

A Question of Fit: The Links among Environment, Strategy Formulation, and Performance

Robert J. Harrington, Nicholls State University

David J. Lemak, Washington State University at Tri-Cities

Richard Reed and Kenneth W. Kendall, Washington State University

This study replicates and extends previous research on strategy formulation. Specifically, it examines the effect that environmental dynamism has on realized strategies that were initially intended versus those that emerged during the formulation process. We argue that firms match their strategy-formulation process with the level of dynamism, and that a fit between the balance of deliberate and emergent strategies with the environment enhances financial performance. Support for those arguments was found using a sample of firms drawn from industries that allowed us to maximize dynamism heterogeneity.

The strategy literature is rich with studies that examine specific aspects of the strategic process. For example, it has been addressed in terms of strategic decision-making (e.g., Eisenhardt, 1989; Sharfman & Dean, 1997), strategy implementation (e.g., Bryson & Bromiley, 1993; Nutt, 1989), and planning (e.g., Bracker & Pearson, 1986; Rhyne, 1986; Hopkins & Hopkins, 1997), with the latter receiving the most research attention. In the empirical tests of the relationship between strategic planning and performance, the findings have provided mixed results (Boyd, 1991; Miller & Cardinal, 1994). Researchers have suggested this outcome may arise from things like the use of unidimensional constructs, inconsistent measures, and a lack of controls for other theoretically important variables (Boyd, 1991; Brews & Hunt, 1999; Miller & Cardinal, 1994). Conceptual and methodological developments have, however, been made (Brews & Hunt, 1999; Mueller, Mone, & Barker, 2000), and the purpose of this work is to build upon this new and improved base. Specifically, we focus on the proportion of planned versus unplanned parts of firms' strategy as it is eventually realized, how the environment influences it, and how it affects performance. We thus draw on the notion of deliberate and emergent strategies (Mintzberg & McHugh, 1985; Mintzberg & Waters, 1985). Deliberate strategies are defined as "intentions realized" from strategies that are formulated in advance, whereas an emergent approach produces evolving strategic patterns "despite or in the absence of intentions" (Mintzberg & McHugh, 1985, p. 161). A major contribution this study makes is to develop and operationalize a more comprehensive version of the deliberate-emergent construct than has been done to date.

We adopt a contingency perspective by arguing that an effective strategic process depends in large part on the nature of the environment in which the organization operates (Scott, 1998). This contingency approach is consistent with previous strategy research (e.g., Ansoff, 1987; Bourgeois & Brodwin, 1984; Chaffee, 1985; Grandori, 1984; Hart, 1992; Mintzberg, 1973; Mintzberg & Waters, 1985; Nonaka, 1988), and with the notion that "fit" with the environment improves firm performance. We define fit as "matching" (Venkatraman, 1989).

In the following sections, we explore the extant literature, develop theoretical arguments, and articulate our hypotheses. An explanation of the study's research design and the reporting of results follow, along with a discussion of our findings and their implications for future research.

STRATEGIC PLANNING LITERATURE

Typically, strategic planning has been measured as level of formality, the number of written documents, planning horizon or comprehensiveness (e.g., Fredrickson, 1984; Fredrickson & Jaquinto, 1989; Fredrickson & Mitchell, 1984; Rhyne, 1985, 1986). Some researchers found a positive relationship with formal planners achieving higher performance (e.g., Thune & House, 1970; Karger & Malik, 1975; Robinson, Vorzikis, & Pearce, 1981) while others found no consistent relationship (e.g., Fulmer & Rue, 1974; Leontiades & Tezel, 1980; Robinson & Pearce, 1983). While such studies have generated mixed results—a positive, negative, or no relationship with performance (Pearce, Freeman & Robinson, 1987)—they do permit some interesting observations. First, Rhyne (1985) found that the environment affects the planning process. Second, planning persistence pays off (Bracker & Pearson, 1986; Brews & Hunt, 1999), but the type of strategic plans and processes seem to vary on a continuum whether described as structured/unstructured, formal/informal, comprehensive/non-comprehensive, or deliberate/emergent (Bracker & Pearson, 1986; Fredrickson & Jaquinto, 1989; Mintzberg & Waters, 1985; Rhyne, 1985). Third, the strategic-planning construct appears to be multi-dimensional in nature; differing findings may thus be a result of inconsistent or incomplete measurement (Brews & Hunt, 1999; Mueller et al., 2000).

As already suggested, divergent findings on planning and performance could largely be an artifact of methodological problems. Boyd and Reuning-Elliott (1998) indicated that measurement error (when using single indicators) would cause researchers to conclude that criterion variables are unrelated to planning 50 % of the time. Thus, a multi-indicator approach to the planning and performance constructs could reduce Type II error rates and substantially increase statistical power. Organizational size, industry, context, and timeframe are critical variables to be considered in strategic planning research. In addition, measurement validity is a central issue of concern in this stream of literature (Pearce, Freeman, & Robinson, 1987).

Mueller et al. (2000) suggested that the equivocal results arose from the confounding effects of a variety of constructs. They concluded that some of the equivocality was caused by a lack of decomposition of the planning-rationality construct into its component parts. Similarly, Brews and Hunt (1999) used a multidimensional measure to test the impact of planning-versus-learning approaches and the effect on firm performance. In their study, they decomposed the deliberate strategy construct into the specificity of strategic ends (e.g., objectives) and means (e.g., resource allocations). The types of ends and means, the number of ends and means, and how specific they were, measured the level of specificity. The specificity score for ends and means was a summed total of the types, number, and level of specificity. Although it was not shown in their study whether the difference in summed scores (between firms in stable and unstable environments) was caused by different types, numbers, or specificity of ends and means, their findings indicated that firms in unstable environments used higher specificity in strategic ends and means. This suggested to Brews and Hunt that the environment neither moderated the need for formal planning, nor the

direction of the planning-performance relationship. But, they noted that the environment did moderate planning capabilities and planning flexibility. Although the Brews and Hunt (1999) study was imperfect (i.e., the work relied upon self-report measures, for a relatively homogeneous sample, and used a one-item measure of planning flexibility) it does constitute a large step forward in this stream of research.

