

Proclivity for Improvisation as a Predictor of Entrepreneurial Intentions

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This study examines the relationship between improvisation and entrepreneurial intentions. Of specific interest is whether or not a proclivity for improvisation explains any variance in entrepreneurial intentions beyond what is accounted for by other relevant individual difference measures. Using a sample of 430 college students, entrepreneurial intentions are found to be significantly associated with measures of personality, motivation, cognitive style, social models, and improvisation. The strongest relationship is found between entrepreneurial intentions and improvisation. The results of hierarchical regression show that improvisation accounts for a significant amount of variance in entrepreneurial intention above and beyond what is accounted for by the other variables.

Introduction

There is a growing view in the literature that entrepreneurship research should be centered around the process through which individuals identify and exploit opportunities to create future goods and services (Venkataraman 1997). This process has been primarily described as a strategically planned sequence of opportunity identification followed by evaluation and execution (Shane and Venkataraman 2000). This rational model is an appropriate starting point for investigating entrepreneurial action, but fails to fully elucidate how

entrepreneurs behave within the highly uncertain, novel, and turbulent environments in which they often operate (Baron 1998).

This gap has been filled to some degree by research that has considered how entrepreneurs use cognitive biases and heuristics (Busenitz and Barney 1997). According to this body of work, when information for rational decision-making is unavailable and time pressure is high, entrepreneurs use familiar mental shortcuts to make decisions. In conjunction with the strategic planning view, these complementary perspectives

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suggest that entrepreneurs develop and enact plans when adequate resources are available and follow pre-scripted routines when rational planning is not possible. We suggest that both of these views are correct within certain boundary conditions—such as when resources are available for planning or when a heuristic is available for making a quick decision. But through what process do entrepreneurs act when there is no time for planning and no available heuristic to follow?

A recent study by Baker, Miner, and Eesley (2003) points out that these conditions, in which neither strategic planning nor heuristics and biases are feasible, are markedly common throughout the entrepreneurial process. The authors examined the nascent activities of 68 firms through interviews with their founders and employees, and the collection of public documents. Contrary to the utility maximization model of entrepreneurial action (Shane and Venkataraman 2000), none of the firms in the study behaved in a manner that was primarily strategically planned. Further, many of the firms lacked the background to have formed heuristics to fall back upon during the uncertain conditions through which they navigated. Instead, the authors described the behavior of these firms as being characteristic of improvisation. This is to say that the norm for these new ventures was to extemporaneously compose and execute novel solutions to the problems and opportunities that they encountered.

Baker, Miner, and Eesley (2003) demonstrate that improvisation is often an elemental factor in the founding of new firms and that it is also useful in the exploitation of opportunity. The authors note, however, that their study was exploratory, inductive, and designed to focus only on generating hypotheses about improvisation and firm founding. Baker and his colleagues call for further

research to test the role of improvisation in entrepreneurship. The current study heeds this call by first developing a conceptual framework for improvisation and then testing hypotheses regarding the role of improvisation within the process of entrepreneurship.

Improvisation and Entrepreneurship

Improvisation can extend current entrepreneurship theory by providing a framework for explaining how entrepreneurs deviate from both strategic plans and cognitive biases and heuristics in order to exploit opportunities in the moment, as they arise. We suggest that entrepreneurial action occurs in at least four different ways, depending on the novelty of the situation and the resource constraints of the individual or firm (see Figure 1). For example, when information and time are abundant, strategic planning is likely to occur. On occasions when time and information are both limited, but the entrepreneur has moderate familiarity with the problem or opportunity, then cognitive heuristics and biases are likely to be available and employed. When resources are abundant, but the novelty of the situation is very high, the entrepreneur can afford to take a trial-and-error approach—and likely will need to in order to gather further information. Finally, when resource constraints are prohibitive and the entrepreneur finds himself/herself faced with a novel problem or opportunity, then improvisation appears to be the most reasonable course of action. In this instance, the entrepreneur has only one opportunity to “get it right.” Constraints on time and resources do not allow for planning or trial-and-error, and the extreme novelty makes the use of heuristics and biases untenable. Under these conditions, however, existing strategic plans and/or cognitive biases and heuristics can serve as useful referents to be deviated from (or impro-

Figure 1
Entrepreneurial Action under Varying Degrees of Novelty
and Resource Constraints

		Resource Constraints	
		Low	High
Novelty	High	Trial-and-Error	Improvisation
	Low	Strategic Planning	Heuristics and Biases

vised on) during an improvisational episode.

