



RESEARCH ARTICLE



Strategic entrepreneurial orientation: Configurations, performance, and the effects of industry and time

Aaron F. McKenny¹ | Jeremy C. Short² | David J. Ketchen Jr.³ |
G. Tyge Payne⁴ | Todd W. Moss⁵

¹UCF College of Business Administration, Orlando, Florida

²University of Oklahoma, Norman, Oklahoma

³Auburn University, Auburn, Alabama

⁴Texas Tech University, Lubbock, Texas

⁵Syracuse University, Syracuse, New York

Correspondence

Aaron F. McKenny, UCF College of Business Administration, PO Box 161400, Orlando, FL 32816-1400.

Email: aaron.mckenny@ucf.edu

Research Summary: Strategic entrepreneurship research has sought to understand how firms' entrepreneurial behaviors and decision making influence firm performance. Generally this research has treated entrepreneurial orientation (EO) as consisting of dimensions that independently influence firm performance. This approach conflicts with conceptual and empirical work suggesting that managers embrace complex knowledge structures. Taking a configurational perspective that accounts for relations among the EO dimensions, we analyze a longitudinal sample of 399 firms in four technology industries to reveal how different EO patterns—identified using fuzzy-set qualitative comparative analysis—lead to higher or lower firm performance based on industrial-, temporal-, and measurement-related factors.

Managerial Summary: A firm's entrepreneurial orientation consists of its relative emphasis on autonomy, competitive aggressiveness, innovativeness, proactiveness, and risk taking. Do companies intentionally emphasize different aspects of entrepreneurship? Our analysis suggests that they do and that different patterns developed by companies have implications for their performance. Our work suggests managers should develop a profile of entrepreneurial dimensions that fit well in their industry. For instance, firms in growing yet stable industries tend to perform well when they emphasize autonomy and competitive aggressiveness and focus less on innovativeness, proactiveness, and risk taking. In contrast, this approach would not lead to high performance in more hostile industries where innovativeness is essential.

KEYWORDS

configurations, content analysis, entrepreneurial orientation, equifinality, firm performance, fuzzy-set analysis

Configurations richly describe organizations, revealing their complex, gestalt, and systematic nature. They also draw important distinctions among organizations, avoiding confusions born of excessive aggregation and aiding prediction

Danny Miller (1987, p. 686)

Entrepreneurial orientation (EO) refers to a family of constructs concerned with the entrepreneurial behavior, decision making, and processes of organizations (George & Marino, 2011; Lumpkin & Dess, 1996). EO has been shown to influence many business-level outcomes, including distinctive marketing competencies (Smart & Conant, 1994), strategic alliance portfolios (Marino, Strandholm, Steensma, & Weaver, 2002), and technology commercialization (Li, Guo, Liu, & Li, 2008). Of particular interest to strategic entrepreneurship scholars is the relationship between EO and firm performance (Stam & Elfring, 2008); a meta-analysis of 51 studies found that this relationship is significant (Rauch, Wiklund, Lumpkin, & Frese, 2009).

Progress in unveiling the linkage between EO and performance has generally come from two related, yet distinct, conceptualizations of EO. The three-dimensional conceptualization is concerned with the strategic posture of the firm as emphasizing risk taking, innovativeness, and proactiveness (Covin & Slevin, 1989; Miller, 1983); it is operationalized as a latent construct reflecting the covariance among these dimensions (Covin & Wales, 2012; George & Marino, 2011). Other work has leveraged a five-dimensional conceptualization (e.g., Short, Payne, Brigham, Lumpkin, & Broberg, 2009). This version of EO incorporates two additional dimensions—autonomy and competitive aggressiveness—and hypothesizes that engagement in the five activities will be associated with new entry (Lumpkin & Dess, 1996). The five dimensions are thought to be related but independent, and each may have a distinct relationship with firm performance (Covin & Lumpkin, 2011). While related to the three-dimensional conceptualization, recent research indicates that these two conceptualizations may capture different phenomena (e.g., George & Marino, 2011). Accordingly, to distinguish the two conceptualizations, we refer to the five faceted conceptualization as a firm's *strategic EO*.

While research examining the strategic EO-performance relationship has provided insights into firms' entrepreneurial behavior and decision making, most studies examine the dimensions as independent without considering how relations among the dimensions constitute part of the firms' overall entrepreneurial strategy (e.g., Kreiser, Marino, Dickson, & Weaver, 2010). However, as our opening quote suggests, adopting a configurational perspective on EO has the potential to "richly describe organizations, revealing their complex, gestalt, and systematic nature" as well as avoiding "excessive aggregation" and "aiding prediction" of important outcomes such as firm performance (Miller, 1987, p. 686). Indeed, examining configurations allows researchers to move beyond examining variables' independent effects to examine how multiple variables interact in potentially complex and nonlinear ways to influence firm performance (Fiss, 2007). Consistent with this approach, research on managers' knowledge structures suggests that managers tend to view multidimensional concepts such as EO holistically rather than as a discrete, but related, set of dimensions (Kabanoff & Brown, 2008).

Despite the promise of configurations for understanding how managers build patterns of strategic EO to influence performance, the relevant work has generally examined how EO can be configured with external and internal contingencies to identify when an entrepreneurial strategy is more or less important to performance (e.g., Engelen, Gupta, Strenger, & Brettel, 2015; Wiklund & Shepherd, 2005). While valuable, this approach does not tap potentially interesting insights regarding patterns of the strategic EO dimensions and their performance implications.

In response, we examine three research questions. The first two consider whether successful patterns of strategic EO differ based on (1) industry characteristics and (2) over time. Organizational ecology research indicates that environmental forces that vary by industry and over time may influence the strategies and structures that will be successful (Hannan & Freeman, 1977, 1984). Accordingly, the demands of different environments may influence which strategic EO patterns will be successful. Our third research question asks whether the success of strategic EO patterns differ based on conceptualization of firm performance. Like EO, firm performance is a family of related, but distinct dimensions. These dimensions are united in their concern with a firm's achievements, but diverse in what

aspect of achievement is measured (Carton & Hofer, 2006). As a result, patterns of strategic EO may influence various aspects of performance differently.

