

The contrasting interaction effects of improvisational behavior with entrepreneurial self-efficacy on new venture performance and entrepreneur work satisfaction

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Received 1 June 2006; received in revised form 1 April 2007; accepted 1 April 2007

Abstract

Although improvisation is often considered to be an elemental component of entrepreneurship, little work has been done to evaluate factors that influence the relationship of entrepreneur improvisational behavior with important outcome variables. In an attempt to partly fill this gap, the current study examines the moderating effect of entrepreneurial self-efficacy on the relationship of founders' improvisational behavior with both the performance of their startups and their individual level of work satisfaction using a national (United States) random sample of 159 entrepreneurs. In alignment with our predictions, improvisational behavior was found to have a positive relationship with new venture performance (i.e., sales growth) when exhibited by founders who were high in entrepreneurial self-efficacy, whereas improvisational behavior was found to have a negative relationship with new venture performance when exhibited by founders who were low in entrepreneurial self-efficacy. Contrary to our expectations, entrepreneurial self-efficacy was found to have a negative moderating effect on the relationship between entrepreneur improvisational behavior and work satisfaction.

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Keywords: Decision making; Entrepreneurship; Improvisation; New venture performance

1. Executive summary

In a world defined by constant opportunity and change, deciding whether to “stay the course” or reach for a promising new prospect can mean the difference between success and failure. For entrepreneurs this situation is exacerbated. Virtually by definition, most entrepreneurs must be able to work efficiently with limited resources and under intense time pressure. Additionally, they are often faced with unique problems and opportunities for which they have no available heuristics or pre-composed plans to guide them. For these reasons, the ability of entrepreneurs to extemporaneously compose and execute novel plans is likely to have important implications for the performance of

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their new ventures. Although improvisation appears to be an important component of the entrepreneurial process, we know little about why some entrepreneurs are more effective improvisers than others. Similarly, it is not known what effects that improvisational behavior has on the work satisfaction of entrepreneurs. For example, we do not know if improvisational behavior tends to energize versus exhaust entrepreneurs, and which factors may enhance or reduce such effects. To this end, the current study examined the linkage of entrepreneur improvisational behavior with both performance and satisfaction.

Across a wide variety of domains, there appears to be a consensus that improvisation is not inherently good or bad; instead the effectiveness of improvisational behavior appears to be dependent on multiple factors. Perhaps most importantly, improvisation requires domain-specific confidence in one's abilities. It is not enough to be highly skilled within a domain — improvisers must be confident in their ability to effectively apply their knowledge (i.e., be high in domain-specific self-efficacy). This is because improvisation can be very risky and highly stressful, especially for those who lack confidence in their abilities. New venture founders who lack confidence in their entrepreneurial abilities are likely to experience cognitive overload during improvisational episodes and have a more difficult time recognizing unique ways in which resources may be recombined. For these reasons, entrepreneurial self-efficacy was expected to have a positive moderating effect on the relationship of entrepreneur improvisational behavior with new venture performance.

Work satisfaction is another important outcome of improvisational behavior, and one that has been underrepresented in entrepreneurship research. Entrepreneurs who are not satisfied with their work are less likely to persist in their efforts over time, experience greater health concerns, and treat their employees more poorly. Although work on improvisation within organizations has been relatively silent with respect to work satisfaction, we point again to the fact that improvisation can be a highly stressful endeavor, especially when acting under the pressure filled situations that often characterize the new venture development process. In this context, we suggest that improvisation may act as a role stressor for entrepreneurs. Congruent with the literature on workplace role stressors, entrepreneurial self-efficacy should help to reduce the degree of psychological strain experienced by improvising entrepreneurs. Based on this logic, we anticipated that perceived confidence in one's ability to perform the roles and tasks of entrepreneurship would positively moderate the linkage between the improvisational behavior of founders and the level of their work satisfaction.

We tested our hypotheses using a national random sample of 159 entrepreneurs who were both founders and top management team leaders of their firms. The results of the study supported our prediction that entrepreneurial self-efficacy positively enhances the effects of improvisational behavior on performance. Those entrepreneurs who were avid improvisers and high in entrepreneurial self-efficacy were found to be the highest performers. The results in terms of work satisfaction were, however, found to be contrary to our expectations. Entrepreneurial self-efficacy had a significant negative moderating effect on the relationship between improvisational behavior and work satisfaction. Rather than reducing the psychological strain of improvisational behavior, it seems that entrepreneurs high in entrepreneurial self-efficacy may have been burning themselves out by over-engaging in their work and improvising to a greater extent than what may have been good for their well-being. Despite being the highest performers in our study, those entrepreneurs who rated highly in both improvisational behavior and entrepreneurial self-efficacy were among the least satisfied with their work — suggesting that new venture performance and entrepreneur work satisfaction might not necessarily go hand-in-hand.

2. Introduction

Recently it has been suggested by several authors that the entrepreneurial process might be best viewed as an improvisational activity (Baker et al., 2003; Baker and Nelson, 2005; Hmieleski and Corbett, 2006; Miner et al., 2001; Weick, 2002). Perhaps the most appealing aspect of this perspective is that improvisation blends together both planned and emergent behavior (Cunha et al., 2003; Weick, 1998). It is clear that new ventures almost always begin with a goal or vision of some form, implying an initial rational outlook (Baum et al., 1998; Shane and Venkataraman, 2000). In this regard, new venture creation — much like improvisation — is a deliberate and intentional process (Bird, 1992; Krueger et al., 2000). Inevitably, however, environmental conditions, resource constraints and cognitive limitations almost always prevent entrepreneurs from executing their plans as initially intended (Baker et al., 2003; Baron, 1998). 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 (Hmieleski and Ensley, 2004). Therefore, the ability to extemporaneously create and execute new plans on the fly would seem to be an important ability for entrepreneurs to possess. Research by Baker et al. (2003) drives home this point by demonstrating

that new venture founders are often forced to make decisions extemporaneously, using only the resources available to them in the moment. This does not imply that improvisational behavior will always result 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 et al., 2005; Crossan and Sorrenti, 1997; Vera and Crosson, 2005). Instead, the effects of entrepreneur improvisational behavior are likely to be moderated by context specific factors. The current study makes the case for entrepreneurial self-efficacy as a particularly important moderating variable. In so doing, we examine the moderating effects of entrepreneurial self-efficacy on the relationship of entrepreneurs' improvisational behavior with both the performance of their new ventures and the perceived level of their work satisfaction. These are important outcomes because the pace of change in today's markets (Drucker, 1992; Foster and Kaplan, 2001) and the pressure placed upon decision-makers to move quickly (Baron, 1998) are likely to affect both firm performance and entrepreneurs' satisfaction with their work (Brigham and DeCastro, 2003).