The improvisation process occurs in the following manner. First, an individual is presented with a problem (which in the context of entrepreneurship, might be viewed as an opportunity). Next, the individual compares the problem to others that he/she has previously faced and selects a referent based on past experience. A referent is a plan or strategy for reacting to the environment (Hmieleski and Corbett 2003). It can be as formal as a published standard operating procedure or as informal as a cognitive bias or heuristic (Busenitz and Barney 1997). After identifying the referent, the decision-maker considers its feasibility given the constraints that characterize the problem (for example, the available resources). If the referent is feasible and appears to have a high probability of success, then it should be followed. Otherwise, the actor should improvise by either extending or reconfiguring the referent to construct a novel course of action. This entire process occurs extemporaneously, such that the individual is assessing probabilities and

formulating strategy while acting out the solution. The extemporaneous nature of the improvisation process suggests that cognitive heuristics and biases are likely to be the most commonly employed referents.

The use of cognitive heuristics and biases during the improvisation process raises the often asked question of whether entrepreneurs tend to prefer heuristic rather than systematic thinking (Baron and Ward 2004). Certainly, empirical findings demonstrating a positive relationship between individuals' proclivity for improvisation and entrepreneurial intentions would suggest that entrepreneurs might indeed lean toward heuristic thinking more so than others. An analogous discussion is offered by Levi-Strauss (1966, pp. 16–17) in his comparison of bricoleurs and craftsmen. He describes bricoleurs as individuals who use "devious means" (that is, novel processes) to recombine resources that are available at hand to accomplish their work. In contrast, he illustrates how craftsmen restrict themselves to a subset of resources or tools that are used to accomplish their tasks, with little devia-

tion. In this vein, entrepreneurs might be considered bricoleurs—relying heavily on improvisation, versus corporate managers, for example—who, like craftsmen, rely more heavily on traditional tools and/or strategies.

Aside from the Baker, Miner, and Eesley (2003) article, there appears to be little published research directly investigating the role of improvisation in entrepreneurship. A similar gap in the mainstream management literature seems to exist in regard to individual level work on improvisation. There have, however, been noteworthy investigations of improvisation at the group and organizational levels. Eisenhardt and Tabrizi (1995) conducted a study contrasting rational versus improvisational processes of new product development. Their findings suggest that a real-time, hands-on approach to product development tends to be more effective than rational, efficiency-oriented approaches—especially for uncertain products and when speed is of the essence. 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. These organizations provide enough flexibility for their workers to leverage their improvisation competencies, but are not so unstructured as to allow their operations to become unmanageable. Moorman and Miner (1998) found that environmental turbulence tends to have a positive influence on the incidence of improvisation, organizational memory tends to have a negative influence on the incidence of improvisation, and that environmental turbulence, real-time information flow and organizational memory tend to have a positive effect on the effectiveness of improvisation. Additional research conducted by Miner, Bassoff, and Moorman (2001) indicates that improvisation can be accepted and incorporated into

formal organizational activities, such that organizations may be able to plan for improvisation by creating opportunities for improvisation and supporting the improvisation process.

In regard to entrepreneurship, two important points 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. 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, and do so in accordance with the demands of their environment. As improvisation appears to be an important behavioral strategy for navigating the entrepreneurial process, we seek to determine the extent to which nascent entrepreneurs tend to have a proclivity for improvisational behavior.

Entrepreneurial Intentions

As a first step toward investigating the improvisational tendencies of entrepreneurs, we set out to examine how improvisation relates to entrepreneurial intentions (Bird 1988). Specifically, we seek to determine whether or not individuals exhibiting a proclivity for improvisation display a tendency toward self-selecting themselves into the field of entrepreneurship. To this end, a measure of improvisation is developed and contrasted with other relevant individual difference measures in regard to the dependent measure of intent to start a new business.

Entrepreneurial intentions, for the purposes of the current study, are defined as intentions toward starting a high-growth business. We adopt a high-growth perspective for three reasons. The primary rationale being that high-

growth start-ups operate in turbulent environments (Venkataraman et al. 1990). This type of environment is characterized by factors such as time pressure and novelty, which demand frequent improvisation as a requirement for survival. A secondary reason is that high-growth ventures are a primary creator of new jobs (Reynolds et al. 2002). Thus, new knowledge relating to the process of creating high-growth ventures is likely to have important societal implications. Finally, small businesses, which are content to maintain the status quo, are fundamentally different from high-growth ventures in terms of innovation, strategic orientation, and propensity for bearing risk (Carland et al. 1984). Accordingly, the characteristics of the founders for each type of business (low-growth and high-growth) are likely to be substantially different (Stewart et al. 1998). In the following sections, we outline hypotheses that consider the association of entrepreneurial intentions with measures of improvisation, personality, motivation, cognitive style, and social models.

Considering the centrality of improvisation within the entrepreneurial process, we expect to find a positive relationship between one's propensity for improvising and extent of entrepreneurial intentions. Thus, we suspect that improvisational individuals tend to seek out entrepreneurial opportunities, in part, as a pathway to act upon their natural inclination to improvise.

