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# The relationship of achievement motivation and risk-taking propensity to new venture performance: a test of the moderating effect of entrepreneurial munificence

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**Abstract:** New venture start-up is an interactive process between individuals and their environments. We thus propose and empirically test a model of the entrepreneurial process that examines the dynamic relationships between entrepreneurs' personality characteristics and environmental conditions. Findings reveal that entrepreneurs' achievement motivation significantly and positively relates to performance regardless of the munificence level in the environment. However, risk-taking propensity is only negatively associated with performance at low munificence level.

**Keywords:** achievement motivation; risk-taking propensity; entrepreneurial munificence.

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## 1 Introduction

New venture creation is a complex and dynamic process involving interactions between the individual and his social economic environment (Dubini, 1988). Early studies on entrepreneurship focused on psychological characteristics of entrepreneurs such as risk-taking propensity (Sexton and Bowman, 1983), internal locus of control (Seligman, 1990), and need for achievement (McClelland, 1961; 1987). Recently, the role of environmental conditions in developing entrepreneurship has been recognised by a growing number of researchers (Bouchikhi; 1993; Gnyawali and Fogel, 1994; Korunka *et al.*, 2003; Naffziger *et al.*, 1994). More specifically, these scholars have proposed similar research models of the entrepreneurial start-up process in the sense that all these models agree with the portrayal of an interactive relationship between the individual and the environment. According to this perspective of entrepreneurship, the outcome is determined neither by the entrepreneur nor by the context, but emerges in the mere process of their interaction.

However, few studies have confirmed the validity of such interactive models of the entrepreneurial process by empirical investigation. Built upon previous research, this paper relates entrepreneurs' personality characteristics, achievement motivation and risk-taking propensity, to such environmental characteristics as munificence, and empirically tests the usefulness of such an interactive model. Drawing on Klein (1990) and Shane (2003), we define achievement motivation as an affective and cognitive process that energises, directs, and maintains goal-directed behaviours of establishing new businesses. Risk-taking propensity is defined as an individual's current tendency to take or avoid risks (Sitkin and Pablo, 1992; Sitkin and Weingart, 1995). Organisational theorists have defined environmental munificence as the scarcity or abundance of critical resources needed by firms operating within an environment (Dess and Beard, 1984; Pfeffer and Salancik, 1978; Randolph and Dess, 1984; Staw and Szwajkowski, 1975; Tushman and Anderson, 1986). In entrepreneurship research, a highly munificent environment is defined as an area characterised by a strong presence of family businesses and role models, a diversified economy in terms of size of companies and industries represented, rich infrastructure and the availability of skilled resources, a solid financial community, and government incentives to start a new business (Dubini, 1988). We thus refer to munificence in the entrepreneurship context as *entrepreneurial munificence*.

We first set forth a framework consisting of both individual and environmental factors that influence the start-up process. This framework illustrates how entrepreneurial munificence moderates the relationship between risk-taking propensity and new venture performance. We then test our framework using evidence from PSED dataset. We discuss the limitations and implications of this study last.

## 2 Literature review and framework development

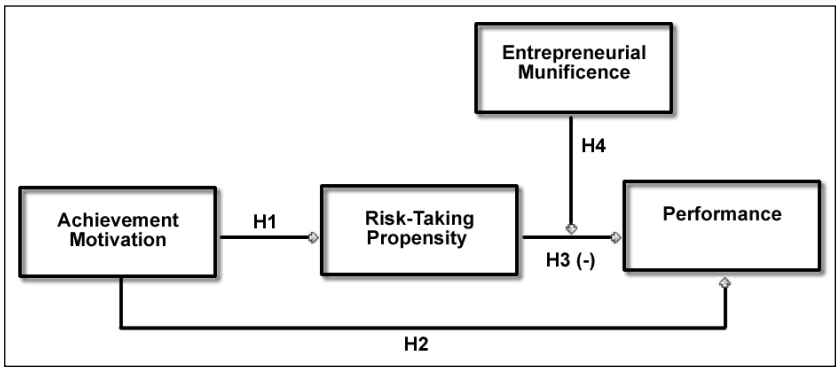
Previous research on entrepreneurship has focused on how psychological characteristics could help differentiate founders from non-founders or how founders' characteristics were related to venture performance. The most heavily researched personality traits include risk-taking propensity (Brockhaus and Horwitz, 1986; Hull *et al.*, 1980; Sexton and Bowman, 1983; Timmons *et al.*, 1985), internal locus of control (Brockhaus, 1982; Rotter, 1966; Seligman, 1990), and high need for achievement (Begley and Boyd, 1987; Hornaday and Aboud, 1971; McClelland, 1961; 1987; Rauch and Frese, 2000). Notwithstanding the fruitlessness of previous research on demographic and psychological characteristics of entrepreneurs (Begley and Boyd, 1987; Brockhaus, 1982; Low and MacMillan, 1988), persistent evidence offers support for the revival of research interest in personal characteristics as an explanation of new venture performance (Baum and Locke, 2004; Baum *et al*., 2001; Chandler and Jansen, 1992; Dyke *et al*., 1992; Shane *et al*., 2003; Stewart and Roth, 2001). In fact, even researchers who have argued strongly against the usefulness of trait-based research in entrepreneurship acknowledged that individual psychological characteristics matter to the entrepreneurial process (Aldrich and Zimmer, 1986; Gartner, 1985).