We offer three contributions to strategic entrepreneurship research. First, we respond to several calls to examine the dimensions of strategic EO through a configurational lens (e.g., Covin & Lumpkin, 2011; Miller, 2011; Short, Payne, & Ketchen, 2008). In doing so, we show that various combinations differentially influence performance. Second, we draw from equifinality research, which argues that more than one strategic configuration may have comparable levels of performance (e.g., Gresov & Drazin, 1997; Payne, 2006), to suggest that there can be multiple strategic EO configurations that enjoy high performance within the same setting. Finally, we break new ground methodologically by examining strategic EO configurations using fuzzy-set qualitative comparative analysis (fsQCA; Ragin, 2008a). Our research questions cannot be tested adequately using the correlational methods used in most strategic EO studies because correlational methods assume that all independent variables individually predict variance in the dependent variable, and multiplicative interactions of more than three variables are difficult to interpret. Set-theoretic methods, such as fsQCA, can overcome these limitations by directly examining whether configurations of a number of variables influence the dependent variable (e.g., Fiss, 2011). Overall, our study provides the first empirical linkage between configurations of firms' strategic EO and firm performance to date.

1 | STRATEGIC ENTREPRENEURIAL ORIENTATION CONFIGURATIONS

Organizational configurations are defined as "any multidimensional constellation of conceptually distinct characteristics that commonly occur together" (Meyer, Tsui, & Hinings, 1993, p. 1175). These characteristics can include strategy, structure, environment, leadership, goals, and other factors that, together, form meaningful gestalts (Miller, 2011; Payne, 2006). This treatment parallels research on managerial knowledge structures, which suggests that managers not only attend to the individual strategic constructs such as a firm's innovativeness, but also cognitively group firms based on collections of shared attributes (e.g., Kabanoff & Brown, 2008).

1.1 | Environment and the success of strategic EO patterns

Organizational ecology research suggests that environmental forces influence the strategies and structures that will be successful in an environment (Hannan & Freeman, 1977, 1984). For instance, in munificent industries where resources are readily available, there is less competition for resources needed to ensure firm survival. This reduced competition for resources enables firms with strategies that might be otherwise unfit for the environment to endure and perform well (e.g., Brittain & Freeman, 1980). As a result, munificent industries may have a greater number of strategic EO patterns, enjoying high performance than more hostile industries.

Environmental munificence in an industry may also influence the composition of the strategic EO patterns that are successful. For instance, innovation is expensive and many initiatives fail before a market-viable innovation is uncovered (e.g., Gupta, Smith, & Shalley, 2006). Munificence enables the assembly of slack resources that can buffer firms against the costs of innovation failure (Herold, Jayaraman, & Narayanaswamy, 2006). Wide resource availability also enables firms to pursue multiple innovation projects, making it more likely that at least one project will result in an outcome (such as a patent) that can then be exploited to create a competitive advantage. In contrast, relatively resource-constrained industries may see stronger performance returns to strategies with decreased emphasis on innovation and increased emphasis on competitive aggressiveness (Castrogiovanni, 1991).

The dynamism in an industry may also contribute to performance differences across strategic EO patterns. Dynamism increases the threat of obsolescence over time, and environmental fluctuations can manifest in changes in technologies, consumer preferences, and shifts in the supply or demand of key resources (Wiklund & Shepherd, 2005). Further, dynamism makes forecasting future trends and changes more difficult (Anglin, McKenny, & Short, 2016). This may suggest that configurations emphasizing high innovation and low proactiveness may be successful in

dynamic industries as firms seek to respond to changes in technologies and preferences in their environment. In contrast, stable industries are likely to favor strategic EO patterns emphasizing high competitive aggressiveness (e.g., Lumpkin & Dess, 2001). In slower-moving industries where changes are more predictable, firms will tend to make similar assessments regarding environmental conditions and arrive at similar conclusions regarding what opportunities to exploit. This increases the likelihood of exploitation rather than exploration activity, making competitive action to defend the firm's competitive position valuable (e.g., Lumpkin & Dess, 2001).

Dynamism may also influence the rate at which strategic EO patterns give way to new patterns. Long-term gradual shifts characterized by stable environments may lead to considerable stability in the successful patterns of strategic EO over time. In more chaotic environments, a successful strategic EO pattern at one time period may be very different than at others, as firms experiment to recover their alignment between structure, strategy, and environments (e.g., Meyer, Brooks, & Goes, 1990). In sum, while existing research indicates a stable relationship between EO and firm performance across environments and over time, it is possible that this stability may not hold equally for all configurations of strategic EO. Accordingly, we pose two research questions:

Research Question 1 *Do successful patterns of strategic EO differ based on industry characteristics?*

Research Question 2 *Do successful patterns of strategic EO differ over time?*

1.2 | Performance measurement and the success of strategic EO patterns

Broadly, firm performance captures the extent to which an organization succeeds in accomplishing its goals. However, given the diverse goals and stakeholders of modern organizations, firm performance is a multifaceted construct (Carton & Hofer, 2006). While there appears to be a positive relationship between EO and firm performance across measures (Rauch et al., 2009), the additional nuance and complexity provided by the configurations perspective may shed new light on the relationship.

Contingency theory has been used frequently to examine the link between organizational configurations and firm performance (Ketchen et al., 1997). Contingency theory suggests that improving the alignment between strategy, structure, and environment will improve firm performance (Lawrence & Lorsch, 1967). Work grounded in contingency theory also suggests that the relationship between antecedents and performance may vary based on the performance measure used (Ittner, Larcker, & Randall, 2003).

Entrepreneurial orientation is often linked to measures of accounting performance such as return on assets, return on investment, return on equity, and sales growth (e.g., Kreiser, Marino, Kuratko, & Weaver, 2013; Wales, Patel, Parida, & Kreiser, 2013). These measures capture the extent to which the organization conducts business efficiently and effectively. For instance, return on assets generally captures how well an organization uses its assets to generate income. If two organizations generate the same income over a specified time period, but one of those organizations uses fewer total assets, that organization is deemed more efficient and has outperformed the other. Market-based measures emphasize the importance of external stakeholders—shareholders, in particular—to the organization (e.g., Miller & Le Breton-Miller, 2011). Using these measures incorporates the investment value the firm creates for its owners into the assessment of firm performance (Carton & Hofer, 2006). Meanwhile, survival measures such as Altman's Z capture the firm's risk of bankruptcy and failure. Studies have begun to address the possibility that an EO strategy may lead to increased likelihood of firm failure (e.g., Wiklund & Shepherd, 2011).