Our review of the literature suggests that this is the first study to link improvisational behavior to measures of firm performance and work satisfaction. Over the past decade a burgeoning literature has evolved that connects improvisation to organizational processes. This research has extended our understanding of the role of improvisation within organizations by examining it with respect to innovation (Akgun et al., 2002; Eisenhardt and Tabrizi, 1995; Miner et al., 2001; Moorman and Miner, 1998b; Vera and Crosson, 2005), learning (Miner et al., 2001; Vera and Crosson, 2005), and organizational change (Brown and Eisenhardt, 1997; Cunha and Cunha, 2003; Orlikowski, 1996). To date, however, the literature has been relatively silent with respect to improvisation by top executives. This presents a critical gap in the literature, because these are the individuals who are likely to have the greatest impact on the performance of their firms (Hambrick and Mason, 1984). Further, although the relationship between improvisational behavior and satisfaction has been speculated about (Barrett, 1998; Hatch, 1999; Kamoche et al., 2003), there is a dearth of empirical research on this relationship. This is an important point considering that individuals start new businesses primarily for intrinsic reasons, as opposed to extrinsic rewards (Cooper and Artz, 1995). Therefore, work satisfaction may be an even more important indicator of success for individual entrepreneurs than financial performance. After all, money is only a means through which one may potentially use in the pursuit of finding satisfaction. Lack of money is sure to reduce satisfaction if one's basic needs cannot be met, but excess amounts of money will not guarantee happiness (Diener and Seligman, 2004). Not surprisingly, the results of the current study fail to uncover a significant relationship between the financial performance of new ventures and the work satisfaction of their founders.

In the following section, we review relevant literature on improvisational behavior. Afterward, the case is made in further detail for why entrepreneurial self-efficacy is likely to moderate the effects of improvisational behavior with both performance and satisfaction. Finally, the methodology and results of the study are reviewed, and the findings are discussed.

3. Improvisational behavior

We adopt the Moorman and Miner (1998a) definition of improvisational behavior as the deliberate extemporaneous composition and execution of novel action. 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. Further, as Baker et al. (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).

Although work on improvisation is just beginning to emerge in entrepreneurship (e.g., Baker et al., 2003; Baker and Nelson, 2005; Hmieleski and Corbett, 2006), there have been several noteworthy investigations of improvisation within the context of larger, established organizations. Several studies have focused on the linkage between improvisation and new product development. Eisenhardt and Tabrizi's (1995) study contrasting rational versus improvisational processes of new product development suggests that a real-time, hands-on approach to product development tends to be more effective than rational, efficiency-oriented approaches. Moorman and Miner (1998b) found that environmental turbulence, organizational memory, and real-time information flow are related to the effectiveness of improvisation. Miner, Bassoff, and Moorman (2001) indicates that improvisation can be accepted and incorporated into formal organizational activities, such that firms may be able to plan for improvisation. Akgun, Lynn, and Reily (2002) study of new product development teams found that improvisation can have a positive impact on speed to market, especially under turbulent market and technology conditions.

Other studies of improvisation have considered its relationship with change management, leadership, and innovation and learning. Brown and Eisenhardt (1997) examined continuous change processes within large technology-oriented firms and found that those organizations most successful at change tend to have a greater capacity for improvisation. Similarly, Orlikowski (1996) and Cunha and Cunha (2003) found improvisation to be an effective tool for achieving organizational change. A study by Cunha, Kamoche, and Cunha (2003) revealed three major antecedents of improvisational leadership: (1) the environmental turbulence felt by the group, (2) the importance of the event to the leader, and (3) the ease of use of resources. Garud and Karnoe (2003) found improvisational-type strategies to be superior to strictly planned strategies that focused on developing breakthrough technologies. Research by Vera and Crosson (2005) identified organizational culture and real-time information as positive moderators of the linkage between improvisation and innovation. In addition, these scholars found no main effect of improvisation on innovation, suggesting that improvisation is not inherently good or bad. Finally, these authors found that training programs can be developed to enhance the effectiveness of improvisation.

In regard to entrepreneurship, there are several important points that can be drawn from these studies. First, improvisation seems to be an effective behavioral strategy for dealing with change, particularly in dynamic conditions — such as those in which new ventures operating in high-growth industries commonly face. In fact, a recent study by Hmieleski and Ensley (2004) demonstrates that startups led by entrepreneurs with a proclivity toward improvisational behavior tend to outperform their less improvisational counterparts — especially within highly dynamic industrial environments. Second, it appears that improvisational activities can be incorporated into specific work processes, as well as an organization's culture. Thus, entrepreneurs might consider actively managing the degree to which their firms improvise, while taking into account the demands of their environment. Third, improvisation is not necessarily good and its effectiveness is moderated by several factors. To this end, there may be some moderating factors unique to the entrepreneurial context that might be worth searching for. Finally, it seems that individuals can be trained to become more effective improvisers. Therefore, research focusing on the improvisational behavior of entrepreneurs might help to inform the development of entrepreneurship curriculums and, as a result, potentially help to increase the survival and growth of new ventures.

Considering the centrality of improvisation within the entrepreneurial process, we suggest that further and more in-depth empirical investigations of entrepreneur improvisational behavior may lead to a greater understanding of the central research question of entrepreneurship, namely, how are opportunities for future goods and services are discovered, evaluated and exploited (Shane and Venkataraman, 2000; Venkataraman, 1997). The current study is an attempt to move in this direction. In the following section we consider the moderating effect of entrepreneurial self-efficacy on the relationship of entrepreneur improvisational behavior with performance and satisfaction. As stated previously and congruent with extant literature (Vera and Crosson, 2005), we do not anticipate a direct relationship of improvisational behavior with either of these outcome variables.

4. The moderating effects of entrepreneurial self-efficacy

Self-efficacy relates to the general belief in one's ability to produce high levels of performance in tasks undertaken in life (Bandura, 1977). Self-efficacy has been found to influence cognition and behavior. It is considered a state-like characteristic that generally increases with experience and is highly related to actual ability (Phillips and Gully, 1997). People with high levels of self-efficacy tend to set challenging goals; persist toward the achievement of their goals, even under difficult and stressful circumstances; recover quickly from failure, even in the face of conditions that would appear to be overwhelming to the average person; be more satisfied with their jobs; and experience greater levels of life satisfaction (Bandura, 1997). In organizational research, separate meta-analyses by both Stajkovic and Luthans (1998) and Judge and Bono (2001) have demonstrated a robust positive relationship between employee self-efficacy and performance. Similarly, several studies have shown a significant positive relationship between self-efficacy and work satisfaction (Dormann et al., 2006; Judge and Bono, 2001).

In regard to entrepreneurship research, Markman, Balkin, and Baron (2002) found that patent holders who are actively involved in the formation of new businesses tend to have higher levels of general self-efficacy than patent holders that decide not to start new businesses. Similar findings were observed in a later study by Markman, Baron, and Balkin (2005). These findings suggest that self-efficacy might be an important mechanism for overcoming perceptions of risk that are often associated with new venture creation.

Other entrepreneurship studies have examined a context-specific measure of self-efficacy, called “entrepreneurial self-efficacy.” This research focuses on the belief of individuals in their ability to perform entrepreneurship-related tasks. For example, [Chen et al. \(1998\)](#) created a measure of entrepreneurial self-efficacy comprised of dimensions related to marketing, innovation, management, risk-taking, and financial control. Using this measure, [Chen et al. \(1998\)](#) found entrepreneurial self-efficacy to significantly differentiate entrepreneurs from non-entrepreneurs. [De Noble, Jung and Ehrlich \(1999\)](#) built upon the work of [Chen et al. \(1998\)](#) to create a measure that was even more focused toward the entrepreneurship context. The dimensions for their measure include developing new product and market opportunities, building an innovative environment, initiating investor relationships, defining core purpose, coping with unexpected challenges, and developing critical human resources. Similar to the results of [Markman et al. \(2002\)](#), who used a measure of general self-efficacy, [De Noble et al. \(1999\)](#) found scores from their measure of entrepreneurial self-efficacy to be positively related to persons’ intentions to start a new venture.

