

Entrepreneurial alertness: Study of the Influence of Individual Characteristics and Entrepreneurship

Hilka Pelizza Vier Machado[†]

Centro Universitário de Maringá /UNICESUMAR - Universidade do Oeste de Santa Catarina/UNOESC

Valter da Silva Faia^Ω

Universidade Estadual de Maringá - UEM

Juliano Domingues da Silva[¥]

Universidade Estadual de Maringá - UEM

ABSTRACT

This research tried to understand which statistical variables associated to the individual and the company influence the entrepreneurial alertness. The sample was constituted by 180 entrepreneurs. The entrepreneurial alertness was measured in agreement with the model of Tang, Kacmar and Busenitz (2012). Descriptive statistical tests and normality exam were developed; as well as checked the validity and reliability of the scale through Confirmatory Factor Analysis (CFA). In order to identify the factors that influenced the alertness we developed multiple linear regression and the ANOVA test to determine possible differences among groups (gender, education). The results showed the negative influence of the educational level and the size of enterprises on alertness level; as well as the negative relationship between age and entrepreneurial experience, furthermore, shows that alert level is not determined by gender difference. One of the main implications of this research is to present factors that can potentiate the effects of the entrepreneurial alertness, enlarging the possibilities of identification of opportunities for individuals.

Keywords: Entrepreneurial alertness. Opportunities. Businesses creation. Entrepreneurship.

Received on 03/19/2015; Reviewed on 08/01/2015; Accepted on 09/09/2015; Divulgued on 09/05/2016.

**Author for correspondence:*

[†]. Doctorate in Production Engineering.

Link: University Center - CESUMAR/UNICESUMAR & University of Oeste de Santa Catarina - UNOESC

Address: Rua Joaquim Nabuco, 120 CEP 87014-100 Maringá – PR. Brazil. Cep. 87014-100.

E-mail: hilkavier@yahoo.com

^Ω PhD Student and Master in Business Administration.

Link: University State of Maringá - UEM.
Address: Av. Colombo, 5.790, Bloco C23 – Sala 239. Jardim Universitário. Maringá – PR. Brazil. Cep. 87020-900.

E-mail: valterfaia@gmail.com

[¥] PhD Student and Master in Business Administration.

Link: University State of Maringá - UEM.
Address: Av. Colombo, 5.790, Bloco C23 – Sala 239. Jardim Universitário. Maringá – PR. Brazil. Cep. 87020-900.

E-mail: jdomingues8@gmail.com

Note from the Editor: This paper was accepted by Bruno Felix.



This article has a [Creative Commons License - Attribution 3.0 Not Adapted](https://creativecommons.org/licenses/by/3.0/).

1 INTRODUCTION

Opportunities are central elements in the Entrepreneurship field. The origin of the emphasis of opportunities lies in the Austrian School of Economics (FOSS; KLEIN, 2010). The contribution of this school to the theory of opportunity is enriched in Kirzner's studies, in 1973, for whom, profitable opportunities result from the imbalance of prices, quantity and quality.

Kirzner (1997, p. 62) uses the term 'entrepreneurial discovery', which results from the Equilibrium obtained by market participants in the systematic process of seeking knowledge on potential demand attitudes and market supply. For the author, the market is a continuous process of opportunity discovery. Earnings obtained in this process reflect the discovery and exploitation of opportunities that had not been exploited due to lack of entrepreneurial activity. For the Austrian school, competition is central and dynamic, it is the force that drives the discovery, and it is discovery that characterizes the entrepreneurial process. Courage and imagination are attributes that drive the market process, and that the approach of opportunities help us to understand how markets work. The recognition of the importance of studying the opportunities for the field of Entrepreneurship has also been observed in other studies, notably Shane and Venkataraman's (2000), who explained the entrepreneurial process as a link between individuals and opportunities. For these authors, the field's epistemological challenge is to explain by whom and with what effect opportunities that create goods and services are discovered, assessed and exploited by some individuals and not by others.

According to Eckhardt and Shane (2003), the approach to opportunities enables a convergence amongst researchers in the field, as it is a way to coincide on central issues on the discovery, evaluation and exploitation of opportunities. The development of studies in the field has two components: one that advocates the discovery of opportunity, which is associated with the market equilibrium to information (FOSS; KLEIN, 2010), and another which considers that the opportunity can be created and not only discovered (ALVAREZ; BARNEY, 2007). In addition, although entrepreneurs have a clear initial idea about what they want to accomplish – such as the purpose and the type of product or service they want to offer on the market –, they change their objectives and their business models and strategies in response to environmental changes (BARON, 2010).