The strategic EO patterns that are associated with high performance may differ based on which measure is used. The association of a strategic EO pattern with accounting performance measures suggests that the firm's entrepreneurial strategy is having tangible results on the way that the organization does business by enabling the firm to charge higher prices, preempt competitors, and obtain other benefits of entrepreneurial behavior (e.g., Rauch et al., 2009). In contrast, by incorporating market value into firm performance, market-based performance measures are influenced by the perceptions of shareholders. When valuing a firm's equity, shareholders also look at the firm's

communicated strategy, which may include the firm's strategic EO (Short, Broberg, Cogliser, & Brigham, 2010). Research in behavioral finance suggests that investors are subject to decision-making biases (e.g., Thaler, 2005). These biases may influence investors' evaluations of the link between strategic EO and the firm's subsequent performance, suggesting that market performance measures may not mirror accounting performance measures. Survival-based performance may be associated with yet other patterns of strategic EO. While EO strategies generally lead to high accounting and market performance, they are also risky, which may cause a different relationship with survival measures. In sum, while research has found a positive relationship between EO and firm performance generally, patterns of strategic EO may differ in their relationships to various measures of firm performance. Accordingly, we ask:

Research Question 3 *Does the success of a strategic EO pattern differ based on how firm performance is measured?*

2 | METHOD

We gathered data from industries in the high-tech sector. This enabled us to build from considerable existing research on organizational configurations in high-tech industries (e.g., Bantel, 1998; Branzei & Vertinsky, 2006). Also, our first research question asks whether strategic EO patterns vary with industry characteristics. By selecting four industries within one sector, we can provide greater precision regarding the industry characteristics driving differences in the patterns while holding potential sector-level confounds constant. Finally, by sampling firms from one sector, we can refine our measure of strategic EO, thus providing a more reliable and valid measure (McKenny, Aguinis, Short, & Anglin, forthcoming).

To examine whether successful strategic EO patterns differ based on industry characteristics, we selected four high-tech industries based on two environmental characteristics that have received considerable attention in the EO literature: munificence and dynamism (Rauch et al., 2009). Environmental munificence is defined as the capacity of an environment to sustain firm growth and reflects the availability of resources available to firms competing in the environment (Dess & Beard, 1984). Environmental dynamism is defined as instability in the firm's environment caused by the frequency and unpredictability of changes (Dess & Beard, 1984).

We drew a purposive sample of the 50 largest high-tech industries in the Compustat database and calculated munificence and dynamism using Dess and Beard's (1984) measures. We then identified four industries reflecting each combination of high and low munificence and dynamism based on their standard deviation (SD) from the mean. The pharmaceutical industry (SIC 2834) reflected low munificence ($SD = -0.44$) and low dynamism ($SD = -0.77$); the prepackaged software industry (SIC 7370) reflected high munificence ($SD = 1.15$), but low dynamism ($SD = -0.21$); the Internet firm industry (SIC 7372) reflected high munificence ($SD = 0.34$) and high dynamism ($SD = 1.22$); and the computer systems integration industry (SIC 7373) reflected low munificence ($SD = -1.01$), but high dynamism ($SD = 0.57$).

To identify specific firms, we identified all publicly traded firms associated with each SIC code in the Compustat system (e.g., Moss, Payne, & Moore, 2014). Because our second research question concerns the extent to which successful patterns differ over time, we collected all firms' 10-K filings over two sampling frames: 2001–2003 and 2004–2006. This resulted in a sample of 2,405 10-Ks across 408 firms. We eliminated firms for which 10-K documents were not available for each year in the sampling frame, yielding a final sample of 2,268 10-K documents from 399 firms over six years.

2.1 | Measuring strategic EO

We examined the management discussion and analysis (MD&A) sections of 10-K filings to identify strategic EO rhetoric in our sampled firms (Li, 2010). This section is produced by management to provide the investment community

with language regarding the firm's activity and management's plans and expectations for the future. Importantly, past examinations of the content of these narrative statements have suggested that the material tends to accurately reflect organizational reality and is associated with financial outcomes such as bankruptcy (e.g., Tennyson, Ingram, & Dugan, 1990) and financial performance (e.g., Bryan, 1997). Because each publicly traded firm is required to present a 10-K to the investing public every year, phenomena of interest can be examined over time, enabling us to examine Research Question 2 concerning the stability of successful strategic EO patterns over time.

To assess strategic EO in these narratives, we drew from and refined the computer-aided text analytic word lists developed by Short et al. (2010). These word lists were developed using a sample of shareholder letters from the S&P 500 including firms from many industries (Short et al., 2010). When using a computer-aided text analytic measure in a context where the language used to convey the construct may differ from the context in which the measure was developed, the word lists should be refined to ensure the reliability of the measure in the new context (McKenny et al., forthcoming).

We used a 50% subsample of our texts to refine our measure of strategic EO. The computer-aided text analytic measure refinement process follows Short et al.'s (2010) deductive/inductive word list evaluation process (McKenny et al., forthcoming). To generate the deductive word list, we identified the words used in existing computer-aided text analytic measures of entrepreneurial orientation (i.e., McKenny et al., forthcoming; Short et al., 2010). To generate the inductive word list, we identified all words that occur three or more times in our subsample of texts (Short et al., 2010).

Two authors, both with professional experience in one or more of our sampled industries, independently evaluated the words on both lists to identify words that are likely to be used to reflect strategic EO in high-tech industries. We used Holsti's (1969) method to calculate interrater reliability and found satisfactory reliability for all dimensions (i.e., greater than 0.80; Krippendorff, 2004; Riffe, Lacy, & Fico, 2005). After calculating interrater reliability, disagreements were resolved to near-perfect (greater than 0.99) agreement. All remaining disagreements were omitted from the word lists.

To further refine the word lists, one author manually coded a 10% random sample of the MD&A statements for each of the strategic EO dimensions (e.g., McKenny et al., forthcoming). To minimize specific factor error, words from the word lists that were regularly used in a context that did not reflect the strategic EO dimension were removed from the word list. Further, words that regularly indicated the strategic EO dimension in the texts but were not included in the word list were added to the word list. This process was iterated until no further additions or subtractions from the word list decreased specific factor error (McKenny et al., forthcoming).¹

We used CAT Scanner (McKenny, Short, & Newman, 2012) to measure strategic EO rhetoric. CAT Scanner has been used to measure constructs of interest to management research such as corporate social responsibility (e.g., Pencle & Mălăescu, 2016) and entrepreneurial orientation (e.g., McKenny et al., forthcoming; Zachary, Payne, Moore, & Sexton, 2017). Further, because our revised dictionaries include phrases (e.g., "take a chance"), CAT Scanner provides a valuable alternative to other tools that do not enable researchers to include phrases in custom dictionaries (McKenny et al., forthcoming).