[Forbes \(2005\)](#) developed a measure of entrepreneurial self-efficacy based on one’s confidence in his/her ability to perform activities related to financial, marketing, management, and risk-taking aspects of entrepreneurship. The results of his study found a positive relationship between entrepreneurial self-efficacy and subjective measures of new venture performance. Perhaps more interestingly, [Forbes \(2005\)](#) found entrepreneurs to develop higher levels of entrepreneurial self-efficacy when involved in startups in which decision making was comprehensive, included multiple inputs of external decision advisors, and made use of current information. Therefore, it seems that the more exposure to factors traditionally related to decision making quality, the greater the individual’s confidence in his/her ability to perform the roles and tasks of entrepreneurship.

[Baum, Locke, and Smith \(2001\)](#) and [Baum and Locke \(2004\)](#) have used measures of entrepreneurial self-efficacy, relating to entrepreneurs’ confidence in their ability to achieve high-growth, rather than their confidence in performing specific entrepreneurship-related tasks. Both studies identified a positive relationship between entrepreneurial self-efficacy and new venture growth. These findings suggest that entrepreneurs who are confident in their ability to achieve high-growth are likely to set challenging growth expectations for their firms and persist in their leadership efforts toward the accomplishment of those goals.

We suggest here that entrepreneurial self-efficacy should have a positive effect on the effectiveness of entrepreneur improvisational behavior. If faced with the likelihood of failure, entrepreneurs without sufficient belief in their abilities are likely to give up mid-way through improvisational episodes rather than persisting through the process until reaching a successful result. As such, the “persistent” aspect of self-efficacy would appear to be a critical component of effective entrepreneur improvisational behavior. This is to say that improvisers must be able to persevere after an error has been made, since most improvisational episodes are likely to contain several missteps ([Barrett, 1998](#)). The key is to be able to continue forward until a successful outcome has been achieved. In this vein, [Crossan et al. \(2005, p. 134\)](#) suggest that having faith in one’s ability to “make do” is critical to effective improvisation. This is in alignment with [Kanter’s \(2002, p. 79\)](#) argument that improvisation requires confidence in one’s ability to perform under distress. Therefore, we offer the following hypothesis:

Hypothesis 1. Entrepreneurial self-efficacy will have a positive moderating effect on the linkage between entrepreneur improvisational behavior and performance.

In addition, we suspect that entrepreneurial self-efficacy also moderates important affective outcomes of entrepreneur improvisational behavior — such as work satisfaction. Although little has been mentioned about the relationship between improvisational behavior and work satisfaction, several authors have pointed out that improvisation can be an inherently stressful activity to undertake within organizations ([Cunha et al., 2003](#); [Eisenhardt and Tabrizi, 1995](#); [Moorman and Miner, 1998a](#); [Vera and Crosson, 2005](#)). Further, we would expect the psychological strain of improvisational behavior to be even greater for entrepreneurs, since failure for them is likely to have exceptionally profound consequences — affecting their personal well-being, as well as that of their families, employees, and outside investors. Therefore, improvisational behavior may be a role stressor for some entrepreneurs, potentially decreasing their level of work satisfaction. This view would be in opposition to findings from jazz and theater that have found improvisational performers to experience a “personal feeling of transience” ([Kamoche et al., 2003, p. 2030](#)) or a sense of “being in the groove” ([Barrett, 1998, p. 614](#)). Due to the intense pressures involved in establishing and growing new ventures, we would expect even successful entrepreneur improvisational behavior to be

met more often with feelings of relief, as apposed to the positive affect that may be experienced by those improvising in aesthetic endeavors that carry with them lower levels of risk and more closely resemble hobbies than jobs.

Following this view, we look to relevant research from the organizational behavior literature that has found self-efficacy to reduce the negative effects of role stressors on work satisfaction (Lent and Brown, 2006). This work suggests that confidence in one's abilities can partly mitigate psychological strain caused by role stressors (Brown et al., 2005; Jex and Bliese, 1999). For example, efficacious entrepreneurs are likely to be less distressed when spontaneously developing and executing plans for exploiting rapidly shifting business opportunities, as compared to their less efficacious counterparts. This is because higher levels of self-efficacy tend to be associated with a belief in one's ability to overcome losses (Bandura, 1997). Therefore, self-efficacious entrepreneurs should be less fearful of the potential losses that they might incur through improvisation. In addition, prior research would suggest that self-efficacious entrepreneurs are more likely to attribute failed improvisational attempts to external sources, whereas those who are comparatively lower in self-efficacy are more apt to internalize failure as being due to their own ineptitude (Silver et al., 1995), thereby potentially heightening their frustration with their job. For these reasons, we expect entrepreneurial self-efficacy to reduce the potential negative effects of improvisational behavior on the work satisfaction of entrepreneurs. To this end, we offer our second and final hypothesis:

Hypothesis 2. Entrepreneurial self-efficacy will have a positive moderating effect on the linkage between entrepreneur improvisational behavior and work satisfaction.

To summarize, we anticipate that entrepreneurial self-efficacy will be a positive moderator of the relationships of improvisational behavior with new venture performance and improvisational behavior with work satisfaction. In the next section, we review the methodology used to examine our hypotheses.

5. Methodology

5.1. Sample and procedure

A random sample of 1000 new ventures was drawn from Dun and Bradstreet's Selectory Database of 14 million U.S. firms for use in the current study. Dun and Bradstreet compiles what is considered to be one of the most exhaustive database of young firms founded in the United States (Kalleberg et al., 1990). Thus, a random sample of firms drawn from their database — although perhaps not a completely random sample — is arguably as close of a random sample of startups as can be feasibly drawn. Dun and Bradstreet provided the names and address of the firms and their top management team leaders. A packet containing our survey, along with a cover letter and pre-paid business reply envelope was sent to the top management team leader of each firm. An initial and one follow-up mailing were sent. The first mailing resulted in 115 responses and the follow-up mailing provided 44 additional completed surveys. The follow-up mailing was sent approximately 8 weeks after the initial mailing. In total, 178 of the mailings were returned as non-deliverable. This resulted in a total response rate of 19.3%. Although this might not be considered a high response rate, it is in alignment with those produced by other studies using similar samples of top management (e.g., Neck et al., 2004). Non-response bias was examined using *t* test on firm age, revenues, number of employees, and firm growth. In each case, the results were non-significant.

The participants, who were each founders and top management team leaders of their firms, included 133 males and 26 females, with an averaged age of 52 years ($SD=9.74$). The highest educational degree earned by participants included high school ($n=31$), associates ($n=12$), bachelors ($n=67$), masters ($n=34$), and doctoral ($n=15$). Seventy-four of the participants had previous entrepreneurial experience as business founders of other firms. Finally, the location of participants' firms ranged across 40 different states, with primary operations in 105 different industries (as classified by 4-digit Standard Industrial Classification codes).

5.2. Measures

5.2.1. 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 .86 in the current study.

5.2.2. Entrepreneurial self-efficacy

This construct was measured using an instrument designed by De Noble, Jung, and Ehrlich (1999). The measure comprises 23 items requiring participants to rate their perceived ability to perform well on various behaviors that have been established within the literature as being robust predictors of entrepreneurial performance (Chandler and Jansen, 1992). Example items include “I can develop and maintain favorable relationships with potential investors” and “I can recruit and train key employees.” Respondents rated their level of agreement with each item using a seven-point Likert-type scale ranging from (1) Strongly disagree to (7) Strongly agree. These scores were summed to form an overall measure of entrepreneurial self-efficacy. This measure produced a Cronbach’s coefficient alpha of .92.