H1: The greater the proclivity for improvisation, the greater will be the intent to start a high-growth business.

Personality

Recently, there has been a resurgence of individual differences research in organizational behavior, which has, in part, been spawned by investigations of the five fundamental dimensions of personality known as "The Big Five" (for

example, Hogan and Holland 2003; Hurtz and Donovan 2000; Judge and Bono 2000). Advocates of this perspective claim that most individual differences can be traced back to variations in standing across these five dimensions—extraversion, contentiousness, agreeableness, emotional stability, and openness. With few exceptions (Ciavarella et al. 2004; Singh, De Noble, and Kalousova 2002; Wooten, Timmerman, and Folger 1999), entrepreneurship researchers have ignored The Big Five, instead opting for the use of less theoretically and psychometrically sound measures, such as locus of control (Chen, Greene, and Crick 1998) and risk-taking propensity (Brockhaus 1980). This fact might partially explain why much of the entrepreneurship literature on individual differences is either contradictory and/or inconclusive. Therefore, in order to further the field of entrepreneurship and validate our research in the eyes of those working in complementary fields, it is important that we demonstrate that our constructs and measures provide explanatory value beyond those that have longer and validated histories of use in other domains. In this vein, we anticipate that improvisation will provide explanatory value in regard to entrepreneurial intentions beyond that which is accounted for by The Big Five.

H2: Proclivity for improvisation will account for a significant amount of variance in entrepreneurial intentions beyond that which is accounted for by personality.

Motivation

A firm cannot easily exist without employees to carry out the day-to-day operations that define its purpose. Thus, an essential aspect of any organization is the active and persistent effort of its workers (Baron 1991). Research on worker motivation has primarily focused on factors that initiate and sustain the

behavior of individuals and groups within organizations (Ambrose and Kulik 1999). Measures of self-efficacy (Chen, Greene, and Crick 1998), locus of control (Gilad 1982), need for autonomy (Cromie 1987), risk-taking (Brockhaus 1980) tolerance for ambiguity (Begley and Boyd 1987) have pervaded the literature in regard to entrepreneurial motivation (Shane, Locke, and Collins 2003; Vecchio 2003). Similar to our previous hypotheses, it is also necessary that new constructs within our own field show explanatory value beyond those that are more commonly used in entrepreneurship research. To this end, we seek to determine whether or not improvisation provides explanatory value in regard to entrepreneurial intentions beyond that which is accounted for by commonly investigated correlates of entrepreneurial motivation.

H3: Proclivity for improvisation will account for a significant amount of variance in entrepreneurial intentions beyond that which is accounted for by motivation.

Cognitive Style

A recent trend in the entrepreneurship literature is to consider the variety of ways in which entrepreneurs process information (Baron 2004). The different ways that individuals react to stimuli in various environments comprise the field of cognitive styles research. Within the cognitive styles literature, research pertaining to innovation, intuition, and learning are likely to be of particular relevance to entrepreneurship (Allison and Hayes 1996; Eison and Pollio 1990; Kirton and Pender 1982). For example, Corbett (2005) suggests that the manner in which individuals cognitively process information is related to their ability to identify and exploit opportunities. A follow-up empirical study supports this assertion by showing a relationship between cognition and the discovery of

entrepreneurial opportunities (Corbett, forthcoming). Here, we seek to determine whether or not improvisation adds any explanatory value in regard to entrepreneurial intentions beyond that which is accounted for by these aspects of cognitive style.

H4: Proclivity for improvisation will account for a significant amount of variance in entrepreneurial intentions beyond that which is accounted for by cognitive style.

Social Models

Social models have been shown to be a consistent and strong predictor of entrepreneurial intentions (Hisrich 1990). This is to say that individuals who have family members and/or close friends who are entrepreneurs tend to, on average, be more likely to start their own business than those who have not benefited from the same level of exposure to entrepreneurship. This appears to be, in part, due to the lower barriers to entry into entrepreneurship that these individuals tend to experience through the opportunity that they possess to capitalize on their close ties with entrepreneurs (Greve and Salaff 2003). Thus, we seek to determine whether or not improvisation adds any explanatory value in regard to entrepreneurial intention beyond that which is accounted for by entrepreneurial social models.

H5: Proclivity for improvisation will account for a significant amount of variance in entrepreneurial intentions beyond that which is accounted for by the individual's entrepreneurial social models.

Cumulative Test

As an overall test, we are curious to determine whether or not improvisation explains any variance in entrepreneurial intentions when personality, motivation,

cognitive style, and social models are simultaneously controlled for.

H6: Proclivity for improvisation will account for a significant amount of variance in entrepreneurial intentions beyond that which is accounted for by personality, motivation, cognitive style, and entrepreneurial social models.