Studies on entrepreneurial alertness were extended as a result of the importance attached to the study of opportunity in order to understand the entrepreneurial process (HÉBERT, LINK, 2006). Alertness is characterized by a constant state of vigilance in the environment, which allows some individuals to capture market opportunities favored by constant attention (KIRZNER, 1997; VALLIERE, 2013). In this sense, subjective and entrepreneurship factors can influence alertness, and this research sought to identify them. In addition to scientific relevance, research contributes to show elements that can increase the identification of potential business opportunities by individuals.

The objective of the research was to identify factors that influence entrepreneurial alertness, and this article presents the results of the research, which was performed with a group of entrepreneurs composed of men and women.

2 LITERATURE REVIEW

2.1 OPPORTUNITIES AND ENTREPRENEURIAL ALERTNESS

The opportunity may be the result of an accidental discovery or a process developed over time, having been created or discovered (ALVAREZ; BARNEY, 2007) or even stimulated by certain contexts, such as the technological (ZAHRA, 2008). Opportunities can both be recognized and built simultaneously as they are discovered and developed (VAGHELY; JULIEN, 2010). There is a relationship between identifying and recognizing opportunities, creativity and alertness (ARDICHVILI et al., 2003), and alertness influences the discovery and exploitation of opportunities (FAIA, ROSA, MACHADO, 2014; HÉBERT, LINK, 2006).

The origin of the entrepreneur alert concept is attributed to Kirzner (1979 apud TANG; KACMAR; BUSENITZ, 2012, p.78) as being: “[...] a process or a perspective that helps some individuals to be more attentive to changes, opportunities and neglected possibilities”. For Ardichvili, Cardozo and Ray (2003, p.113), alertness is “a propensity to notice and be sensitive to information about objects, incidents, and patterns of behavior in the environment, with special sensitivity to maker and user problems, unmet needs and interests, and novel combinations of resources”.

Alertness is a casual, accidental and unanticipated finding, coupled with the discovery of a business idea, which some authors call ‘eureka’, ‘aha’ or even alert (LUMPKIN; LICHTENSTEIN, 2005; VALLIERE, 2013). For Valliere (2013, p. 436), alertness is “[...]”stimulated to change his conceptualization of subjective reality and thereby to make a new meaning for it.

Creativity influences alert (ARDICHVILI et al., 2003), and it is an unfolding of creative process. This process begins with preparation of the individual, through the accumulation of experiences and by immersion in situations that require decision-making and the development of problems solutions. Concomitantly, new mental associations are processed in the incubation period, and the further away from existing standard models, the greater the tendency of these associations representing something creative (BARON, SHANE, 2007; GIELNIK, KAPPEL, FRESE, 2014). For Gielnik, Kappel and Frese (2014), this is achieved by means of divergent thinking. Thus, creative thinking emanates from the mind and translates to “insights” (GIELNIK, KAPPEL, FRESE, 2014, p. 520), which constitute the essence of alertness.

However, it is dependent on obtaining and evaluating information (GIELNIK, KAPPEL, FRESE, 2014; SHANE, VENKATARAMAN, 2000), as well as the active surveillance to obtain information to ensure the prior acquisition of knowledge (GIELNIK, KAPPEL, FRESE, 2014). Although causality characterizes alertness, it is also dependent on the individual and subjectivity, which intervenes in the discovery process. For the alertness process to occur, the initial idea is subjected to evaluation, which may include a market assessment as well as an exchange of views with other people (GIELNIK, KAPPEL, FRESE, 2014). In this sense, Keh, Foo and Lim (2002) investigated the evaluation of opportunities by entrepreneurs and found that risk perception plays an important role, and that when the level of risk perception is low, it is more likely for the entrepreneur to make a positive assessment of the opportunity. On the other hand, the perception of risk and opportunity assessment is dependent on subjective elements, such as the fear of failure and the vulnerability of the individual (MITCHELL; SHEPHERD, 2010). The expectation of financial return is another important element in the assessment of opportunities, and when it is high it will be positively related to the number of identified opportunities and the positive assessment of the opportunities (SHEPHERD; DE TIENNE, 2005; WELPE et al., 2011). According to Welpe et al. (2011), the expectation of potential financial reward provides motivation for individuals with little knowledge to identify opportunities, but it is little motivation to those who have considerable prior knowledge – prior knowledge is associated with the level of innovation opportunities. Thus, the greater the potential financial reward, the greater the number of identified opportunities, although those opportunities are not necessarily more innovative (SHEPHERD; DE TIENNE, 2005).