Using CAT Scanner to measure strategic EO produced a count of the number of words in each text that were associated with each strategic EO dimension. For example, words from the innovativeness word list appeared 103 times in Microsoft's 2004 MD&A statement. Table 1 provides illustrative examples of the strategic EO dimensions from the MD&A statements of our firms.

To test the convergent validity of the content analytic measures of strategic EO with existing archival measures of EO, we correlated the results of our innovativeness dictionary with a measure of R&D intensity, calculated as the percentage of annual sales spent on R&D (e.g., Stam & Elfring, 2008). We found that the number of words indicative of innovativeness was positively correlated to R&D intensity ($\rho = 0.14$; $p < .05$). While we use the five-dimensional conceptualization of EO in our study, existing studies have used R&D intensity to provide a test of convergent

¹The final word lists can be found online at <http://www.catscanner.net>.

TABLE 1 Examples of entrepreneurial orientation language in management discussion and analysis documents

Dimension	Coding definition	Example
Autonomy	The actions of individuals or teams to surface and pursue opportunities to completion.	"separate subsidiaries that operate as decentralized businesses with a high degree of autonomy " (NIC Inc., 2005)
Competitive aggressiveness	The aggressive organizational positioning or responses to defend against competitors, unfavorable industry trends, and other external threats.	"...influenced by the Company's ability to maintain its manufacturing availability and capacity together with its marketing and distribution capabilities in order to continue to compete on a national and international level." (Prophase, 2003)
Innovativeness	A firm's willingness to encourage creativity and the development of new marketable ideas and inventions.	"We have developed a topical formulation of the antibiotic, azithromycin, a broad spectrum of antibiotic activity" (InSite Vision, 2003)
Proactiveness	A firm's anticipation of future changes and the undertaking of appropriate, often innovative, action to capitalize on the opportunity or mitigate the threat.	"Our DCA 3-Year Pricing Option agreements were a first step in preparation for being a leader in a deregulated industry" (Sabre Holdings Corp., 2004)
Risk taking	A firm's willingness to take bold action in the face of uncertainty.	"We face the substantial risks of failure inherent in developing drugs based on new technologies" (Adolor Corp., 2003)

validity for the three-dimensional measure of EO (e.g., Stam & Elfring, 2008). Accordingly, to provide a second test of convergent validity for our measure, we calculated three-dimensional EO as the sum of the innovativeness, proactiveness, and risk-taking dimensions. We found that this EO variable was positively correlated with R&D intensity ($\rho = 0.11$; $p < .05$).

We used fuzzy-set qualitative comparative analysis to investigate our research questions (e.g., Fiss, 2007, 2011; Ragin, 2008a). FsQCA is a nonparametric set-theoretic analytical approach for examining how configurations of conditions lead to the occurrence of a desired outcome (Fiss, 2011). Using this method, all conditions (independent variables) and outcomes (dependent variables) are expressed in terms of degrees of membership in a set. These sets can be "crisp" if membership is dichotomous and all cases can be identified as being fully in or fully out (Fiss, 2007). For example, having the founder of the company in the CEO role might be calibrated as a crisp set because firms would be classified either as being fully in or fully out of the set of firms that have founder CEOs (e.g., Judge et al., 2015). Alternately, sets can be "fuzzy" where membership in the set is a function of degree. For example, Bell, Filatotchev, and Aguilera (2014) configured board independence as a fuzzy set where some firms were classified as being fully in or fully out of the set of firms with independent boards, but allowed for other firms to be partially in the set based on the degree to which the members of the board had personal or prior ties to the firm and/or its management. The selection of whether to use a crisp or fuzzy set as well as how to calibrate these sets should be based on the researchers' substantive understanding of both the theory and data (Schneider & Wagemann, 2010).

We calibrated our autonomy condition as a crisp set of firms that use autonomous language and those that do not. We made this decision because, unlike the other dimensions of strategic EO where there was considerable variance in the frequency of language associated with the dimension, we found that only 138 MD&A statements (6%) contained any autonomous language and that only 47 (2%) used more than one autonomous word. Accordingly, firms were classified as being fully in the set of firms that use autonomous language if they used any autonomous words and fully out of the set if they never used an autonomous word in their MD&A statements.

Before calibrating our remaining measures for fsQCA, we followed recent computer-aided text analysis (CATA) studies by dividing each variable by the total number of words used in the text to control for the varying lengths of 10-K MD&A sections (e.g., Payne, Moore, Griffis, & Autry, 2011; Zachary, McKenny, Short, Davis, & Wu, 2011). We then calibrated each condition into a fuzzy set of firms that frequently use language associated with the dimension relative to the average for their industry. We used the fsQCA "calibrate" function to convert our continuous measure

of language use into fuzzy-set membership scores (Ragin, 2008b; Ragin, Drass, & Davies, 2006). This function requires the specification of three thresholds—the fully in threshold, the fully out threshold, and the crossover point (Ragin, 2008b). The fully in and fully out thresholds indicate the value of the continuous measure beyond which all firms are classified as full members or nonmembers of the set. The crossover point is a level of maximum ambiguity whereby cases that are greater than this level were treated as being more in the set than out and cases below this level are treated as being more out of the set than in (Fiss, 2011; Ragin, 2008a). For example, Fiss (2011) used a crossover point of 50 employees to classify firms based on size. Firms were not fully members of the set of large firms until they reached 250 employees; however, firms with at least 51 employees were considered more in the set of large firms than they were out of the set. Because we are concerned with the use of strategic EO language relative to the norm for each industry, we calibrated each set using a crossover point of the average use of language for that industry and set the fully in and fully out threshold at one standard deviation above or below that average, respectively. If one standard deviation below the mean was less than zero, we set the fully out threshold at zero because the complete nonuse of strategic EO language in MD&A statements theoretically should place the firm in the group of firms that do not use language associated with strategic EO. While such non-systematic changes in operationalization are uncommon in correlational research, using theory in this way to improve the calibration of sets is best practice in fsQCA research (Schneider & Wagemann, 2010).