Method

Participants

Five hundred and ninety undergraduate students participated in the study. One hundred and sixty of these participants were subsequently eliminated because their scores on the dependent measure, entrepreneurial intentions, varied by more than 25 percent between Part 1 and Part 2 of the study. Thus, the eliminated participants either did not attentively complete each portion of the study or did not have a clear view regarding the extent of their intentions to start a new business. The resulting sample consisted of 430 participants (322 males and 108 females). The mean age was 20 (S.D. = 1.50) years old. The ethnic composition of the sample included Caucasians ($n = 322$), Asians ($n = 58$), Hispanics ($n = 19$), African Americans ($n = 15$), and Native Americans ($n = 2$). Fourteen of the participants failed to report their ethnicity. Twenty-eight of the participants had started their own business, 74 had worked for a start-up, and 37 had taken a course in entrepreneurship.

Measures

Improvisation. A 27-item instrument was developed as a part of the current study in order to measure one's proclivity for improvising. The instrument contains three scales, each comprised of nine items. The first dimension relates to creativity and bricolage ($\alpha = 0.89$), and was partly adapted from Tierney, Farmer, and Graen (1999) following the

work of Vera (2002). This dimension represents the extent to which individuals are able to produce novel solutions under constrained conditions by recombining available resources. Individuals high in this dimension are likely to seek out opportunities to display their ingenuity. The second dimension relates to the ability to function and excel under pressure-filled and stressful environments ($\alpha = 0.83$). This dimension represents the ability of individuals to excel in uncertain and rapidly changing environments. Individuals who are high in this dimension tend to rise to the occasion and perform best under pressure. The final dimension relates to spontaneity and persistence ($\alpha = 0.70$), and was partly adapted from Unger and Kernan (1983) and Moorman and Miner (1998) following the work of Vera (2002). This dimension represents the action-orientation and determination of individuals toward achieving goals and solving problems in the moment. Individuals who are high in this dimension tend to prefer action rather than analysis and are highly focused on the problem at hand. These individuals are opportunistic and act with a killer instinct. The three-dimensional structure of the measure was confirmed using principal components factor analysis. These dimensions are aggregated to form a total score representing an individual's overall proclivity for improvisation ($\alpha = 0.87$). Thus, a high score represents a preference toward improvisational action. A three-week test-retest of the measure produced a correlation coefficient of .85 for the total scale. The three-factor confirmatory principal components matrix along with each item can be viewed in Table 1.

Personality. The International Personality Item Pool (IPIP) (Goldberg 1999) was used to measure the five facets of personality. The IPIP measures the same domain constructs as the NEO-PI-R

Table 1
Confirmatory Principal Components Matrix of
Improvisation Items Using Varimax Rotation

Item	Creativity- Bricolage	Pressure- Stress	Action- Persistence
I am inventive.	0.62	0.07	0.22
I serve as a good role model for creativity.	0.68	0.13	0.12
I demonstrate originality in my work.	0.73	0.12	-0.02
I am creative when asked to work with limited resources.	0.80	0.07	0.08
I identify ways in which resources can be recombined to produce novel products.	0.63	0.25	0.29
I find new uses for existing methods or equipment.	0.67	0.21	0.09
I think outside of the box.	0.69	0.11	0.13
I take risks in terms of producing new ideas in completing projects.	0.72	0.04	0.17
I identify opportunities for new services/ products.	0.69	0.18	0.17
I perform better under time pressure.	0.25	0.54	0.19
I need pressure in order to focus.	0.04	0.74	-0.07
I enjoy taking risks.	0.29	0.51	0.36
I respond to problems in a "spur of the moment" way.	0.22	0.53	0.38
I seek out pressure-filled environments.	0.19	0.69	0.29
I wait until the last moment to complete projects.	0.15	0.67	0.17
I live in the moment.	0.09	0.60	-0.39
I "think on my feet" when carrying out actions.	-0.02	0.72	-0.25
I enjoy taking risks.	0.09	0.60	0.14
I am not easily distracted.	0.25	0.14	0.45
I am a persistent person.	0.25	0.31	0.41
I don't let past failures hinder future performance.	-0.02	-0.20	0.62
I am action oriented.	0.26	0.04	0.36
I am an optimist.	0.08	0.04	0.55
I don't easily get frustrated when things don't go my way.	0.25	0.27	0.50
During a catastrophe, I am likely to adopt a leadership role.	0.24	0.00	0.44
Nothing is more important than the achievement of my goals.	0.27	0.11	0.53
I am good at solving logic problems.	-0.06	0.06	0.36

(Costa and McCrae 1992), which is perhaps the most widely used and psychometrically sound commercially published personality inventory. The primary advantage of the IPIP is that it contains two-thirds less items, while maintaining acceptable psychometric properties. The five scales of the IPIP include a seven-item measure of agreeableness—extent of friendliness and cooperation ($\alpha = 0.74$), 10-item measure of conscientiousness—extent of organization and persistence ($\alpha = 0.82$), nine-item measure of extraversion—extent of outgoingness in social settings ($\alpha = 0.87$), seven-item measure of openness—extent of desire to partake in a variety of experiences ($\alpha = 0.85$), and eight-item measure of emotional stability—extent of insecurity and emotional distress ($\alpha = 0.85$).