Valliere (2013) emphasizes that the mental model of entrepreneurs who have heightened alertness is rich in assigning value creation and is more strongly associated with the internal and external stimuli, since they present ability to deal with unexpected stimuli.

2.2 EXPLANATORY MODELS OF THE ENTREPRENEURIAL ALERTNESS

Valliere (2013) developed an explanatory model of the entrepreneurial alertness that emphasizes the entrepreneurial attention and which consists of a state of alert and of opportunity seeking, through the immersion in a knowledge corridor as well as through the social role of the individual. For this author, there is a link between alertness and attention. The structural factors and cultural norms or “mental frameworks (schemata)” (p. 433) favor a particular situation of attention by individuals, focused on the need to address changes in the environment. But individuals can use different schemes for the same stimulus, and differences will be established from the richness of each one’s schemes, through their own experience. Each individual prepares their own scheme, making use of associations between existing schemes and the present stimulus. Thus, for this model, alertness results from the richness of individual schemes of value creation, mental associations and from the preparation of individual schemes. These, in turn, result from expertise, practice and entrepreneurial intention, respectively.

Another alertness model is that by Tang, Kacmar and Busenitz (2012), for whom alertness results from scanning and search mechanisms, where tacit and explicit knowledge are important. Then, an association or connection between the information obtained and the knowledge application possibilities will be required. While scanning and search are passive, the association is proactive. During this stage, individuals need to manipulate information, excluding redundant information and interpreting them, as well as trying to identify possible associations between accumulated knowledge and new possibilities, however this process requires a mental relaxation state. Tang, Kacmar and Busenitz (2012) consider that the search for information must recursively occur, between association and connection, and ideas and information or additional associations are produced by individuals throughout the process.

According to the model by Tang, Kacmar and Busenitz (2012, p. 79), entrepreneurial alertness covers three dimensions: “[...] scanning and searching for new information, connecting previously-disparate information and evaluating whether the new information represents an opportunity”. The need for evaluation and judgment manifests itself encompassing the attention and judgment of the opportunity by an unrelated person to the

process and evaluation by the person themselves. The evaluated information is then discussed with someone and followed by the individual resuming it, and that allows one to filter the essential information and to make the evaluation if it really denotes a business opportunity and thus, the individual perceives the situation. Judgment allows one to choose between multiple possibilities.

The scale developed by Tang, Kacmar and Busenitz (2012, p. 84) to measure alertness is constituted by three groups of variables: scanning and search, association and connection, and evaluation and judgment. The first group of variables seeks to measure search and scanning and the demand consists of six items: a) interaction with other people for information; b) the search for new business ideas when one has access to information; c) regularly reading news, magazines, publications for new information; d) daily access to the internet; e) avid search for information; f) active and constant attitude in the search for new information. To measure the ability of association and connection, they suggest three indicators: a) identification of association between disconnected pieces of information; b) good ability to ‘connect the dots’; c) vision of information across previously unrelated fields of information. Finally, the measurement of evaluation and judgment unfolds in: a) the ability to recognize potential opportunities; b) the ability to distinguish between profitable and non-profitable opportunities; c) talent and ability to distinguish opportunities for high value and low value; d) the ability to choose the best among multiple opportunities. Table 1 presents a summary of the alertness models discussed above.

Authors	Assumptions	Stages
Valliere (2013)	Alertness and attention	1- Stock and wealth of information and experience; 2- Preparation of individual scheme according to experiences and stimulus; 3- Value creation
Tang, Kacmar and Busenitz (2012)	Scanning and search, association between internal and external knowledge.	1- Information scanning and search; 2- Associations and connections with existing knowledge; 3- Evaluation and judgment by the person and by third parties.

Table 1 - Explanatory models of the entrepreneurial alert

Both explanatory models are similar when recognizing the search and information storage, the association of this information in the creation of entrepreneurial practices and the evaluation of the value creation capacity of opportunities as entrepreneurial alertness dimensions (VALLIERE, 2013; TANG; KACMAR; BUSENITZ, 2012). However, for

purposes of this research we used the scale by Tang, Kacmar and Busenitz (2012), since this study proposes and validates a multidimensional scale to measure the degree of entrepreneurial alertness.

