

ENTREPRENEURS' IMPROVISATIONAL BEHAVIOR AND FIRM PERFORMANCE: A STUDY OF DISPOSITIONAL AND ENVIRONMENTAL MODERATORS

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Previous research indicates that improvisation—the deliberate extemporaneous composition and execution of novel action—is a key form of entrepreneurial behavior. It has been argued, however, that entrepreneurs' improvisational behavior does not necessarily result in performance gains for their firms. Instead, a contingency perspective suggests that the effectiveness of entrepreneurs' improvisational behavior depends on key moderating variables. Drawing on this framework, the current study uses a national (U.S.) random sample of new ventures to examine the interactive effects on firm performance of entrepreneurs' improvisational behavior with key dispositional and environmental variables. Consistent with predictions, findings indicated that within the context of dynamic environments, the relationship between improvisational behavior and firm performance was significantly more negative for entrepreneurs who were high in optimism than it was for those who were moderate in optimism. In contrast, within the context of stable environments, results demonstrated marginally significant evidence that entrepreneurs' improvisational behavior was more positively associated with firm performance for entrepreneurs who were high in optimism than it was for those who were moderate in optimism. Overall, results suggest that improvisational behavior can be an effective form of entrepreneurial action within rapidly and unpredictably shifting environments, but only when coupled with realistic levels of optimism. Copyright © 2012 Strategic Management Society.

INTRODUCTION

'Sometimes it works, sometimes it fails, but that's what we face when we're dealing with improvisation.'

—Jan Garbarek

Keywords: cognition; entrepreneurial action; individual differences; improvisation; upper echelons; new venture performance

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As the new venture development process unfolds, entrepreneurs typically need to change course from their original plans, remain flexible, and continually evolve their business (Mullins and Komisar, 2009). As a result, entrepreneurs must be able to formulate and execute novel strategic decisions in the moment (i.e., improvise)—so as to capitalize on opportunities to move their firm in a more promising direction. Research by Baker, Miner, and Eesley (2003) affirms that entrepreneurs do indeed spend a significant amount of time extemporaneously formulating and executing strategic decisions, using only the resources available to them in the moment. However,

this fact should not be perceived as implying that improvisational behavior is always, or even usually, a beneficial form of action for entrepreneurs. As noted by many researchers, improvisation is not necessarily good or bad; rather, it can generate both positive and negative results (Miner, Bassoff, and Moorman, 2001). For example, Crossan and Sorrenti (1997: 31–32) note that ‘There is variability in both the quality of improvisational action and its suitability under various conditions,’ while Vera and Crossan (2005: 204) add that ‘improvisation may be highly innovative or chaotic; improvisation may solve a problem or worsen it.’ This reasoning suggests that the effects of improvisation are likely to be moderated by several factors. The present research focuses on this issue and, specifically, addresses the question of what variables moderate the relationship between entrepreneurs’ improvisational behavior and the subsequent performance of their firms.

Contingency theory provides a useful framework for examining the mechanisms through which the improvisational behavior of entrepreneurs may exert positive and/or negative effects on the performance of their firms. Specifically, contingency theory suggests that the role of individual behavior in organizational processes involves complex—and often higher-order—interactions of dispositional and environmental moderating factors (Fiedler, 1996; 1998). This theoretical framework is consistent with arguments made by Vera and Crossan (2005) that the effectiveness of improvisational behavior likely depends on the characteristics of the improviser(s) and the context in which such action takes place. Following this logic, we suggest that optimism is a key dispositional characteristic and that dynamism is a key environmental variable and—moreover—that these factors will jointly interact to moderate the effectiveness of entrepreneurs’ improvisational behavior with respect to the performance of their firms. Optimism is selected for study because it is a dispositional variable that stands out, arguably more than any other, as one in which entrepreneurs are particularly high (de Meza and Southey, 1996). In addition, there are strong theoretical grounds for understanding how its effects are likely to relate to the efficacy of improvisation (Geers and Lassiter, 2002). Dynamism is assessed as an environmental variable because this factor, perhaps more than any other industry characteristic, holds important implications for the effectiveness of improvisation in the strategic decision-making process (Eisenhardt, 1989). From a contingency theoretical perspective,

these two variables should have a particularly strong impact on the effectiveness of entrepreneurs’ improvisational behavior and are, thus, key components of our conceptual model.¹

The findings of our study are expected to contribute to the organizational studies literature examining the effects of improvisational behavior, which has been primarily conducted within work teams. While this research has produced meaningful results regarding outcomes such as innovation (Vera and Crossan, 2005), speed to market of new products (Akgun, Lynn, and Reily, 2002), and organizational change processes (Cunha and Cunha, 2003), it has provided little information pertaining to the strategic decision behavior of entrepreneurs and subsequent effects of this behavior on the performance of their new ventures. The current study also contributes to the upper echelons literature by demonstrating the importance of dispositional and environmental moderating factors in the relationship between the decision behavior of top management and firm performance (Baron, 2007; Hambrick, 2007; Hitt *et al.*, 2007).