Motivation. In this section we grouped five of the most commonly studied constructs relating to entrepreneurial motives. These constructs include self-efficacy, locus of control, need for autonomy, risk-taking, and tolerance for ambiguity.

Self-efficacy was measured using the General Self-Efficacy Scale (Schwarzer 1993). The instrument is comprised of 10 items, which are added together to form an overall measure of general self-efficacy ($\alpha = 0.82$). High scores represent the belief in an individual's ability to produce high levels of performance in tasks undertaken in life. Specific measures of entrepreneurial self-efficacy, such as those developed by Chen, Greene, and Crick (1998) and De Noble, Jung, and Ehrlich (1999), comprised of items specific to managerial and entrepreneurial skills were considered. However, these instruments were considered inappropriate for use with our sample of undergraduates from technology related fields, because they were unlikely to have much exposures to the business related concepts in which the items within these measures are comprised.

Levinson's (1980) chance scale was used as a measure of locus of control. The scale is comprised of eight items that are added together to form a measure of the degree to which a person believes that chance influences his/her outcomes in life ($\alpha = 0.72$). Positive scores represent an internal locus of control, whereas negative scores represent an external locus of control.

Deci and Ryan's (2000) Need for Autonomy Scale was used to measure the basic desire for an individual to exercise his/her free will. The scale is comprised of seven items that are aggregated to form a general measure of need for autonomy ($\alpha = 0.68$). High scoring individuals have a preference for setting their own goals and agendas, and for seeking autonomous environments.

The Risk Attitudes Inventory (Calvert 1993) was used to measure the risk-taking propensity of individuals. The scale is comprised of 15 items that are added to form an overall score of one's risk-taking attitude ($\alpha = 0.57$). High scores represent the extent to which people are willing to partake in events that have uncertain outcomes and for which the consequences of failure are meaningful.

The Tolerance for Ambiguity Scale (Budner 1962) was used to measure the extent to which individuals are threatened by situations that are ambiguous, rapidly changing, and unpredictable. The scale is comprised of 16 items that are summed to form an overall score of one's tolerance for ambiguity ($\alpha = 0.62$). Individuals who score high on this measure tend to be comfortable working in complex environments and with limited information.

Cognitive Style. The Cognitive Style Index Allison and Hayes, 1996) was used as a measure of how individuals think. The scale is comprised of 38 items that are summed to form an overall score of one's cognitive style ($\alpha = 0.85$). High

scores represent a left-brain or analytical-orientation, whereas low scores represent a right-brain or intuitive-orientation.

The Kirton Adaptor Innovator Inventory (Kirton and Pender, 1982) was used to measure individual styles of defining and solving problems. The scale is comprised of 32 items that are added to form an overall score of one's problem-solving style ($\alpha = 0.85$). High scoring individuals have an innovative style, and tend to be independent thinkers and game changers. In contrast, low scoring individuals tend to have an adaptive style, such that they prefer working within the status quo.

The Learning-Orientation/Grade-Oriented (LOGO) II Scale was used to assess the learning- and grade-oriented attitudes and behaviors of the participants (Eison and Pollio 1990). The LOGO II is comprised of two main 16-item scales, one representing grade-oriented attitudes and behaviors (GOT; $\alpha = 0.76$) and the other representing learning-oriented attitudes and behaviors (LOT; $\alpha = 0.76$). Individuals scoring high on the LOT scale seek opportunities for learning outside of the classroom in order to fulfill their natural curiosity. Those who score high on the GOT scale structure their studies around the achievement of grades and material rewards.

Social Models. We developed a five-item measure to assess the extent to which participants have social models who are entrepreneurs. The items ask whether or not the individual has an immediate family member who has started a business, has an immediate family member who is a successful entrepreneur, has a close friend who has started a business, has a close friend who is a successful entrepreneur, and knows many people who have started their own business ($\alpha = 0.86$). High scores indicate that the individual has an extensive array of entrepreneurial social models.

Entrepreneurial Intentions. For this scale we used five items from Chen, Greene, and Crick (1998) to assess whether or not participants intend to start a new business. These items asked whether or not the individual is interested in starting a business, has considered a particular type of business to start, has begun planning for starting a business, is likely to try hard to start a business, and plans to start a business in the near future. In addition, we included five items that were created for the current study regarding the extent to which participants want to rapidly grow a new business. These items asked whether or not the individual would like to start a business that will grow rapidly, become an industry leader, have multiple locations, be listed on a major stock market, and become known internationally. Thus, the aggregate measure indicates the degree of intent to start a new high-growth business ($\alpha = 0.94$). A three-week test-retest of the measure produced a correlation coefficient of 0.93 for the total scale.