Although the role of personality characteristics in entrepreneurship has received scholarly attention, inconsistent findings suggest a need to develop a deeper understanding of how these individual characteristics relate to new venture performance. We thus go beyond previous studies by focusing on a more sophisticated multidimensional model of new venture performance that considers the interaction between entrepreneurs' achievement motivation, risk-taking propensity, and the entrepreneurial munificence. The central theme of our model is that an expanded view of entrepreneurship should include the entirety of the entrepreneurial experience, which is composed of both internal characteristics of entrepreneurs such as personalities and external conditions in the environment such as munificence.

Recently, researchers in the field of entrepreneurship have suggested or hinted on the importance of interactive models (Baum *et al.*, 2001; Bouchikhi, 1993; Chandler and Hanks, 1994; Gartner, 1985; Gnyawali and Fogel, 1994; Greenberger and Sexton, 1988; Korunka *et al*., 2003; Naffziger *et al.*, 1994). However, Chandler and Hanks' (1994) work represented the only one that empirically tested such an interactive model. Thus the purpose of this study does not attempt to argue with a behavioural-trait description of entrepreneurship, but to further understand the relationship between entrepreneurs' personality characteristics and new venture performance. More importantly, we test the moderating effect of entrepreneurial munificence on such relationships.

In the theoretical model guiding our research (Figure 1), we propose that entrepreneurs' achievement motivation influences their risk-taking propensity as well as new venture performance. Risk-taking propensity relates to performance negatively. More importantly, entrepreneurial munificence moderates the negative relationship between entrepreneurs' risk-taking propensity and new venture performance.

**Figure 1** Relationships predicted




## *2.1 Entrepreneurs' personality characteristics and performance*

### *2.1.1 Achievement motivation*

We propose that in entrepreneurship research, it is more important and more appropriate to investigate achievement motivation as a situationally specific concept that focuses on the task rather than a generic trait. More specifically, such an achievement motivation energises, directs, and maintains entrepreneurs' task of establishing new businesses. For example, Miner *et al*. (1994) viewed entrepreneurs' achievement motivation by placing greater emphasis on the stated role requirements rather than the single achievement motive, and his study of 135 founder-entrepreneurs compared with 71 managers found that the entrepreneurs were distinctly more task motivated.

### *2.1.2 Risk-taking propensity*

Following Sitkin and Weingart (1995), we define risk-taking propensity as an individual's current tendency to take or avoid risks. Risk bearing is a fundamental part of entrepreneurship because a person cannot know with certainty if the desired products can be produced, consumers' needs can be met, or profits can be generated before a new product or service is introduced. Early research shows that people who exploit entrepreneurial opportunities have a higher propensity to bear risk than those who do not exploit entrepreneurial opportunities (Begley, 1995; Caird, 1991; Sagie and Elizur, 1999; Stewart and Roth, 2001; Uusitalo, 2001; Van Praag and Cramer, 2001). It is worth noting that risk-taking propensity is differentiated from risk perception in the way that risk perception is defined as a decision-maker's assessment of the risk inherent in a particular situation (Sitkin and Pablo, 1992).

McClelland (1961) argued and Schwer and Yucelt (1984) confirmed that individuals with high achievement motivation tended to take moderate risks, while individuals with low levels of achievement showed fewer reservations toward risk-taking. In line with McClelland's motivation theory, we propose that entrepreneurs' achievement motivation toward establishing their new businesses may be an important predictor of entrepreneurs' propensity to take or avoid risks of acting in the face of uncertainty. That is, entrepreneurs with higher motivations will exhibit higher level of risk-taking propensity because they desire to fulfil their need for self-actualisation even if the situation they are facing are full of uncertainty and unpredictability. Therefore:

*Hypothesis 1* *Entrepreneurs' achievement motivation will be positively related to their risk-taking propensity.*

Under the same logic, entrepreneurs' achievement motivational will be a particularly important ingredient of new business performance because the initial difficulties and uncertainties associated with the start-up process require motivationally spurred individuals to perform the activities. A positive relationship between achievement motivation, however defined and measured, and some type of entrepreneurial behaviour or new venture performance has been found (Baum and Locke, 2004; Baum *et al*., 2001; Johnson, 1990). For instance, studies support the argument that achievement motivation increases the likelihood of opportunity exploitation (Harper, 1996; Miner, 2000; Wu, 1989), and enhances performance of entrepreneurial activity such as business sales growth (Lee and Tsang, 2001; Miner *et al*., 1994), amount of income generated by the new firm (Lerner, 1995), and employment rate (Tullar, 2001). The latest meta-analysis of 41 studies on the relationship of achievement motivation to entrepreneurial activities found that achievement motivation both differentiated between entrepreneurs and others, and predicted the performance of founders' firms (Collins *et al.*, 2004). Thus, reflecting the evidence from previous research, our second hypothesis is:

*Hypothesis 2* *Entrepreneurs' achievement motivation will be positively related to performance.*

Although the above discussion shows that people who have a higher risk-taking propensity are more likely to engage in opportunity exploitation, there may exist an interesting relation between entrepreneurs' risk-taking and new venture performance. The entrepreneurial process involves uncertainty with respect to financial well-being, psychic well-being, career security, and family relations, which are summarised as residual uncertainty by Venkataraman (1997). Under such situations, entrepreneurs with lower risk-taking propensity may expect higher level of performance at entrepreneurial activities because they tend to take less risky approaches to running their businesses in terms of resource acquisition, strategy, and organising. In other words, increased risk-taking might lead to disaster when the risks are foolish (Baum and Locke, 2004). Several empirical studies have provided evidence that founders' risk-taking propensity appears to be negatively associated with the performance of their new ventures. For example, Begley and Boyd (1987) found that the Return on Assets (ROA) of 147 small business firms decreased when risk-taking propensity became excessive. Miner *et al.* (1989) survey of 118 technical entrepreneurs showed that the mean annual growth in sales of entrepreneurs' ventures was positively related to their tendency to avoid risks. More recently, Forlani and Mullins (2000) conducted an experiment with 78 chief executive officers of fast-growing new firms and found that entrepreneurs preferred low variable outcome ventures to high variable outcome ventures. Taken as a whole, the above argument and prior research suggest that:

*Hypothesis 3* *Entrepreneurs' risk-taking propensity will be negatively related to performance.*

### *2.2 The moderating effect of entrepreneurial munificence*

In his theoretical assessment of environmental munificence, Castrogiovanni (1991) examined munificence from five environmental levels, and his task environment included specific customers, suppliers, financiers, and so forth. We propose this task level environmental munificence is the most salient external feature that influences the survival and growth of new business start-ups and refer to it as entrepreneurial munificence in the present study. Several scholars have examined the entrepreneurial munificence from the task environmental level. For instance, Dubini (1988) proposed a highly munificent environment for entrepreneurs would be characterised by a strong presence of family business and role models, rich infrastructure, and the availability of skilled resources, a solid financial community, and government incentives to start a new business. This definition is fully consistent with that offered by Gnyawali and Fogel (1994) and Korunka *et al.* (2003). Gnyawali and Fogel's (1994) socio-economic dimension of entrepreneurial environment refers to the availability of assistance and support services that facilitate the start-up process, and according to Gnyawali and Fogel, it is this dimension that relates to entrepreneurs' motivation to go into businesses. Similarly, Korunka *et al.* (2003) summarised resources in the start-up process into two categories: micro-social (for example, family restrictions, support) and macro-social (for example, social networks based on earlier occupational experience) aspects.

Thus, in order to further our understanding of how entrepreneurs' personality characteristics contribute to performance outcomes, it is necessary to investigate the role of entrepreneurial munificence in our model. As far as non-financial assistance is concerned, the presence of experienced entrepreneurs and successful entrepreneurial role models conveys a message to entrepreneurs that they can always lean on their role models for advice and expertise when they face hurdles in the entrepreneurial process. Entrepreneurs require financial assistance from the environment as well to diversify the start-up risk, to accumulate start-up capital, and to finance growth and expansion (Gnyawali and Fogel, 1994).

More specifically, although entrepreneurs' risk-taking propensity relates to new venture performance negatively, this relationship may be contingent upon the munificence level in the environment in which the new business exists. In a highly munificent environment where financial assistance and support services that facilitate the entrepreneurial process are highly available, better performance will be expected regardless of the risk level of entrepreneurs' strategy or organising. When entrepreneurs make a decision of low or moderate risk level for business development, the abundant resources in the environment will assist them in achieving the goal and boost their performance. Even under a situation where entrepreneurs make a highly risky strategy, better performance of the new business would still be expected because outside expertise will be obtained easily when necessary, which will offset the low probability of success associated with the risky decision. However, under low munificent environment, there is a lack of a solid financial community or unavailability of skilled resources. The higher tendency the entrepreneurs exhibit toward risk-taking, that is, the higher risky decisions they make, the lower the performance of new businesses will be expected due to lack of support for entrepreneurs' behaviours from the community. In sum:

*Hypothesis 4* *Entrepreneurial munificence will moderate the relationship between risk-taking propensity and performance. Specifically, risk-taking propensity will be highly and negatively related to performance under low entrepreneurial munificence. Conversely, risk-taking propensity will be minimally related to performance under high entrepreneurial munificence.*

## 3 Methodology

### *3.1 Sample and weights*

In this study, we used data from the Panel Study of Entrepreneurial Dynamics (PSED) to test our hypotheses. PSED was initiated to provide systematic, reliable and generalisable data on the underlying processes and factors that lead individuals to pursue the creation of a new business firm. Valid measures and assessment tools were used, covering all of the variables of interest to this study, thus making it an ideal sample to examine the impact of environmental factors on entrepreneurs' personalities during the start-up process.

The final sample of PSED respondents totalled 1261, with 830 nascent entrepreneurs and 431 in the comparison group. Listwise deletion on key constructs in this study left us with 362 cases. Because several of the sub-samples involved over sampling, Reynolds (2000) suggested that any analysis be completed with a weighted sample because appropriate tests of statistical significance require the use of weighted samples. Following Reynolds (2000), we employed post-stratification weights based on estimates of gender, age, education, and race/ethnicity from the US Census Bureau's Current Population Survey. This weighting procedure reduced the sample size to a total of 227 cases with female entrepreneurs approximating one third of the sample. Table 1 presents demographic characteristics of the final sample.

We conducted three tests to check for bias in the self-report survey data. First, to assess the presence of non-response bias in our data, we compared usable responses after the sample was weighted against non-usable responses on four characteristics: age, gender, education and ethnicity. The non-response bias test showed that the responses were biased toward white people ($p < .05$). Therefore, the results of our analysis should be interpreted accordingly.

Second, we used Harman's one-factor test to check for the presence of common method variance based on Podsakoff *et al.*'s (2003) suggestion. To test for this potential threat to validity, we entered all the variables in the study into an exploratory factor analysis using principal axis factoring method. We then examined the results of the unrotated factor analysis to determine the number of factors that were necessary to account for the variance in the variables. Five factors yielded with eigenvalues greater than one, and no single factor was dominant. Therefore, common method variance is not a significant problem in our data.