THEORETICAL DEVELOPMENT AND HYPOTHESES

Entrepreneur improvisational behavior

Improvisational behavior is defined as the deliberate extemporaneous composition and execution of novel action (Moorman and Miner, 1998). A person can improvise his/her actions at any given time. The

¹ There are a few points of clarification that should be made with regard to how we develop and examine our conceptual model. First, we focus on *lead entrepreneurs*—individuals who are both founder and chief executive officer (CEO) of their firm—because such persons have an inordinate impact on the strategic direction and performance of their firms (Wright *et al.*, 2007). Second, improvisation is evaluated in the current research as a behavioral tendency. As such, we are concerned with the degree to which entrepreneurs consistently engage in improvisational behavior throughout the various aspects of their work as founding CEO (e.g., while developing and executing the strategy of their firm), as opposed to individual acts of improvisation that may be rare and/or irregular events. Third, in both the development of our hypotheses and discussion of our results, we refer to dispositional optimism as ranging from only moderate to high. As compared to the general population, this is the range in which the vast majority of entrepreneurs tend to fall (Hmieleski and Baron, 2009). In other words, low scores on dispositional optimism among entrepreneurs (a unique population) tend to be equivalent to moderate scores on this dimension for the general population. The use of this labeling convention enhances our ability to connect to the broader literature on dispositional optimism (Scheier, Carver, and Bridges, 2001).

reason for such behavior may stem from the presentation of a problem, lack of an appropriate heuristic or alternative solution that can be applied to a problem, or simply as an impulse to try something new in the moment (Vera and Crossan, 2005). Notably, Baker and colleagues (2003) point out that improvisational behavior can be used to evaluate how current resources can be applied to either meet preexisting goals (i.e., causation) or as an attempt to discover what outcomes are possible (i.e., effectuation). In the following sections, we consider the potential moderating effects of dispositional optimism and environmental dynamism on the relationship of entrepreneurs' improvisational behavior with the performance of their firms.

Improvisational behavior and dispositional optimism

Dispositional optimism, the generalized expectation of experiencing positive outcomes (Scheier *et al.*, 2001), has important implications for the judgment and decision making of entrepreneurs and, consequently, for their ability to effectively improvise. Highly optimistic individuals have been found to ignore disconfirming information, reconstruct perceptions of past experiences in ways that exaggerate their probability of achieving future success, engage frequently in heuristic thinking processes, and perceive an endless stream of high potential opportunities (Geers and Lassiter, 2002; Segerstrom and Solberg Nes, 2006). These research findings suggest that the improvisational behavior of highly optimistic entrepreneurs is likely to involve applying a narrow set of information inputs toward the exploitation of a wide range of entrepreneurial opportunities and that such actions will be executed with more confidence than is rationally justified. Conversely, persons possessing moderate levels of optimism tend to have a more realistic view with respect to their probability of attaining success (Geers, Handley, and McLarney, 2003). For example, compared to highly optimistic individuals, persons who are moderate in optimism tend to value, rather than filter out, negative feedback (Spirrison and Gordy, 1993), are not easily persuaded by positive information (Segerstrom, 2001), more accurately perceive levels of risk than those higher in optimism (Gibson and Sanbonmatsu, 2004), engage in systematic thinking processes (Scheier *et al.*, 2001), and are more selective in the opportunities they pursue (Segerstrom and Solberg Nes, 2006). These research findings suggest

that the improvisational behavior of moderately optimistic entrepreneurs is likely to involve applying a wide set of information inputs toward the exploitation of a narrow range of entrepreneurial opportunities, and that such actions will be taken with realistic expectations regarding the probability of attaining success. Of particular relevance to these points, using an extensive array of information inputs, adopting a focused strategy toward opportunity exploitation, and holding realistic expectations regarding the probability of achieving positive outcomes have each been shown to be key to effective improvisational behavior (Baker and Nelson, 2005; Miner *et al.*, 2001; Vera and Crossan, 2005) and leadership of new ventures (Baum and Wally, 2003; Forbes, 2005). In sum, findings from the literatures we examined converge to suggest that the improvisational behavior of moderately optimistic entrepreneurs will be more positively related to the performance of their firms than will be such behavior for highly optimistic entrepreneurs. Thus, we offer the following hypothesis:

Hypothesis 1 (H1): The relationship between entrepreneurs' improvisational behavior and the performance of their firms will be moderated by dispositional optimism, such that this relationship will become more negative as entrepreneurs' dispositional optimism increases.