Procedure

The measures were compiled to form two separate surveys in order to minimize fatigue on the participants and to allow for a test-retest of the improvisation, social models, and entrepreneurial intentions measures. The first survey (Part I) was comprised of items pertaining to improvisation, personality, self-efficacy, need for autonomy, locus of control, entrepreneurial intentions, social models, and demographics. The second survey (Part II) contained the same items pertaining to improvisation, entrepreneurial intentions, and social models as well as items pertaining to cognitive style, tolerance for ambiguity, risk taking, and additional demographics. The second survey was administered three weeks after the first. Both surveys were paper-and-pencil, 10 pages long, and completed in class.

Results

Means, standard deviations, Bivariate Pearson correlation coefficients, and Cronbach's coefficient alphas for all variables are shown in Table 2. The highest correlation between entrepreneurial intentions and the other variables was

with improvisation, which accounted for 20.3 percent ($p < .01$) of the variance in participants' intentions to start a new business (in support of H1).

Hierarchical linear regression was used to test H2–6. In each analysis, the variable(s) for which we compared improvisation against were placed into

Table 2
Descriptive Statistics and Correlations for all Variables^a

Measures	Mean	S.D.	Correlation w/ Entrepreneurial Intentions	Correlation w/ Improvisation	Alpha
Improvisation	128.54	15.24	0.45**	—	0.87
Personality					
Agreeableness	26.57	4.22	−0.10*	0.07	0.73
Conscientiousness	34.50	6.19	−0.05	0.01	0.81
Extraversion	29.36	6.82	0.18**	0.44**	0.87
Openness	24.62	5.10	0.06	0.22**	0.73
Emotional Stability	19.95	6.30	0.06	0.33**	0.85
Motivation					
Self-Efficacy	32.26	3.81	0.22**	0.56**	0.82
Locus of Control	2.69	8.50	0.08	0.08	0.72
Need for Autonomy	35.04	5.24	0.01	0.25**	0.68
Tolerance for Ambiguity	49.21	8.11	0.20**	0.35**	0.62
Risk-Taking	54.30	6.91	0.19**	0.41**	0.57
Cognitive Style					
CSI ^b (Intuitive- Analytical)	44.53	11.85	0.26**	0.42**	0.85
KAI ^c (Innovator- Adaptor)	96.46	13.24	0.28**	0.49**	0.85
LOGO II					
Learning- Orientation	45.69	7.61	0.24**	0.26**	0.76
Grade- Orientation	43.75	8.08	0.06	0.06	0.76
Social Models	18.54	8.67	0.36**	0.25**	0.86

^a $N = 430$.

^bCSI = cognitive style index.

^cKAI = Kirton adaptor innovator.

* $p < .05$.

** $p < .01$.

the first block of the regression procedure, whereas improvisation was placed into a second block to test whether or not the construct accounts for any additional variance in entrepreneurial intentions. See Table 3 for results of the analyses.

Personality. As shown in Table 3 (model 1), improvisation accounted for

an additional 17.1 percent ($p < .01$) of variance in entrepreneurial intentions beyond the 5.4 percent ($p < .01$) that was explained for by the five primary facets of personality (in support of H2).

Motivation. As shown in Table 3 (model 2), improvisation accounted for an additional 13.0 percent ($p < .01$) of variance in entrepreneurial intentions

Table 3
Results of Hierarchical Regression Analysis[†]

Models	Variables	Entrepreneurial Intentions			
		R^2	F of R^2	p of R^2	Overall R^2
1	Control Variable:				
	Personality ^a	0.054	4.822	0.000	0.054
	Improvisation	0.171	93.006	0.000	0.224
2	Control Variable:				
	Motivation ^b	0.098	9.162	0.000	0.098
	Improvisation	0.130	70.947	0.000	0.227
3	Control Variable:				
	Cognitive Style ^c	0.133	16.348	0.000	0.133
	Improvisation	0.095	52.105	0.000	0.228
4	Control Variable:				
	Social Models	0.125	62.325	0.000	0.125
	Improvisation	0.141	82.118	0.000	0.268
5	Control Variables:				
	Personality ^a	0.054	4.822	0.000	0.054
	Motivation ^b	0.074	7.152	0.000	0.128
	Cognitive Style ^c	0.044	5.459	0.000	0.172
	Social Models	0.073	39.937	0.000	0.245
	Improvisation	0.071	42.164	0.000	0.315

^aPersonality predictors = emotional stability, extraversion, agreeableness, conscientiousness, openness.