Previous studies have explored the influence of subjective variables on the identification of opportunities. DeTienne and Chandler (2007), for example, found differences in the way of identifying opportunities for men and women. However, González and Husted (2011) found no significant differences for gender regarding the number of identified opportunities and the degree of innovation of such opportunities. For the authors, the negative effects were associated with people with less work experience and not gender. Tang, Kacmar and Busenitz (2012), when developing the entrepreneurial alertness scale, also tested the relationship with gender and found only one significant result among the six tested models. Thus, it is assumed that there are no differences between the entrepreneurial alertness for male and female entrepreneurs:

H₁: There are no differences between the entrepreneurial alertness for male and female entrepreneurs.

In addition to gender, the identification of opportunities is associated with managerial experience and the stock of knowledge, which can be derived from the age of the individual, as noted by Lumpkin and Lichtenstein (2005) and Dimov (2007). Both tacit as codified or formal learning are associated with the identification of opportunities (SMITH; MATTHEWS; SCHENKEL, 2009). That is, individuals with higher managerial experience and greater stock of knowledge are more likely to identify business opportunities. As alertness is directly associated with the identification of opportunities, the hypothesis that forms is that the older the age, the level of education and experience of the individual the greater the alertness variations:

H₂: Entrepreneurial alertness increases according to (a) age, (b) level of education and (c) the experience of the individual

The entrepreneurial experience can influence the identification of opportunities not only on the characteristics of the individual but also on the number of enterprises created and the number of co-managed enterprises (FAIA; ROSA; MACHADO, 2014), which provides experience to the entrepreneur, in addition to expanding their participation in social networks, increasing their stock and wealth of information (VALLIERE, 2013). Ucbasaran, Westhead, Wright (2009) verified the effect of entrepreneurial experience and the number of ventures

created upon the identification of opportunities, and the number of identified opportunities proved to be positively associated with the number of ventures created up to the limit of four projects. Similarly, entrepreneurial alertness can be influenced by the number of enterprises created and the extent of entrepreneurial activity, therefore we have that:

H₃: Entrepreneurial alertness is positively associated with the (a) number of enterprises created and the (b) number of current developments of the entrepreneur.

We also consider that the project size can influence alertness, and the larger the enterprise, the more likely it is to result in a broader view of the market and greater access to information. Cohen and Levinthal (1990) show that the size of companies influences the capacity to innovate and to allocate more resources for research and development. Mas-Tur and Soriano (2014) demonstrated that the business size positively affects the degree of innovation of young innovative companies, and for them, the larger the company the larger the investment capacity to boost innovation tends to be. Thus:

H₄: Entrepreneurial alertness is positively associated with the size of the enterprise.

In the proposed theoretical model (figure 1), we present the relations and directions of the research hypotheses, which were tested empirically. The model suggests a direct relationship between three different dimensions of entrepreneurial activity and the degree of entrepreneurial alertness. First, we expect that the entrepreneurial characteristics interfere with alertness. Second, we suggest that the entrepreneurial experience, measured by the number of ventures initiated and managed simultaneously, will also present a relationship with alertness. Third, we expect that the size of the enterprises currently managed to present a relationship with alertness.