Improvisational behavior and environmental dynamism

Dynamic industry environments are distinguished by rapid and unpredictable change (Castrogiovanni, 2002; Sharfman and Dean, 1991). Such environmental conditions can make it challenging for entrepreneurs to form accurate judgments regarding which products and services will take hold in the long run (Markides and Geroski, 2004). For this reason, entrepreneurs leading their firms in dynamic industries must be able to make quick and often novel modifications to their businesses in order to survive (Mullins and Komisar, 2009). For example, research by Hmieleski and Baron (2008b) found that new ventures operating in dynamic industries experienced higher performance when led by entrepreneurs who modified their firms' original business concept in response to the fast and often unforeseen changes taking place in their competitive environment—suggesting that improvisational behavior may be a key mechanism for surviving or

even thriving in dynamic industries. Such gains in performance were, however, not realized in stable industry environments for firms that made significant changes away from their original business concept. In stable environments, rapid and novel changes to a firm's products and services are likely to be unnecessary because appropriate strategic decisions are more obvious and outcomes more easily predicted (Alvarez and Barney, 2007; Baum and Wally, 2003; Hmieleski and Baron, 2008a). This logic leads to the following hypothesis:

Hypothesis 2 (H2): The relationship between entrepreneurs' improvisational behavior and the performance of their firms will be moderated by industry environmental dynamism, such that the relationship will become more positive as the level of dynamism present in the industry environment increases.

The joint moderating effects of dispositional optimism and environmental dynamism

Consistent with contingency theory, dispositional optimism and environmental dynamism are likely to jointly moderate the relationship between entrepreneurs' improvisational behavior with the performance of their firms. Specifically, highly optimistic entrepreneurs should be relatively ineffective at improvising in dynamic environments because they will not possess the focus needed to effectively capitalize on rapidly changing opportunities. In addition, the tendency of such individuals to discount negative information and rely on heuristic thought processes based on past experience could prove harmful if it prevents them from identifying key elements that can be recombined to formulate and execute new strategic plans in response to shifts in their competitive environment. Finally, because of their tendency to focus on self-confirming information, highly optimistic entrepreneurs are unlikely to be effective at recognizing 'when' improvisation is most needed. Consistent with this logic, research by Eid *et al.* (2005) has shown high levels of optimism to be related to decreased levels of situational awareness, in that optimistic individuals fail to accurately perceive their environment, understand associated demands, and envision how their current situation impacts their future. Due to the need for quickly identifying and interpreting information when leading firms in dynamic environments (Eisenhardt, 1989), entrepreneurs who are high in optimism are

likely to be at a relative disadvantage when improvising key strategic decisions, as opposed to those who are moderate in optimism. Based on prior research and theory, and in alignment with a contingency theoretical perspective, we offer the following hypothesis:

Hypothesis 3a (H3a): In dynamic industry environments, the relationship between entrepreneurs' improvisational behavior and the performance of their firms will become more negative as entrepreneurs' dispositional optimism increases.

As compared to dynamic environments, overconfidence is less likely to occur as result of high levels of optimism in stable environments because the high degree of predictability and transparency present in such environments helps clarify appropriate decisions choices (Klayman *et al.*, 1999). Moreover, the heuristics that highly optimistic individuals form on the basis of their past experiences, and on which they tend to draw when making decisions, are likely to be more applicable in stable, as opposed to dynamic, industry environments (Scheier *et al.*, 2001). Thus, it is expected that entrepreneurs who regularly engage in improvisational behavior and are high in optimism will be relatively effective in stable environments. In contrast, because predictions of the future tend to be more apparent, the systematic processing engaged in by moderate optimists when improvising in stable environments may prove to be inefficient. This logic suggests the following hypothesis:

Hypothesis 3b (H3b): In stable industry environments, the relationship between entrepreneurs' improvisational behavior and the performance of their firms will become more positive as entrepreneurs' dispositional optimism increases.

METHODOLOGY

Sample and procedure

The *Dun and Bradstreet U.S. Market Identifiers Database* was used to draw a national random sample of 1,000 new ventures. An envelope including our survey, a cover letter, and a return envelope was mailed to the participants—individuals who were each CEO and founder of their firm. A total of 185 mailings were returned as undeliverable and 207

completed questionnaires were received. The amount of non-deliverable mailings was consistent with the fact *Dun and Bradstreet* reports that 20 percent of firms in their database change addresses each year. Six cases were unusable because of incomplete performance data. The result was a usable response rate of 24.8 percent, which is similar to those achieved in other studies of top management (Sapienza and Korsgaard, 1996). The firms of the participating entrepreneurs were located in 40 different states and operated in 114 different industries (according to four-digit SIC codes). No more than four firms were based out of the same state, no more than three firms operated in the same primary industry, and no firms were subsidiaries of other companies. Therefore, it appears that our *national* sample is not biased by geographic location, industry, or corporate affiliation.²

Measures

Unless otherwise noted, all measures were rated on a seven-point Likert-type scale, with responses ranging from 1 (*strongly disagree*) to 7 (*strongly agree*).