^bMotivation predictors = self-efficacy, locus of control, need for autonomy, risk taking, tolerance for ambiguity.

^cCognitive style predictors = intuitive-analytical, innovator-adaptor, learning-orientation, grade-orientation.

[†]Each of the regressions was also performed with only the significant variable, and the results were similar in each case to those listed here.

beyond the 9.8 percent ($p < .01$) that was explained for by the measures of motivation (in support of H3).

Cognitive Style. As shown in Table 3 (model 3), improvisation accounted for an additional 9.5 percent ($p < .01$) of variance in entrepreneurial intentions beyond the 13.3 percent ($p < .01$) that was explained for by the measures of cognitive style (in support of H4).

Social Models. As shown in Table 3 (model 4), improvisation accounted for an additional 14.1 percent ($p < .01$) of variance in entrepreneurial intentions beyond the 12.5 percent ($p < .01$) that was explained for by social models (in support of H5).

Cumulative Test. As shown in Table 3 (model 5), improvisation accounted for an additional 7.1 percent ($p < .01$) of variance in entrepreneurial intentions beyond the 24.5 percent ($p < .01$) that was explained for by the combination of personality, motivation, cognitive style, and social models (in support of H6).

Entrepreneurial Experience. As a supplementary analysis, we took a closer look at those participants who had some entrepreneurial experience. Proclivity for improvisation accounted for the following percentages of variance in entrepreneurial intentions: 10.2 percent ($n = 28$, $p > .05$) for those who had started a business, 28.1 percent ($n = 74$, $p < .01$) for those who had worked for a start-up, 17.6 percent ($n = 37$, $p < .01$) for those who had taken a course in entrepreneurship, and 18.5 percent ($n = 133$, $p < .01$) overall for participants who had at least one of these three types of experience.

Follow-Up Study

Whereas some have criticized the use of students as subjects in behavioral research (Copeland, Francia, and

Strawser 1973), there have also been studies that have shown that graduate students are good proxies for decision-makers in business situations (Khera and Benson 1970). As such, we sampled 63 (43 males and 20 females) MBA students in order to cross-validate our results. Their average age was 29 (S.D. = 4.86) years old. These participants were only asked to complete items related to their proclivity for improvisation, entrepreneurial intentions, and demographics. Fifteen had started their own business, 18 had worked for a start-up, and 34 had taken a course in entrepreneurship.

The results of the follow-up survey are consistent with our initial study. Proclivity for improvisation accounted for 15.2 percent ($p < .01$) of the variance in entrepreneurial intentions for this sample. Drilling down by entrepreneurial experience, proclivity for improvisation accounted for the following percentages of variance in entrepreneurial intentions: 47.6 percent ($n = 15$, $p < .01$) for those who had started a business, 17.6 percent ($n = 18$, $p < .01$) for those who had worked for a start-up, 10.9 percent ($n = 34$, $p < .05$) for those who had taken a course in entrepreneurship, and 12.3 percent ($n = 39$, $p < .05$) overall for participants who had at least one of these three types of experience (see Table 4).

As shown in Table 4, the follow-up study with MBA students generally supports the findings from the initial study using an undergraduate sample. There are, however, some notable differences between the amount of variance explained in entrepreneurial intentions by proclivity for improvisation between the undergraduate and MBA student samples across entrepreneurial experience. Perhaps most interesting is the difference among those who have started a business. For these individuals, the relationship between improvisation and entrepreneurial intentions was much greater for MBA students than for

Table 4
Percent of Variance in Entrepreneurial Intentions
Accounted for by Improvisation across Level of
Entrepreneurial Experience and Sample

Entrepreneurial Experience	Percent Variance Explained	
	Undergraduates	MBAs
Started a business	10.2 (28)	47.6** (15)
Worked for a start-up	28.1** (74)	17.6** (18)
Taken a course in entrepreneurship	17.6** (37)	10.9* (34)
At least one of above three types of experience	18.5** (133)	12.3* (39)

* $p < 0.05$.

** $p < 0.01$.

undergraduates. This may be an artifact of the experience of the MBA students, who are more likely to have started viable new ventures than less experienced undergraduates who are more likely to have started businesses as hobbies, experiencing fewer of the pressures that would require improvisational action. Conversely, a greater amount of variance in entrepreneurial intentions was accounted for by proclivity for improvisation by undergraduates as compared to MBA students among those who have worked for a start-up and those who have taken an entrepreneurship course. This suggests that entrepreneurship experts and practitioner might have a greater effect on the entrepreneurial intentions of undergraduate than their more “real world” experienced MBA student counterparts.

Discussion

As indicated by our results, it seems that improvisation is an important construct to consider in regard to entrepreneurial intentions in that it appears to add explanatory value above and beyond other significant predictors, such as

measures of personality, motivation, cognitive style, and social models that have been previously established in the literature. More specifically, our results suggest that nascent entrepreneurs, on average, exhibit a proclivity for improvisation. Important implications related to this point are briefly discussed below in terms of future research, education, and practice.