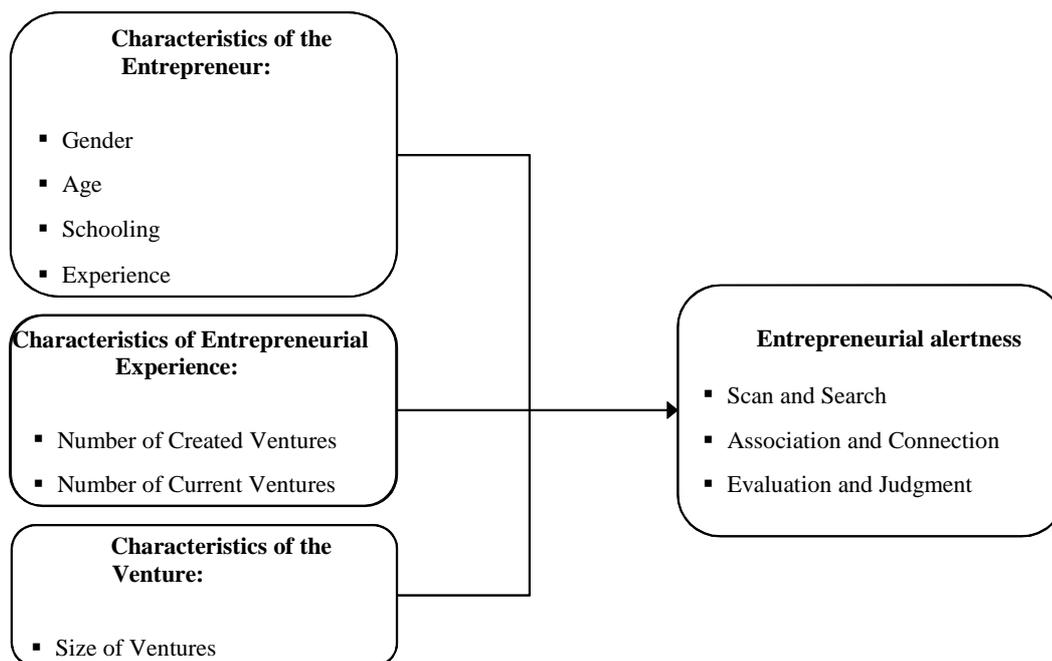


Figure 1 - Proposed theoretical model
Source: Research authors

3 METHODOLOGICAL PROCEDURES

3.1 SAMPLE

This research used a quantitative, cross-sectional approach. The sample was non-probabilistic for convenience, and consists of 199 micro and small entrepreneurs operating in trade and services and are affiliated to Trade Associations of three municipalities in the state of Paraná. To determine the presence of extreme values, we chose to diagnose multivariate outliers according to the Mahalanobis Distance measure (Marôco, 2010). In this stage, 19 respondents were eliminated, so the final sample totaled 180 entrepreneurs. The sample size satisfies the condition for multivariate analysis, which requires at least five respondents for each item (HAIR JUNIOR et al., 2009).

3.2 DATA AND METHOD

The data collection instrument used was a structured questionnaire with questions about the company (number of employees, foundation year); on entrepreneurs (age, gender, schooling, length of entrepreneurial activity time, number of companies already opened) and a scale to measure alertness, developed by Tang, Kacmar and Busenitz (2012), previously validated by Faia, Rosa and Machado (2014). This scale, as mentioned earlier, consists of 13 items divided in three dimensions: scanning and search (six items), association and connection (three) and evaluation and judgment (four). Data collection was carried out through a specific link on the internet, accompanied by an explanation of the research

objectives. To measure the degree of entrepreneurial alert, we used a Likert scale of five points anchored by 1– totally disagree and 5 – totally agree.

The analysis of results occurred through five steps: (a) descriptive statistical tests and examination of normality; (b) verification of the validity and reliability of the scale through Confirmatory Factor Analysis (CFA), since the scale had already been validated in previous studies, and convergent and discriminant validity tests; (c) correlation analysis between variables (Pearson correlation); (d) multiple linear regression to identify the factors influencing alertness; and (e) ANOVA (analysis of variance), to determine whether means differences between groups (e.g. gender, schooling) were significant, and if those groups exert influence on the dependent variable (Alertness). Analyses were performed with the use of software IBM SPSS Statitics 20® and IBM SPSS Amos 20®.

For the items on the alertness scale, we performed the univariate normality analysis obtaining the skewness and kurtosis measures, satisfying the condition to assume the normality of the variables (MARÔCO, 2010). Through these measures, we also obtained the normal distribution of the entrepreneurial alertness degree between the different sample groups (Appendix A). For the ANOVA test, we assume that each group comes from a normal distribution, regardless of the number of observations (FÁVERO et al., 2009).

4 RESULTS PRESENTATION

4.1 SAMPLE CHARACTERIZATION

Table 2 presents a description of the sample. Most entrepreneurs were male (72.2%), having initiated only one venture (67.2%), most with schooling in higher education (67.8%) and had small businesses, according to criterion of number of employees. Most entrepreneurs have only one company; the current number of ventures for 23.9% of participants varied from 2 to 7. The average age of entrepreneurs was 37 years of age, and the average time as an entrepreneur is close to seven and a half years.