CONSTRUCTS, THEORY, AND HYPOTHESES

Environment

In the studies that have considered environmental effects (e.g., Eisenhardt, 1989; Hart & Banbury, 1994), the tendency has been to use an all-encompassing measure of uncertainty that is rooted in early conceptualizations of the environment (Lawrence & Lorsch, 1967; Thompson, 1967). Although Dess and Beard's (1984) multi-dimensional conceptualization has been widely adopted in organization research, it has been used by only a handful of scholars studying strategy formulation (e.g., Rhyne, 1985). Therefore, while it is widely recognized that dynamism, complexity, and munificence can affect the firm in numerous and different ways, knowledge of their impact on strategy formulation remains incomplete.

Dess and Beard's (1984) seminal work provides a theoretical and empirical characterization of dynamism as a construct that is separate from complexity. Dynamism is defined as unexpected change or change that is hard to predict (Dess & Beard, 1984). Quantitative measures used as a proxy for dynamism have included the volatility of net sales in an industry, and the volatility of operating income (Boyd, 1995; Dess & Beard, 1984; Keats & Hitt, 1988). Dess and Beard's (1984) definition for complexity reflected the geographic dispersion of activities in their sample, but complexity has been most often operationalized as the concentration (dispersion) of firms within an industry (e.g., Boyd, 1995; Keats & Hitt, 1988; Palmer & Wiseman, 1999; Rasheed & Prescott, 1992). Environmental munificence is defined as resource abundance and the resulting capacity to support growth (Dess & Beard, 1984).

Following the work of Brews and Hunt (1999), we consider the relative stability or instability of the environment (i.e. dynamism) to be the driving force in deliberate-emergent decisions of strategy formulation. But, to partial out the pure effects of dynamism from other environmental variables, we include environmental complexity and munificence as control variables.

Deliberate versus Emergent Strategies

The question of whether strategy formulation is a rational and comprehensive process (the deliberate view) or a more incremental and trial-and-error type of approach (the emergent view) remains unanswered because, again, the results of empirical studies are mixed (Boyd, 1991; Brews & Hunt, 1999; Mueller et al., 2000). One reason may be the tendency to view deliberate and emergent strategies as dichotomous (Boyd, 1991), whereas the original conceptualization offered by Mintzberg and McHugh (1985) and Mintzberg and Waters (1985) described the two processes as ends of a continuum with multiple elements. We have adopted the original view in this study.

The deliberate perspective is based on an early view of strategic management that assumes a predictable environment and perfect foresight by managers. This perspective is typified by the work of Ansoff (1965), Andrews (1971), and Porter (1980), and is generally viewed as an analytical approach to strategy formulation, driven by formal structure and planning systems (Hart & Banbury, 1994). The ideas underpinning the emergent approach to strategy formulation were primarily promoted by Mintzberg and colleagues (Mintzberg, Ahlstrand, & Lampel, 1998; Mintzberg & McHugh, 1985; Mintzberg & Waters, 1985) and Quinn (1980). Many of those ideas are based on an earlier manuscript by Lindblom (1959) where he discusses "incrementalism" as part of the art of "muddling through." These concepts reflect the idea that strategy is developed within a group of strategic subsystems that use interactive learning, testing, and innovation to formulate and implement strategy in an iterative process (Quinn, 1980). The strategic process is thus seen as both a learning and a maneuvering process (Mintzberg et al., 1998) that allows managers to "make decisions as late as possible consistent with the information available and needed" (Quinn, 1980, 22) which, in turn, allows them to respond to the vagaries of a dynamic environment.

Because we view the deliberate and emergent approaches to strategy formulation as ends of a continuum, any change between what was intended and what is realized includes the "replacement" of deliberate with emergent strategies. Further, as Mintzberg et al. (1998) indicate, emergent strategies can be new, additional strategies, and can thus be additive in nature. Strategy makers may thus find that their original intentions are realized, but that additional strategies have also emerged during the strategic process. Therefore, following Mintzberg and colleagues, we propose that a more accurate differentiation between a primarily deliberate or emergent approach is a measure of strategy that is "realized" (Mintzberg's term). Realized strategy can be conceptualized as the combination of deliberate components (intentions defined in advance) and emergent components (the level of replacement and additive strategies). Consequently assessment of the deliberate-emergent nature of a firm's strategy formulation process should include factors that capture the complex nature of the phenomenon; i.e., the number of strategic ends and means, the types of ends and means, the level of specificity of ends and means, and the number of ends and means that are realized.

The concept of strategic ends and means is well established and has been widely used in the strategic-management literature (e.g., Andrews, 1971; Chandler, 1962; Hofer & Schendel, 1978). Brews and Hunt (1999) argued that high specificity of ends and means is consistent with a deliberate approach, and low specificity is consistent with a more emergent approach. This basic idea is sound, but it does not go far enough. Mintzberg and McHugh (1985) described the emergent approach as "despite or in the absence of intentions" (p. 161), which implies that movement on the deliberate-emergent continuum also reflects emergent strategies replacing intentions as well as emergent strategies modifying intentions. Therefore, a measure of the emergent elements of strategy formulation should include the number of changes to intended strategies, the magnitude of change to intended strategies, and the number of additive strategies that emerge between intended and realized strategies.

