ENTREPRENEUR IMPROVISATIONAL BEHAVIOR AND NEW VENTURE PERFORMANCE: A SOCIAL COGNITIVE PERSPECTIVE

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ABSTRACT

The current study uses a national (United States) random sample of 201 lead entrepreneurs to examine the interactive effects of entrepreneurs’ improvisational behavior with key individual (i.e., optimism) and environmental (i.e., industry dynamism) variables on firm performance (i.e., lagged measures of revenue and employment growth). Results indicate that these factors moderate the effects of entrepreneurs’ improvisational behavior; in fact, a three-way interaction between improvisational behavior, optimism, and environmental dynamism was observed with respect to firm performance. Consistent with predictions, in dynamic environments, the effects of entrepreneurs’ improvisational behavior on firm performance were positive when combined with moderate optimism, but non-significant when combined with high optimism. In stable environments, the effects of improvisational behavior were relatively weak, and were not moderated by 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.

INTRODUCTION

Recent work has established improvisation as a key form of entrepreneurial behavior (Baker, Miner, & Eesley 2003; Baker, 2007). It is clear that new ventures almost always begin with a goal or vision of some form, implying some degree of advanced planning (Baum, Locke, & Kirkpatrick, 1998; Shane & Venkataraman, 2000). Inevitably, however, environmental conditions, resource constraints and cognitive limitations almost always prevent entrepreneurs from executing their plans as initially intended (Hmieleski & Baron, 2008). This implies that entrepreneurs must be able to effectively deviate from their plans in order to adapt to their environmental conditions, which in many cases are changing both quickly and unpredictably (Baron, 1998). Therefore, the ability to extemporaneously create and execute new plans on the fly would seem to be an important form of behavior for entrepreneurs to be able to effectively perform. Research by Baker and colleagues (2003) affirms this view by demonstrating that new venture founders are often forced to make decisions extemporaneously, using only the resources available to them in the moment. This fact should not be mistaken as implying that improvisational behavior necessarily results in positive outcomes for entrepreneurs or the new ventures that they lead. As has been noted by many authors, improvisation is not inherently good or bad (Crossan, Cunha, Vera, & Cunha, 2005; Crossan & Sorrenti, 1997; Vera & Crossan, 2004; 2005). Therefore, what variables might moderate the relationship of entrepreneurs’ improvisational behavior with the performance of their firms? This is a crucial question because, even though it has been argued that the ability of
entrepreneurs to develop and execute novel strategic decisions “on the fly” is key to the success of new ventures, few studies have investigated boundary conditions in which such types of behavior may be effective. Further, studies that have considered such relationships have failed to evaluate the joint effects of both individual and environmental characteristics on the outcomes of entrepreneurs’ improvisational behavior (e.g., Hmieleski & Corbett, 2008).

Social cognitive theory (SCT: Bandura, 1986) provides a useful theoretical framework for understanding such effects. Specifically, SCT suggests that the effects of individual behavior (such as improvisation) are often determined by their interaction with important dispositional and environmental factors (Wood & Bandura, 1989). As such, the theory blends behavioral, dispositional, and environmental perspectives, thus providing a more comprehensive framework for examining human action and its outcomes than could be gained by focusing on any of these levels and classes of variables independently. In this regard, SCT provides a useful framework for undertaking the task of identifying the mechanisms through which individual behavior ultimately influence firm-level performance—a task that has been identified as crucial in recent years by many researchers (e.g., Baron, 2007; Wright, Hmieleski, Siegel, & Ensley, 2007). Further, the basic proposals of SCT are consistent with the multi-level perspective highlighted by Hitt, Beamish, Jackson, and Mathieu (2007). This perspective suggests that in order to fully understand complex organizational processes (including new venture development), it is essential to examine variables operating at different levels of analysis (e.g., individual, group, subunits, organizations, interorganizational, and environmental). The current study adopts this perspective by examining the joint effects of two individual variables (i.e., improvisational behavior and dispositional optimism), and a key environmental variable (i.e., dynamism).

Resting firmly both on SCT and a multi-level perspective, it is argued that the dispositional characteristics of entrepreneurs and the decision-making context in which they lead their firms will interact with their behavior to affect performance. More specifically, it is suggested that dispositional optimism is a key individual characteristic and that dynamism is a key environmental variable interacting to created contingencies regarding the effectiveness of entrepreneurs’ improvisational behavior. It is proposed that entrepreneurs with high levels of dispositional optimism will be relatively ineffective at improvising when leading their new ventures within dynamic industry environments, because they will have a tendency to overestimate the probability of obtaining positive outcomes from their attempts to extemporaneously develop and enact novel plans in accordance with the unpredictable changes taking place around them. In contrast, entrepreneurs with moderate levels of dispositional optimism are expected to be more effective improvisers within dynamic environments, acting more strategically and not overextending themselves and their firms. Within stable industry environments, where overconfidence is less likely to occur, dispositional optimism is expected to have a more positive effect on the relationship of entrepreneurs’ improvisational behavior with the performance of their new ventures.