2.2 | Firm performance

To address Research Question 3 regarding the consistency of successful strategic EO patterns across conceptualizations of firm performance, we examined three forms of firm performance (e.g., Short, Ketchen, Palmer, & Hult, 2007). First, to maximize comparability with previous configurations research using fsQCA that links organizational configurations to high firm performance, we identified high performing firms based on their return on assets (ROA; Fiss, 2011; Misangyi & Acharya, 2014). ROA is one of the most prevalent accounting-based measures of performance in the management literature and is a common metric for studies examining the performance differences of organizational configurations (e.g., Ketchen, Thomas, & Snow, 1993; Payne, 2006; Short et al., 2007). Second, to provide a market-based measure of firm performance, we capture Tobin's Q. Tobin's Q is the ratio of the market value of the firm to the replacement cost of its assets (Chung & Pruitt, 1994). Finally, we use Altman's Z to provide a performance measure linked to the likelihood of bankruptcy (i.e., Altman, 1968).

Each of our firm performance measures were calculated as three-year averages to balance out any nonrecurring abnormalities. We also used a one-year lag for each sample such that strategic EO measured over 2001–2003 would be associated with firm performance in 2002–2004 (e.g., Carpenter & Sanders, 2002). To calibrate our performance outcome measures, we followed Fiss' (2011) calibration technique for identifying high-performing firms in an industry. Specifically, Fiss (2011) identified firms as being fully in the set of high-performing firms if the firm was at or above the 75th percentile mark in the industry and fully out if the firm was at or below the 50th percentile mark. The crossover point was set at the midpoint between these two thresholds. Accordingly, we calibrated firms into a set of high-performing firms using the same threshold percentiles for each of the four industries in our sample. Table 2 reports the thresholds used in the calibration of our variables. Table 3 reports the descriptive statistics and zero-order correlations for the calibrated variables in our analyses.

3 | ANALYSIS AND RESULTS

Because our study seeks to provide a systematic comparison of the strategic EO configurations that lead to high performance in different environments, we include our environmental condition variables as causal indicators in a single cross-industry sample rather than conduct an fsQCA analysis of the four industry samples separately. This enables the fsQCA algorithm to systematically analyze the extent to which the success of each configuration is unique to a

TABLE 2 Calibration table for fsQCA analysis

Measure	Years	Fully in	Crossover point	Fully out
High performance (ROA)	2002–2004	0.0575	–0.0142	–0.0859
High performance (Tobin's Q)	2002–2004	0.7508	0.6704	0.5899
High performance (Altman's Z)	2002–2004	7.0175	5.1178	3.2182
Autonomy	2001–2003	1.0000	N/A ^a	0.0000
Competitive aggressiveness	2001–2003	0.0026	0.0014	0.0002
Innovativeness	2001–2003	0.0169	0.0094	0.0019
Proactiveness	2001–2003	0.0024	0.0015	0.0005
Risk taking	2001–2003	0.0008	0.0004	0.0000
High performance (ROA)	2005–2007	0.0661	0.0284	–0.0093
High performance (Tobin's Q)	2005–2007	0.7251	0.6397	0.5542
High performance (Altman's Z)	2005–2007	6.2589	4.5389	2.8188
Autonomy	2004–2006	1.0000	N/A ^a	0.0000
Competitive aggressiveness	2004–2006	0.0022	0.0012	0.0002
Innovativeness	2004–2006	0.0154	0.0085	0.0016
Proactiveness	2004–2006	0.0024	0.0016	0.0007
Risk taking	2004–2006	0.0006	0.0003	0.0000

^a Autonomy is coded as a crisp set where any autonomous word usage is coded as a 1 and no autonomous word usage is coded as a 0. For crisp sets, there is no calibration crossover point.

particular environment or generalizable across environments. If a configuration consistently leads to success in only one environment, the fsQCA algorithm will indicate that environmental factors are core conditions of the configuration. By contrast, if the success of a configuration is not dependent on one or more of the environmental factors, the fsQCA analysis will indicate that the dimension did not influence the success of the configuration.

The fsQCA method uses set theory to reduce complex relationships among multiple theoretically related variables into a parsimonious set of configurations that consistently relate to the outcome of interest (Fiss, 2007, 2011; Ragin, 2008a). FsQCA accomplishes this in three phases (Fiss, 2011). First, a truth table relating the various combinations of conditions (independent variables) to outcomes (dependent variables) is created. Table 4 provides an excerpt of the truth table for our 2001–2003 sample using ROA as the firm performance measure. Each row in this table

TABLE 3 Descriptive statistics and correlations of entrepreneurial orientation and firm performance (2001–2003)

Variable	Mean	S.D.	1	2	3	4	5	6	7	8	9
1. Return on assets ^a	0.39	0.45									
2. Tobin's Q ^a	0.39	0.44	0.17**								
3. Altman's Z ^a	0.37	0.43	0.40**	0.64**							
4. Autonomy ^a	0.06	0.24	0.04	–0.05	–0.06						
5. Competitive aggressiveness ^a	0.44	0.38	0.12*	0.03	0.10*	0.14**					
6. Innovativeness ^a	0.42	0.34	–0.20**	0.10	0.12*	–0.04	0.07				
7. Proactiveness ^a	0.44	0.35	–0.15**	0.04	0.06	0.04	0.07	0.40**			
8. Risk taking ^a	0.38	0.37	–0.07	0.01	0.04	0.11*	0.64**	0.15**	0.03		
9. Munificence ^a	0.44	0.50	0.05	0.05	–0.05	0.11*	0.19**	–0.33**	–0.15**	0.13**	
10. Dynamism ^a	0.35	0.48	–0.00	–0.01	–0.11*	0.09	–0.05	–0.46**	–0.19**	–0.00	0.02

^a After fsQCA calibration.

* $p < 0.05$ (two tailed). ** $p < 0.01$ (two tailed).

