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Understanding entrepreneurial cognition through thinking style, entrepreneurial alertness and risk preference: do entrepreneurs differ from others?

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Abstract

The purpose of this study is to investigate entrepreneurial cognition through thinking style, entrepreneurial alertness and risk preference on an overall sample composed of entrepreneurs, accountants and managers. In this context, potential differences across these professional groups are examined. A survey was conducted on 42 small and medium sized enterprises operating in Ankara. One entrepreneur, one accountant and one manager were selected as respondents from each firm. It was observed that all professional groups included in this study preferred a highly linear thinking style and there were no significant group differences across linear, nonlinear, and balanced linear and nonlinear thinking style. On the other hand, accountants scored lower than the other groups in evaluation and judgment dimension of entrepreneurial alertness. Also it was observed that entrepreneurs, managers and accountants are significantly different on their risk preference. While entrepreneurs' risk preference found to be higher than expected, accountants risk preference found to be lower than expected.

Keywords: Entrepreneurial Cognition, Linear/nonlinear thinking style, Entrepreneurial alertness, Risk preference

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1. Introduction

Entrepreneurship has long been acknowledged as the basic engine for economic growth and wealth creation and researchers have spent so much effort in order to explain this phenomenon through various perspectives. Recently they have postulated that a focus on the role of cognition has the potential to contribute significantly to the study of entrepreneurship (Baron, 1998; Mitchell, Smith, Seawright and Morse, 2002; Krueger, 2003). Based on the general definition of cognitions, Mitchell et al. (2002:97) described entrepreneurial cognitions as “the knowledge structures that people use to make assessments, judgments, or decisions involving opportunity evaluation, venture creation, and growth”.

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The purpose of current study is to address entrepreneurial cognition by examining the differences between entrepreneurs and other people in terms of thinking style, risk preference and entrepreneurial alertness. Thinking style is “one’s preferred manner of using mental abilities to govern daily activities, including understanding and solving problems and challenges” (Vance, Groves, Paik and Kindler, 2007: 168). It refers to an individual’s preferred and habitual approach to using (processing) information. This study investigates two different thinking styles, namely linear and nonlinear thinking styles and attempts to explain whether entrepreneurs possess a high nonlinear thinking style as asserted by some studies and whether they possess a more balanced linear and nonlinear thinking style. Risk preference can be defined as the general tendency or the desire to pursue or avoid risks (Sitkin and Pablo, 1992). Since entrepreneurship includes many risks, such as financial and social risks, risk preference is assumed to be a distinguishing factor. This study also compares entrepreneurs with accountants and managers in risk preference. Entrepreneurial alertness is described by Kirzner (1979) as an individual’s ability to identify opportunities which are overlooked by others. The study is composed of three parts. In the first part, the literature on entrepreneur’s thinking style (cognitive style), risk preference and entrepreneurial alertness is reviewed and the theoretical framework of the study is drawn. In the second part, the information regarding the survey conducted is presented. The survey aims to reveal the thinking style, entrepreneurial alertness and risk preference of three professional groups, namely entrepreneurs, managers and accountants. Also it aims to determine whether there are differences across entrepreneurs and other groups. The last part includes the results of analysis, discussion and suggestions for future research.

2. Literature Review And Hypotheses

2.1. Thinking Style

Research on entrepreneurial cognition has emphasized two qualitatively distinct styles of information processing/ thinking: analytic and intuitive. Analytical or rational thinking style encompasses thinking and decision making that is variously described as objective, sequential, convergent, constrained, logical, critical and detailed. In contrast, intuitive thinking style encompasses thinking and decision-making that is described as subjective, divergent, unconstrained, synthetic, simultaneous, feeling, holistic and creative (Nickerson, Perkins and Smith, 1985; Sadler-Smith, 2004; Allinson, Chell and Hayes, 2000). In this study, the first style of thinking will be named linear and the second style will be named nonlinear thinking as suggested by Vance et al. (2007).