**Table 1** Demographic characteristics of Nascent entrepreneurs (N = 227)

| | *n* | *(%)* |
|---|---|---|
| Gender | | |
| Male | 161 | 70.90 |
| Female | 66 | 29.10 |
| Age | | |
| 18–24 years old | 17 | 7.50 |
| 25–34 years old | 57 | 25.10 |
| 35–44 years old | 84 | 37.00 |
| 44–54 years old | 42 | 18.50 |
| 55–95 years old | 27 | 11.90 |
| Education | | |
| Up to high school degree | 37 | 16.30 |
| High school plus, no college degree | 110 | 48.50 |
| College degree | 46 | 20.30 |
| Post college | 34 | 15.00 |
| Ethnicity | | |
| White | 155 | 68.30 |
| Black | 53 | 23.30 |
| Hispanic | 12 | 5.30 |
| Others | 7 | 3.10 |

Finally, because entrepreneurs were assessing their own psychological characteristics as well as environmental characteristics, it could be argued that the measure of entrepreneurial munificence might be interrelated with and influenced by measures of achievement motivation and risk-taking propensity. However, the variables measuring the munificence and two psychological traits were not strongly correlated ($r$ between munificence and motivation = .02 n.s.; $r$ between munificence and risk propensity = –.08 n.s.). These results suggest that individual characteristic and environmental characteristic constructs are not confounded with one another.

## *3.2 Measures*

### *3.2.1 Achievement motivation*

Johnson (1990) recommended Miner's (1982; 1986) measure – MSCS Form T – because it was designed specifically to measure achievement motivation to perform the stated role requirements as opposed to the more global, generalised operationalisations of achievement motivation. In accordance with this perspective, we chose six items ($\alpha$ = .76) from PSED that represented an adaptation of Miner's MSCS Form T measure. See Appendix 1 for the items. In order to confirm the underlying dimensionality of these six items, we conducted exploratory factor analysis with principal axis factoring. One component emerged with all factor loadings greater than .61. The factor accounted for 49.75% of variance.

### *3.2.2 Risk-taking propensity*

Schneider and Lopes' (1986) Risk Style Scale has been used as operationalisation of risk propensity in entrepreneurship. The items used to measure risk-taking propensity in the present study closely matched Schneider and Lopes' (1986) Risk Style Scale. See Appendix 1 for the items and standard deviation transformation of the measure. Based on the transformation procedure, the higher the standard deviation, the higher the entrepreneur demonstrates risk-taking propensity.

### *3.2.3 Entrepreneurial munificence*

Following from our earlier definition of munificent environment by Dubini (1988), we chose three items from PSED survey data which were representative of this environmental characteristic. See Appendix 1 for the items. The coefficient alpha was .71, which represented stronger magnitude than those reported for similar perceptual measures of environmental dimensions (Pillai, 1995; Waldman *et al*., 2001). Again to ascertain the underlying dimensionality of these three items, principal axis factoring analysis was conducted, which resulted in one component accounting for 62.77% of variance with all factor loadings greater than .78.

### *3.2.4 Performance*

Chandler and Hanks (1993) showed considerable reliability for founder-reported performance measures and argued that such measures were anchored to objectively defined performance criteria and appeared to be content valid. Therefore, in order to measure the performance of new businesses during the start-up process, entrepreneurs' perceptions of their performance were measured ($\alpha = .72$). See Appendix 1 for the items. The results of the principal axis factoring analysis confirmed the one-factor solution which accounted for 42.07% of variance with all factor loadings greater than .62.

### *3.2.5 Control variables*

Because demographic variables, gender, age, and education, have been shown to explain variance in performance (Reynolds, 2000), we included them as control variables in the analyses.

## *3.3 Construct validation*

We focused on five procedures to evaluate the construct validity of the measures used in the study: content validity, reliability, discriminant validity, convergent validity, and investigating nomological networks (Schwab, 2005). See Appendix 2 for details of the procedures for construct validation.

### *3.4 Analysis*

Hypotheses were tested using hierarchical regression analysis. Age, gender, and education of nascent entrepreneurs were entered as control variables prior to allowing other variables to enter. Then the independent variable achievement motivation was entered, followed by risk-taking propensity. Betas, incremental change in $R^2$ resulting from the addition of variables, and F-test based on the statistical significance of the change in $R^2$ were used as indicators for supporting or rejecting the hypotheses. We utilised the full sample to test Hypotheses 1–3. To test Hypothesis 4, we split the sample into two sub-samples composed of data partitioned into lower (scale score lower than the 2.65 mean score, n = 99) and higher (> 2.65, n = 128) levels of entrepreneurial munificence. This approach parallels more traditional split-group regression analysis recommended by Cohen and Cohen (1983), Stone and Hollenbeck (1989), and Aiken and West (1991).

## 4 Results

The means, standard deviations, Pearson product-moment correlations, and coefficient alphas (where applicable) for all the variables are displayed in Table 2. The correlation matrix shows statistically significant correlations in the direction as expected between achievement motivation and risk and performance. Achievement motivation correlated positively with risk-taking propensity ($r = .21$, $p < .01$), and performance ($r = .29$, $p < .01$). The correlation between risk-taking propensity and performance was negative, albeit insignificant ($r = –.10$, n.s.). Consistent with previous research, munificence was positively and significantly associated with performance ($r = .14$, $p < .05$). As the correlation matrix indicates, the intercorrelation between entrepreneurial munificence and achievement motivation was insignificant ($r = .02$); munificence was also insignificantly related to risk-taking ($r = –.08$), thereby minimising the problem of multicollinearity.