Improvisational behavior ($\alpha = 0.86$)

A 12-item scale adapted from the work of Hmieleski and Corbett (2006) was used to measure the degree to which individuals display improvisational behavior in their work role. Participants rated the extent to which each item was descriptive of their behavior while in their role as the leader of their firm's top management team. Item responses were averaged to create an overall score for participants' tendency to partake in improvisational behavior while in their work role.

Optimism ($\alpha = 0.80$)

This variable was examined using the Life Orientation Test-Revised (LOT-R), developed by Scheier, Carver, and Bridges (1994). The scale consists of six items and requires respondents to rate the extent of their agreement with each item. Some example items include: 'I'm always optimistic about my future' and 'In uncertain times, I usually expect the best.' Item responses were averaged to create an overall score of optimism (high scores) versus pessimism (low scores).

² The data for the current study come from the same data collection that was used for Hmieleski and Baron (2009).

Environmental dynamism ($\alpha = 0.69$)

The industry-level rate of unpredicted change was measured as the standard errors of four regression slopes following procedures described by Sharfman and Dean (1991) and Castrogiovanni (2002). The independent variable for each case was time. The four dependent variables were industry revenues, number of industry firms, number of industry employees, and research and development intensity. The data for industry revenues, number of industry firms, and number of industry employees were acquired from the U.S. Bureau of the Census, while data for research and development intensity were obtained from the U.S. Patent Office. We regressed time on these variables for the most recent 10-year period, and an index of the standard errors of the regression slopes was divided by their respective means as the indicator of unpredicted change for each of the four variables. These totals were standardized and added to form an overall index of industry environmental dynamism. To examine the degree to which the four indicators loaded onto a single dimension, a single-factor confirmatory analysis was performed using AMOS 6.0. A nonsignificant chi-square was observed for the model ($\chi^2 = 2.35$, $p = 0.13$) and results from absolute fit (GFI = 0.986; standardized RMR = 0.042) and relative fit (CFI = 0.979) indices both demonstrated good fit. Standardized factor loadings ranged from 0.68 to 0.86.

Firm performance

Revenue growth and employment growth were used as indicators of firm performance. Revenue and employment totals were provided by *Dun and Bradstreet* at two different points in time, during the year in which the survey was administered and again two years afterward. Growth for each variable was calculated as the lagged percentage change over this two-year period. Due to the fact that our sample represented several different industries, we subtracted the average growth rate (revenue and employment growth rates, respectively) of each firm's principal industry (cf. Florin, Lubatkin, and Schulze, 2003). Data for industry revenue and employment growth were acquired from the U.S. Census Bureau. An overall index of firm performance was created by standardizing and then summing scores for the revenue growth and employment growth indicators. The index was used since there was a high correlation between revenue and

employment growth ($r = 0.54, p < 0.01$) and because similar results were observed when using revenue growth and employment growth as individual dependent variables.

Control variables

The firm control variables included the age of the firm, size of the firm, and prior growth of the firm. *Firm age* was assessed as the number of years since the firm had been incorporated. *Firm size* was measured by standardizing and then summing revenue and employment totals. The average revenue and employment growth rates for the three years prior to the survey data collection were standardized and summed to create a variable labeled *prior growth*. The individual control variables included the *sex* (0 = male, 1 = female), *age* (in years), *educational attainment* (highest educational degree: 1 = high school, 2 = associates, 3 = bachelors, 4 = masters, 5 = doctoral), *industry experience* (number of years working in the current industry), *entrepreneurial experience* (number of previous firms founded), the Big Five facets of personality—*extraversion*, *openness*, *emotional stability*, *conscientiousness*, and *agreeableness* (Saucier, 1994), and *generalized self-efficacy* (Chen, Gully, and Eden, 2001).³

Statistical procedures

We used moderated hierarchical regression as the primary statistical tool for examining the moderating effects of dispositional optimism and environmental dynamism on the relationship of entrepreneurs' improvisational behavior with firm performance. All independent variables were mean centered before being entered into the regression. The three-way interaction of improvisational behavior, optimism, and environmental dynamism was graphed and differences between the simple slopes were estimated following Dawson and Richter (2006).