The current study is designed to make several contributions. First, the empirical literature examining the effects of improvisational behavior has been primarily conducted within work teams. While such samples have produced meaningful results regarding outcomes such as innovation (e.g., Eisenhardt & Tabrizi, 1995; Garud & Karnoe, 2003; Vera & Crossan, 2005), speed to market of new products (e.g., Akgun & Lynn, 2002), and organizational change processes (Brown & Eisenhardt, 1997; Cunha & Cunha, 2003; Orlikowski, 1996), they do not provide information pertaining to the strategic decision behavior of top management. Thus, they do not relate directly to lead entrepreneurs, who are often required to make rapid ad hoc decisions without consulting other top management team members and while under more stressful conditions than new product development teams working in large, established organizations. Lead
entrepreneurs are the ultimate source of accountability for the success or failure of their firms. Most have invested a great deal of financial and emotional resources, and have multiple-stakeholders depending on them (e.g., their families, employees, investors, suppliers, and customers). When improvising strategic decisions, such individuals are truly performing without a safety net. Thus, the present research will provide new evidence concerning factors that influence the effectiveness of such behavior and should meaningfully contribute to our understanding of the new venture development process.

Second, in examining the effects of improvisational behavior, a perspective suggested both by SCT and by the emerging multi-level perspective in management research is adopted (Barden & Mitchell, 2007; Hitt et al., 2007). Specifically, the current research addresses the fact that the effects of individual-level variables occur primarily through interactions with key environmental factors. Failure to adopt such an approach has long been a criticism of prior research in the fields of organizational behavior (House, Shane, & Herold, 1996), strategic management (Henderson, Miller, & Hambrick, 2006), and entrepreneurship (Shaver and Scott, 1991). In response to such critiques, the current study employs social cognitive theory, which emphasizes the reciprocal relationships between dispositional, behavioral, and environmental variables, as the basis for deriving predictions concerning the mechanisms through which improvisational behavior influences the performance of key organizational decision-makers (in this case, lead founders of new ventures).

Third, following the spirit of Hambrick’s (2007) assertion that organizational researchers must balance theoretical with practical implications, this study also addresses an issue considered to be of great importance: How best to coach or train entrepreneurs so that they recognize both their proclivity to engage in improvisational behavior and optimistic nature, and are maximally able to convert these combined tendencies into personal strengths that help them to found, lead, and grow their new businesses. Such findings are likely to contribute to the literature on how entrepreneurs learn. As Chelariu, Johnston, and Young (2002) note, “Central to improvisation is learning, as improvisation requires continuous evaluation of activity and outcomes and modification as needed.” Further, Crossan and Sorrenti (1997) suggest that individuals can “learn and build expertise by improvising.” Thus, the current research is expected to shed light on why some entrepreneurs learn better than others—by examining contingencies that are likely to effect the extent to which entrepreneurs are able to rapidly process information and formulate novel strategic decisions that lead to increased firm performance.

THEORETICAL DEVELOPMENT AND HYPOTHESES

Entrepreneur Improvisational Behavior

Improvisational behavior is defined as the deliberate extemporaneous composition and execution of novel action (Moorman & Miner, 1998). An individual can engage in an improvisational episode at any given moment. The cause may be the presentation of a problem, an opportunity for which the actor has no acceptable pre-composed solution, or simply the desire to try something new and spontaneous (Vera & Crossan, 2005). Further, as Baker and colleagues (2003) suggest, improvisation can be utilized to see how current resources can be used to either meet pre-existing goals (i.e., causation) or to explore what outcomes are possible (i.e., effectuation). Thus, improvisation should not be confused with a lack of planning or characterized as a form of irrational behavior (Chelariu et al., 2002). On the contrary, Cunha and Cunha (2003: 170) clarify that, “Improvisation is an instance of teleological change in the sense that it is necessarily grounded on pre-conceived plans—implicit or explicit—that aim at a future state
which is different from the present.” These implicit or explicit plans are often referred to in the improvisation literature as the template (otherwise referred to as a referent or the head, see Bastien and Hostager, 1988; Hatch, 1999; Pressing, 1984) and represents the point from which deviation is realized (Kamoche, Cunha, and Cunha 2003). The template provides a “minimal structure” and reduces the cognitive load of the improviser by acting as a guiding framework from which to rapidly recombine elements into novel action. As Kamoche and Cunha (2001: 750) indicate, “…you cannot improvise on nothing.” For example, imagine that while pitching a business idea to a panel of potential investors, an entrepreneur realizes that she has not identified the most appropriate target market for her product. In the midst of the presentation, she shifts her description to a new target market that had not been previously considered by her, but one that—in this moment of insight—she realizes is far more suitable. This would represent an improvisational act. The previously identified target market is the template from which departure took place and the concept of a target market provided a minimal structure to guide reformulation of a novel solution.