5.2.3. New venture performance

Following previous work examining new ventures (Ensley et al., 2006), sales growth was used as our primary performance variable. Multi-year sales trend data could be considered a measure of sustainable growth, which has been suggested as the most important outcome of new ventures (Ireland et al., 2003). This is a particularly suitable measure for use with the current sample, since the age of the firms averages about 7 years. The performance data were acquired from Dun and Bradstreet, which were reported as average annual sales growth rate over the most recent three-year period. Further, recent studies have confirmed the accuracy of sales growth figures reported by Dun and Bradstreet (Baum et al., 2001; Baum and Locke, 2004).

5.2.4. Work satisfaction

Work satisfaction was measured using the “work itself satisfaction” scale of Spector’s (1985) Job Satisfaction Survey. This scale is comprised of 4 items relating to the extent that the individual enjoys performing his/her job. Example items include “I like doing the things I do at work” and “My job is enjoyable.” Respondents rated their level of agreement with each item using a seven-point Likert-type scale ranging from (1) Strongly disagree to (7) Strongly agree. These scores were summed to form an overall measure of satisfaction with one’s work. This measure produced a Cronbach’s coefficient alpha of .85.

5.2.5. Control variables

Following previous research on new venture performance, firm age, industry, and revenue were used as control variables for examining the hypothesis related to new venture performance (Keats and Hitt, 1988; Schaefer et al., 1990). Firm age was measured as the number of years since the firm had been established. Revenue was measured as the total revenue generated by the firm for the current year. Considering the large number of repeat entrepreneurs in the sample, we also controlled for the number of startups founded by participants. Firm age, new venture performance, and number of ventures founded were used as control variables for examining the hypothesis related to work satisfaction.

5.2.6. Confirmatory factor analysis

To examine the within and between statistical structure of the measurement scales used, we conducted a three-factor confirmatory analysis in AMOS 6.0 using the indicators for improvisational behavior, entrepreneurial self-efficacy, and work satisfaction. The chi-square for the model was non-significant ($\chi^2=342.58$, $DF=348$, $p=.57$) and results from absolute fit ($GFI=.91$), parsimony fit ($RMSEA=.00$), and relative fit ($CFI=.99$) indices each demonstrated good fit. In addition, there were no single modification indices over 3.84. The factor loading ranged from .43 to .69 for improvisational behavior, .43 to .75 for entrepreneurial self-efficacy, and .57 to .77 for work satisfaction. Overall these findings suggest that the within and between statistical structure for each of the constructs is sound.

Table 1
Descriptive statistics and variable intercorrelations

Variable	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7
1. Firm age	7.81	2.36							
2. Total revenue (Log)	6.20	.81	-.06						
3. # of ventures founded	.99	1.33	-.04						
4. Improvisation	5.65	.77	-.06	-.23**	.21**				
5. Entrepreneurial self-efficacy	5.68	.68	-.10	.01	.25**	.49**			
6. Improvisation × entrepreneurial self-efficacy	.49	1.13	.02	-.16*	-.14	-.08	-.14		
7. New venture performance	3.02	.40	-.23**	.20*	.10	.07	.16*	.02	
8. Work satisfaction	6.25	.94	-.13	-.13	.23**	.34**	.48**	-.29**	.06

N=159; **p*<.05; ***p*<.01.

5.3. Statistical procedures

Moderated hierarchical regression analysis was utilized as the main statistical procedure for examining the interaction effects of improvisational behavior × entrepreneurial self-efficacy on new venture performance and work satisfaction. In addition, all interactions were graphed using procedures described by Cohen, Cohen, West and Aiken (2003). Each graph was plotted at 1 standard deviate above and below the mean for entrepreneurial self-efficacy.

6. Results

Means, standard deviations, and bi-variate correlations for all measured items are shown in Table 1. The results for the hierarchical regression model for new venture performance and work satisfaction are shown in Tables 2 and 3, respectively. The interactions of improvisational behavior × entrepreneurial self-efficacy on new venture performance and on work satisfaction are illustrated in Figs. 1 and 2, respectively.

Multiple analyses were conducted to investigate the threat of multicollinearity and for potential outliers. In terms of examining the threat of multicollinearity, the highest correlation between any pair of independent variables was .49 (see Table 1), no variance inflation scores were greater than 1.47, and all conditional index scores were less than 23.49. These tests show multicollinearity not to be a concern, as each of these results falls well within acceptable ranges (Fox, 1997; Neter et al., 1996; Tabachnick and Fidell, 2001). Potential outliers were assessed using leverage values (Neter et al., 1996) and DfBetas (Tabachnick and Fidell, 2001). These analyses found no leverage scores higher than .46 and no standardized DfBetas greater than an absolute value of .86. The evidence from the leverage scores and DfBetas are well within accepted ranges and suggest that there are no outliers.

Table 2
Hierarchical regression model of new venture performance

Variable	New venture performance		
	Model 1	Model 2	Model 3
	<i>β</i>	<i>β</i>	<i>β</i>
Firm age	-.11	-.09	-.08
Total revenue (Log)	.25**	.26**	.29**
# of ventures founded	.10	.04	.06
Improvisation		.07	.08
Entrepreneurial self-efficacy		.19*	.24**
Improvisation × entrepreneurial self-efficacy			.21**
<i>F</i> -change		3.88*	6.40**
ΔR^2		.04	.04
<i>F</i> -ratio	3.64**	3.82**	4.31**
<i>R</i> ²	.09	.13	.17
Adjusted <i>R</i> ²	.07	.10	.14

N=159; **p*<.05; ***p*<.01; Note: Standardized beta coefficients are shown.

Table 3
Hierarchical regression model of work satisfaction

Variable	Work satisfaction		
	Model 1	Model 2	Model 3
Firm age	-.09	-.05	-.05
Total revenue (Log)	-.07	-.05	-.10
New venture performance	.03	-.05	-.03
# of ventures founded	.22**	.08	.05
Improvisation		.13	.11
Entrepreneurial self-efficacy		.48**	.47**
Improvisation × entrepreneurial self-efficacy			-.23**
<i>F</i> -change		32.33**	11.65**
ΔR^2		.28	.05
<i>F</i> -ratio	2.59*	13.20**	13.77**
<i>R</i> ²	.06	.34	.39
Adjusted <i>R</i> ²	.05	.32	.37

N = 159; * $p < .05$; ** $p < .01$; Note: Standardized beta coefficients are shown.

Before moving forward, there are a few non-hypothesized relationships worth noting. First, as anticipated, no direct relationship between improvisational behavior and new venture performance was identified. The correlation between improvisational behavior and new venture performance was non-significant ($R = .07$, $p > .10$) and the beta-coefficient for improvisational behavior on new venture performance was non-significant ($\beta = .07$, $p > .10$). Second, somewhat surprisingly, a positive correlation was found between improvisational behavior and work satisfaction ($R = .34$, $p < .01$). However, when controlling for entrepreneurial self-efficacy (as shown in Model 2 of Table 2), the relationship between improvisational behavior and work satisfaction became non-significant ($\beta = .13$, $p > .10$). Finally, entrepreneurial self-efficacy was found to have a significant positive relationship with both new venture performance ($R = .16$, $p < .05$; $\beta = .18$, $p < .05$) and work satisfaction ($R = .34$, $p < .01$; $\beta = .48$, $p < .01$). The results of the study will now be discussed in terms of the specific hypotheses.