RESULTS

Multiple analyses were used to evaluate the threat of multicollinearity. The highest correlation between any pair of variables was 0.52 (see Table 1), the

³ The items used to measure the Big Five facets of personality were rated on a nine-point Likert-type scale.

highest variance inflation score was 1.70, and the highest conditional index score was 3.43. Each of these statistics falls within acceptable ranges (Tabachnick and Fidell, 2001), suggesting that multicollinearity is not a threat to the integrity of the results. We now discuss the results in regard to the specific hypotheses.

Hypothesis 1 proposed that the relationship between entrepreneurs' improvisational behavior and the performance of their firms would be moderated by dispositional optimism, such that the relationship would become more negative as entrepreneurs' dispositional optimism increases. As shown in Model 3 of Table 2, dispositional optimism did not moderate the relationship between entrepreneurs' improvisational behavior and firm performance ($\beta = -0.01, p > 0.05$). Therefore, results do not provide support for H1.

Hypothesis 2 proposed that the relationship between entrepreneurs' improvisational behavior and the performance of their firms would be moderated by industry environmental dynamism, such that the relationship would become more positive as the level of dynamism present in the industry environment increases. As shown in Model 3 of Table 2, environmental dynamism did not moderate the relationship between entrepreneurs' improvisational behavior and firm performance ($\beta = 0.08, p > 0.05$). Thus, results fail to provide support for H2.

Hypothesis 3a proposed that in dynamic industry environments, the relationship between entrepreneurs' improvisational behavior and the performance of their firms would become more negative as entrepreneurs' dispositional optimism increases. Results shown in Table 3 and illustrated in Figure 1 indicate that slope 3 was significantly more positive than slope 1 ($t = 2.41, p < 0.05$). This finding indicates that in dynamic environments, the effects of improvisational behavior are greater (more positive) for firms led by entrepreneurs who are moderate in optimism than for those led by entrepreneurs who are high in optimism. Therefore, the results provide support for H3a.

Hypothesis 3b proposed that in stable industry environments, the relationship of entrepreneurs' improvisational behavior with the performance of their firms would become more positive as entrepreneurs' dispositional optimism increases. As shown in Table 3 and illustrated in Figure 1, although the direction of the slopes aligns with predictions, the difference between slope 4 and slope 2 was marginally significant ($t = 1.68, p < 0.10$). Thus, the findings offer only partial support for H3b.

Table 1. Descriptive statistics and variable correlations

Variable	Mean		SD		r														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17		
1. Firm age	5.74	2.43																	
2. Firm size	0.00	1.81	-0.08																
3. Prior growth	0.00	1.93	-0.09	0.35***															
4. Age (of entrepreneur)	51.83	9.12	0.07	0.14**	-0.08														
5. Sex (male = 0, female = 1)	0.19	0.40	0.00	-0.12*	-0.07***														
6. Educational attainment	2.97	1.19	0.04	0.11	-0.09	0.07	0.10												
7. Industry	21.26	10.47	0.14*	0.03	-0.10	0.51***	-0.21***	-0.03											
8. Entrepreneurial experience	0.95	1.34	-0.08	0.00	0.05	0.22***	-0.12	-0.07	0.17**										
9. Extraversion	6.90	1.23	0.00	-0.07	-0.04	-0.11	0.14*	0.01	-0.08	0.13*	(0.83)								
10. Openness	6.94	0.94	0.02	-0.08	0.00	0.08	-0.04	0.09	-0.13*	0.12*	0.25***	(0.68)							
11. Emotional stability	6.77	1.16	-0.11	-0.07	0.01	0.11	0.08	0.07	-0.03	0.12*	0.15**	0.10	(0.73)						
12. Conscientiousness	7.22	1.24	-0.05	0.03	-0.03	0.14**	0.11	0.13*	0.04	0.05	0.17**	0.08	0.37***	(0.86)					
13. Agreeableness	7.46	1.01	-0.01	0.00	-0.03	-0.03	0.21***	0.03	-0.07	0.24***	0.16**	0.17**	0.52***	0.31***	(0.79)				
14. Self-efficacy	6.00	0.72	-0.06	0.04	-0.03	0.00	0.09	-0.06	0.05	0.22***	0.21***	0.19***	0.22***	0.33***	0.19***	(0.90)			
15. Improvisational behavior	5.68	0.75	-0.08	-0.07	-0.06	-0.08	0.11	-0.09	-0.05	0.20***	0.33***	0.33***	0.06	0.07	0.44***	(0.86)			
16. Optimism	5.87	0.90	-0.09	-0.10	-0.03	0.16**	0.12	-0.03	0.01	0.21***	0.31***	0.23***	0.31***	0.26***	0.37***	0.35***	(0.80)		
17. Dynamism	16.56	11.19	-0.04	0.10	-0.04	0.12	-0.04	0.08	0.05	.05	-0.07	0.12*	-0.02	0.08	-0.01	0.05	-0.02	0.02	
18. Firm performance	0.00	1.76	-0.03	-0.02	0.17**	-0.03	0.01	0.05	-0.09	.05	0.02	0.14**	0.06	0.00	0.04	0.02	0.07	-0.13*	0.16**

n = 201; *p < 0.10; **p < 0.05; ***p < 0.01. Cronbach's coefficient alphas are shown in parentheses along the diagonal.

