for managers. Given a certain level of perception of environmental uncertainty, entrepreneurs might not be prompted to scan because, although not conclusive, there is evidence that entrepreneurs have a higher tolerance for ambiguity and risk taking than do managers (cf. Stewart, Watson, Carland, & Carland, 1999), particularly in generating change that may rejuvenate existing industries or spawn new ones. Thus, environmental uncertainty would not be as likely to prompt entrepreneurs to scan as it might managers. Also, time and resource scarcity limit the ability of small firms to respond to environmental change (Gibb & Scott, 1985), and resource access limits the

range of opportunity, choice and growth potential of entrepreneurial firms (Thakur, 1999). Because the entrepreneur is concurrently dealing with daily operational issues, time for strategic planning is often limited (Sexton & Van Auken, 1985). These time constraints truncate scanning (Dollinger, 1985), and resources are often unavailable for scanning in the small firm (Callahan & Casar, 1995; Masten et al., 1995; Matthews & Scott, 1995; Mohan-Neill, 1995; Pineda et al., 1998). Thus, from the entrepreneur's perspective, the time and costs required for information searching necessary for a comprehensive decision process might not be worthwhile, which is also the case with managers of organizations in volatile environments (Fredrickson, 1984; Fredrickson & Mitchell, 1984; Fredrickson & Iaquinto, 1989). Decision makers may be forced to abandon rational, comprehensive analysis because of cognitive and resource limits (Cyert & March, 1963; Simon, 1957), and instead, focus on fewer alternatives. Such may particularly be the case with entrepreneurs, who are dealing with multiple demands for the business, and who may have reduced decision making time, and other demands with simplified decision heuristics. Here, it would seem that the perceived accessibility of information, representing lower actual and opportunity costs of data collection, is particularly important in identifying data gathering activities of entrepreneurs.

## Limitations and Future Research

The potential limitations of the study are primarily those associated with the lack of control in a survey Methodology, and those inherent in relying on self-report items on a single questionnaire. We had no control over the conditions during response, and the research context precluded multi-method data collection, common circumstances in field research. We did attempt to strengthen our case through careful

attention to measurement equivalence, particularly conceptual congruence by providing explicit, clear explications of the constructs in the survey, and guidelines for its administration. There was substantial variation in the two samples, and a relatively high rate of response across a wide array of industries and individuals may cancel chance imbalances (Isaac & Michael, 1990), reduce method variance (Mitchell, 1985) and enhance generalizability (Neale & Liebert, 1986). A Harman's single-factor test of the primary variables in the study did not produce a single or general factor that explained the majority of covariance in predictor and criterion variables, conditions indicative of common method variance (Podsakoff & Organ, 1986). In summary, while we do not believe that these measurement limitations jeopardize the usefulness of our findings, particularly as an exploratory cross-cultural comparison of scanning behavior, they should be considered in evaluating and extending the results.

We believe that the topic of scanning is important for a refined understanding of decision making processes in entrepreneurial firms. Toward this end, we suggest some avenues for additional research that might overcome the limitations of our study, and could extend the nomological framework of scanning behavior. First, we focus on methodological issues, primarily measurement and analysis.

Consensus is lacking concerning how organization environments and uncertainty should be conceptualized and measured (cf. Boyd et al., 1993). We decided to focus on measurement precision and equivalency, and direct comparability with previous research in strategic management by following the measurement framework of Daft et al. (1988), which has been replicated in two non-Western scanning studies by Sawyerr (1993) and Elenkov (1997). Although we believe this decision maximized the outcomes

of the study, it did involve tradeoffs. First, we used one item per environmental sector to tap perceptions about each of the three environmental constructs (seven items per construct), but the use of multiple items per environmental sector could provide more insight. Also, the use of this instrumentation focused on environmental heterogeneity, and precluded the measurement of proposed subdimensions of complexity, such as predictability and analyzability. We deemed this decision prudent because of the aforementioned priority of direct comparability to other non-Western studies which used the Daft et al. (1988) conceptualization of strategic uncertainty and the instrumentation, as well as extending the inferences concerning managers in the strategic management literature to entrepreneurs. In so doing, holding constant as many sources of potential variance as possible enhances the generalizability of the results (Schwab, 1980), thereby contributing to the efficient accumulation of robust theory.