Hypotheses

While dynamism does not seem to have a strong relationship with firm planning *per se* (Brews & Hunt, 1999; Miller & Cardinal, 1994), research has suggested that it may impact

flexibility and adaptability, particularly with regard to strategic ends and means (Brews & Hunt, 1999; Mintzberg et al., 1998). Because unexpected change created by dynamism is difficult to plan for, it is likely that firms in a highly uncertain environment will value flexibility and will have strategies that are more emergent in nature (Chaffee, 1985; Fredrickson & Mitchell, 1984; Mintzberg et al., 1998). Thus, higher levels of change in a firm's environment will result in strategic patterns emerging over time (e.g., Mintzberg et al., 1998; Mintzberg & McHugh, 1985; Mintzberg & Waters, 1985; Quinn, 1980), and this is thought to occur either *despite* intentions in advance or in the *absence* of intentions (Mintzberg & McHugh, 1985). Consequently, there should be a positive relationship between the level of environmental dynamism and the emergent nature of a firm's strategic process. As dynamism increases, accurate predictions of the future become more difficult and strategy formulation, in terms of both ends and means, will become less deliberate and more emergent, and intended strategies will constitute a decreasing proportion of realized strategies. We therefore postulate that firms in a more (less) volatile environment will create a smaller (greater) number of strategic ends and means, and these firms will reduce (increase) the level of specificity in those strategic ends and means. Therefore:

H1a: *There will be a direct and negative relationship between dynamism and the number of strategic ends.*

H1b: *There will be a direct and negative relationship between dynamism and the number of strategic means.*

H2a: *There will be a direct and negative relationship between dynamism and the level of specificity of strategic ends.*

H2b: *There will be a direct and negative relationship between dynamism and the level of specificity of strategic means.*

As dynamism increases, accurate predictions of the future become more difficult and strategy formulation—in terms of both ends and means—will also be increasingly emergent. In accordance with the arguments of Mintzberg & McHugh (1985), we postulate that firms in a more (less) volatile environment will have a higher (lower) number of new ends and means emerge during the strategic process, have a higher (lower) frequency of change that takes place in the ends and means (from intention to realized), and have a higher (lower) magnitude of change to ends and means (i.e. minor changes versus significant modifications). Intended strategies thus will constitute a decreasing proportion of actual strategies. Therefore:

H3a: *There will be a direct and negative relationship between dynamism and the strategic ends that are realized.*

H3b: *There will be a direct and negative relationship between dynamism and the strategic means that are realized.*

Contingency theory would suggest that a fit between the environment and the strategic process should have a positive effect on performance. From our arguments thus far, we can deduce that, all else being equal, firms operating in an environment with low (high) dynamism

should use a more deliberate (emergent) strategy formulation process. Because firms with a fit with their environment are utilizing their resources more efficiently and effectively in the strategic process, it is hypothesized that they will achieve higher relative performance than firms without a fit. Therefore:

H4: Firms whose strategy formulation process fits their environment will have higher performance than those that do not have a fit.

METHODS

We have used both primary and secondary data to assess convergent and discriminant validity in our environmental and performance variables; environmental variables and firm performance were both calculated from archival sources (Boyd, 1995; Li & Simerly, 1998) and self-report measures. Survey responses were also used to establish strategy formulation dimensions for each firm.

Sample and Procedures

We followed the method of Boyd (1995) and Li and Simerly (1998) and identified a sample frame of 56 industries (at the 4 digit SIC code level) using information provided in U.S. Industry & Trade Outlook for the years 1995-1999. This period gave us five years of the most recent available data for our longitudinal design. From the initial examination, we selected 18 industries that maximized heterogeneity on the dynamism dimension to ensure a sufficient level of variation to increase the power in our tests of hypotheses. This process was consistent with contingency-theory studies going back nearly 35 years (Lawrence & Lorsch, 1967).

Our survey instrument contained both intact and modified scales used in previous studies, as well as some new items (see Appendix). The validity and reliability of the intact items are well documented (Brews & Hunt, 1999; Hart & Banbury, 1994). Modifications were improvements (e.g., making the measure of strategic ends more specific), whereas most of the new items were, by necessity, developed to measure emergent strategies. To assess the impact of modifications and new scale items in the instrument, two pretests were performed. The first pretest of the instrument was done using a group of 21 executives and managers. Based on this initial pretest, several changes were made. After these changes, a second pretest of the instrument was done using input from a different group of 12 executives and managers. Based on the feedback from the second pretest, the final instrument received only minor changes.

Mailing Procedures. The self-report survey was administered following a modified Dillman (2000) procedure. The initial mailing, which went out to 490 top executives (senior VP and above) resulted in 68 usable responses from firms in 18 different industries. The response rate of 14% was comparable to other recent surveys of this population (Agle, Mitchell, & Sonnefeld, 1999; Isobe, Makino, & Montgomery, 2000; Simons, Pelled, & Smith, 1999). To assess the presence of non-response bias in our data, we compared the firms that responded to our survey to the entire sample on three characteristics: sales, total assets, and percentage of service to manufacturing firms. No significant differences were found.

Measures

Environment. Dynamism was operationalized as a standardized measure of the volatility of industry sales growth rate over the 1995-1999 period. By regressing values of industry sales against time (1995-1999) and dividing the standard error of the regression slope coefficient of the time dummy by the mean value of industry sales, standardized indices of environmental dynamism were obtained (Boyd, 1995; Li & Simerly, 1998). Table 1 provides the measures of dynamism for the 18 industries used in this study. For the sake of completeness, Table 1 also includes measures for the environmental control variables of complexity and munificence.