Table 2. Hierarchical regression model of firm performance

Variable	Firm performance			
	Model 1	Model 2	Model 3	Model 4
	β	β	β	β
<i>Firm control variables</i>				
Firm age	-0.01	-0.00	0.00	0.00
Firm size	-0.03	-0.04	-0.05	-0.05
Prior growth	0.18**	0.19***	0.22***	0.22***
<i>Individual control variables</i>				
Age	-0.02	0.03	-0.01	-0.00
Sex	0.02	0.04	0.07	0.08
Educational attainment	0.06	0.04	0.04	0.02
Industry experience	-0.04	-0.06	-0.03	-0.04
Entrepreneurial experience	0.04	0.04	0.08	0.06
Extraversion	-0.02	0.03	-0.00	0.01
Openness	0.13*	0.10	0.08	0.08
Emotional stability	0.04	0.09	0.09	0.10
Conscientiousness	-0.02	-0.01	-0.04	-0.03
Agreeableness	0.01	0.03	0.06	0.03
Self-efficacy	-0.01	0.01	0.01	-0.03
<i>Main effects</i>				
Improvisational behavior (I)		0.12	0.11	0.17**
Optimism (O)		-0.27***	-0.24***	-0.26***
Dynamism (D)		0.17**	0.22***	0.31***
<i>Two-way interactions</i>				
I x O			-0.01	-0.10
I x D			0.08	0.11
O x D			-0.29***	-0.36***
<i>Three-way interaction</i>				
I x O x D				-0.23***
F-Ratio	0.86	1.66*	2.26***	2.55***
R ²	0.06	0.13	0.20	0.23
Adjusted R ²	0.00	0.05	0.11	0.14

n = 201; *p < 0.10; **p < 0.05; ***p < 0.01; Standardized coefficients are shown.

Table 3. Slope difference tests

Pair of slopes	Firm performance	
	t-value for slope difference	p-value for slope difference
(1) and (2)	0.824	0.411
(1) and (3)	2.412	0.017
(1) and (4)	0.369	0.712
(2) and (3)	1.782	0.076
(2) and (4)	1.675	0.096
(3) and (4)	3.177	0.002

DISCUSSION

The findings suggest that, within dynamic environments, entrepreneurs' improvisational behavior is more positively associated with firm performance for those who are moderate in optimism than it is for those who are high in optimism. In stable environments, in contrast, results demonstrated marginally significant evidence that entrepreneurs' improvisational behavior is more positively associated with firm performance for entrepreneurs who are high in optimism than for those who are moderate in optimism. Therefore, it appears that the performance of new ventures is related to entrepreneurs' improvisational behavior, but—as predicted by contingency

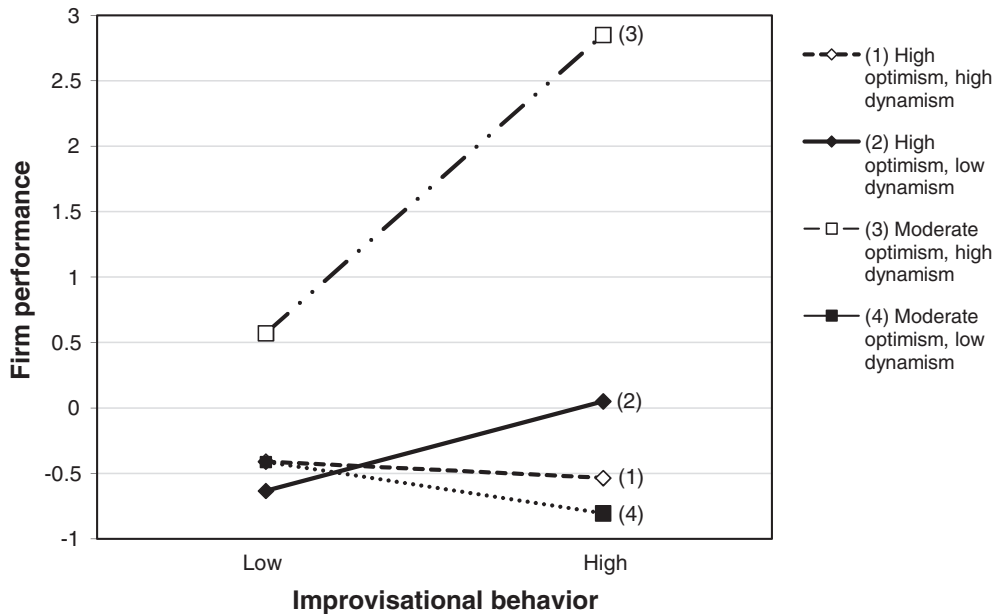


Figure 1. Interactive effects of improvisational behavior, dispositional optimism, and environmental dynamism on firm performance