TABLE 4 Truth table (2001–2003 using return on assets)^a

Autonomy	Competitive aggressiveness	Innovativeness	Proactiveness	Risk taking	Munificence	Dynamism	Number of firms	High performance	Consistency
1	1	0	0	0	0	0	2	1	0.97
1	0	0	0	0	1	1	5	1	0.82
1	1	0	0	1	1	1	1	1	0.80
1	0	0	0	0	0	1	1	1	0.78
0	1	1	1	0	0	1	1	0	0.72
0	1	0	0	0	0	1	5	0	0.71
0	1	1	0	0	1	0	1	0	0.70
0	1	0	0	0	1	0	8	0	0.70
0	0	1	0	1	1	0	1	0	0.69
0	1	0	1	1	0	0	1	0	0.69
0	1	0	0	0	0	0	3	0	0.66
0	1	0	1	0	0	0	5	0	0.66
0	0	1	0	0	0	1	2	0	0.64
0	0	0	1	1	0	0	1	0	0.64
0	1	1	1	0	1	0	3	0	0.64
0	1	0	1	0	1	0	4	0	0.63
0	1	1	0	1	1	0	8	0	0.60

^a The original fsQCA truth table contained all combinations of the EO dimensions, but rows where no firms espoused the combination were removed in step 2 of the fsQCA analysis.

reflects the relationship between one pattern of the strategic EO dimensions and high firm performance. For instance, the first row relates the set of firms in the pharmaceutical industry (low munificence and low dynamism) with a strategic EO configuration that is high in autonomy and competitive aggressiveness, yet low in innovativeness, proactiveness, and risk taking to the set of firms that were high in firm performance when measured as ROA.

In the second phase, rows of the truth table are eliminated if a minimum number of cases associated with the row are not met or if the consistency with which cases relate to the row does not meet a minimum threshold set by the researcher. Consistent with Ragin (2008a), we use 0.75 as our minimum consistency level. We also set the minimum number of cases for each row to one because our smallest sample (2004–2006) contained 372 firms and there were 128 (2^7) different configurations possible in our truth table. In a scenario wherein all strategic EO configurations were equally represented in our sample, only 2.9 firms would represent each configuration, making the identification of successful configurations with higher thresholds difficult. As seen in Table 4, setting the minimum number of cases to 1 and consistency to 0.75 eliminated unobserved combinations of the strategic EO dimensions and set high firm performance to 1 only when consistency was greater than 0.75.

In the final phase of fsQCA, the remaining rows of the truth table are combined using Boolean algebra to provide a parsimonious view of the configurations and conditions that consistently lead to the desired outcome. For instance, the second and fourth rows of Table 4 reflect the same pattern of the strategic EO dimensions and environmental conditions, with the exception of munificence. In the second row, munificence is high, whereas in the fourth row, munificence is low. Since both configurations consistently related to high firm performance, Boolean algebra would combine these two rows and remove munificence from the resulting pattern—suggesting that only environmental dynamism influences the success of this strategic EO pattern.

Fuzzy-set analysis identifies all combinations of the strategic EO dimensions that consistently lead to high performance. However, fsQCA research also offers guidelines for delineating which of the components are “core” and “periphery” with respect to the configuration (i.e., Fiss, 2011). Core conditions are those that appear in both the parsimonious and intermediate solutions produced by the fsQCA software (Fiss, 2011). Periphery conditions are those

that appear in the intermediate solution, but are eliminated in the parsimonious solution (Fiss, 2011). Following existing research distinguishing between core and periphery components, we present the intermediate solutions for our 2001–2003 and 2004–2006 samples in Tables 5 and 6, respectively. We distinguish between core and periphery components of each configuration based on the size of the symbol associated with the presence or absence of the component (e.g., Fiss, 2011; Misangyi & Acharya, 2014).

Research Question 1 asked whether successful patterns of strategic EO differ based on industry characteristics. Our results indicate that the success of strategic EO configurations differs across industry context in several ways. First, we found that 15 (94%) of the successful configurations include either munificence or dynamism as a core component. In nine (56%) of the configurations, both munificence and dynamism are core components. When environmental factors are core components of the configuration, this indicates that the configuration consistently led to high performance only in that industry context. For instance, configuration 3 (shown in Table 5) contains high munificence and high dynamism as core components, suggesting that this strategy was consistently successful only in the Internet industry. Similarly, configuration 11 (shown in Table 6) contains low munificence as a core component but is indifferent to the level of dynamism, suggesting that this strategy was consistently successful in the pharmaceutical and systems integration industries (those industries with low munificence). We also found that the patterns varied from industry to industry. These differences were particularly pronounced with respect to the innovativeness, proactiveness, and risk-taking dimensions.

Research Question 2 asked whether successful patterns of strategic EO differ over time and required us to compare configurations in both time periods. In our comparisons, we found evidence of a stable core of strategic EO patterns over time. For instance, configuration 4 from the 2001–2003 sample (shown in Table 5) demonstrates a similar pattern to configuration 10 from the 2004–2006 sample (shown in Table 6). However, despite some constancy, there were no strategic EO patterns that remained exactly the same across both samples. Indeed, our comparison uncovered some notable differences. First, the number of successful configurations changed over time. For Tobin's Q, fsQCA was able to identify only two consistently successful configurations in 2001–2003, but uncovered seven in 2004–2006. Second, the industries in which successful configurations were identified also changed in some instances. Finally, there were instances where the successful strategy in an industry differed materially across the

TABLE 5 Configurations for achieving high performance (2001–2003)^a

Performance measure	Solution					
	ROA			Tobin's Q		Altman's Z
Configuration	1	2	3	4	5	6
Autonomy	●	●	●	●	●	●
Competitive aggressiveness	⊗	●	●	●	●	●
Innovativeness	⊗	⊗	⊗	⊗	●	⊗
Proactiveness	⊗	⊗	⊗	⊗	●	⊗
Risk taking	⊗	⊗	●	⊗	●	⊗
Munificence		⊗	●	●	⊗	⊗
Dynamism	●	⊗	●	⊗	⊗	⊗
Consistency	0.81	0.98	0.80	0.92	0.83	1.00
Raw coverage	0.02	0.01	0.01	0.00	0.01	0.01
Unique coverage	0.02	0.01	0.00	0.00	0.01	0.01
Overall solution consistency		0.86			0.85	1.00
Overall solution coverage		0.04			0.02	0.01

^a ⊗ indicates that firms espousing the configuration were relatively low on the dimension. ● indicates that firms espousing the configuration were relatively high on the dimension. Large symbols indicate that the dimension was a core condition, and small symbols indicate that the dimension was a peripheral condition. Blank spaces indicate that the dimension did not influence the success of the configuration.

two samples. In other words, a configuration that demonstrated high performance in one time frame often was not equally successful in the other period.