Table 2 - Sample Description

Characteristics	Entrepreneurs (n=180)
Gender	
Male	72.2%
Female	27.8%
Education	
Elementary School	1.7%
High School	30.0%
Undergraduate Degree	36.1%
Graduate Degree (Specialization)	28.9%
Master's Degree	2.8%
Not reported	.6%
Number of Initiated Ventures	
Only 1	67.2%
More than 1	32.2%
Not reported	.6%
Number of Current Ventures	
Only 1	76.1%
More than 1	23.9%
Average age (years)*	37.0 (11.7)*
Monthly Family Income (BRL)(R\$)*	15,317.13 (49,167.33)*
Entrepreneurial experience (years)	7.6 (6.9)*
Size of Current Ventures (Func.)	15 (38)*

* Mean (Standard Deviation)

4.2 VALIDITY AND RELIABILITY OF SCALE

Initially, the data obtained by the entrepreneurial alertness scale (TANG; KACMAR; BUSENITZ, 2012) were submitted to normality, validity and reliability tests. The 13 items have maximum values for skewness and kurtosis measures of 1.34 and 1.58, respectively. These measures allow us to assume the normality of the data (MARÔCO, 2010). The confirmatory factor analysis test¹ (CFA) demonstrated that all items have significant factor loadings on their respective size, i.e., they present factor loadings greater than .50, indicating an explanatory power of at least 25%. In addition, the second-order factor analysis also presented significant factor loadings of the dimensions on entrepreneurial alertness, with a minimum value of .63. All the values are listed in Table 3.

¹ Model's Fitting measures: $\chi^2 = 175.27$; $p = .000$; $\chi^2/df = 2.87$; CFI = .91; GFI = .87; TLI = .88; RMSEA = .10; $p = .000$.

Table 3 - Validity and Reliability of Items of the Entrepreneurial Alertness Scale

Dimensions and scale items	Factor loading
Factor Analysis of 1st Order	
<u>Scanning and Search</u>	<u>AVE = .52 / CR = .87</u>
I often interact with others to acquire new information.	.63
I'm always looking at new business ideas when I see some information.	.65
I regularly read news, magazines or publications to get new information.	.58
I surf the Internet every day looking for information.	.69
I am an avid (insatiable), information seeker.	.87
I'm always actively seeking new information.	.87
<u>Association and Connection</u>	<u>AVE = .67 / CR = .86</u>
I see associations between seemingly unrelated information.	.77
I'm good at connecting points (finding opportunities relating seemingly unrelated facts).	.82
I usually see connections between information from various seemingly unconnected fields of knowledge.	.87
<u>Evaluation and Judgment</u>	<u>AVE = .56 / CR = .83</u>
I have an instinct to find opportunities with potential.	.59
I can distinguish between profitable and not so profitable opportunities.	.79
I have a talent for separating high-value opportunities from low-value opportunities.	.79
When I come across several opportunities, I am able to select the good ones.	.79
Factor Analysis of 2nd Order	
<u>Entrepreneurial alertness</u>	<u>AVE = .62 / CR = .83</u>
Scanning and Search	.89
Association and Connection	.82
Evaluation and Judgment	.64

Once the factorial validity of the scale was attested, data were submitted to the convergent and discriminant validity tests. For this purpose, we used Average Variance Extracted (AVE) measure of each dimension, which was compared with the square of the correlation with the other dimensions. All values for AVE were greater than .50, indicating a significant explanatory power of the items on their respective size and of dimensions on the entrepreneurial alertness construct (MARÔCO, 2010). Furthermore, measures for each dimension were superior to the square of the correlation with the other dimensions, indicating that the items have an explanatory power of the dimension higher than the other dimensions of the entrepreneurial alertness scale. As for the reliability of the scale, we used the composite reliability test (CR). All dimensions presented values higher than .80, indicating internal consistency of items to explain the common latent construct (FORNELL; LARCKER, 1981).

4.3 HYPOTHESES TESTS AND CORRELATIONS

Once the validity and reliability of the entrepreneurial alertness scale were obtained, based on factor loadings, the values for the scale were imputed, to thereby proceed with the tests for analysis of results. Initially, we performed the bivariate Pearson correlation test. The results are shown in Table 4. By analyzing the entrepreneurial alertness construct, two relationships presented significant correlation coefficients: the entrepreneur's experience in years and the entrepreneur's age. The former presented a negative and significant relationship with the degree of entrepreneurial alertness ($r = -.28$; $p < .01$), i.e., the longer the individual's time as the front man of the enterprise, the lower their degree of entrepreneurial alertness will be. The latter also presented a negative and significant correlation degree with the entrepreneurial alertness degree ($r = -.37$; $p < .01$). The higher the age, the lower the degree of alertness. The number of created ventures (No of initiated ventures), the size of ventures (Size), the number of ventures managed simultaneously (No of current ventures) and the family's income (Income) did not present significant correlations with entrepreneurial alertness.