Hypothesis 1 stated that entrepreneurial self-efficacy will have a positive moderating effect on the linkage between entrepreneur improvisational behavior and performance. The results of the hierarchical regression analysis (see Table 2) indicate that the interaction of improvisational behavior × entrepreneurial self-efficacy on new venture performance is indeed positive and significant ($\beta = .21$, $p < .01$). As illustrated in Fig. 1, startups led by founders who were high in entrepreneurial self-efficacy tended to grow at a greater rate when their founders exhibited high levels of improvisational behavior, whereas startups led by founders who were low in entrepreneurial self-efficacy tended to grow at a comparatively lower rate when their founders exhibited high levels of improvisational behavior. Therefore, Hypothesis 1 is supported.

Hypothesis 2 stated that entrepreneurial self-efficacy will have a positive moderating effect on the linkage between entrepreneur improvisational behavior and work satisfaction. The results of the hierarchical regression analysis (see Table 3) indicate that the interaction of improvisational behavior × entrepreneurial self-efficacy on work satisfaction is negative and significant ($\beta = -.23$, $p < .01$). As illustrated in Fig. 2, founders who were high in entrepreneurial self-efficacy experienced decreased levels of work satisfaction when exhibiting high levels of improvisational

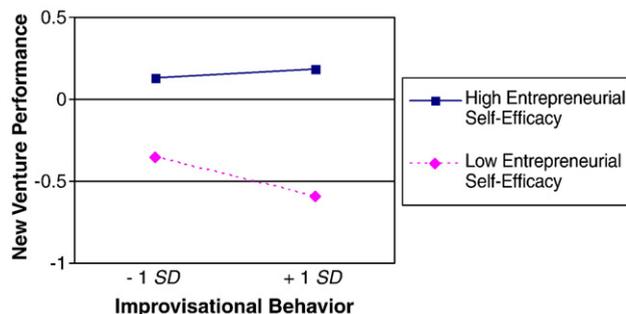


Fig. 1. Interaction graph of improvisational behavior and entrepreneurial self-efficacy on new venture performance.

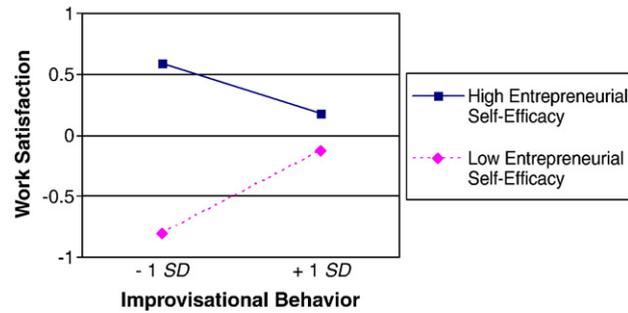


Fig. 2. Interaction graph of improvisational behavior and entrepreneurial self-efficacy on work satisfaction.

behavior, whereas founders who were low in entrepreneurial self-efficacy experienced increased levels of work satisfaction when exhibiting high levels of improvisational behavior. Thus, Hypothesis 2 is not supported. Instead, evidence for the opposite relationships was found.

Overall, the findings support our general thesis that the interaction between improvisational behavior and entrepreneurial self-efficacy has important effects on both performance and satisfaction. The implications of these results will now be discussed.

7. Discussion

The results of the study suggest that (1) there is no direct relationship between entrepreneur improvisational behavior and new venture performance, (2) there is no direct relationship between entrepreneur improvisational behavior and work satisfaction, (3) entrepreneurial self-efficacy positively moderates the relationship between entrepreneur improvisational behavior and new venture performance, and (4) entrepreneurial self-efficacy negatively moderates the relationship between entrepreneur improvisational behavior and work satisfaction. Our discussion reviews the implications of these findings.

7.1. New venture performance

Consistent with the extant literature, we found no direct relationship between improvisational behavior and performance. Therefore our results uphold the notion that improvisation is not inherently good or bad for organizations (Crossan et al., 2005; Crossan and Sorrenti, 1997; Vera and Crosson, 2005). We did, however, find entrepreneur improvisational behavior to be positively related to new venture performance within startups led by entrepreneurs who were high in entrepreneurial self-efficacy, as compared to startups led by entrepreneurs who were comparatively lower in entrepreneurial self-efficacy. Thus, domain-specific self-efficacy appears to be an important moderator of the linkage between improvisational behavior and performance. This represents a novel contribution to the literature on improvisation in organizations. Previous research has linked improvisational behavior to specific organizational processes (e.g., Akgun et al., 2002; Brown and Eisenhardt, 1997; Cunha and Cunha, 2003; Eisenhardt and Tabrizi, 1995; Miner et al., 2001; Moorman and Miner, 1998b; Orlikowski, 1996; Vera and Crosson, 2005), but not to measures of firm performance.

Further, our results support the notion that improvisation is not for the faint of heart (Kanter, 2002). It seems that entrepreneurs who are low in self-efficacy and frequently improvise might be shooting themselves in the foot. Improvisation for such individuals is more of a “craps shoot,” because they do not have the confidence to actively seek out how resources might be recombined. Moreover, their lack of confidence in their abilities is likely to stifle their attempts to improvise. It does, however, appear that many entrepreneurs in our sample may have recognized these facts, as those low in entrepreneurial self-efficacy did not rate themselves as partaking in improvisational behavior in their work as much as those higher in entrepreneurial self-efficacy ($R = .49, p < .01$).

Finally, our results found entrepreneurial self-efficacy to share a significant and positive relationship with new venture performance. This finding suggests that there is similar credence in the common notion that, like improvisation, entrepreneurship — in general — is also not for those lacking in confidence (Chen et al., 1998). Thus, nascent entrepreneurs might want to consider developing confidence in their entrepreneurial abilities before attempting to

develop a high-growth new venture. Some good starting points for developing one's entrepreneurial self-efficacy might include starting a small business in a stable industry or working for a high-growth new venture.

7.2. *Work satisfaction*

Contrary to our initial expectations, we found entrepreneurial self-efficacy to have a negative moderating effect on the relationship between improvisational behavior and entrepreneurs' level of satisfaction with their work. Even though the entrepreneurs in our study who exhibited high levels of entrepreneurial self-efficacy rated themselves as being higher in work satisfaction whether high or low in improvisational behavior than those comparatively lower in entrepreneurial self-efficacy, their level of satisfaction decreased as their level of improvisational behavior increased. Further, the firms led by these individuals (i.e., entrepreneurs who were high in both entrepreneurial self-efficacy and improvisational behavior) were by far the fastest growing startups in our sample. This last fact may help to explain this finding. The rapid pace at which these firms were growing may have been causing distress for the entrepreneurs leading them. As their firms grow, their improvisational behavior becomes inherently more risky because they now have firm assets to protect (Thaler, 1991). Therefore, in the entrepreneurship context it may be possible for entrepreneurs to over-engage in their work. The financial reward that such efforts might bring apparently does not necessarily carry a promise of work satisfaction for entrepreneurs. This assumption is congruent with the research of Cooper and Artz (1995), which found that entrepreneurs who focus on non-economic goals tend to display higher levels of satisfaction than entrepreneurs who focus on economic goals.