Few empirical studies on entrepreneurs’ improvisational behavior have been published to date. These studies—along with research on related constructs—have, however, begun to build a meaningful knowledgebase on this topic. One of the first studies on the improvisational behavior of entrepreneurs was conducted by Baker and colleagues (2003), and demonstrated the centrality of improvisational behavior to the entrepreneurial process. These authors examined the nascent activities of 25 firms in the computer training and air pollution industries, 21 business-to-business software firms and 22 faculty startups through interviews with their founders and employees and the collection of public documents. Data concerning the background and goals of the participants and the history of the firms’ activity from inception up to the present were collected and analyzed. None of the firms in the study followed a formation process that was entirely volitional, strategically planned or linear. Instead, the authors describe the nascent stages of organizing as more typical of the following:

“Founders spent the short time between leaving jobs and starting firms fulfilling obligations to their employer, looking for office space, buying or borrowing equipment, telling people about the business and starting to recruit employees. In no case did a founder describe a primary focus on a plan or market analysis or even thinking through the new firm’s overall design or strategy. Founders just started moving toward creating their businesses, improvising their way to entrepreneurship.”

The results of Baker et al. (2003) provide clear evidence that improvisational action is commonplace within the entrepreneurial process and often an integral part of the strategic decision-making process. Their findings also demonstrate that improvisation can create both beneficial and harmful effects—highlighting that it should be used strategically and not haphazardly.

A study of 430 college students by Hmieleski and Corbett (2006) found the proclivity to engage in improvisational behavior to be a significant predictor of entrepreneurial intentions, above and beyond measures of personality, motivation, cognitive style, and social models. To this end, these researchers suggest that individuals might seek out careers in entrepreneurship, in part, as a pathway to leverage their improvisational tendencies. This evidence in conjunction with the findings of Baker et al. (2003) suggests that both the dispositional makeup of entrepreneurs and the demands of the new venture context might jointly explain the prevalence of improvisational behavior in the entrepreneurial process.
Baker and Nelson (2005) studied an activity closely related to improvisation, bricolage—making do by applying combinations of the resources at hand to new problems and opportunities. The primary difference between these two forms of action is that in bricolage composition can precede execution, whereas for improvisation composition and execution occur extemporaneously. These researchers conducted an intensive qualitative study of 28 small businesses and identified four patterns of bricolage. First, non-bricolage firms were described as those that participated in little bricolage and, in fact, often avoided bricolage. Second, parallel bricolage firms participated in early and continued use of bricolage on multiple, simultaneous projects. Third, selective bricolage firms temporarily used bricolage in some parts of the business in order to free resources for other parts, and more broadly during difficult or transition periods. Fourth, serial bricolage firms engaged in early and continued use of bricolage in a series of connected projects. The results of the study found parallel bricolage to be associated with little or no business growth, while selective and serial bricolage were found to support and, in some cases, drive growth. These findings further support the notion that improvisational-type behaviors can be leveraged as a strength when applied strategically and can become a weakness when wielded without caution.

A recent study by Hmieleski and Corbett (2008) of 159 new ventures examined the moderating effects of business founders’ entrepreneurial self-efficacy on the relationship of their improvisational behavior with the performance of their firms and with their individual work satisfaction. Their findings demonstrate that entrepreneurial self-efficacy positively enhances the relationship of entrepreneurs’ improvisational behavior with the performance of their firms, but negatively influence the relationship of entrepreneurs’ improvisational behavior with their work satisfaction. These results suggest that entrepreneurs high in entrepreneurial self-efficacy may be effective at leveraging improvisation to drive growth, but tend to overextend their cognitive and emotional capacities while so doing. The authors speculate that such growth may not be sustainable in the long run. These findings are consistent with those of Baker and Nelson (2005) suggesting that improvisational-type behaviors are likely to be most effective when applied conservatively—so as not to overextend the personal resources of the entrepreneur or those of his/her firm.

In the following section, the joint moderating effect of dispositional optimism and environmental dynamism on the relationship of entrepreneurs’ improvisational behavior with the performance of their firms is considered. As stated previously and congruent with extant literature (Vera & Crossan, 2005), no direct relationship of improvisational behavior with firm performance is anticipated.