Table 4 – Mean, Standard Deviation and Correlation Coefficient Between the Variables

Variable	M	SD	1	2	3	4	5	6	7	8	9
1 No of current ventures	1.31	.88	1								
2 Experience	7.40	6.70	.03	1							
3 Size	14.00	36.00	-.05	.16*	1						
4 No of initiated ventures	1.74	2.22	.01	.13	.47**	1					
5 Age	37.60	11.50	.05	.55**	-.06	.01	1				
6 Scan and Search	3.79	.85	-.06	-.18**	.06	-.07	-.24**	1			
7 Association and Connection	3.14	.86	.01	-.24**	.08	-.02	-.35**	.67**	1		
8 Evaluation and Judgment	3.29	.66	-.05	-.01	.06	.03	-.04	.68**	.50**	1	
9 Alert	4.30	.90	-.06	-.18**	.07	-.05	-.25**	.98**	.75**	.76**	1

Note: M = Mean; SD = Standard Deviation; ** $p < .01$. * $p < .05$ (two-tailed)

To meet the objective of this study and for a more robust analysis, data were subjected to multiple linear regression tests. Four models were created, each one containing as dependent variable the three dimensions of entrepreneurial dimension (scanning and search, association and connection and evaluation and judgment) and the actual second-order entrepreneurial alertness. As independent variables, we inserted the number of created ventures, entrepreneurial experience, size of ventures, number of

current ventures, age, gender, schooling and monthly family income. The results are described on Table 5.

Table 5 - Entrepreneurial Alertness Regression Analysis

Variable	Entrepreneurial Alertness		Scan and Search		Association and Connection		Evaluation and Judgment	
	Beta (β)	p-value	Beta (β)	p-value	Beta (β)	p-value	Beta (β)	p-value
H ₁ Gender	-.13	.08†	-.13	.07†	-.13	.08†	-.05	.56
H _{2a} Age	-.24	.01**	-.21	.03*	-.28	.00**	-.10	.34
H _{2b} Schooling	.13	.10†	.18	.02*	.04	.59	.07	.42
H _{2c} Experience	-.16	.07†	-.16	.07†	-.18	.04*	.00	.97
H _{3a} No of initiated ventures	-.05	.51	-.08	.30	.00	.97	-.03	.74
H _{3b} No of current ventures	-.12	.15	-.14	.09†	-.10	.24	-.01	.88
H ₄ Size	.15	.08†	.15	.08†	.14	.10†	.09	.35
Income	-.09	.22	-.09	.22	-.07	.33	-.08	.35
R ²	.21		.22		.22		.03	
R ² adjusted	.17		.18		.18		.00	

Beta (β) = Standardized regression coefficients. N = 180. ** p <.01; * p <.05; † p <.10

For hypothesis 1, which assumes that there are no differences in entrepreneurial alert levels between male and female entrepreneurs, results from model 1, demonstrate that gender has a significant relationship with the alertness level only at the 90% level of confidence ($\beta = -.13$; $p < .10$). However, the variance analysis test indicated no significant difference between the averages of the two groups ($F_{1,178} = 2.19$; $p > .05$). Thus, as the regression coefficient did not present significance and there is no significant difference between the groups means, **hypothesis H₁ was corroborated**. The results are presented in similar ways in models 2, 3 and 4, in which neither did we find significant mean differences between groups for the alertness dimensions.

For hypothesis H₂, we examined the relationship between age, level of schooling and experience with entrepreneurial alert. In model 1, for hypothesis H_{2a}, which analyzes the relationship between age and the degree of entrepreneurial alertness, we identified a significant negative association ($\beta = -.24$; $p < .01$). This demonstrates that the older the individual, the lower the entrepreneur alertness level; thus, **hypothesis H_{2a} was corroborated**.

Furthermore, additional analyzes were performed to examine the relationship between age and the entrepreneurial alertness dimensions. In model 2, which aimed to predict the

degree of scanning and search of the entrepreneur for new opportunities, the age of the individual presented significant explanatory power at the 95% level of confidence. The results also indicate a negative relationship between the age of the entrepreneur and their ability to identify new opportunities through alertness ($\beta = -.21$; $p < .05$).

In model 3, concerning the entrepreneur's ability to associate and connect previous and new information, the results also indicate a negative relationship with age ($\beta = -.28$; $p < .01$). This negative association was not found only in relation to the ability of the entrepreneur to evaluate and judge the opportunities (model 4).