Intuitive individuals are likely to discover opportunities by observing cues or signals through unfamiliar and unorganized information that is processed in a holistic manner (Olson, 1985). This can help them identify an opportunity and motivate them to take action, as shown by the study of Miner (1997) who found intuition to be an important thinking mode of expert idea generators (Kickul, Gundry, Barbosa and Whitcanack, 2009). Therefore, nonlinear thinking style may be useful for the entrepreneur especially in the beginning of entrepreneurship process, opportunity identification. On the other hand, Olson (1985) also states that when individuals rely on linear, sequential processing of information, this will enable them to evaluate and plan for the new venture. So, linear thinking style may help entrepreneur display competency in judging and evaluating information and selecting actions to implement skills that are needed in the later stages of new venture creation (Kickul, 2009). It can be asserted that entrepreneurs utilize both nonlinear and linear dimensions in their overall cognitive processes, and employ either a linear or a nonlinear thinking style depending on situational factors and the different entrepreneurial and functional needs within an enterprise. This ability to use either linear or nonlinear thinking where warranted as “balanced” thinking style means balance in linear and nonlinear thinking (Groves, Vance and Choi, 2011).

In order to investigate whether entrepreneurs really have this balance in thinking, entrepreneurs should be compared with other professionals. We expect that accountants exhibit a preference for linear thinking because of the nature of their work and accounting training. Findings of several empirical studies conducted on accountants and accounting students support this view in some way (Vassen, Baker and Hayes, 1993; Schlomer and Schlomer, 1993; Abdolmohammadi, Read and Scarbrough 2003; Groves et al., 2011). On the other hand, in their famous study, Allinson et al. (2000) compared a sample of 156 entrepreneurs and 564 managers at multiple levels and reported that entrepreneurs are more intuitive than the general population of managers. In other words, they provided empirical support for the view that entrepreneurs adopt an intuitive approach. Many researchers also agree with this view that nonlinear thinking is crucial to entrepreneurship because of the rapidly changing and ambiguous environment where

entrepreneurs usually operate in. So, it might be expected that entrepreneurs possess a more balanced linear and nonlinear thinking style compared with managers and professional accountants.

Based on the above discussion and previous findings, the following hypotheses are proposed:

H₁: Accountants will score significantly higher linear thinking style than entrepreneurs on frequency of utilizing a linear thinking style.

H₂: Entrepreneurs will demonstrate greater linear and nonlinear thinking style balance compared with professional accountants.

H₃: Entrepreneurs will demonstrate greater linear and nonlinear thinking style balance compared with managers.

2.2. Entrepreneurial Alertness

Entrepreneurial alertness is a term used to explain the beginning of the entrepreneurship. Through the cognitive perspective, entrepreneurial alertness refers to the accumulation, evaluation and selection of the knowledge which can lead the individual into potential business opportunities (Tang, 2007). Owing to high entrepreneurial alertness, entrepreneur can assess the changes in the environment differently than other people and perceive these changes as potential opportunities. Entrepreneurial alertness is acknowledged as one of the main dynamics of opportunity identification (e.g. Kaish and Gilad, 1991; Gaglio and Katz, 2001; Li, 2004), so the following hypothesis is proposed:

H₄: Entrepreneurs will score higher in entrepreneurial alertness compared with (a) managers and (b) accountants.

2.3. Risk Preference

A large amount of literature has been dedicated to risk taking within the context of entrepreneurship. Although some studies (e.g. Brockhaus, 1980; Carland and Carland, 1992) state that risk taking propensity does not distinguish entrepreneurs from managers, many other researchers (e.g. Das and Teng, 1997; Stewart, Watson, Carland and Carland, 1998; Douglas and Shepherd, 2002) report that risk taking attitudes and behavior are distinguishing characteristics of entrepreneurship. Thus, the following hypothesis is proposed:

H₅: Entrepreneurs will score higher in risk preference compared with (a) managers and (b) accountants.

3. Methodology

3.1. Research Goal

The purpose of this study is to identify the differences between entrepreneurs and other professional groups in terms of thinking style, entrepreneurial alertness and risk preference. To test the hypotheses, a survey was conducted and data was gathered through question forms.

3.2. Sample and Data Collection

The sample of this study is composed of entrepreneurs, professional accountants and managers of 42 firms which operate in Ostim Organized Industrial Zone, Ankara, Turkey. Firms comprising the sample are selected through convenience sampling technique. One entrepreneur, one manager and one accountant are selected as respondents from each firm.