TABLE 1
Industry Environmental Measures

Industry	Dynamism	Complexity ^a	Munificence
General Components	0.0030	0.6918	0.0574
Photography Equipment/Supplies	0.0020	0.6259	0.0344
Book Publishing	0.0018	0.7496	0.0391
Household Appliances	0.0019	0.7777	0.0043
Motorcycles/Bicycles	0.0008	0.5140	0.0286
Musical Instruments	0.0024	0.5284	0.0389
Telecommunication Services	0.0013	0.9622	0.0855
Eating Places	0.0016	0.9344	0.0473
Pulp Mills	0.0401	0.3449	-0.0379
Plastic Material/Resins	0.0144	0.7882	0.0324
Printed Circuit Boards	0.0407	0.7997	0.0758
Construction Machinery	0.0215	0.2276	0.0401
Mining Machinery	0.0190	0.6551	-0.0373
Oil/Gas Field Machinery	0.0264	0.7285	0.0541
Aircraft - Aerospace	0.0226	0.4020	0.1361
Lawn/Garden Equipment	0.0074	0.7873	0.0316
Medical Supplies	0.0071	0.9422	0.0906
Management Consulting Services	0.0069	0.9015	0.1092

a The complexity score shown is the Herfindahl score (Boyd, 1995).

Realized Strategy Ratio. We constructed a ratio to be used as a proxy for firms' realized strategy. In line with our earlier argument that a weakness of previous empirical studies was treating deliberate and emergent strategies as distinct strategies, instead of ends of a continuum, we constructed a continuous (ratio) measure that is consistent with theory. The ratio measures both deliberate and emergent strategy in absolute and relative terms, which we deemed to be more accurate than using simple scores on individual items:

$$R = (D-E)/(D+E)$$

where R is the measure of the realized strategy (from -1.0, purely emergent, to +1.0, purely deliberate), D is the measure of deliberate strategy (calculated as the number of strategies multiplied by their level of specificity), and E is the measure of emergent strategy (calculated as the frequency of change in strategies multiplied by the percentage of change). Note that this ratio can be used for both strategic ends and means.

Fit. We used two indicators to evaluate fit: the strategic-ends realized-strategy ratio and the strategic-means realized-strategy ratio. The breakpoints used to determine fit from these indicators were the mean values. Whether a firm was above or below the mean for each realized ratio gave an indication as to whether its process was predominantly deliberate or emergent. Using the "fit as matching" concept (mentioned earlier) a firm was considered to have a "fit" if there was a match between its environment and each indicator. Firms were coded 1 if placed in the fit group, 0 otherwise. Thus, each firm achieved a score of 0, 1, or 2 with 0 meaning no fit, 1 meaning a fit with one indicator, and 2 meaning a fit with both indicators.

Performance. Given that 56 % of the firms in our sample reported that they had been using their current strategy formulation process for 5 years or less, averaging performance across the study period was deemed inadequate for inferring causality in a fit-performance relationship. Therefore, to provide a sufficient level of stability and consistency, while still representing each firm's current situation, we used secondary data to assess performance for the past three years (1998-2000). Secondary data reflecting current situations were necessary for validity checks on the self-report measures of each firm's profitability, stock-price performance, and overall performance, relative to peers.¹

Consistent with recent studies (e.g., Audia, Locke, & Smith, 2000; Simons et al., 1999), we calculated performance from the secondary data as change in profitability, rather than average profitability. This approach effectively controls for past performance, industry differences, and variance in performance across firms (again, see Simons et al., 1999). The change was measured as the slopes of the regressions of return on sales (ROS) and return on assets (ROA). Earnings before interest and tax were used to control for differences in debt levels and/or tax rates between firms.

Controls

Based on previous research in this area, we chose to control for firm size, complexity, and munificence (Boyd, 1991; Miller & Cardinal, 1994; Pearce et al., 1987). Size has been conceptualized in a variety of ways in the literature (e.g., Hart & Banbury, 1994); we used what is probably the most common measure—the natural log of total employment for each firm (Keats & Hitt, 1988). Following the work of Boyd (1995), we operationalized environmental complexity as one minus the sum of squared market shares for all firms in an industry group with a resulting value that ranges from 0 to 1 (i.e. a Herfindahl score). A score approaching 1 implies greater complexity, while a score approaching zero implies less complexity (as in an oligopoly) (Boyd, 1995). Munificence was operationalized as a standardized measure of

¹ These self-report measures used a 5-point (quintiles) scale taken intact from Brews and Hunt (1999).

industry sales growth over a 5-year period. Measures of munificence were established by regressing values of industry sales against time over 5-years (1995-1999) and dividing the regression slope coefficient by the mean value of industry sales (Boyd, 1995).

Validity and Reliability

Construct validity for munificence, dynamism, and complexity has been established elsewhere (Boyd, 1995; Boyd & Reuning-Elliott, 1998; Dess & Beard, 1984; Keats, 1988; Rasheed & Prescott, 1992) and, therefore, did not require further validation here. The conceptualization of a deliberate and emergent strategic process as a continuum has construct validity in the literature and some preliminary empirical support (Boyd, 1991; Boyd & Reuning-Elliott, 1998; Brews & Hunt, 1999; Mintzberg et al., 1998; Mintzberg & Waters, 1985).