Results for the direct effects posited in Hypotheses 1–3 are reported in Table 3. Hypothesis 1 predicts that achievement motivation is positively related to risk-taking propensity. When risk-taking was regressed on achievement motivation after all the control variables were entered, $R^2$ increased by .04. Consistent with earlier discussion, entrepreneurs' achievement motivation to start the business significantly influenced risk-taking propensity ($\beta = .21$, $p < .01$). Hypothesis 1 was supported. Hypothesis 2 predicts that achievement motivation would be positively associated with new venture performance. When performance was regressed against achievement motivation after all the control variables were entered, $R^2$ increased by .08 ($\beta = .28$, $p < .001$). Hypothesis 2 was supported. Hypothesis 3 proposes a negative relationship between risk-taking propensity and performance. As Table 3 shows, when performance was regressed on risk-taking propensity with age, gender, education and achievement motivation controlled, $R^2$ increased by .03 ($\beta = –.18$, $p < .01$), supporting Hypothesis 3.

Hypothesis 4 concerns the moderated effect of entrepreneurial munificence on the relationship between risk-taking and performance. More specifically, Hypothesis 4 posited that risk-taking propensity would be highly related to performance under low entrepreneurial munificence. Conversely, risk-taking propensity would be minimally related to performance under high entrepreneurial munificence. Table 4 summarises the results of the hypothesis test of the two sub-groups.

**Table 2** Mean, standard deviations and correlation coefficients

| *Variable* | *Mean* | *S.D.* | *1* | *2* | *3* | *4* | *5* | *6* | *7* |
|---|---|---|---|---|---|---|---|---|---|
| Age | 3.02 | 1.11 | | | | | | | |
| Gender | 1.29 | .45 | –.02 | | | | | | |
| Education | 2.19 | .70 | .01 | .07 | | | | | |
| Achievement motivation | 3.59 | .83 | –.22** | –.03 | .16* | (.76) | | | |
| Risk | 1.44 | .67 | .00 | –.08 | .09 | .21** | | | |
| Performance | 3.88 | .56 | –.07 | –.06 | .06 | .29** | –.10 | (.72) | |
| Munificence | 2.65 | .83 | .01 | .02 | –.00 | .02 | –.08 | .14* | (.71) |

Notes: N = 227
** $p < .01$ (2-tailed)
* $p < .05$ (2-tailed)
Coefficient alphas are on the diagonal where applicable.

| | | | |
|---|---|---|---|
| Gender: | 1 = male | Education: | 1 = up to high school degree |
| | 2 = female | | 2 = post high school |
| Age: | 1 = 18–24 years old | | 3 = college degree |
| | 2 = 25–34 years old | | 4 = post college degree |
| | 3 = 35–44 years old | Risk: | 1 = low risk propensity |
| | 4 = 45–54 years old | | 2 = moderate risk propensity |
| | 5 = 55 and up years old | | 3 = high risk propensity |

**Table 3** Hierarchical regression results (betas)

| | *Dependent variables* | | | | |
|---|---|---|---|---|---|
| | *Risk-taking* | | *Performance* | | |
| | *Step 1* | *Step 2* | *Step 1* | *Step 2* | *Step 3* |
| Age | –.00 | .05 | –.07 | –.01 | .00 |
| Gender | –.09 | –.08 | –.07 | –.06 | –.07 |
| Education | .10 | .06 | .07 | .02 | .03 |
| Achievement motivation | | .21** | | .28*** | .32*** |
| Risk-taking | | | | | –.18** |
| $R^2$ | .02 | .06 | .01 | .09 | .12 |
| $\Delta R^2$ | .02 | .04 | .01 | .08 | .03 |
| Adjusted $R^2$ | .00 | .04 | .00 | .07 | .10 |
| d.f. | 3, 223 | 4, 222 | 3, 223 | 4, 222 | 5, 221 |
| $F$ | 1.17 | 3.24* | .99 | 5.16*** | 5.74*** |
| $F$ ($\Delta R^2$) | | 9.3** | | 17.46*** | 7.44** |

Notes: N = 227
*** $p < .001$
** $p < .01$
* $p < .05$

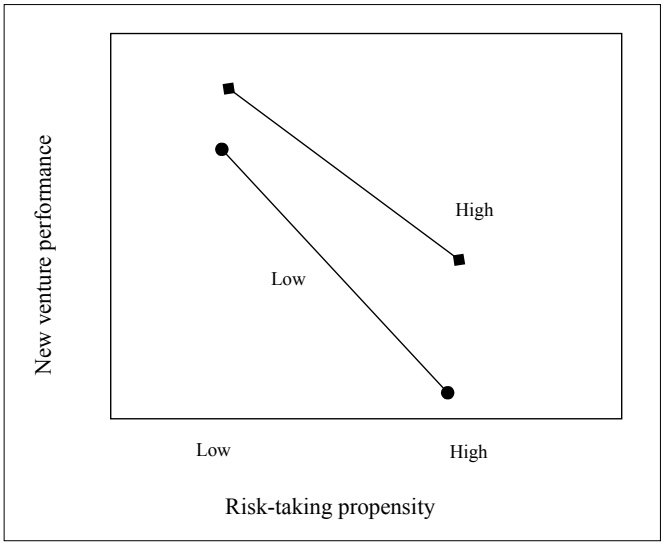
**Table 4** Hierarchical regression results for low munificence level and high munificence level (betas)