The Joint Moderating Effects of Dispositional Optimism and Environmental Dynamism

Previous research indicates that entrepreneurs are generally high in optimism (Busenitz & Barney 1997; Cooper, Woo, & Dunkelberg 1988; Simon, Houghton, & Aquino 1999)—the tendency to expect positive outcomes even when such expectations are not rationally justified (Carver & Scheier, 2003). For example, a recent study by Hmieleski and Baron (2009) found entrepreneurs to range only from moderate to very high in dispositional optimism. De Meza and Southey (1996) account for the occurrence of this phenomenon of entrepreneurs tending to be higher than the general population in optimism by arguing that many individuals starting new businesses have little evidence upon which to base their beliefs about the likelihood of failure or success, and that this creates a situation ripe for attracting persons with unrealistic optimism into entrepreneurship. This line of reasoning is consistent with literature demonstrating that highly optimistic individuals are confident of achieving successful outcomes independent of being able to
visualize the path that will get them there—simply believing that everything will work out favorably in the end (Scheier, Carver, & Bridges, 2001).

This situation has serious implications for the judgment and decision making of entrepreneurs and hence their ability to effectively improvise. Specifically, highly optimistic individuals tend to hold unrealistic expectations, discount negative information, and mentally reconstruct experiences so as to avoid contradictions (Geers & Lassiter, 2002). In contrast, individuals who are moderate in optimism tend to possess a more balanced view and see the world less through rose-colored glasses (Spencer & Norem, 1996). Instead, they are more sensitive to negative information and less likely to gloss over discrepancies (Spirrison & Gordy, 1993), less easily persuaded by positive information (Geers, Handley, & McLarney, 2003), less likely to have an attentional bias in favor of positive stimuli (Segerstrom, 2001), and hold more realistic expectations when engaging in high risk situations than those higher in optimism (Gibson & Sanbonmatsu, 2004). For these reasons, research findings suggest, overall, that high levels of optimism often result in overconfidence and excessive risk taking. Considering the consistency of such findings in extant literature, it seems likely that highly optimistic entrepreneurs may be prone to make less than optimal strategic decisions, as compared to those who are moderately optimistic, and particularly when improvising—since individuals’ dispositional characteristics tend to most significantly influence behavior when forced to act quickly.

Also relevant to entrepreneurs, positive expectations often lead to goal conflict, in that optimists tend to see new opportunities everywhere they look (Segerstrom & Solberg Nes, 2006). This can generate significant problems for individuals who cannot easily decide which goals to pursue, and therefore tend to become seriously overextended as they seek to exploit more opportunities than is realistically feasible. This could potentially lead to what Baker and Nelson (2005) refer to as parallel bricolage—thus, in a similar vein, highly optimistic entrepreneurs may be forced to use improvisation haphazardly, to keep up with the wide range of unrelated opportunities that they have committed their firms to exploiting. In contrast, moderate optimists tend to be more realistic in their choice and pursuit of opportunities. This is important because entrepreneurs must be able to decide which goals they can realistically accomplish early in the development of their new ventures in order to maximize the potential for survival and long-term success (McMullen & Shepherd, 2006). These individuals are more likely to engage in what Baker and Nelson (2005) refer to as selective or serial bricolage. Similarly, moderate optimists would be seemingly more likely to use improvisation conservatively, as a strategic tool to capitalize on fast moving opportunities—but only when they are congruent with the firm’s mission.

These relationships are likely to become more exaggerated when coupled with high levels of environmental dynamism. Dynamic environments are characterized by unpredictable and rapid change, which increases uncertainty for individuals and firms operating within them (Dess & Beard, 1984). It has been suggested that environmental dynamism forms a fertile context in which entrepreneurial opportunities arise (Hayek, 1945; Kirzner, 1997; Shane & Venkataraman, 2000). Such environments, however, also present major challenges. Due to high levels of uncertainty and the large amount of financial capital (and associated risk) needed to compete (Aldrich, 2000), entrepreneurs leading their firms in dynamic environments often face unusually heavy information processing burdens (Chandler, Honig, & Wiklund, 2005). As a result, they may also tend to experience high levels of distress and anxiety (Markman, Baron, & Balkin, 2005). Optimism can help to reduce such effects (Luthans & Youssef, 2004), but can also lead to overconfidence or other cognitive errors (Hayward et al., 2006) and hence, can negatively affect judgment and decision-making (McKenzie, 1997), especially within dynamic environments (Klayman, Gonzalez-Vallejo, & Barlas, 1999). Therefore, it is suggested that highly optimistic entrepreneurs
will be particularly poor at improvising strategic decisions in dynamic, as opposed to stable, industry environments, because their attention will lack the focus needed to respond quickly and effectively to emerging opportunities. Further, their discounting of negative information could be particularly damaging if it prevents them recognizing and recombining key elements in their environment to develop and put into action novel strategic changes that are necessary to respond effectively to competitors. Further, due to their tendency to focus on self-confirming information, highly optimistic entrepreneurs might not be effective at recognizing “when” improvisation is most necessary. In support of this line of reasoning, optimism has been found to be negatively related to situational awareness, such that highly optimistic persons tend to be fairly ineffective at perceiving the elements within their environment, comprehending their meaning, and projecting their status into the near-term future (Eid, Matthews, Meland, & Johnsen, 2005). Considering the importance of rapidly identifying and integrating key information when improvising strategic decisions in fast-changing environments (Eisenhardt, 1989), highly optimistic entrepreneurs would appear to be at a particular disadvantage when extemporaneously composing and executing novel strategic decisions in dynamic, as opposed to stable, industry environments. On the basis of this reasoning and again, consistent with the social cognitive perspective, the following hypothesis is offered:

$H1$: In dynamic industry environments, the effects of CEO’s improvisational behavior on firm performance will be more positive for those who are moderate, rather than high, in dispositional optimism.

In stable environments, where decision options are more certain due to higher levels of transparency and predictability, overconfidence is less likely to occur (Klayman et al., 1999). In fact, in such a context, underconfidence is sometimes experienced (Soll, 1996). In such an environment, effective improvisational behavior is likely to require less deviation from prior plans. Thus, it is expected that entrepreneurs who regularly engage in improvisational behavior and are high in dispositional optimism will be relatively effective because the environment is more likely to be in alignment with their past experience (than in dynamic environments), thus reducing the need to recognize and recombine as wide a range of potential decision options in order to effective solution. As such, they should be able to draw on their optimism to move forward to recombine familiar elements in new ways so as to make quick decisions with less negative consequences, because there will be less uncertainty in making judgments concerning whether following a new course of action will be effective in stable, as compared to dynamic, environments. This reasoning suggests the following hypothesis:

$H2$: In stable industry environments, the effects of CEO’s improvisational behavior on firm performance will be more positive for those who are high, rather than moderate, in dispositional optimism.

**METHODOLOGY**

**Sample and Procedure**

A national random sample of 1,000 new ventures was drawn from Dun and Bradstreet for use in the current study. Dun and Bradstreet compiles what is considered to be the most exhaustive database of young firms founded in the United States (Kalleberg Marsden, Aldrich & Cassell, 1990). The vast majority of new ventures within the United States must file for a DUNS number with Dun and Bradstreet in order to create a business credit record, which is a primary way that companies evaluate whether to do business with each other (e.g., whether to sell, lend money,
partner, or lease equipment to a company). Dun and Bradstreet provided the names and address of the firms and their top management team leader (i.e., chief executive officer), who in each case was also a founder of the firm.

A packet containing the survey, along with a cover letter and pre-paid business reply envelope was sent to the participants—who were each founder and chief executive officer of their firms. In total, 185 of the mailings were returned as non-deliverable and 207 completed surveys were received. The number of non-deliverable survey mailings was not surprising considering that Dun and Bradstreet reports that 20 percent of the firms that they track change addresses each year. Six cases were removed due to incomplete performance data. This resulted in a total usable response rate of 24.8 percent, which is in alignment with those produced by other studies using similar samples of top management (e.g., Hmieleski & Ensley, 2007; Waldman, Ramirez, House, & Puranam, 2001). Non-response bias was examined using t tests on gender of top management team leader, firm age, revenue, number of employees, and firm growth. In each case the results were non-significant.

Demographic questions at the end of the administered survey confirmed that each respondent was a founder and the top management team leader of his/her firm. These participants included 163 males and 38 females, with an average age of 52 years. The highest educational degree earned by participants included high school (n = 37), associates (n = 18), bachelors (n = 80), masters (n = 47), and doctoral (n = 19). The mean age of the firms studied was 5.74 years, which is in alignment with literature arguing that startups tend to be in a critical developmental stage during their first six years of existence and may be considered new ventures during this period (Shrader, Oviatt, & McDougall, 2000). Further, this is a particularly relevant time period in the development of the firm within which to consider objective performance outcomes such as revenue and employment growth, whereas earlier on in the firm’s development such factors may be less relevant.

Finally, the sample is broad in scope, with participants’ current businesses being located in 40 different states and with primary operations in 114 different industries (as classified by 4-digit Standard Industrial Classification codes). Further, no more than 4 firms were from the same state and no more than 3 firms were from the same industry. Thus, the sample is not biased by industry or geographic location.

Measures

**Improvisational behavior.** 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 at their job. Participants rated the extent to which they agreed that each item was descriptive of their job-related behavior using a seven-point Likert-type scale ranging from (1) Strongly disagree to (7) Strongly agree. The following are some example items: “I improvise solutions to problems,” “I find new uses for existing methods or equipment,” and “I deviate from plans in order to take advantage of opportunities in the moment.” High scores indicate a proclivity to partake in improvisational behavior at work. This scale produced a Cronbach’s coefficient alpha of 0.86 in the current study, with a 95% confidence interval of 0.83 to 0.89.