To assess the convergent and discriminant validity between primary and secondary measures of dynamism and complexity, a multitrait-multimethod matrix was constructed (Campbell & Fiske, 1959; Venkatraman & Ramanujam, 1986). An analysis of the matrix showed that secondary industry measures did a good job of matching managers' perceptions of dynamism and complexity. Further, it was clear that dynamism and complexity were separate constructs.²

To assess reliability, we used Cronbach's alpha, with the traditional value of .70 as the threshold to demonstrate consistency. All of the environmental-variable scales used in previous research that were included in this study surpassed the .70 minimum, ranging from .86 to .91. The modified items measuring the deliberate dimension of strategy formulation came out at .80, but the newly developed items for the emergent dimension were somewhat low at .66. Given that we are breaking new ground, and this construct did not have the rich empirical support of the other well-established constructs used in this study, we concluded that this was an adequate level of reliability.

Data Analysis

SPSS was used to run linear regression statistical tests. Size, complexity and munificence were included as controls in all tests to partial out their effects from hypothesized main effects. A visual inspection of the variable correlation matrices suggested that no problems of multicollinearity existed. A check for any violations in the assumptions was performed by inspecting residual plots, inspecting normal probability plots, and using Levene's Test of Equality of Error Variances. These three methods showed no evidence that parametric-test assumptions had been significantly violated.

Because of the possible artificial deflation of the standard deviation when using variables in fractional (proportional) form, secondary tests were performed with the variables transformed to arcsine (Cohen & Cohen, 1983). These tests produced the same results as the raw data, so only the tests using the raw data are reported. Fractional variables included dynamism, the realized ratios, complexity, and munificence.

² Because of space limitations, results are not shown; specific results are available from the first author.

RESULTS

Descriptive statistics and Pearson correlations for variables used in testing the hypotheses are shown in Table 2. There is nothing particularly surprising or unanticipated in the correlations.

Table 2
Correlations and Descriptive Statistics

Variables	Mean	s.d.	1	2	3	4	5	6	7	8	9
1 Size	2.91	.82									
2 Munificence	.065	.037	-.43**								
3 Complexity	.80	.20	-.25*	.46**							
4 Dynamism	.01	.01	.19	-.20	-.35**						
5 Number of Ends	3.53	.83	.29*	-.05	-.35**	.00					
6 Number of Means	6	1.95	.13	-.37**	-.35**	-.21+	.26*				
7 Ends Specificity	7.08	1.43	-.04	-.02	.09	-.59**	-.06	.19			
8 Means Specificity	7.12	1.59	-.01	.02	-.00	-.31*	.38**	.41**	.25*		
9 Realized Ratio Ends	-.31	.30	-.21+	-.17	.04	-.44**	.09	.34**	.38**	.42**	
10 Realized Ratio Means	-.26	.29	.25*	-.42**	-.09	-.20	.11	.57**	.16	.25*	-.46**

** $p < 0.01$

* $p < 0.05$

+ $p < 0.10$

Tests of Hypotheses

As shown in Table 3, hypothesis 1a was not supported; the relationship was in the predicted direction but non-significant. Size ($\beta = .31$ $p < .01$) and munificence ($\beta = .25$ $p < .10$) had significant positive relationships with the number of strategic ends. In addition, complexity had a significant negative relationship ($\beta = -.45$ $p < .001$). The results provide strong support for hypothesis 1b. The effect was in the predicted direction with a highly significant negative relationship between dynamism and the number of strategic means ($\beta = -.38$ $p < .01$). The change in R^2 indicated that dynamism explained 12% more of the variance in the number of means than did the restricted model alone (change in $F = 10.61$). While munificence ($\beta = -.28$ $p < .05$) and complexity ($\beta = -.35$ $p < .01$) had a significant negative relationship with the number of strategic means, size had a non-significant one ($\beta = .02$).

TABLE 3
Test of Hypothesis 1a & 1b: Number of Strategic Ends/Mean
(Regression Results)

	Strategic Ends:		Strategic Means:	
	Restricted model	Average Number Full Model	Restricted model	Average Number Full Model
<i>Control Variables</i>				
Size	.30*	.31**	-.03	.02
Munificence	.25+	.25+	-.24*	-.28*
Complexity	-.39**	-.45***	-.23*	-.35**
<i>Hypothesis Testing</i>				
Dynamism		-.17		-.38**
F	5.60**	4.76**	4.49**	6.55***
R	.46	.48	.43	.55
R ²	.21	.23	.18	.30
Adj. R	.17	.18	.14	.26
Chg. R ²		.02		.12
Chg. F		1.99		10.61**
df	3, 64	4, 63	3, 61	4, 60
N	68	68	65	65

All betas are standardized.

*** $p < .001$

** $p < 0.01$

* $p < 0.05$

+ $p < 0.10$

As shown in Table 4, hypothesis 2a received strong support. The dependent variable for the overall test was calculated as the average level of specificity across all types of strategic ends. As predicted, there was a significant negative relationship between environmental dynamism and ends specificity ($\beta = -.64$, $p < .001$). The change in R^2 indicated that dynamism explained 36% more of the variance in ends specificity than did the restricted model alone (change in $F = 35.81$). The effects of size, munificence, and complexity were non-significant in the full model for strategic ends specificity. Similarly hypothesis 2b received strong support. The dependent variable for this test was the average level of strategic means specificity. Results indicated a negative, significant relationship between level of dynamism and strategic means specificity ($\beta = -.36$, $p < .01$, change in $F = 7.88$). The change in R^2 indicated that dynamism explained 11% more of the variance in means specificity than did the restricted model alone. Again none of the control variables were significant in this test.