A similar explanation for these findings might be found in the recent research of Baker and Nelson (2005), who found entrepreneurs engaging in extremely high levels of improvisational-type behavior often have a tendency to take on too many unrelated tasks. Even though this led to growth for many of the firms they studied, it also led to chaos and undermined the long-term sustainability of the firms. In contrast, others who employed improvisational-type behavior across only related projects that built upon each other were more successful at achieving sustainable growth. Further, the amount of chaos and distress that these entrepreneurs experienced appeared to be considerably lower. Similarly, we wonder if the entrepreneurs in our study who were high in both entrepreneurial self-efficacy and improvisational behavior were simply taking on more than they could handle. As Hatch (1999, p.84) notes, "excessive improvisation can lead to stress and psychological burnout." This very well could have been the case for these entrepreneurs and is congruent with our assumption that improvisation may sometimes act as a role stressor within the entrepreneurship context. What is interesting here is that rather than reducing the negative effects of role stressors (Jex and Bliese, 1999), it seems that very high levels of self-efficacy may increase psychological distress by driving entrepreneurs to take on greater and greater challenges — that eventually become overwhelming. This is in alignment with research by Krueger and Dickson (1994), which found the level of individuals' confidence in their abilities to be positively related to increased levels of risk-taking in a study of entrepreneurial opportunity recognition.

In contrast, entrepreneurs low in entrepreneurial self-efficacy reported themselves as having higher work satisfaction when comparatively higher in improvisational behavior than those exhibiting lower levels of improvisational behavior. Since the entrepreneurs in our study who were lower in entrepreneurial self-efficacy led firms that were growing at a much slower rate than those higher in entrepreneurial self-efficacy, there likely was not as much risk associated with their improvisational activities. Even though the improvisational behavior of these individuals was found to be negatively related to the growth of their firms, the engagement that improvisation provided may have been driving them up the learning curve. Effective improvisation requires confidence in one's abilities, but improvisation also helps to develop abilities — as a form of learning (Barrett, 1998; Garud and Karnoe, 2003; Kamoche et al., 2003; Miner et al., 2001; Vera and Crosson, 2005; Weick, 1998). Considering the established linkage between workplace learning and work satisfaction (Rowden, 2002; Rowden and Conine, 2005), improvisation may have driven learning for these individuals and subsequently had a positive effect on their work satisfaction. There was likely a greater opportunity for these individuals to learn more than the entrepreneurs who were comparative higher in entrepreneurial self-efficacy, because they had more to learn. This is, of course, a speculative assumption, since we did not measure learning in the current study.

7.3. *A note about repeat entrepreneurs*

Due to the fact that our sample contained a large number of repeat entrepreneurs, we took the opportunity to examine how experience founding multiple startups related to entrepreneurial self-efficacy and improvisational behavior. First,

we found repeat entrepreneurs (i.e., those who had founded multiple business in their career) to be significantly higher in entrepreneurial self-efficacy than novice entrepreneurs (i.e., those who were first-time entrepreneurs) ($t=3.16, p<.01$). This finding is congruent with the general literature on self-efficacy, demonstrating that individuals' confidence in their abilities tends to increase over time and with experience (Bandura, 1997).

Secondly, repeat entrepreneurs were found to rate higher in levels of improvisational behavior than were novice entrepreneurs ($t=3.10, p<.01$). This finding would run counter to the notion that entrepreneurs improvise simply out of necessity and lack of resources. Despite the fact that repeat entrepreneurs are likely to have greater levels of financial, social, and human capital than novice entrepreneurs, they appear to exhibit higher levels of improvisational behavior. There are several reasons why this relationship may exist. One reason may be that repeat entrepreneurs simply become more comfortable with improvising over time, thus increasing their likelihood of engaging in such behavior. Another explanation would be that repeat entrepreneurs may share a different set of personality characteristics than those who wish only to create and grow a single business. This explanation would be congruent with research by Hmieleski and Corbett (2006), demonstrating that individuals high in entrepreneurial intentions tend to have a proclivity toward improvisational behavior.

7.4. Limitations and future directions

There are some noteworthy limitations of the study, which also pose opportunity for future research. First, the correlational design of our study does not allow us to assume causation. Longitudinal designs could be used in future research to further establish the linkages of improvisational behavior and entrepreneurial self-efficacy with the performance and work satisfaction of entrepreneurs. In terms of performance, different outcomes may need to be considered depending on the stage of the venture in the organizational life cycle.

Secondly, the age of the firms in the current study were not as "young" as some other studies of new ventures. The focus of the current study was on entrepreneurs, which we defined as being the founders and the current top management team leaders of their firms. New venture performance was treated as a reflection of the performance of the "lead entrepreneurs" who we studied. The use of sales growth may be a less appropriate measure of performance when considering the performance of entrepreneurs leading their firms through more nascent stages of development, but consistent with extant literature (Baum et al., 2001; Ensley et al., 2006), it seemed to be a relevant indicator of performance for our sample.

Thirdly, we chose to study the lead founder based on research suggesting that an individual usually emerges as the leader within new venture top management teams — and that this person tends to have an inordinate impact on the decision making of the firm (Ensley et al., 2000). By following this path in the current study, we do not mean to discount the value of the founding team. Future studies might extend our research by considering the interaction of improvisational behavior at the team level (Vera and Crosson, 2005) with the collective efficacy of the team (Watson et al., 2001) on the performance and satisfaction of the team.

In addition, we would like to point out that — although we have alluded to the importance of persistence to the improvisational process — we did not directly measure this construct. Instead we drew from previous research linking persistence as an outcome of self-efficacy (Bandura, 1997). Therefore, there seems to be an opportunity for future research to examine persistence or related constructs such as personal initiative (Frese et al., 1997) as a potential pathway through which the effects of entrepreneurial self-efficacy might be exhibited.

Further, our findings suggest that there may be some inherent limitations involved in drawing parallel connections from improvisation within jazz and theater to that of improvisation within entrepreneurship. For example, contrary to predictions that would be derived from studies of efficacious jazz and theater performers, who are often described as finding themselves "in flow" or "in the groove" while improvising, we found improvisational behavior to have a significantly negative relationship with work satisfaction for those entrepreneurs who were high in entrepreneurial self-efficacy. Jazz musicians and theater performers rarely have as much on the line in the decisions that they make as do entrepreneurs, who could potentially lose their entire life's savings over a bad business decision. These increased stakes of "entrepreneurial performers" may therefore carry a different set of requirements for effective improvisation. Other moderating variables worth investigating may include psychological hardiness (Rush et al., 1995) and tolerance for ambiguity (Teoh and Foo, 1997), which have each been demonstrated to reduce the negative effects of role stressors.

Finally, we would like to highlight the potential for improvisation to be incorporated into entrepreneurship education programs. Our experience has been that the majority of entrepreneurship courses tend to be comprised of topics based primarily on strategic planning and linear decision making (e.g., business plan writing, opportunity

assessment, market analysis, competitive positioning, product life-cycle planning). Such content is an important and necessary component of any entrepreneurship curriculum. Educators should, however, be careful to make the distinction that most entrepreneurs, due to the various constraints mentioned throughout the current paper, are often unable to apply the strategies that are taught in business school classrooms. In so doing, the utility of these tools need not be downplayed. Rather, the importance in understanding the value of strategic planning should be underscored, since those who firmly comprehend the principals of strategic planning will be better able to identify when improvised courses of action are most appropriate. To emphasize the important role of improvisation in entrepreneurship, we suggest that students be placed in scenarios that test their ability to function under time pressure and with limited resources such that they are forced to make tradeoffs and extemporaneously formulate and enact strategy. Feedback from such experiences should help to build students' improvisational skills and self-confidence, and provide a realistic preview of the entrepreneurial experience.