Two forms of action have dominated the literature on entrepreneurial behavior—strategic planning (Shane and Venkataraman 2000) and cognitive heuristics and biases (Busenitz and Barney 1997). In the current article, we have suggested that improvisation is a third and equally important component in the entrepreneurial process. Earlier, we illustrated in a 2×2 matrix the different types of entrepreneurial action that are likely to be appropriate when considering the novelty of the situation and level of resource constraints (see Figure 1). In light of our results, we wonder whether nascent entrepreneurs improvise in situations in which they should actually enact strategic plans or cognitive heuristics and biases (for

example, when novelty and resource constraints are low). Our suspicion of excessive improvisation is consistent with research indicating that entrepreneurs suffer from a tendency to be overconfident (Cooper, Woo, and Dunkelberg 1988), and could prove to be an elemental reason for the failure of some start-ups. Future research could make important contributions to our understanding of entrepreneurial behavior by investigating whether entrepreneurs do, in fact, overimprovise.

The concept of intention implies planned behavior (Ajzen 1991). In other words, by saying that an individual intends to start a business, we are assuming that the individual intends to plan for the eventuality of starting a business. In fact, a portion of our measure of entrepreneurial intentions was the extent to which the individual had begun planning for the creation of a start-up. Conversely, the concept of improvisation implies deviation from a plan or, at an extreme, operating without a plan. Therefore, individuals who have a proclivity for improvisation might not "intend" to start a business, but may spontaneously undertake in the creation of a new venture if an opportunity to do so presents itself. Therefore, proclivity for improvisation might predict a greater proportion of variance in the actual decision to start a business than in entrepreneurial intentions. Future research can answer this question through longitudinally investigating the proclivity for improvising as a predictor of new venture creation.

Since nascent entrepreneurs appear to exhibit a proclivity for improvisation and improvisation seems to play an important role in the entrepreneurial process (Baker, Miner, and Eesley 2003), it might prove worthwhile to consider how improvisation can be infused into entrepreneurship curriculums. For example, simulations and role-playing exercises might be used to help strengthen

students' improvisational capabilities. Further, capstone courses might focus on how to deviate from strategic plans in order to take advantage opportunities and solve problems as they arise.

In regard to practice, entrepreneurs should develop a balance in the makeup of their founding teams with respect to improvisational competencies and inclinations. Teams should be neither too rigid so as to miss opportunities nor too improvisational to the point where their firms struggle to establish stability. Further, it is important for entrepreneurs to understand that they are less likely to be successful at improvising in domains in which they have little expertise (Crossan 1998). This is an important point for entrepreneurs to consider when assessing the level of risk associated with unique opportunities.

Limitations

In regard to the generalizability of our results, there are some limitations that are worthy of discussion. First is the use of a student sample. One could argue that our findings might have differed if we had considered an older and more experienced sample. We agree with this presumption, but also advocate the importance of studying the intentions of students who, through university incubator programs and the increased infusion of entrepreneurship across educational curriculums, experience increasingly lower barriers to starting their own businesses. Additionally, previous entrepreneurship research (Crant 1996; Gartner 1989) has stated that using a student population may be more appropriate than using other samples when researching individual differences and vocational intentions. It is worthy to note that most of the participants in our sample were studying in technical fields (for example, biotechnology and nanotechnology), and clearly have the potential to start high-growth firms in emerging areas of industry. In fact, 28 of

the participants had already started their own firms and 74 had experience working for start-ups. Therefore, although perhaps narrow, our sampling frame represents an important population from which future entrepreneurs will spawn. In support of the generalizability of our results, we found a similar relationship between proclivity for improvisation and entrepreneurial intentions in a survey of older and more experienced MBA students. An additional limitation is the cross-section design of our study. Although, there is much evidence concerning intentions as a robust predictor of future behavior (Ajzen 1991), a preferable design would adopt a longitudinal approach that follows up to see which participants actually start their own business.

Conclusions

The study of individual differences in entrepreneurship has met with inconclusive results, in part, because of the failure to link characteristics of individuals to the actual behavioral tendencies of entrepreneurs (Shaver and Scott 1991). This study attempted to bridge this gap by considering improvisation, a mode of action frequently engaged in by entrepreneurs (Baker, Miner, and Eesley 2003), as an individual difference characteristic. Our findings indicate that proclivity for improvisation can provide additional information regarding why individuals intend to become entrepreneurs beyond that which can be found in measures of personality, motivation, cognitive style, and social models. The next step in this line of research is to investigate how proclivity for improvisation relates to actual firm founding and subsequent success at various stages of the entrepreneurial process.

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