TABLE 4
Test of Hypothesis 2a & 2b: Level of Specificity in Strategic Ends/Mean
 (Regression Results)

	Strategic Ends:		Strategic Means:	
	Restricted model	Full Model	Restricted model	Full Model
<i>Control Variables</i>				
Size	-.05	.03	.00	.04
Munificence	-.09	-.09	.03	.03
Complexity	.12	-.09	-.02	-.13
<i>Hypothesis Testing</i>				
Dynamism		-.64***		-.36**
F	.28	9.28***	.01	1.98+
R	.11	.61	.03	.33
R ²	.01	.37	.00	.11
Adj. R	-.03	.33	-.05	.06
Chg. R ²		.36		.11
Chg. F		35.81***		7.88**
df	3, 64	4, 63	3, 64	4, 63
N	68	68	68	68

All betas are standardized.

*** $p < .001$

** $p < 0.01$

* $p < 0.05$

+ $p < 0.10$

As shown in Table 5, the results provide strong support for hypothesis 3a. The relationship was in the predicted direction with a highly significant negative relationship between dynamism and the realized strategy ratio for strategic ends ($\beta = -.47$ $p < .001$). The change in R^2 indicated that dynamism explained 19% more of the variance in the realized ratio than did the restricted model alone (change in $F = 18.02$). In addition, size ($\beta = -.29$ $p < .05$) and munificence ($\beta = -.37$ $p < .01$) had significant negative relationships with the realized ratio. The results also provide strong support for hypothesis 3b. The effect was in the predicted direction with a highly significant negative relationship between dynamism and the realized strategy ratio for strategic means ($\beta = -.29$ $p < .01$). The change in R^2 indicated that dynamism explained 7% more of the variance in the realized ratio than did the restricted model alone (change in $F = 6.39$). While munificence ($\beta = -.44$ $p < .001$) had significant negative relationship with the realized ratio, size ($\beta = .13$) and complexity ($\beta = .04$) had a non-significant one.

TABLE 5
Test of Hypothesis 3a & 3b: Realized Ratio of Strategic Ends/Means
 (Regression Results)

	Strategic Ends:		Strategic Means:	
	Restricted model	Full Model	Restricted model	Full Model
<i>Control Variables</i>				
Size	-.34**	-.29*	.10	.13
Munificence	-.37**	-.37**	-.44**	-.44***
Complexity	.13	-.02	.13	.04
<i>Hypothesis Testing</i>				
Dynamism		-.47***		-.29**
F	3.48*	7.81***	5.16**	5.79***
R	.38	.58	.44	.52
R ²	.14	.33	.20	.27
Adj. R	.10	.29	.16	.22
Chg. R ²		.19		.07
Chg. F		18.02***		6.39**
df	3, 64	4, 63	3, 64	4, 63
N	68	68	68	68

All betas are standardized.

*** $p < .001$

** $p < 0.01$

* $p < 0.05$

+ $p < 0.10$

The results for tests on fit and performance are shown in Table 6. Hypothesis 4 received only weak support. All three self-report measures were in the predicted direction but only one was significant. Profitability and stock performance had positive but non-significant relationships with our measure of fit. Overall performance had a significant positive relationship with fit ($\beta = .24$ $p < .05$), and membership in the fit group explained 6% more overall performance variance (change in $F = 4.73$). For archival measures of performance, there were no significant relationships. Both change in ROS and change in ROA had non-significant relationships with our measure of fit.

Size had a highly significant and positive relationship with all three self-report measures of performance: profitability ($\beta = .41$ $p < .01$), stock performance ($\beta = .41$ $p < .01$), and overall performance ($\beta = .45$ $p < .001$). Munificence and complexity had non-significant relationships with the self-report measures of performance. Munificence had negative and significant relationship with both archival measures of change in performance: ROS ($\beta = -.30$ $p < .05$) and ROA ($\beta = -.28$ $p < .10$). Size and complexity had non-significant relationships with our archival measures of performance.

TABLE 6
Test of Hypothesis 4: Fit and Performance Relationships
 (Regression Results)

	Self Report Measures			Archival Measures	
	Profitability	Stock Performance	Overall Performance	ROS Trend	ROA Trend
<i>Control Variables</i>					
Size	.41**	.41**	.45***	-.09	-.09
Munificence	-.04	.13	.20	-.30*	-.28+
Complexity	-.02	-.20	-.04	.09	.16
<i>Hypothesis Testing</i>					
Fit Measure (0,1,2)	.13	.12	.24*	.07	-.01
F	3.84**	4.19**	4.46**	1.08	.92
R	.44	.46	.47	.26	.24
R ²	.20	.21	.22	.07	.06
Adj. R	.15	.16	.17	.01	-.01
Chg. R ²	.02	.02	.06	.01	.00
Chg. F	1.38	1.18	4.73**	.29	.01
df	67	67	67	66	65
N	68	68	68	67	66

All betas are standardized.

*** $p < .001$

** $p < 0.01$

* $p < 0.05$

+ $p < 0.10$

DISCUSSION

The findings in this study provide support for a contingency relationship between environmental dynamism and a firm's strategy formulation process. In line with theoretical arguments (e.g., Aldrich, 1979) and empirical findings (Dess & Beard, 1984; Rasheed & Prescott, 1992), we treated dynamism, complexity, and munificence as separate constructs. As per our hypothesized relationship, dynamism was consistently associated with emergent strategy formulation. The observed relationship for complexity and munificence was not consistent. Thus, the approach used in this study points to the importance of separating these environmental constructs, rather than the favored method of combining them both into a single measure.³

³ The combination of dynamism and complexity is often justified by the argument that they interact to create "uncertainty." Second-guessing ourselves, we ran a *post hoc* check and found no meaningful evidence of an interaction effect (results not shown).