| | *Low munificence (n = 99)* | | | | | *High munificence (n = 128)* | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | *Dependent variables* | | | | | | | | | |
| | *Risk-taking* | | *Performance* | | | *Risk-taking* | | *Performance* | | |
| *Variable* | *Step 1* | *Step 2* | *Step 1* | *Step 2* | *Step 3* | *Step 1* | *Step 2* | *Step 1* | *Step 2* | *Step 3* |
| Age | .05 | .11 | –.07 | –.03 | .00 | –.06 | –.02 | –.07 | .01 | .01 |
| Gender | –.14 | –.14 | .03 | .02 | –.01 | –.04 | –.03 | –.14 | –.11 | –.12 |
| Education | .10 | .06 | .11 | .08 | .09 | .08 | .05 | .05 | –.01 | –.00 |
| Achievement motivation | | .27** | | .23* | .29** | | .16 | | .32*** | .34*** |
| Risk-taking | | | | | –.22* | | | | | –.12 |
| $R^2$ | .03 | .10 | .02 | .07 | .11 | .01 | .03 | .02 | .11 | .13 |
| $\Delta R^2$ | | .07 | | .05 | .04 | | .02 | | .09 | .02 |
| Adjusted $R^2$ | .00 | .06 | .01 | .03 | .07 | –.01 | .00 | .00 | .09 | .09 |
| d.f. | 3, 95 | 4, 94 | 3, 95 | 4, 94 | 5, 93 | 3, 124 | 4, 123 | 3, 124 | 4, 123 | 5, 122 |
| $F$ | .99 | 2.55* | .57 | 1.69 | 2.36* | .01 | 1.05 | 1.00 | 3.07** | 3.55** |
| $F$ ($\Delta R^2$) | | 7.07** | | 4.95* | 4.76* | | 2.90 | | 12.58*** | 1.78 |

Notes: *** $p < .001$
** $p < .01$
* $p < .05$

As Table 4 shows, under low entrepreneurial munificence, risk-taking was significantly and negatively related to performance with age, gender, education and achievement motivation controlled. Under high entrepreneurial munificence, the significant relationship between risk-taking and performance disappeared, although their relationship was in the negative direction as expected. Hypothesis 5 was supported. The nature of this interactive relationship was plotted in Figure 2. The plot indicated that the influence of risk-taking propensity on new venture performance was magnified when entrepreneurial munificence was perceived low.

**Figure 2** Interaction effect between entrepreneurial munificence and risk-taking propensity




Notes: ◆–◆ – High entrepreneurial munificence
●–● – Low entrepreneurial munificence

## 5 Discussion

In the present study, we tested the relationship between two commonly recognised psychological characteristics of entrepreneurs: achievement motivation and risk-taking propensity. Achievement motivation was shown to be positively related both to risk-taking propensity and to performance. Risk-taking had a significant relationship with performance as well, though negatively. More importantly, in response to the newer stream of entrepreneurship research that emphasises the interaction between environmental and personal attributes, we empirically tested the moderating role of munificence in the entrepreneurial process and confirmed that entrepreneurs do not operate in vacuums, rather they respond to their environment (Gartner, 1985). Under low entrepreneurial munificence, when the community was not able to provide entrepreneurs with the financial and social resources necessary to establish the business, lower performance would be expected for entrepreneurs representing higher levels of risk-taking propensity. However, the same relationship did not exist under high

entrepreneurial munificence. The only link existing under high munificence was between achievement motivation and performance, which showed that risk-taking propensity was not a key factor in the model anymore.

This research makes three significant contributions to the literature. First, it employs an interactive model to show how entrepreneurs' personality characteristics interact with entrepreneurial munificence and their effect on new venture performance. Although several researchers have started to propose interactive models to portray the entrepreneurial process, few of the extant studies have empirically tested the validity of interactive models. We realise that it is impossible to take into account every potential moderating, intervening or confounding variable in a given study. Thus, we introduce the entrepreneurial munificence concept because we expect it to be the most salient external variable to be considered in interactive models of entrepreneurship. Our study confirms the moderating effect of entrepreneurial munificence. Therefore it also contends that entrepreneurship study should recognise the complexity and variation that abounds in the process of new venture creation (Gartner, 1985). In addition, the introduction of a third variable into the analysis of a two-variable relationship allows for a more precise understanding of the original two-variable relationship, and reduces the potential for misleading inferences (Rosenberg, 1968).

Second, it responds to Collins *et al*.'s (2004) call for additional research to determine whether achievement motivation would still retain a significant role in multivariate models that examine multiple causal factors that promote venture success. The results of our study indicate that entrepreneurs' level of achievement motivation toward establishing the new venture significantly correlates with performance regardless of the munificence level in the environment. These results parallel those of Collins *et al*.'s (2004) meta-analysis on the relationship of achievement motivation to entrepreneurial performance, and are fully consistent with Baum and Locke's (2004) findings that the situationally specific motivation concepts have strong direct effects on venture growth.

Third, it provides an explanation for prior controversy over the psychological perspective of entrepreneurship. As mentioned earlier, the psychological explanation for entrepreneurship has been under criticism for a long time because no clear link has been established between the personality characteristics of entrepreneurs and the success of their business ventures (Brockhaus, 1982). For instance, Brockhaus (1982) suggested that risk-taking propensity had no direct bearing upon financial performance. Yet Begley and Boyd's (1987) finding suggested an inverse relationship between risk-taking propensity and liquidity. In addition, Ginzberg and Buchholtz (1989) observed that no single empirical study provided a conclusive answer in terms of psychological differences between entrepreneurs and non-entrepreneurs. For example, in comparisons of firm founders and managers, neither Babb and Babb (1992) nor Palich and Bagby (1995) found significant differences between the two groups in terms of risk-taking propensity. However, Begley (1995) found that risk-taking propensity was the only trait on which founders and non-founders differed. Gartner (1988) even argued that the debate on personality traits was asking the wrong question. The research model proposed and tested in this study suggests that the debate on personality traits may not be asking the wrong question if we take into consideration the effect of environmental conditions in the entrepreneurial process. What previous scholars failed to identify was the environmental conditions in which the entrepreneurial firms existed, which could have explained the inconsistency in the findings of the studies described above.