There will be two groups of questions in the question form. First group measures demographic characteristics of respondents such as role, gender, age, formal education level and tenure in profession. These variables are included because they might have importance within the context of entrepreneurial cognition. Also the industry and size of the firm is asked. Second group of questions measures thinking style balance, entrepreneurial alertness degree and risk preference of respondents. Thinking style is measured with a 26-item, four dimensional, forced-choice self-report

measure (Linear and Nonlinear Thinking Style Profile -LNTSP), developed by Vance et al. (2007). This is an ipsative scale consisting of 13 item pairs and respondents were asked to allocate exactly 3 points across each pair of alternative statements. In this scale, there are 4 subscales. ‘External information sources’ and ‘inner information sources’ subscales comprise of eight pairs of alternative words or phrases which aim to measure the degree of using external / internal information sources during decision making. Using a Likert-type scale (3: very strong influence on how I behave, 2: strong influence on how I behave, 1: moderate influence on how I behave, 0: little or no influence on how I behave), respondents are asked to indicate the impact of these sources on their decision making process. ‘Linear decision making’ and ‘nonlinear decision making’ subscales comprise of five pairs of alternative words or phrases which aim to measure the frequency of performing such behaviors regarding decision making. There are some significant problems in applying factor analysis on ipsative data due to the interdependency between items in each pair, so the original dimensional structure is utilized in this study without conducting exploratory factor analysis. Entrepreneurial alertness is measured with the 13 item Likert type scale (1-strongly disagree to 5-strongly agree) developed by Tang, Kacmar and Busenitz (2012). Risk preference is assessed with a measure used in The Panel Study of Entrepreneurial Dynamics (PSED) survey (Reynolds, 2000; Barbosa, Gerhardt and Kickul, 2007). The respondents are asked to select one choice for this question: Assuming you are the sole owner of a business, which situation would you prefer?

1. A business that would provide a good living, but with little risk of failure, and little likelihood of making you a millionaire
2. A business that was much more likely to make you a millionaire, but had a much higher chance of going bankrupt.

3.3. Analyses and Results

Descriptive statistics for demographic variables are summarized in Table 1.

Table 1. Descriptive Statistics for Demographic Variables^a

Variable	Levels/Descriptives	Overall sample	Entrepreneurs	Accountants	Managers
Gender (n)	Male	118	42	35	41
	Female	8	-	7	1
Age	Mean	34.45	39.69	29.43	34.22
	S. D.	6.71	6.52	3.94	5.22
Education (n)	Primary school	1	1	-	-
	High school	62	34	3	25
	College	57	6	36	15
	Post graduate	-	-	-	-
Tenure in profession	Mean	9.66	15.29	4.7	8.88
	S. D.	7.18	7.83	3.16	5.22
Industry (n)	food-beverage	12			
	instruction	8			
	automotive	9			
	machine-metal	36			
	electric-electronics	27			
	textile	6			
	chemical	3			
	furniture	9			
other	6				
Number of	1-9	48			

^a Due to missing data, the total frequencies of some variables are not equal to the relevant sample size.

employees (n)	10-24	54
	25-49	15
	50-99	9

As demonstrated in Table 1, there are only 8 female respondents, 7 of whom are accountants, compared to 118 male respondents in the overall sample. So, there will be no opportunity to compare men and women in this study. The average age of the overall sample is 34.45 and it can be stated that the sample consists of quite young people. Regarding the education variable, it is observed that half of the sample (62 respondents) has the high school diploma and no one has postgraduate degree. The average tenure in the overall sample is 9.66 years and entrepreneur sample seems to have higher tenure in profession (15.29 years) compared to accountants (4.27 years) and managers (8.88 years). Regarding the industry variable, it is observed that the firms in the sample operate in many different areas ranging from food-beverage to instruction. Machine- metal (36 firms) and electric-electronics (27 firms) industries has the highest frequencies. Almost half of the firms in the overall sample (54 firms) have 10 to 24 employees and they are followed by 48 firms employing 1 to 9 employees. There are only 9 firms employing 50 to 99 people.

Table 2 (in the following page) demonstrates the descriptive statistics for professional group scores across the LNTSP Scales and Linear and Nonlinear Balance.