Two issues need to be reiterated here. First, our measurement of the deliberate-emergent construct is more sophisticated than those used in prior studies. The debate between Mintzberg (1990, 1991) and Ansoff (1991) typifies the view that firms' strategy formulation processes are either deliberate or emergent. Consequently, the norm has been to separate strategy formulation into deliberate and emergent categories. We treated it as a continuum to better tap into the idea that both approaches can be present in organizations. The notion of "requisite variety" suggests that a system should be as intricate as its environment, and because our measure is more intricate than previous ones, we contend that it captures the deliberate-emergent construct more completely and accurately than past efforts. Second, our measure of strategy formulation addresses the relative emphasis placed on deliberate and emergent approaches. Consequently, even with low (high) levels of dynamism, some emergent (deliberate) strategies were still evident. Because dynamism and its associated uncertainty are on a continuum, managers do not have an either/or approach to strategy formulation. Where Brews and Hunt (1999) argued that their finding of a relationship between uncertainty and planning specificity contradicts the "rigidity hypothesis" (Hart & Banbury, 1994), our findings move that argument to a new level—managers are cognizant of the environment and they respond by manipulating the strategy formulation process.

Futurists (e.g., Toffler, 1980) have long maintained that change in the environment is increasing at an increasing rate. That idea fits well with a steady stream of reports in the popular business press that managers have to deal with increasingly difficult and more competitive operating environments. In short, there is the belief and anecdotal evidence to suggest that dynamism is increasing. More dynamism means more uncertainty, and we may therefore expect firms increasingly to adopt a more emergent form of strategy formulation. Therefore, questions such as what sort of skills do managers need to best manage an emergent process, and how can an organization culture that is rooted in deliberate processes be changed to accommodate emergent strategy formulation, need to be addressed by future research.

We found limited support for a fit between dynamism and strategy formulation translating into improved performance. Our results support the contingency view only for a fit between environment and strategy formulation leading to higher overall performance as indicated by a self-reported measure. It is interesting to note that organization size was a particularly strong predictor of managerial perceptions of performance (accounting measures were not affected by size). Previous studies on strategy formulation and performance that have not controlled for size may thus have overstated their findings. Given conventional thinking on the relationship between industry growth and performance, it is somewhat surprising that munificence had very little effect on any of the self-report measures of performance but had a negative impact on change in ROS and change in ROA.

Our findings point to the importance of managerial skills as a valuable organizational resource (Polanyi, 1967) and their consequent implications for performance (Barney, 1991). A manager's ability to judge how deliberate or emergent the strategy formulation process should be (given the external environment) is a skill that is tacit and therefore difficult to imitate (Reed & DeFillippi, 1990). Thus, research is needed to identify the signals from the environment that managers use in their decisions on how to design or modify the strategic process. It would also be useful to identify how much they adjust the process in response to particular signals.

Although this study provides improvements over previous research designs, there are still some limitations that should be mentioned. Firstly, we have extended some established survey instruments to better tap into emergent strategies. We were careful to use the same format and we pre-tested the additional items but, obviously, a replication of this work, using a different sample, is needed to fully validate the instrument. Secondly, the lack of correspondence between self-report measures for performance and historical measures may reflect a lag effect; i.e., managers perceive improved performance that has not yet materialized. Thirdly, even with multiple years of archival data for our two non-subjective measures of performance (i.e., ROA, ROS) it is not possible to completely disentangle causality. A longitudinal study that explores performance before and after the implementation of a new strategy formulation process would confirm the causal direction. Fourthly, we believe the nature of our sample—varying firm size, multi-industry—makes the results generalizable, but it would be prudent to replicate the work using different populations (e.g., non-U.S. firms). Finally, although our survey response rate of 14% is in line with other studies, and there was no apparent response bias, it still has to be cited as a cause for concern. The fact that it is in line with the response rate achieved by others is troubling and suggests that, as a field of study, we either need a new approach for improving senior-management response rates, or we need to adopt alternative methods of eliciting information.

In conclusion, this study has made progress in untangling the relationship between environment and strategy formulation. We have shown that it is insufficient to see strategy formulation simply in terms of either deliberate or emergent strategies because firms can (and should) use both approaches, as dictated by environmental dynamism.

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APPENDIX

SURVEY INSTRUMENT

Section 1: Missions, Goals, and Objectives: WHAT an organization intends to achieve.

1. If included in your firm's strategic plan, *first*, indicate the approximate **NUMBER** of missions, goals and objectives and, *second*, indicate **HOW SPECIFIC** (i.e. detailed specifics, quantified measures, time limits, etc.) you perceive each component to be. For example, if you determine that your firm has two mission statements that are highly specific, you would circle "2" for the number and maybe "8" for level of specificity.

Number of Each Component										Component Type	Specificity Level of Each Component									
Zero					Many						No Specifics					Fully Specified				
1	2	3	4	5	6	7	8	9	10	Mission Statement	1	2	3	4	5	6	7	8	9	10
1	2	3	4	5	6	7	8	9	10	Basic Business Purpose	1	2	3	4	5	6	7	8	9	10
1	2	3	4	5	6	7	8	9	10	Key Strategic Goals	1	2	3	4	5	6	7	8	9	10
1	2	3	4	5	6	7	8	9	10	Specific Financial Targets	1	2	3	4	5	6	7	8	9	10
1	2	3	4	5	6	7	8	9	10	Specific market share/sales growth statements	1	2	3	4	5	6	7	8	9	10
1	2	3	4	5	6	7	8	9	10	Key result areas/objectives for many/all areas of the firm	1	2	3	4	5	6	7	8	9	10

2. If included in your firm's strategic plan, *first*, indicate the **FREQUENCY OF CHANGE** (1 = never changes, 10 = continuously changing) in each component and, *second*, indicate the approximate **PERCENTAGE OF CHANGE** (i.e. the magnitude of change) that is expected or allowed during their execution. For example, if your firm's Key Strategic Goals receive changes very frequently and the changes are highly significant at approximately 70% change, you might circle an "8" for frequency of change and a "7" for percentage of change next to Key Strategic Goals.