Research Question 3 asked whether the success of a strategic EO pattern differs based on the conceptualization of firm performance. We found considerable variability in the industries for which successful configurations emerged based on the conceptualization of firm performance. In our 2001–2003 sample, fsQCA uncovered successful strategies for only one industry (pharmaceuticals) across all three measures of performance. The remaining industries may have found a consistently successful configuration using one or two measures of performance, but no consistently successful strategies across all measures. However, while we found substantial variability across measures, when successful configurations were found across measures, these configurations were often similar. For example, configurations 2 and 6 from Table 5 suggest similar patterns of the strategic EO dimensions lead to high performance with regard to ROA and Tobin's Q in the pharmaceutical industry, but differ in the relative importance of the individual dimensions.

In our main analyses, we calibrated our high firm performance indicator using firms in the top 25% of the industry, following existing research using fsQCA to examine organizational configurations leading to high performance (e.g., Fiss, 2011). To examine whether strategic EO configurations may also predict very high performance, we conducted a *post hoc* analysis using the top 10% of firms as being fully in the set of high performing firms. In some cases, no configurations of strategic EO consistently led to very high firm performance. However, we found several instances where our findings were consistent even with this higher bar for firm performance. For instance, we uncovered several configurations leading to very high ROA in 2002–2004 and 2005–2007 that were similar to the configurations uncovered in our main analysis. We also found configurations leading to high Tobin's Q in 2005–2007 that were similar to the configurations uncovered in our main analysis. For example, configuration 2 from Table 5 was perfectly replicated in our *post hoc* analysis, and configuration 3 was replicated with similar prescriptions, but differed in the importance of individual dimensions to the configuration. We also found that configurations leading to a high Tobin's Q in the 2004–2006 sample were similar to the configurations uncovered in our main analysis. For example, configuration 11 from Table 6 was replicated in our *post hoc* analysis; however the replicated configuration only applied to dynamic industries rather than to both dynamic and stable industries.

4 | DISCUSSION

Covin and Lumpkin (2011, p. 867) encourage researchers to examine configurations of EO, highlighting this area as one of two “high-potential research foci.” Addressing this call, our study advances understanding of how firms use entrepreneurial strategies by examining configurations of the strategic EO dimensions in different industries, over time, and in relation to different measures of performance. Our findings demonstrate the value of treating strategic EO from a configurations perspective and provide support for equifinality—where more than one pattern can lead to high performance in the same environment (e.g., Gresov, 1989; Payne, 2006). Our findings also show that the five strategic EO dimensions are not equally important to performance across contexts (i.e., industry and time). In fact, the more successful configurations tend to focus on one or a few key dimensions rather than give equal attention to them all, as traditional views and measures of EO might assume. These findings hold implications for EO research and the broader strategic entrepreneurship field.

One clear and very applicable challenge to the extant literature is associated with the common practice of conceptualizing and operationalizing strategic EO from a linear and cross-sectional perspective. In most studies, strategic EO is treated as five independent dimensions, where they are all treated equally (i.e., entered into regression equations separately). Following previous scholars who suggest the need for a reconceptualization of EO (e.g., Anderson, Kreiser, Kuratko, Hornsby, & Eshima, 2015; Miller, 2011), we adopt a more nuanced view of the complex nature of strategic EO and the value of a configurations perspective (Fiss, 2007). For instance, our analyses found three

configurations (9, 13, and 14 in Table 6) in the Internet industry that achieved high market-based performance from 2004 to 2006, demonstrating that there is more than one path to high firm performance (i.e., equifinality).

While our findings clearly support a configurations-based view of strategic EO, they may also suggest that some strategic EO dimensions appear to be more important than others within the configurations that influence firm performance. For instance, nearly all of the successful configurations consisted of high autonomy and competitive aggressiveness, either as a core or peripheral component of the configuration. Autonomy, most notably, emerged as a consistent and driving component of the various patterns; it was pervasive across contexts and performance metrics. Perhaps because autonomy sets the stage for organization members to move with independence and freedom to make decisions and take entrepreneurial actions (Lumpkin, Cogliser, & Schneider, 2009), it may serve as an important precondition to other activities such as innovation, proactiveness, and competitive aggressiveness, which tended to demonstrate more variability across the configurations. Future research might explore autonomy more specifically to determine if and how it plays a key and, possibly, causal role in determining the success of strategic EO configurations. That said, researchers have noted that autonomy has both internal (as operationalized here) and external components (e.g., Nordqvist, Habbershon, & Melin, 2008) that may be influencing the nature of the configurations; external autonomy would represent the ability of the firm to act independently from external stakeholders such as suppliers, customers, and regulatory agencies. Considering these components separately may also be a worthwhile endeavor.

Context is clearly an important factor when considering strategic EO, and more research is needed in this area. Although there is substantial evidence demonstrating the significance of context in determining differences in firm performance (e.g., Short et al., 2007), the diversity of the high-performing patterns associated with the various environmental conditions and performance measures was striking. This suggests that traditional contingency-based notions of matching strategy and structure to the environment do not fully capture the complexities associated with strategic EO; our findings illustrate the need for more contextualizing—presenting a study in terms of the situation surrounding it—when examining strategic EO and its relationship to performance. As demonstrated here, a change in the research context—either industry or time—can alter theory predictions in important ways; this can challenge long-standing theoretical tenets and help open the proverbial “black box” associated with EO, as well as other entrepreneurial phenomena (Zahra & Wright, 2011).

Our conceptualization of adaptation and time, for instance, may be limited. Although we recognize the need to strategically adapt, relatively little is known about what influences the pace of change. Generally, adaptation comes in the form of incremental refinements (e.g., Levinthal, 1997). Barring significant environmental upheavals, firms are unlikely to attempt significant (or fast) change that moves them to an alternative configuration primarily due to mobility barriers (Caves & Porter, 1977; Fox-Wolfgramm, Boal, & Hunt, 1998). However, with an increasingly fast-paced business environment, our findings suggest that those firms that do not make significant and quick changes in response to misfit may be taking significant risks. While the key characteristics of successful configurations in our study's first time period (2001–2003) were often consistent with successful configurations in the second, there was considerable variability in the total number of successful configurations—several fewer in the first period than the second—and the industries to which they pertain. We suggest that these temporal anomalies—perhaps associated with the 2001 dot-com recession period that affected high-technology companies—created the need for constant adjustment. In fact, in a recent study using growth modeling, Zachary et al. (2017) showed how the economic jolt of 2007–2008 influenced firms' overall emphasis on EO. Together, these findings suggest that strategic EO, which largely has been assumed to be generalizable and somewhat static over time, may need to be tailored and adjusted—emphasizing and deemphasizing various EO dimensions—more quickly and more often than traditionally thought.