As shown in Table 2, the means of each subscale and total scales across groups are very similar. Also it is trivial that all professional groups prefer a highly linear thinking style. In order to test the hypothesis regarding the differences in thinking style, one way ANOVA was conducted. According to the results of the analysis, there is no statistically significant difference regarding the thinking style of different professional groups because the significance of all F values is above 0.05. Thus, hypothesis 1, 2 and 3 are not supported. In other words, the professional groups are not significantly different with respect to linear decision making, nonlinear decision making, using external information sources, using inner information sources, linear thinking style, nonlinear thinking style, and balanced linear and nonlinear thinking style.

In order to extract the underlying dimensions, exploratory factor analysis was applied to 14 item entrepreneurial alertness scale using principal components analysis with Varimax rotation. First, preconditions of this analysis are tested. Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) was found to be 0.777 and Bartlett's Test of Sphericity classified data as adequate for analysis (757.07, $p < 0.000$). In the first stage, it was observed that 4th item which refers to scanning and search loads to two dimensions and the differences in two loadings are below 0.10. So, this item is excluded from further analysis. The analysis is conducted again with 13 items and all items loaded into only one dimension. The resulting dimensional structure matches perfectly with original structure of the scale. The results of exploratory factor analysis are summarized in Table 3.

Table 3. Results of Exploratory Factor Analysis on Entrepreneurial Alertness Scale

Factors and Items	<i>Eigenvalue</i>	<i>Factor loading</i>	<i>% of Variance</i>
<i>Scanning and search</i>	2.89		24.10
I always keep an eye out for new business ideas when looking for information.		.795	
I have frequent interactions with others to acquire new information.		.750	
I am an avid information seeker.		.738	
I read news, magazines or trade publications regularly to acquire new information.		.704	
I am always actively looking for new information.		.571	
<i>Evaluation and judgement</i>	2.86		23.86
When facing multiple opportunities, I am able to select good ones.		.895	
I have a knack for telling high-value opportunities apart from low-value opportunities.		.882	
I have a gut feeling for potential opportunities.		.784	
I can distinguish between profitable opportunities and not-so-profitable opportunities.		.718	
<i>Association and connection</i>	2.46		20.48
I am good at "connecting dots".		.883	
I see links between seemingly unrelated pieces of information.		.818	

I often see connections between previously unconnected domains of information.		.813	
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Table 2. . Descriptive Statistics for Professional Group Scores across the LNTSP Scales and Linear and Nonlinear Balance

n	EIS		IIS		LDM		NDM		Linear ^a		Nonlinear ^b		Linear and Nonlinear Balance Score ^c	
	M	S.D.	M	S.D.	M	S.D.	M	S.D.	M	S.D.	M	S.D.	M	S.D.
Accountants	14.48	2.40	3.52	2.40	12.17	2.01	2.83	2.01	26.64	4.26	6.36	4.26	20.33	8.40
Managers	14.98	2.57	3.02	2.58	12.60	2.00	2.40	2.00	27.57	4.30	5.43	4.30	22.67	7.04
Entrepreneurs	15.07	2.30	2.93	2.30	12.50	2.70	2.50	2.70	27.57	4.58	5.43	4.58	22.52	8.15

S.D. : Standard deviation, EIS: External information sources, IIS: Inner information sources, LDM: Linear decision making, NDM: Nonlinear decision making.

^a Linear score is the sum of the linear thinking style scales, namely EIS and LDM.

^b Nonlinear score is the sum of nonlinear thinking style scales, namely IIS and NDM.

^c Linear and nonlinear balance score is the absolute value of the difference between the linear and nonlinear scores.

The descriptive statistics of entrepreneurial alertness subscales are summarized in Table 4 below:

Table 4. Entrepreneurial Alertness Subscale Descriptive Statistics and Correlations

	Mean	S.D.	1.	2.	3.
1.Scanning and search	4.17	.55	(.80)		
2.Evaluation and judgment	3.75	.54	.27**	(.83)	
3.Association and connection	3.54	.82	.54**	.31**	(.87)

Notes: Numbers in parentheses are cronbach alpha coefficients, **p<0.01

To test whether there is any difference across the groups in the sample in terms of entrepreneurial alertness dimensions, a series of one way ANOVA was conducted. The results are shown in Table 5:

Table 5. Results of ANOVA for entrepreneurial alertness and role

		Sum of Squares	df	Mean Square	F	Sig.
Scanning and search	Between Groups	.234	2	.117	.389	.679
	Within Groups	34.964	116	.301		
	Total	35.199	118			
Evaluation and judgment	Between Groups	1.841	2	.921	3.233	.043
	Within Groups	33.034	116	.285		
	Total	34.875	118			
Association and connection	Between Groups	1.739	2	.869	1.292	.279
	Within Groups	78.037	116	.673		
	Total	79.776	118			

According to the significance values in Table 5, there is difference in evaluation and judgment degrees across three professional groups (F:3.233, p<0.05). Since the assumption of the homogeneity of variance is supported with the Levene statistic (0.522, p>.05) for this dimension, LSD test is conducted to indicate the source of difference. The result of LSD test states that the difference stems from accountants group. Accountants' evaluation and judgment degree is lower than both entrepreneurs' (I-J:-0.28 p=0.023) and managers' (I-J=0.26, p=0.040) degree. In other words, accountants scored lower than managers and entrepreneurs in distinguishing between profitable opportunities and not-so-profitable opportunities. Thus, H₄ is partially supported.

Crosstabs are prepared and Cramer's V value is estimated to examine the differences in risk preference across groups. The results are summarized in Table 6:

Table 6. Chi-square analysis of Risk Preference among Entrepreneurs, Managers and Accountants

Variable	Role			Total	Cramer's V	p
	Entrepreneur	Manager	Accountant			
High risk preference	30	21	10	61	.39	<.001
Low risk preference	11	21	31	63		
Total	41	42	41	124		

Table 6 indicates that entrepreneurs, managers and accountants are significantly different on their risk taking propensity. While entrepreneurs' risk preference is higher than expected, accountants risk preference is lower than expected. So, we can assert that entrepreneurs have a higher tendency toward taking risk than other groups and H₅ is supported. On the other hand, accountants have a higher tendency to avoid risk. This difference is consistent with their professional tasks. Entrepreneurs usually encounter with risky situations but accountants almost always work under regular and predictable conditions.

4. Conclusions and Suggestions

Although the findings of this study are not generalizable to the greater population of entrepreneurs, managers and accountants due to the convenience nature of the sample, they have important implications. Regarding the thinking style, it was observed that all three groups prefer a dominantly linear thinking approach. This implies that they all lack nonlinear thinking abilities, such as utilizing integrated and holistic thinking on an unconscious basis. Considering the role of nonlinear thinking in the entrepreneurship process and strategic management of enterprises, we can assert that especially entrepreneurs and managers should take training in developing their nonlinear thinking ability. It was observed that the highest score belongs to ‘scanning and search’ dimension and the lowest score belongs to ‘association and selection’ dimension of entrepreneurial alertness in the overall sample. This finding is consistent with the findings explained above. As stated, all three groups use a highly linear thinking style and use nonlinear thinking approach quite rarely. Thus they perform highly rationalistic activities like knowledge search and accumulation better than intuitive activities like identifying links between seemingly unrelated pieces of information. This study also reported that there is no difference in entrepreneurial alertness among entrepreneurs and managers, but accountants scored lower than managers and entrepreneurs in evaluation and judgment dimension of entrepreneurial alertness. This difference might be attributed to the stagnant nature of their roles. Since they rarely encounter with different tasks and situations in performing their job, they don’t need to distinguish the potential opportunities as profitable and not-so-profitable. But the managers in this sample are as alert as entrepreneurs. The study also revealed that entrepreneurs’ risk preference is higher than expected and accountants’ risk preference is lower than expected. This finding implies that risk taking is an important entrepreneurial concept.

This study has some limitations like other studies. First, a non-probability sampling technique is used, so the findings are not generalizable to a greater population. Future studies should use probability sampling methods to provide generalizability. Second, the original dimensional structure of LNTSP scale is utilized because of the statistical cautions about the ipsative nature of scale. The reliability and validity of the translated LNTSP is not assured in this study, so future studies should evaluate psychometric properties of this scale in detail. Beyond methodological issues, future studies should examine the relationships between thinking style, entrepreneurial alertness and risk preference.

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