Frequency of Change										Component Type	Percentage of Change									
Never					Continuously						Zero					100%				
1	2	3	4	5	6	7	8	9	10	Mission Statement	1	2	3	4	5	6	7	8	9	10
1	2	3	4	5	6	7	8	9	10	Basic Business Purpose	1	2	3	4	5	6	7	8	9	10
1	2	3	4	5	6	7	8	9	10	Key Strategic Goals	1	2	3	4	5	6	7	8	9	10
1	2	3	4	5	6	7	8	9	10	Specific Financial Targets	1	2	3	4	5	6	7	8	9	10
1	2	3	4	5	6	7	8	9	10	Specific market share/sales growth statements	1	2	3	4	5	6	7	8	9	10
1	2	3	4	5	6	7	8	9	10	Key result areas/objectives for many/all areas of the firm	1	2	3	4	5	6	7	8	9	10

3. Indicate the additional number of missions, goals and objectives that **EMERGE DURING THE EXECUTION OF YOUR FIRM'S STRATEGIC PLAN.**

Never 1 2 3 4 5 6 7 8 9 10 All Emerge

Section 2: Strategies, policies, alternatives, programs and action plans. HOW an organization intends to achieve its mission, goals and objectives.

4. Please indicate **HOW COMPREHENSIVE** you perceive your firm's strategies, policies, programs and action plans to be.

No Strategies/Plans 1 2 3 4 5 6 7 8 9 10 Highly Comprehensive Strategies/Plans

5. Please indicate the response that most closely describes the **NUMBER** of strategies, policies, alternatives, programs and action plans included in your firm's strategic plan.

Unspecified 1 2 3 4 5 6 7 8 9 10 Many

6. Indicate **HOW SPECIFIC** you perceive your firm's strategies, policies, alternatives, programs and action plans to be in general.

None 1 2 3 4 5 6 7 8 9 10 Totally Specified

7. Please indicate which response best describes **HOW** your firm's strategies, policies, alternatives, programs and action plans **ARE FORMED** (i.e. fully formed prior to execution, partially formed prior to execution, form during execution).

None Formed in Advance 1 2 3 4 5 6 7 8 9 10 Fully Formed in Advance

8. Please indicate the response that most closely describes the **NUMBER OF EXPECTED CHANGES** during execution of your firm's strategies, policies, alternatives, programs and action plans.

No Changes 1 2 3 4 5 6 7 8 9 10 All Continuously Change

9. Please indicate the approximate **PERCENTAGE OF CHANGE/ALTERATION** (i.e. the magnitude of change) that is expected and allowed (in strategies, policies, alternatives, programs and action plans) during execution.

Zero 1 2 3 4 5 6 7 8 9 10 100%

10. Indicate in general, the **NUMBER OF ADDITIONAL** strategies, policies, alternatives, programs and action plans that **EMERGE** during the execution of your firm's strategic plans and actions.

None 1 2 3 4 5 6 7 8 9 10 More than 10

11. Please select the one statement that indicates **HOW OFTEN** your firm's strategies, policies, alternatives, programs and action plans **ARE CHANGED**.

Never 1 2 3 4 5 6 7 8 9 10 Continuously

12. How many **YEARS** has your firm been utilizing its current strategy formulation process?

Less than 1 2 3 4 5 6 7 8 9 10 or More

Section 3: Industry Ratings: Please rate your firm's **PRIMARY** industry according to factors listed below.

13. Volatility in sales, on an annual basis	No Volatility	1	2	3	4	5	6	7	8	9	10	High Volatility
14. Volatility in earnings, on an annual basis.	No Volatility	1	2	3	4	5	6	7	8	9	10	High Volatility
15. Rate of change in technology.	Low Rate	1	2	3	4	5	6	7	8	9	10	High Rate
16. Rate of change in government regulation.	Low Rate	1	2	3	4	5	6	7	8	9	10	High Rate
17. Rate of product/service obsolescence.	Low Rate	1	2	3	4	5	6	7	8	9	10	High Rate
18. Degree of pressure to research and develop new products/services, applications, etc.	Low Pressure	1	2	3	4	5	6	7	8	9	10	High Pressure
19. Degree of difficulty in forecasting industry trends/developments/changes.	Low Difficulty	1	2	3	4	5	6	7	8	9	10	High Difficulty
20. Degree of technological complexity.	Low Complexity	1	2	3	4	5	6	7	8	9	10	High Complexity
21. Degree of complexity in the general business environment	Low Complexity	1	2	3	4	5	6	7	8	9	10	High Complexity
22. Degree that your actions directly affect your competitors.	Low Degree	1	2	3	4	5	6	7	8	9	10	High Degree
23. The number of firms relative to other industries.	Relatively Low	1	2	3	4	5	6	7	8	9	10	Relatively High

24. **Firm Performance Measures:** Please circle a choice in each line, which best indicates how your firm currently compares to peers in your **PRIMARY** industry.

Characteristic	NA	Lowest 20%	Next 20%	Middle 20%	Next 20%	Top 20%
a. Overall profitability/financial performance	XX	1	2	3	4	5
b. Stock price performance		1	2	3	4	5
c. Overall firm performance/success	XX	1	2	3	4	5

25. Please describe the primary industry from which your firm receives the majority of its revenue:

26. Please describe your current title/position with your firm:

27. Describe the primary responsibility or duty of your current position:

28. Approximately how many employees (in full time equivalents) does your organization employ?