7.5. Conclusions

The entrepreneurial environment is complex and often uncertain. As a result, no entrepreneur is able to successfully plan for every scenario that he or she will face. Similarly, no entrepreneur is able to survive by always making things up on the fly. Effective entrepreneurial behavior tends to comprise of a blending between planned and spontaneous action — a problem space that is characteristic of improvisational behavior. In order to be successful within this context, confidence in one's entrepreneurial-related skills is essential. Entrepreneurs must be confident in their ability to recognize critical resources and how they might be recombined to solve problems and exploit opportunities. They must have similar confidence in their ability to improvise in their interactions with employees, customers, and suppliers — not necessarily as a need to use improvisation as a strategic tool, but rather because they will often be required to do so out of necessity if they are attempting to lead their venture toward high-growth.

Finally, we hope that our findings will stimulate other scholars to conduct further research on the linkage between improvisation and satisfaction, especial in turbulent environments such as those of high-growth new ventures. Our findings suggest that entrepreneurs who are highly confident in their abilities ought to be careful in deciding which activities that they choose to improvise. Even though these individuals are often highly skilled at improvisation, this competency might lead them to overextend themselves and cause potential burnout. In our personal experience, we have witnessed several such cases of confident entrepreneurs whose firms have excelled; all the while their individual emotional states have rapidly deteriorated. This is a cautionary tale that should be known by all nascent and experienced entrepreneurs.

References

- Akgun, A.E., Lynn, G.S., Reily, R., 2002. Multi-dimensionality of learning in new product development teams. *European Journal of Innovation Management* 5 (2), 57–72.
- Baker, T., Nelson, R.E., 2005. Creating something from nothing: resource construction through entrepreneurial bricolage. *Administrative Science Quarterly* 50 (3), 329–366.
- Baker, T., Miner, A., Eesley, D., 2003. Improvising firms: bricolage, account giving, and improvisational competency in the founding process. *Research Policy* 32, 255–276.
- Bandura, A., 1977. Self-efficacy: toward a unifying theory of behavioral change. *Psychological Review* 84 (2), 191–215.
- Bandura, A., 1997. *Self-Efficacy: The Exercise of Control*. W. H. Freeman, New York.
- Baron, R.A., 1998. Cognitive mechanisms in entrepreneurship: why and when entrepreneurs think differently than other people. *Journal of Business Venturing* 13, 275–294.
- Barrett, F.J., 1998. Creativity and improvisation in jazz and organizations: implications for organizational learning. *Organization Science* 9 (5), 605–622.
- Baum, J.R., Locke, E.A., 2004. The relationship of entrepreneurial traits, skill, and motivation to subsequent venture growth. *Journal of Applied Psychology* 89 (4), 587–598.
- Baum, J.R., Locke, E.A., Kirkpatrick, S.A., 1998. A longitudinal study of the relation of vision and vision communication to venture growth in entrepreneurial firms. *Journal of Applied Psychology* 83 (1), 43–54.
- Baum, J.R., Locke, E.A., Smith, K.G., 2001. A multidimensional model of venture growth. *Academy of Management Journal* 44 (2), 292–303.
- Bird, B.J., 1992. The operation of intentions in time: the emergence of the new venture. *Entrepreneurship Theory and Practice* 17, 11–20.
- Brigham, K.H., DeCastro, J.O., 2003. Entrepreneurial fit: the role of cognitive misfit. In: Katz, J.A., Shepherd, D.A. (Eds.), *Cognitive Approaches to Entrepreneurship Research*. JAI Press/Elsevier, Amsterdam.
- Brown, S.L., Eisenhardt, K.M., 1997. The art of continuous change: linking complexity theory and time-paced evolution in relentlessly shifting organizations. *Administrative Science Quarterly* 42 (1), 1–34.

- Brown, S.P., Jones, E., Leigh, T.W., 2005. The attenuating effect of role overload in relationships linking self-efficacy and goal level to work performance. *Journal of Applied Psychology* 90 (5), 972–979.
- Chandler, G., Jansen, E., 1992. The founder's self-assessed competence and venture performance. *Journal of Business Venturing* 7 (3), 295–316.
- Chen, C.C., Greene, P.G., Crick, A., 1998. Does entrepreneurial self-efficacy distinguish entrepreneurs from managers? *Journal of Business Venturing* 13, 295–316.
- Cohen, J., Cohen, P., West, S.G., Aiken, L.S., 2003. *Applied multiple regression/correlation analysis for the behavior sciences*. Lawrence Erlbaum Associates, Mahwah, NJ.
- Cooper, A.C., Artz, K.W., 1995. Determinants of satisfaction for entrepreneurs. *Journal of Business Venturing* 10, 439–457.
- Crossan, M.M., Sorrenti, M., 1997. Making sense of improvisation. *Advances in Strategic Management* 14, 155–180.
- Crossan, M., Cunha, M.P., Vera, D., Da Cunha, J., 2005. Time and organizational improvisation. *Academy of Management Review* 30 (1), 129–145.
- Cunha, M.P., Cunha, J.V., 2003. Organizational improvisation and change: two syntheses and a filled gap. *Journal of Organizational Change* 16 (2), 169–185.
- Cunha, M.P., Kamoche, K., Cunha, R.C., 2003. Organizational improvisation and leadership. *International Studies of Management & Organization* 33 (1), 34–57.
- De Noble, A.F., Jung, D., Ehrlich, S.B., 1999. Entrepreneurial self-efficacy: the development of a measure and its relationship to entrepreneurial action. In: Reynolds, P., et al. (Eds.), *Frontiers of Entrepreneurship Research*. Babson College, Babson Park, MA.
- Diener, E., Seligman, M.E.P., 2004. Beyond money: toward an economy of well-being. *Psychological Science in the Public Interest* 5 (1), 1–31.
- Dormann, C., Fay, D., Zapf, D., Frese, M., 2006. A state-trait analysis of job satisfaction: on the effect of core self-evaluations. *Applied Psychology: An International Review* 55, 27–51.
- Drucker, P.F., 1992. *The age of discontinuity*. Harper & Row, New York.
- Eisenhardt, K.M., Tabrizi, B.N., 1995. Accelerating adaptive processes: product innovation in the global computer industry. *Administrative Science Quarterly* 40 (1), 84–110.
- Ensley, M.D., Carland, J.W., Carland, J.C., 2000. Investigating the existence of the lead entrepreneur. *Journal of Small Business Management* 38 (4), 59–77.
- Ensley, M.D., Pearce, C.L., Hmieleski, K.M., 2006. The moderating effect of environmental dynamism on the relationship on entrepreneur leadership behavior and new venture performance. *Journal of Business Venturing* 21 (2), 243–263.
- Forbes, D.P., 2005. The effects of strategic decision making on entrepreneurial self-efficacy. *Entrepreneurship Theory and Practice* 29 (5), 599–626.
- Foster, R.N., Kaplan, S., 2001. *Creative Destruction: Why Companies that are Built to Last Underperform the Market — And How to Successfully Transform Them*. Random House, New York.
- Fox, J., 1997. *Applied Regression, Linear Models, and Related Methods*. Sage, Thousand Oaks, CA.
- Frese, M., Fay, D., Hilburger, T., Leng, K., Tag, A., 1997. The concept of personal initiative: operationalization, reliability and validity in two German samples. *Journal of Occupational and Organizational Psychology* 70, 139–161.
- Garud, R., Karnoe, P., 2003. Bricolage versus breakthrough: distributed and embedded agency in technology entrepreneurship. *Research Policy* 32 (2), 277–300.
- Hambrick, D.C., Mason, P.A., 1984. Upper echelons: the organization as a reflection of its top managers. *Academy of Management Review* 9, 193–206.
- Hatch, M.J., 1999. Exploring the empty spaces of organizing: how improvisational jazz helps redescribe organizational structure. *Organization Studies* 20 (1), 75–100.
- Hmieleski, K.M., Ensley, M.D., 2004. An investigation of improvisation as a strategy for exploiting dynamic opportunities. In: Bygrave, W.D., et al. (Eds.), *Frontiers of Entrepreneurship Research*. Babson College, Babson Park, MA, pp. 596–606.
- Hmieleski, K.M., Corbett, A.C., 2006. Proclivity for improvisation as a predictor of entrepreneurial intentions. *Journal of Small Business Management* 41 (1), 45–63.
- Ireland, R.D., Hitt, M.A., Sirmon, D.G., 2003. A model of strategic entrepreneurship: the construct and its dimensions. *Journal of Management* 29 (6), 963–989.
- Jex, S.M., Bliese, P.D., 1999. Efficacy beliefs as a moderator of the impact of work-related stressors: a multilevel study. *Journal of Applied Psychology* 84 (3), 349–361.
- Judge, T.A., Bono, J.E., 2001. Relationship of core self-evaluations traits-self-esteem, generalized self-efficacy, locus of control, and emotional stability-with job satisfaction and job performance: a meta-analysis. *Journal of Applied Psychology* 86 (1), 80–92.
- Kalleberg, A.L., Marsden, P.V., Aldrich, H.E., Cassell, J.W., 1990. Comparing organizational sampling frames. *Administrative Science Quarterly* 35 (4), 658–688.
- Kamoche, K., Cunha, M.P., Cunha, J.V., 2003. Towards a theory of organizational improvisation: looking beyond the jazz metaphor. *Journal of Management Studies* 40 (8), 2023–2051.
- Kanter, R.M., 2002. Strategy as improvisational theater. *Sloan Management Review* 43, 76–81.
- Keats, B.W., Hitt, M.A., 1988. A causal model of linkages among environmental dimensions, macro organizational characteristics, and performance. *Academy of Management Journal* 31, 570–598.
- Krueger, N., Dickson, P., 1994. How believing in ourselves increases risk taking: perceived self-efficacy and opportunity recognition. *Decision Sciences* 25 (3), 385–400.
- Krueger, N.F., Reilly, M.D., Carsrud, A.L., 2000. Competing models of entrepreneurial intentions. *Journal of Business Venturing* 15, 411–432.
- Lent, R.W., Brown, S.D., 2006. Integrating person and situation perspectives on work satisfaction: a social-cognitive view. *Journal of Vocational Behavior* 69 (2), 236–247.
- Markman, G., Balkin, D., Baron, R., 2002. Inventors and new venture formation: the effects of general self-efficacy and regretful thinking. *Entrepreneurship Theory and Practice* 27 (2), 149–166.