According to the results reported in this study, psychological characteristics such as risk-taking propensity plays a key role in determining the performance of new businesses when the environment in which the new business exists does not provide necessary social and financial support to the entrepreneurs. More specifically, under the condition of low entrepreneurial munificence, entrepreneurs with higher risk-taking propensity tend to exhibit lower performance. Risk-taking propensity is also found to be significantly related to entrepreneurs' achievement motivation under low entrepreneurial munificence. On the contrary, when the resources in the environment are available and abundant, in other words, under high entrepreneurial munificence, risk-taking propensity is not found to be linked to new venture performance or to achievement motivation. These results suggest that ignoring the impact of environmental characteristics such as munificence may have accounted for the previously reported inconsistencies in risk-taking propensity of individuals who engage in new entry, and equivocal relationships between risk-taking and performance.

### *Limitations and future research*

Although the data appear to be reliable according to our checks, these data were not specifically collected for testing the research model and hypotheses in the current study. Consequently, we had to use proxy measures to estimate the phenomena of interest to us. Future research should be conducted to provide more systematic and longitudinal data for more in-depth examination of related issues.

Single source bias is another potential limitation of this study because all the independent, moderator, and dependent variables were collected from entrepreneurs, especially since we used perceptual measures to test the impact of personality and environmental characteristics on the performance of new venture creation. Although checks for common method variance and perceptual biases were conducted, future research may further validate the results by estimating archival or objective measures of new business performance.

Another limitation of the present study is that PSED was designed to collect information from nascent entrepreneurs who were still active in the start-up process. Therefore, the subjects used in our study may face different difficulties and uncertainties from 'full-fledged' entrepreneurs. For example, nascent entrepreneurs may be more concerned with looking for co-founders and collecting start-up capital rather than making profits and establishing expanding strategies. Future research is needed to generalise the findings of the present study with samples from 'full fledged' entrepreneurs or entrepreneur-managers of infant firms.

Another path for future research to consider as a way to extend our findings is to explore the impact on the entrepreneurial process from the other two important dimensions of environment, complexity and dynamism. Studies indicate that environment is multidimensional (Randolph and Dess, 1984), and that environmental complexity (that is, heterogeneity of and range of environmental activities) and dynamism (that is, degree of change that characterises environmental activities) significantly impact the entrepreneurial process as well (Lumpkin and Dess, 1996). Future research may further investigate the business start-up process by examining the interaction between psychological characteristics and complexity or dynamism. In addition, archival measures of environmental characteristics should be used together with perceptual measures to provide convergent validity for the environment scale.

Although substantial research has sought to identify the entrepreneurial process as an interaction between the individual and the environment, this research represents an initial attempt to draw on the concept of entrepreneurial munificence to empirically test an interactive model of entrepreneurship. Even though the model proposed in this study requires further validation, these preliminary results suggest that practitioners, educators, and policymakers should be aware of the importance of environmental resources in order to boost new venture performance.

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## Appendix 1

### *The achievement motivation scale*

Entrepreneurs' achievement motivation was assessed in terms of the extent to which the following reasons were important to them in establishing this new business (5-point Likert scales: 1 = to no extent; 5 = to a very great extent):

1 to achieve a higher position for myself in society

2 to continue to grow and learn as a person

3 to achieve something and get recognition for it

4 to fulfil a personal vision

5 to lead and motivate others

6 to challenge myself.

### *The risk-taking propensity scale*

Risk-taking propensity was measured based on subjects' preference of three ventures given that their skill and energy could affect the outcome of each. The three ventures have the same 'expected payout' in the sense that the probability of success times the profit is the same:

1 a profit of $5,000,000, but a 20% chance of success

2 a profit of $2,000,000, but a 50% chance of success

3 a profit of $1,250,000, but an 80% chance of success.

Furthermore, we transformed the measure of risk taking propensity by calculating the standard deviation (Eeckhoudt *et al*., 2005) of the expected value in each situation using the formula: $[(X_1 - E) * P_1 + (X_2 - E) * P_2]^{1/2}$, where $X$ is the outcome, $E$ is the expected value, and $P$ is the probability of the corresponding outcome. Under the first situation, $5,000,000 profit with 20% chance of success implies 80% chance of getting zero payback. Therefore, the expected value of the first situation is: $5,000,000 * 20% + $0 * 80% = $1,000,000 and the standard deviation is: $[(0 - 1{,}000{,}000)^2 * .8 + (5{,}000{,}000 - 1{,}000{,}000)^2 * .2]^{1/2} = 2{,}000{,}000$. Similarly, the standard deviations of the second situation and the third situation are 1 000 000 and 500 000, respectively.

### *The entrepreneurial munificence scale*

This scale asked the subjects how much they agreed with the following statements:

1 state and local government provide good support for those starting new firms

2 bankers and other investors go out of their way to help new firms get started

3 other community groups provide good support for those starting new firms.

Responses were on a 5-point scale with anchors ranging from (1) completely disagree to (5) completely agree.

### *The performance scale*

This scale asked entrepreneurs how certain they were that the new business would be able to accomplish the following:

1 obtain start-up capital

2 obtain working capital

3 attract customers

4 compete with other firms

5 comply with local, state and federal regulations

6 keep up with technological advances.