theory—the nature of this relationship depends on both dispositional and environmental factors. These findings reassert the importance of upper echelons with respect to firm performance (Baron, Tang, and Hmieleski, 2011; Hambrick, 2007) and highlight the importance of recent calls to examine both individual and environmental moderating factors underlying such relationships (Baron, Hmieleski, and Henry, 2012; Hitt *et al.*, 2007). Results are now discussed in regard to implications for the effects of entrepreneurs' improvisational behavior on firm performance, the linkage between improvisational behavior and learning, and how entrepreneurs can self-regulate their behavior so as to minimize the negative effects of high dispositional optimism.

Entrepreneurs' improvisational behavior and firm performance

With respect to dynamic environments, our findings suggest that entrepreneurs who are moderate in optimism may be able to use improvisation as a mechanism for capitalizing on the rapid changes taking place within their industry to fuel growth for their firms. Such entrepreneurs may be particularly balanced or strategic in their use of improvisation, because individuals who are moderate in optimism tend to be effective at recognizing a wider range of

elements or resources that can be recombined to improvise strategic decisions (Eid *et al.*, 2005). Prior research has demonstrated that such persons are unlikely to rely on heuristic thinking (Scheier *et al.*, 2001), which can be problematic if the shifting environment does not conform to situations similar to those in which the heuristics were originally acquired (Sarmány, 1992). Furthermore, due to a tendency to be highly focused in the opportunities they pursue (Segerstrom and Solberg Nes, 2006), entrepreneurs who are moderate in optimism may be less likely to improvise haphazardly, enabling them to apply the concentrated effort that is necessary to navigate dynamic environments (Eisenhardt, 1989).

In contrast, highly optimistic entrepreneurs were found to be less effective at improvising in dynamic environments, as compared to those who rated more moderately on this dimension. Entrepreneurs who are high in both improvisational behavior and dispositional optimism might not recognize the high level of risk they are taking on and/or unrealistically believe that they can overcome such risk. As a result, they may attempt to exploit a wide range of different opportunities (i.e., speculating) that are too risky given their resources and capabilities. This general pattern of behavior is consistent with findings reported by Frese, van Gelderen, and Ombach (2000). These authors found that when entrepreneurs

optimistically take on too much by following 'opportunistic strategies,' they run the risk of losing sight of their primary goals and reduce their ability to generate sustainable growth for their firms. Thus, combined with the research mentioned earlier, the results of the current study seem to suggest that improvisational behavior should be used strategically: only to exploit opportunities that focus on the firm's core goals.

Finally, for new ventures operating in stable industry environments, only marginally significant findings were observed with respect to the relationship between entrepreneurs' improvisational behavior and firm performance. This result is consistent with studies of leadership (Fiedler, 1998), which have demonstrated that the impact of leader behavior is often less significant in stable environments because appropriate courses of action tend to be much clearer (e.g., when the present situation reflects past experience, there is a reduced need for rapid *ad hoc* decisions, and there is often more time to collect data and develop well thought out plans) than in dynamic environments (Hmieleski and Ensley, 2007). Therefore, the fact that the findings for stable environments were not as strong as those for dynamic environments is not entirely surprising.

Improvisation and learning

The findings also appear to offer new insights into the processes through which entrepreneurs learn. Specifically, our study provides evidence regarding how the improvisational behavior and optimistic nature of entrepreneurs jointly relate to their ability to achieve high performance for their firms under dynamic versus stable environmental conditions. Improvisation holds the potential for rapid learning and the development of expertise. For example, Chelariu, Johnston, and Young (2002: 142) note that 'central to the process of improvisation is learning, as improvisation requires continuous evaluation of activity and outcomes and modification as needed.' Similarly, Crossan and Sorrenti (1997) suggest that individuals can learn and build expertise by improvising. Our findings suggest that entrepreneurs who rapidly process information and formulate new strategic decisions (i.e., improvise) can have a positive impact upon firm performance so long as their improvisational proclivities are combined with moderate levels of optimism. Conversely, findings of the current study, taken together with those of related research, suggest that highly optimistic entrepre-

neurs leading their firms in dynamic environments may fall prey to overconfidence (Klayman *et al.*, 1999), give less credence to the new information they have encountered (Parker, 2006), and be strongly influenced by previously successful heuristics (Holcomb *et al.*, 2009). As a result, it is likely that highly optimistic entrepreneurs learn less during improvisational acts (presumably due to their tendency to filter out disconfirming information) and fail to gain the performance benefits realized by entrepreneurs with moderate levels of optimism. With respect to our findings, the entrepreneurs who were most effective at adapting their firms to the changes taking place in dynamic industries were probably more effective learners (Baron and Henry, 2010). In fact, successful performance under dynamic conditions is a highly relevant indicator that learning has taken place (Mazur, 2001).