Future research, probing the issues of organization-environment relationships with elaborated construct conceptualizations that address contextual measurement complexities, is needed for further refinement of entrepreneurial environmental scanning theory. In doing so, the results here support Boyd and Fulk's (1996) warning that relying only on the composite measure of strategic uncertainty to predict scanning, as opposed to examining its individual components, may lead to inconclusive or misleading results. A decomposed approach to the analysis of scanning, as presented here, would seem to be particularly important for inquiry in non-Western environments, where even less is known about the perceptions of environmental uncertainty dimensions and their potential role in explaining scanning behavior. Given that much of the research consists of frequencies and statistical inferences drawn from simple correlations, we

also advocate more sophisticated data analytic techniques to test hypotheses about entrepreneurial scanning.

Beyond these methodological issues, the results have broad implications for theory extension at the intersection of strategy, entrepreneurship and international business, but we limit the following discussion to two primary areas of investigation. The first is refining knowledge about entrepreneurial scanning activities and their antecedents, particularly in non-Western contexts. Although information source accessibility did not prove a significant moderator of scanning frequency, it is likely that other individual or situational variables may mediate or moderate scanning behavior. For instance, the entrepreneur's goals for the business, primarily, generating growth or current income, may influence perception-scanning relationships. Also, perceptions of environmental uncertainty differ by culture (Miller, 1993; Schneider & De Meyer, 1991). Thus, culture-influenced variables, such as risk attitudes, achievement orientation and individual control expectations may affect the perceived value and frequency of scanning. For example, there is empirical evidence of a significant relationship between managers locus of control and their scanning behavior (Miller, Kets de Vries, & Toulouse, 1982; Hodgkinson, 1992). The same may be true of entrepreneurs. Moreover, situational factors, such as the entrepreneurial infrastructure, including the quality and reliability of information sources (Auster & Choo, 1993), and factors such as organizational strategy (Hambrick, 1982; Hrebiniak & Joyce, 1985) and firm structure and processes (Hodgkinson & Johnson, 1994; Weick, 1979) may also influence scanning frequency and the choice of information modes. Due to space limitations, we did not investigate entrepreneurs choice of information mode, but entrepreneurs may differ from managers in the sources of information on which they depend. Finally, although we focused on

existing owners, there may be significant differences in scanning behaviors in start-up compared to poststart-up. Investigation of the effects of these factors on scanning and other boundary spanning activities in different environmental contexts may be instructive for entrepreneurial scanning.

The second primary research area involves the outcomes of scanning activities, focused specifically on interpretation and strategic decision making, and the ensuing implications for venture performance. In the West, the environment has a substantial influence on strategic decision processes (cf. Eisenhardt, 1989; Priem, Rasheed, & Kotulic, 1995 Rajagopalan, Rasheed, & Datta, 1993). Moreover, Daft and Weick (1984) hypothesized that the interpretation of problems or opportunities by key decision makers influences the majority of organizational outcomes. This information processing is driven by cognitive schema (Dutton & Jackson, 1987; Jackson & Dutton, 1988), and different interpretations, particularly as influenced by culture (Sallivan & Nonaka, 1988; Schneider & De Meyer, 1991), lead to alternative decision processes and behaviors (Cowan, 1986; Dutton, et al., 1983; Dutton & Jackson, 1987; Nutt, 1984). Accordingly, research on entrepreneurial cognition (cf. Baron, 1998) may be beneficially combined with the study of environmental scanning.

Environmental instability is a fundamental determinant of strategy, structure and organizational outcomes (cf. Keats & Hitt, 1988), requiring the firm to adapt in order to maintain an equilibrium with the environment that boosts firm performance (Venkatraman, 1989; Venkatraman & Prescott, 1990). Environmental scanning is important in maintaining correspondence between the environment and the firm, and leads to improved performance (Daft et al. 1988), a conclusion confirmed in entrepreneurship studies

(Brush, 1992; Dollinger, 1985). More research is needed to confirm the scanning-performance relationship in a variety of contexts. Conversely, firm performance may influence scanning behavior, perhaps contributing toward congruence between perceived and actual environmental conditions, a congruence associated with improved organizational performance (Bourgeois, 1985; Dess & Keats, 1987).

Most of the aforementioned expectations have been generated by research using samples of Western managers. Hence, research is needed to test these precepts in samples of entrepreneurs, and to examine the universality of the conclusions across different entrepreneurial contexts. Particularly important is understanding how scanning influences diagnosis, strategy and performance in different environmental circumstances. Transitional and developing countries provide ideal scenarios for testing hypotheses about scanning in entrepreneurial firms. We heartily encourage such research in order to generate more robust theory and better guidelines for entrepreneurs in surviving and creating value through their ventures.

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