**Optimism.** Optimism was measured using Scheier, Carver, and Bridges’ (1994) Life Orientation Test-Revised (LOT-R). The instrument is comprised of 6 items requiring respondents to indicate the extent of their agreement with each item. Example items include “In uncertain times, I usually expect the best” and “Overall, I expect more good things to happen to me than
A 7-point Likert-type scale anchored by (1) Strongly disagree and (7) Strongly agree was used. The responses were summed to form an overall score of optimism versus pessimism. Thus, high scores indicate a generalized feeling of optimism toward the future, whereas low scores indicate a more pessimistic outlook. To investigate the test–retest reliability of the LOT–R, Scheier and colleagues (1994) examined scores for four different groups of individuals who completed the scale at various time intervals. The test–retest intervals were 4 months, 12 months, 24 months, and 28 months. The test–retest correlations were 0.68, 0.60, 0.56, and 0.79, respectively. Therefore, as expected by a dispositional measure, the LOT–R appears to be fairly stable across time. Finally, the measure produced a Cronbach’s coefficient alpha of 0.80 in the current study, with a 95% confidence interval of 0.76 to 0.84.

Environmental dynamism. The industry level rate of unpredicted change was measured as the standard errors of four regression slopes following the work of Dess and Beard (1984), Keats and Hitt (1988), Sharfman and Dean (1991), and Castrogiovanni (2002). In each case the independent variable was time. The dependent variables were industry revenues, number of industry establishments, number of industry employees, and research and development intensity. Industry revenue has been used as a measure of uncertainty in prior studies (e.g., Keats & Hitt, 1988; Sharfman & Dean, 1991), and number of employees is a common measure of change for use in research involving new businesses. The number of establishments has been used by Aldrich (1979) as the basis for understanding industry size and the extent of industry change. Finally, industry wide research and development intensity is a variable that captures the speed of technological evolution of the industry (Dess & Beard, 1984; Castrogiovanni, 2002).

Data on industry revenues, industry establishment, and industry employment totals were acquired through the U.S. Bureau of the Census. Research and development intensity data were acquired from the U.S. Patent Office. Following Sharfman and Dean (1991), time was regressed against these variables for the most recent 10-year period. An index of the standard errors of the regression slopes divided by their respective means was used the indicator of unpredicted change for each of the four variables. These figures were then standardized and summed to create an overall index of environmental dynamism. To evaluate the extent to which the four variables loaded onto a single dimension, a single-factor confirmatory analysis was conducted using AMOS 6.0. The chi-square for the model was non-significant ($\chi^2 = 2.35, p = 0.13$) and results from absolute fit (GFI = 0.986; standardized RMR = 0.042) and relative fit (CFI = .979) indices each demonstrated good fit. The standardized factor loadings ranged from 0.68 to 0.86. Further supporting the reliability of the measure, the overall index produced a Cronbach’s coefficient alpha of 0.69, with a 95% confidence interval of 0.66 to 0.72.

Firm performance. Growth is often cited as the most important performance indicator of success for entrepreneurs (Brush & Vanderwerf, 1992). Consistent with this perspective, two different objective measures of growth were used: revenue growth and employment growth. Revenue and employment totals were obtained from 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. An overall index of firm performance was formed by standardizing and then summing revenue and employment growth. This allowed for a more parsimonious presentation of the results. Considering the high correlation between revenue and employment growth ($r = 0.71, p < 0.01$) in conjunction with the fact that similar results were observed when testing the hypotheses using these variable as separate performance indicators, this approach seemed warranted. Recent studies have confirmed the accuracy of Dun and Bradstreet firm performance data and have used similar methods to calculate firm growth (Baum et al., 2001, Baum & Locke, 2004).
Control variables. Firm level control variables included the age of the firm, and revenue and employment totals for the year in which the survey data were collected. Data for each of these variables were acquired from Dun and Bradstreet. In order to reduce the threat of multicollinearity, revenue and employment totals for the year in which the survey data were collected were standardized and summed to create a variable labeled “firm size.” Individual control variables included the sex (male = 0, female = 1), age (years old), and entrepreneurial experience (number of new ventures founded). These data were collected as demographic items at the end of the administered survey.