- Markman, G.D., Baron, R.A., Balkin, D.B., 2005. Are perseverance and self-efficacy costless? Assessing entrepreneurs' regretful thinking. *Journal of Organizational Behavior* 26, 1–19.
- Miner, A.S., Bassoff, P., Moorman, C., 2001. Organizational improvisation and learning: a field study. *Administrative Science Quarterly* 46, 304–337.
- Moorman, C., Miner, A.S., 1998a. The convergence of planning and execution: improvisation in new product development. *Journal of Marketing* 61, 1–20.
- Moorman, C., Miner, A.S., 1998b. Organizational improvisation and organizational memory. *Academy of Management Review* 23 (4), 698–723.
- Neck, H.M., Meyer, G.D., Cohen, B., Corbett, A.C., 2004. An entrepreneurial system view of new venture creation. *Journal of Small Business Management* 42 (2), 190–208.
- Neter, J., Kutner, M.H., Nachtsheim, C.J., Wasserman, W., 1996. *Applied Linear Statistical Models*. Irwin, Chicago.
- Orlikowski, W.J., 1996. Improvising organizational transformation over time: a situated change perspective. *Information Systems Research* 7 (1), 63–92.
- Phillips, J.M., Gully, S.M., 1997. Role of goal orientation, ability, need for achievement, and locus of control in the self-efficacy and goal-setting process. *Journal of Applied Psychology* 82 (5), 792–802.
- Rowden, R.W., 2002. The relationship between workplace learning and job satisfaction in U.S. small to midsize businesses. *Human Resource Development Quarterly* 13 (4), 407–425.
- Rowden, R.W., Conine, C.T., 2005. The impact of workplace learning on job satisfaction in small US commercial banks. *Journal of Workplace Learning* 17 (4), 215–230.
- Rush, M.C., Schoel, W.A., Barnard, S.M., 1995. Psychological resiliency in the public sector: 'hardiness' and pressure for change. *Journal of Vocational Behavior* 46 (1), 17–39.
- Schaefer, A.D., Kenny, J.T., Bost, J.E., 1990. Performance measures and strategy: a review, critique, and extension. *Advances in Marketing* 152–157.
- Shane, S., Venkataraman, S., 2000. The promise of entrepreneurship as a field of research. *Academy of Management Review* 25 (1), 217–226.
- Silver, W.S., Mitchell, T.R., Gist, M.E., 1995. Responses to successful and unsuccessful performance: the moderating effect of self-efficacy on the relationship between performance and attributions. *Organizational Behavior and Human Decision Processes* 62 (3), 286–299.
- Spector, P.E., 1985. Measurement of human service staff satisfaction: development of the Job Satisfaction Survey. *American Journal of Community Psychology* 1 (6), 693–713.
- Stajkovic, A., Luthans, F., 1998. Self-efficacy and work-related performance: a meta-analysis. *Psychological Bulletin* 124 (2), 240–261.
- Teoh, H.Y., Foo, S.L., 1997. Moderating effects of tolerance for ambiguity and risk-taking propensity on the role conflict-perceived performance relationship: evidence from Singaporean entrepreneurs. *Journal of Business Venturing* 12 (1), 67–81.
- Tabachnick, B.G., Fidell, L.S., 2001. *Using Multivariate Statistics*. Allyn and Bacon, Boston.
- Thaler, R.H., 1991. *Quasi Rational Economics*. Russell Sage Foundation, New York.
- Venkataraman, S., 1997. The distinctive domain of entrepreneurship research. In: Katz, J.A. (Ed.), *Advances in Entrepreneurship, Firm Emergence, and Growth*, 3. JAI Press, Greenwich, CT, pp. 119–138.
- Vera, D., Crosson, M., 2005. Improvisation and innovative performance in teams. *Organization Science* 16 (3), 203–224.
- Watson, C.B., Chemers, M.M., Preiser, N., 2001. Collective efficacy: a multilevel analysis. *Personality and Social Psychology Bulletin* 27 (8), 1057–1068.
- Weick, K.E., 1998. Improvisation as a mindset for organizational analysis. *Organization Science* 9 (5), 543–555.
- Weick, K.E., 2002. The aesthetic of imperfection in orchestras and organizations. In: Kamoche, K.N., Cunha, M.P., Cunha, J.V. (Eds.), *Organizational Improvisation*. Routledge, New York, pp. 166–184.