Self-regulating the effects of optimism on improvisational behavior

Even though we found dispositional optimism to reduce entrepreneurs' ability to effectively improvise under certain conditions, it is important to note that high levels of such optimism are often advantageous. For example, having an optimistic mind-set is related to increased persistence, motivation to take on high challenge tasks, creativity and innovation, enhanced social skills, and the ability to overcome adversity and bounce back from failure (Carver and Scheier, 2003; Scheier *et al.*, 2001). Such benefits are likely to aid entrepreneurs in several aspects of the new venture development process (e.g., raising capital, attracting talent, identifying entrepreneurial opportunities). Thus, an important practical question that emerges is 'how can entrepreneurs leverage their inherent optimism as a personal strength while minimizing the potential detrimental effects of maintaining too positive of an outlook?'

Research on self-regulation suggests several avenues for addressing this question. Self-regulation involves interrelated processes through which individuals regulate their own actions and emotions (Forgas, Baumeister, and Tice, 2009). These processes involve identification of specific goals or standards, efforts to attain these objectives, careful monitoring of progress toward them, and adjustments in overt actions in order to enhance progress toward attaining these goals or standards (Carver and Scheier, 2011). Self-regulation involves several skills, including focusing persistently and intently on

key goals, exerting self-control, shifting goal priorities as conditions alter and progress is attained, and—perhaps especially relevant for the present discussion—restraining excessive impulsiveness, the tendency to act without prior reflection or consideration of potential consequences (De Young, 2010). Self-regulatory skills can be readily learned and strengthened (Rueda, Posner, and Rothbart, 2010), so to the extent entrepreneurs either possess or develop such self-regulatory skills, they may be able to benefit from improvisation while avoiding the potential ‘downside’ of being highly optimistic.

Limitations

The current study has some limitations worth noting. One potential limitation involves whether the participants in the current study were improvising as an intentional strategy or as a reaction to positive or negative situational demands (e.g., to explore new opportunities or to prevent further losses). The fact that improvisational behavior was measured as a behavioral tendency suggests that participants who scored high in improvisation exhibited such behavior consistently across a wide range of work-related situations. This logic is consistent with the fact that improvisational behavior did not have a significant direct relationship with either prior firm performance or the lagged measure of firm performance. For this reason, there appears to be no reverse causation in terms of high versus low levels of performance triggering a tendency to improvise.

Despite the use of a wide array of study covariates, a further limitation is that additional controls could have been considered. For example, as pointed out by an anonymous reviewer, personal initiative (Bledow and Frese, 2009) and/or energy (Atwater and Carmeli, 2009) may provide alternative explanations for the hypothesized relationships. From a practical standpoint, the nature of surveying lead entrepreneurs (individuals who have major time constraints and little incentive to complete lengthy questionnaires) forced us to make difficult choices with regard to the number of controls included in the study. Nonetheless, future investigations of improvisational behavior may benefit from including such control variables.

A final limitation concerns the fact that entrepreneurs tend to score high in dispositional optimism (de Meza and Southey, 1996). This fact suggests that caution should be taken when generalizing our results to other populations. With this said, our sample of

entrepreneurs may be considered a strength, to the extent that we may not have been able to identify moderating effects of high levels of optimism on the effectiveness of improvisational behavior if we had examined a population of individuals who rated considerably lower on this dimension.

CONCLUSIONS

Overall, the present results pose a perplexing dilemma, which, however, may cast new light on the origins of the high rates of failure among new ventures—especially those launched in dynamic industries. High levels of optimism on the part of founders and a tendency to engage in improvisational behavior are characteristics that are likely to be common among entrepreneurs who start new ventures in dynamic industries. Persons possessing such characteristics are more likely than others to believe that they will be able to overcome the challenges presented by a rapidly and unpredictably shifting environment (Baker *et al.*, 2003; Hmieleski and Corbett, 2008). As shown by our findings, this configuration of characteristics is a combination that can lead to overconfidence and poor performance in dynamic industries. This circumstance highlights the need for entrepreneurs, especially those operating (or aspiring to operate) in dynamic industries, to acquire enhanced self-regulatory skills—capabilities that will allow them to continuously monitor and adjust their behavior so that it remains in close alignment with the demands of the challenging and ever-changing environments they face.

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