Statistical Procedures

Moderated hierarchical regression analysis was utilized as the main statistical procedure for examining the interaction of improvisational behavior x optimism x environmental dynamism on firm performance. Firm age, firm size, age of entrepreneur, sex of entrepreneur, and startup experience of entrepreneur were entered into step 1; improvisational behavior, optimism, and environmental dynamism were entered into step 2; the two-way interactions of improvisational behavior x optimism, improvisational behavior x environmental dynamism, and optimism x environmental dynamism were entered into step 3; and the three-way interaction of improvisational behavior x optimism x environmental dynamism was entered into step 4. In addition, the three-way interaction was graphed and the difference between the slopes was tested following procedures set forth by Dawson and Richter (2006).

RESULTS

Table 1 provides the means, standard deviations, and bi-variate correlations for all of the variables measured in the study. The results of the hierarchical moderated regression model for firm performance are displayed in Table 2. The three-way interaction of improvisational behavior x optimism x dynamism is illustrated in Figure 1. The results of slope difference tests for the 3-way interaction are shown in Table 3.

The results of the hierarchical regression analysis (see Table 2) indicate that the interaction between improvisational behavior, optimism, and environmental dynamism is significant for firm performance ($\beta = -0.15$, $p < 0.05$). The full model accounted for approximately 21 percent of the variance in firm performance. This suggests general support for the proposed model. The results will now be discussed in relation to the individual hypotheses.

Hypothesis 1 stated that in dynamic industry environments, the effects of improvisational behavior on firm performance will be more positive for entrepreneurs who are moderate, rather than high, in dispositional optimism. As shown by Figure 1, results offered support for this prediction. Slope 3 was found to be significantly more positive than slope 1 ($t = 2.04$, $p < 0.05$). 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 dispositional optimism than for those led by entrepreneurs who are high in dispositional optimism. Therefore, the results provide support for Hypothesis 1.

Hypothesis 2 stated that in stable industry environments, the effects of improvisational behavior on firm performance will be more positive for entrepreneurs who are high, rather than moderate, in dispositional optimism. As shown in Figure 1, results failed to offer support for this prediction. Although the direction of the slopes is in alignment with predictions, the difference between slope 4 and slope 2 was not significant ($t = 0.51$, $p = 0.61$). This suggests that within
stable environments the effects of improvisational behavior are not moderated by optimism. In fact, improvisational behavior appears to have no relationship with firm performance in stable environments. Therefore, the results fail to offer support for hypothesis 2.

Overall, the functions illustrated in Figure 1 indicate that the effects of improvisational behavior and optimism are greater in dynamic than in stable environments. This is consistent with literature suggesting that the behavior and characteristics of entrepreneurs are more strongly linked to the performance for those who are leading their firms in dynamic, rather than stable, industry environments (Hmieleski & Baron, 2008).

**DISCUSSION**

The results of the present study suggest that (1) in dynamic environments, improvisational behavior exerts positive effects on performance for firms led by moderately optimistic entrepreneurs, but shares no relationship with performance for firms led by entrepreneurs who are highly optimistic; (2) in stable environments, the effects of improvisational behavior on firm performance are less pronounced and not moderated by dispositional optimism—presumably because there is a decreased potential for overconfidence to operate, as compared to dynamic environments. Thus, consistent with the findings of past research (e.g., Hmieleski & Corbett, 2008) firm performance is indeed significantly influenced by entrepreneurs’ improvisational behavior, but the strength and form of such effects is moderated both by entrepreneurs’ level of optimism and industry conditions (stable versus dynamic environments). These results will now be considered in terms of recent discussions and findings concerning the potential effects of entrepreneurs’ improvisational behavior on the performance of their firms.

The Differential Effects of Entrepreneur Improvisational Behavior on Firm Performance

As consistently demonstrated in prior research (Baker et al., 2003; Crossan, Cunha, Vera, & Cunha, 2005; Crossan & Sorrenti, 1997; Vera & Crossan, 2004; 2005) and further supported by the results of the current study, improvisational behavior does not seem to have a significant direct relationship with performance. Following an approach grounded in social cognitive theory, however, an attempt was made to uncover important dispositional and environmental variables that might moderate the relationship between the improvisational behavior of entrepreneurs and the performances of the new ventures that they work to develop and grow. Optimism was examined as a dispositional variable for two reasons. First, it is arguably the one individual characteristic that most strongly differentiates entrepreneurs from other individuals (Hmieleski & Baron, 2009). This is to say that entrepreneurs tend to be considerably higher in optimism than the general population. Second, optimism has been consistently shown to have serious negative consequences on judgment and decision making—perhaps as much as any other dispositional variable. Thus, there are strong grounds to assume that optimism plays a meaningful role in determining the degree to which the improvisational behavior of entrepreneurs exerts positive versus negative effects on the performance of the firms they lead.