Responses were on a 5-point scale with anchors ranging from (1) very low certainty to (5) very high certainty.

## Appendix 2

### *Construct validation*

#### *Content validity*

According to Schwab (2005), a measure is content valid when its items accurately reflect the domain of the construct as defined conceptually. At this basic level, validity is established by developing measures from well-grounded theory. In regard to the four measures included in the study, strong literature bases exist to support the content validity of achievement motivation, risk-taking, munificence, and performance because we chose the items strictly based on the definition of each construct and on previously well-established measures.

#### *Reliability*

As reported in the previous section, we calculated Cronbach coefficient alpha to evaluate the reliability of the measures. An alpha level of .70 or above is generally considered to be acceptable (Nunnally, 1978). All the measures in the present study exceeded this minimum threshold with the exception of risk-taking propensity because it was a single item measure. Although we utilised standard deviation method to evaluate risk level, which is well-acknowledged and justified by finance research, we do suggest caution when interpreting results involving this scale.

#### *Discriminant validity*

Discriminant validity is inferred when scores from measures of different constructs do not converge. Following Barringer and Bluedorn's (1999) suggestion, we employed Exploratory Factor Analysis (EFA) to assess the discriminant validity of the three multi-item measures in this study. More specifically, we conducted a principal component analysis with varimax rotation, constraining the number of factors to three. The results of this factor analysis are shown in Table 1.

**Table 1** Results of the principal component analysis with varimax rotation (N = 227)

| *Item name* | *Factor 1 Achievement motivation* | *Factor 2 Entrepreneurial munificence* | *Factor 3 Performance* |
|---|---|---|---|
| To achieve a higher position for myself in society | .60 | .13 | .02 |
| To continue to grow and learn as a person | .64 | –.10 | .17 |
| To achieve something and get recognition for it | .67 | .10 | .07 |
| To fulfil a personal vision | .73 | –.10 | .20 |
| To lead and motivate others | .77 | .00 | .12 |
| To challenge myself | .71 | .05 | .19 |
| State and local governments provide good support for those starting new firms | .05 | .69 | –.13 |
| Bankers and other investors go out of their way to help new firms get started | .01 | .74 | –.09 |
| Other community groups provide good support for those starting new firms | .12 | .65 | –.21 |
| Obtain start-up capital | –.08 | .17 | .45 |
| Obtain working capital | –.07 | .32 | .52 |
| Attract customers | .22 | .01 | .57 |
| Compete with other firms | .11 | –.05 | .61 |
| Comply with local, state and federal regulations | .17 | –.15 | .62 |
| Keep up with technological advances | .14 | –.00 | .69 |
| Eigenvalue | 3.54 | 2.36 | 1.65 |
| % of variance explained | 23.60 | 15.74 | 11.02 |

As shown in Table 1, all the variables in the study loaded clearly on three separate factors. All the scale items had factor loadings in excess of .40, a common threshold for acceptance, without any cross loadings. These results support the discriminant validity of the measures used in this study.

*Convergent validity*

Convergent validity is present when there is a high correspondence between scores from two or more different measures of the same construct. We tested the convergent validity of the risk-taking propensity scale by comparing it to a different scale. The second scale was another one-item scale that asked respondents the same question as the first scale did, however, given that the outcome was primarily a function of external events such as market demand and competition rather than internal factors such as skill and energy as indicated in the first scale. The correlation between these two scales was $r = .30$ ($p < .01$), demonstrating convergent validity across two separate measures of this construct.

*Nomological networks*

Nomological networks have been described as relationships between a construct under measurement and other constructs. According to Schwab (2005), evidence for construct validity mounts as empirical research supports relationships expected from a nomological network. Previous research has shown that both internal locus of control and self-efficacy are positively related to achievement motivation (Chen and Bliese, 2002; Erez and Judge, 2001; Watkins and Astilla, 1986). Therefore, the present study established the nomological network of entrepreneurial achievement motivation construct by investigating the usefulness of these two predictors of achievement motivation.

Locus of control was measured by a six-item, 5-point Likert scale ranging from 1 (completely untrue) to 5 (completely true) asking the subjects their self-assessments on the following statements:

- I can do anything I set my mind on doing.
- I do every job as thoroughly as possible.
- There is no limit as to how long I would give maximum efforts to establish my business.
- My personal philosophy is to do whatever it takes to establish my own business.
- When I make plans, I'm almost certain to make them work.
- When I get what I want, it is usually because I worked hard for it (alpha = .65).

These items closely mimic the internal dimension of locus of control measure developed by Rotter (1966) and Levenson's (1973).

Self-efficacy was measured using a three-item 5-point Likert scale ranging from 1 (completely disagree) to 5 (completely agree) assessing respondents' reactions to the following descriptions of the business start-up:

- Overall, my skills and abilities will help me start a business.
- My past experience will be very valuable in starting a business.
- I am confident I can put in the effort needed to start a business (alpha = .72).

This perspective of measuring self-efficacy toward the specific event of new business start up is consistent with Wood and Bandura's (1989) suggestion that self-efficacy can be applied to a variety of domains as long as the efficacy measure is tailored to the specific tasks or event being assessed.

The correlation between achievement motivation and locus of control was significant at the .01 level ($r = .40$). Achievement motivation and self-efficacy were positively and significantly related as well ($r = .28$, $p < .01$). Regressing achievement motivation on locus of control and self-efficacy showed similar findings. These results demonstrated that the nomological network of achievement motivation construct was supported and that the measure was capturing variance that was construct valid.