Given a more dynamic view of strategic EO, and considering the extensive variance within and across the specific contexts, future research might examine more explicitly the role of economic cycles and other temporally oriented factors in the success of different patterns, as well as how firms adapt their entrepreneurial strategies. A resource orchestration perspective may offer some possibilities for better understanding the patterns and how managers might adapt their organizations. Resource orchestration argues that resources should be dynamically

TABLE 6 Configurations for achieving high performance (2004–2006)^a

Performance measure	Solution									Altman's Z
	ROA		Tobin's Q							
Configuration	7	8	9	10	11	12	13	14	15	16
Autonomy	●	●	●	●	●	●	●	●	●	●
Competitive aggressiveness		●	⊗	●	●	●	●		●	●
Innovativeness	⊗	⊗	⊗		●	●	⊗	⊗	⊗	⊗
Proactiveness	⊗	⊗	⊗	⊗	⊗	●	●	⊗	⊗	⊗
Risk taking	⊗	⊗		⊗	●	⊗	●	⊗	⊗	⊗
Munificence	⊗		●	●	⊗	⊗	●	●	●	●
Dynamism	●	●	●	⊗		⊗	●	●		⊗
Consistency	0.89	0.78	0.86	0.91	0.81	0.78	0.80	0.80	0.85	0.86
Raw coverage	0.01	0.02	0.03	0.02	0.02	0.01	0.01	0.03	0.03	0.02
Unique coverage	0.01	0.01	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.02
Overall solution consistency	0.83						0.84		0.86	
Overall solution coverage	0.03						0.08		0.02	

^a ⊗ indicates that firms espousing the configuration were relatively low on the dimension. ● indicates that firms espousing the configuration were relatively high on the dimension. Large symbols indicate that the dimension was a core condition, and small symbols indicate that the dimension was a peripheral condition. Blank spaces indicate that the dimension did not influence the success of the configuration.

managed—using structuring, bundling, and leveraging processes—to create value for the firm (Sirmon & Hitt, 2009). From this perspective, managing strategic EO as a “capability configuration” would require integration and coordination of the dimensions to provide value to customers over time (Sirmon, Hitt, & Ireland, 2007). Research on organizational ambidexterity—which is a firm's ability to balance both the exploration of new opportunities with the exploitation of existing advantages (Lavie, Stettner, & Tushman, 2010)—may also offer some insight into how firms may adapt their EO configurations. For instance, Andriopoulos and Lewis (2009), in their multi-case study of the paradoxes of innovation, suggest that cycles of ambidexterity can be perpetuated by addressing three interacting factors: a multilevel approach, complementary tactics, and learning synergies. Applying these factors to adaptive processes for strategic EO may be a useful direction.

As with any study, our findings should be considered in light of methodological limitations. First, while our use of 10-K filings to measure strategic EO parallels previous studies linking entrepreneurship to performance, MD&A sections may contain elements of impression management that might bias results. While our study design is robust to the extent that most firms likely engage in impression management, it may be fruitful for future research to leverage alternate data sources, such as interviews and surveys. Second, our sample consisted of firms found in four high-tech industries, limiting generalizability. Other industries and other contexts are likely to produce different results, but this may support our configurations findings more than challenge them. As we argued previously, further contextualization is warranted to tease out the nuances associated with strategic EO configurations, and this should go beyond mere industry classifications. For instance, studies have found that the family firm context may influence the strategic EO-firm performance relationship (e.g., Short et al., 2009). It is possible that the successful strategic EO patterns used by family firms may differ from those used by nonfamily firms; future research might examine if and how differences exist.

Our study is also limited in that we examined patterns of entrepreneurial behaviors and decision making associated with Lumpkin and Dess' (1996) five-dimensional conceptualization of EO. This limitation does suggest many opportunities for future inquiry, however. In their original conceptualization, Lumpkin and Dess (1996) define EO as “the processes, practices, and decision-making activities that lead to new entry.” Our study departs from this definition in that we do not examine whether patterns of these dimensions lead to new entry. This provides a valuable

opportunity for future research to build from our findings. Additionally, examining the three-dimensional EO conceptualization using configurations may be valuable as well. While the two conceptualizations of EO are similar, they may differ in the underlying phenomenon they measure (e.g., George & Marino, 2011). As such, future research using a configurations perspective might help in our understanding of the similarities and differences associated with these conceptualizations of EO.

Finally, while autonomy was found to be an important dimension in our configurations, it is uncertain whether our methodology may be influencing our findings. We operationalized our autonomy indicator as a dichotomous crisp set due to the very low base rate with which autonomy words were used in our sample of texts; this may lead to an overemphasis on this variable. However, when we replicated our analyses using a fuzzy-set calibration (rather than a crisp set), we were unable to identify any configurations of strategic EO that consistently led to high firm performance. To examine this, future research might replicate our analyses using a survey measure of autonomy (e.g., Lumpkin et al., 2009).

5 | CONCLUSION

The configurations approach presents a promising path forward for research examining the link between strategic EO and firm performance. By investigating strategic EO as patterns of its dimensions, we alleviate methodological limitations of bivariate analyses, improve interpretation of the five-dimensional strategic EO construct, and facilitate new research questions surrounding the complex interactions among the dimensions of strategic EO and firm performance. In doing so, we sought to leverage the important advantages of examining configurations identified by Miller (1987, p. 686): they “richly describe organizations” and unveil “their complex, gestalt, and systematic nature” while “avoiding confusions born of excessive aggregation” and “aiding prediction.” For scholars, our research suggests that managers may view their firms’ entrepreneurial strategy holistically as a pattern of the related but independent strategic EO dimensions. For practitioners, our research argues that firms with the highest levels of each strategic EO dimension are not necessarily top industry performers. Rather, a more nuanced view reveals that the best entrepreneurial strategy may include being higher on some dimensions and lower on others.

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ORCID

Aaron F. McKenny  <https://orcid.org/0000-0003-0146-001X>

G. Tyge Payne  <https://orcid.org/0000-0003-2829-3661>

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