The potential moderating effects of environmental dynamism were examined for four primary reasons. First, dynamism has been argued to create a context in which entrepreneurial opportunities are most prevalent and/or easily created. Thus, dynamic environments should foster entrepreneurial action. Second, the speed at which change takes place within dynamic environments requires rapid and novel decision making by entrepreneurs who desire to exploit specific, yet fluid, opportunities. This creates a situation where improvisational behavior may be necessary in order to compete effectively. Third, dispositions tend to be most relevant when
uncertainty is high and individuals must make fast ad hoc decisions—such as is commonly the case within dynamic environments. Under stable conditions, appropriate actions tend to be apparent and dispositions tend to exert less influence on the decision making process. This suggests that the effects of entrepreneurs’ dispositional optimism on the effects of their improvisational behavior should be magnified in dynamic environments. Finally, dynamic environments characterize the conditions in which overconfident decision making is likely to be most common. This is because the unpredictable nature of dynamic environments makes it nearly impossible to form accurate probability estimates regarding the likelihood for achieving specific outcomes for any particular strategic behavior. Thus, dynamic environments are likely to produce a great deal of variability in terms of the outcomes of improvised strategic decisions (e.g., larger gains and losses).

The findings of the current study confirmed predictions that optimism and environmental dynamism do indeed exert joint moderating effects in the effectiveness of entrepreneurs’ improvisational behavior. The observed results suggest that improvisational behavior might lead to overconfidence within dynamic environmental conditions, especially when displayed by highly optimistic entrepreneurs. However, it also seems that entrepreneurs who are more moderate in their optimism, and more apt to recognize both the dangers and opportunities that exist within dynamic environments, are able to use improvisation as a mechanism for capitalizing on the rapid changes taking place within their industry in order to fuel growth for their new ventures. The results pose a perplexing issue—which might help to partly explain the high incidence of failure for new ventures, especially those which are launched in dynamic industries: High optimism and a tendency to engage in improvisational behavior are characteristics that are commonly seen in entrepreneurs who are likely to be drawn toward starting new ventures in dynamic, as opposed to stable, industries. This configuration of characteristics is also the combination that is most likely to lead to overconfidence and failure within dynamic industries. This highlights the need for entrepreneurs, especially those operating (or aspiring to operate) in dynamic industries, to be trained to appropriately self-regulate their behavior in alignment with their environment, such that they that learn to recognize when their personal strengths (e.g., optimism) can create blind spots and become personal weaknesses.

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SELECTED REFERENCES – FULL REFERENCES AVAILABLE FROM AUTHOR


Frontiers of Entrepreneurship Research 2009
### Table 1: Descriptive Statistics and Variable Correlations

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>SD</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
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<tbody>
<tr>
<td>Firm age</td>
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<tr>
<td>Firm size</td>
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<td>-0.08</td>
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<td></td>
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<td></td>
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<tr>
<td>Age (of entrepreneur)</td>
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<td>9.12</td>
<td>0.07</td>
<td>0.14*</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Sex (male = 0, female = 1)</td>
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<td>0.00</td>
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<td>-0.20**</td>
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<td>Entrepreneurial experience</td>
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<td>0.22**</td>
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<td>-0.08</td>
<td>0.11</td>
<td>0.20**</td>
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<td>Optimism</td>
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<td>0.16*</td>
<td>0.12</td>
<td>0.21**</td>
<td>0.35**</td>
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<td>0.05</td>
<td>-0.21**</td>
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n = 201; *p < 0.05; **p < 0.01

### Table 2: Hierarchical Regression Model of Firm Performance

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<tr>
<th>Variable</th>
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<td>Model 1</td>
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<td>( \beta )</td>
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<td>Firm size</td>
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<td><strong>Main effects</strong></td>
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<td>Improvisational behavior (I)</td>
<td>0.14</td>
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<tr>
<td>Optimism (O)</td>
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<tr>
<td>Dynamism (D)</td>
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<tr>
<td>I x O</td>
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<tr>
<td>I x D</td>
<td>0.07</td>
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<tr>
<td>O x D</td>
<td>-0.32**</td>
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<tr>
<td><strong>Three-way interaction</strong></td>
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<tr>
<td>I x O x D</td>
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<td><strong>F-Ratio</strong></td>
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<tr>
<td>Adjusted R^2</td>
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</table>

n = 201; *p < 0.05; **p < 0.01
Table 3: Slope Difference Tests

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<th>t-value for slope difference</th>
<th>p-value for slope difference</th>
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<tr>
<td>(1) and (2)</td>
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<td>0.48</td>
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<td>(1) and (3)</td>
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<td>(1) and (4)</td>
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<td>(2) and (3)</td>
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<td>(2) and (4)</td>
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<td>(3) and (4)</td>
<td>2.22</td>
<td>0.03</td>
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Figure 1: Interactive Effects of Improvisational Behavior, Dispositional Optimism, and Environmental Dynamism on Firm Performance