For hypothesis H_{2b}, which analyzes the relationship between the individual's level of schooling and the degree of entrepreneurial alertness, in model 1, we identified a positive relation ($\beta = .13$; $p < .10$). The analysis of variance indicated there is a significant difference between the means of alertness for each level of schooling of the entrepreneur ($F_{4,174} = 3.12$; $p < .05$)², indicating that the alert level increases with the level of schooling. Thus, **hypothesis H_{2b} was corroborated.**

For the additional analysis of the hypothesis H_{2b}, in model 2, we verified the association between schooling and the degree of scanning and search of the entrepreneur for new opportunities. The results indicate that the higher the level of schooling, the greater the ability to search for new opportunities through alertness ($\beta = -.18$; $p < .05$), except at Masters level. This finding was made possible through the analysis of the variance test ($F_{4,174} = 3.89$; $p < .01$)³. The association of schooling with the dimensions of association and connection ($\beta = .07$; *n.s.*) were not significant, and presented direction as proposed in the hypothesis.

For hypothesis H_{2c}, which seeks to predict the association between the entrepreneur's experience and the level of alertness, in model 1, we verify that the entrepreneur's experience in terms of years presented a negative relation ($\beta = -.16$; $p < .10$) with entrepreneurial alertness. The result indicates that entrepreneurs with more experience have less entrepreneurial alertness. Similarly, in models 2 and 3, the individual's entrepreneurial experience in years also appeared as a negative predictor with the ability of scanning and search ($\beta = -.16$; $p < .10$) and with the ability of

²Scheffe's *post hoc* test did not show significant differences at the 95% level between the groups of analysis in pairs.

³Scheffe's *post hoc* test showed significant differences at the 95% level only between the groups high school ($M = 3.67$) and specialization ($M = 4.17$).

association and connection ($\beta = -.18$; $p < .05$). In model 4, this relation presented no significant result. Thus, **hypothesis H_{2c} was not confirmed**.

In hypothesis H₃, we seek to demonstrate that the entrepreneurial alertness is positively associated with the number of ventures created by the individual and the extent of entrepreneurial activity. In hypothesis H_{3a}, which examines the relationship between the number of created ventures and alertness (model 1), we note a negative relationship, although not significant ($\beta = -.05$; *n.s.*). Thus, **hypothesis H_{3a} was not confirmed**. In the additional analysis, neither did we find significant associations between the dimensions of the entrepreneurial alertness and numbers of new enterprises. For hypothesis H_{3b}, which analyzes the relationship between the amplitude as an entrepreneur and the level of alertness (model 1), also identifies a negative relationship, although not significant ($\beta = -.12$; *n.s.*). Therefore, **hypothesis H_{3b} was not confirmed**. However, on further analysis, in model 2, there was a negative association between the amplitude and the degree of scanning and searching of the entrepreneur ($\beta = -.14$; $p < .10$). For the alertness dimensions related to association and connection ($\beta = -.10$; *n.s.*) and evaluation and judgment ($\beta = -.01$; *n.s.*), the amplitude as an entrepreneur presented no significant coefficients.

For hypothesis H₄, in model 1, which implies a positive association between entrepreneurial alertness and size of the enterprise, we note that the size of current ventures has a positive influence on the degree of entrepreneurial alertness ($\beta = .15$; $p < .10$). However, since the coefficient has no significance at the 95% level of confidence, **hypothesis H₄ was not corroborated**. In additional analyzes, the results are similar. In model 2, we note that the degree of scanning and search showed a significant relationship to the size of the enterprise ($\beta = .15$; $p < .10$). In model 3, we find a similar coefficient ($\beta = .14$; $p < .10$), and in model 4 we find a non-significant coefficient ($\beta = .09$; *n.s.*).

As noted in the regression analysis, the variables in model 4 did not present significant results for predicting the ability of the entrepreneur to evaluate and judge the opportunities found.

5 ANALYSIS OF RESULTS

As for the factors that influence the alert, which confirm findings by González and Husted (2011) and Tang, Kacmar and Busenitz (2012), the results showed that the level of alertness is independent of the gender of the entrepreneur. Dahalan, Jaafar and Rosdi (2013), in a research with Malaysian entrepreneurs, supported the hypothesis that there is

a significant difference between men and women in the search for business opportunities, and men are more active in discovering new opportunities, however the justification of the authors to this result is given due to the social and cultural norms specific to the place. In contrast, Maes, Leroy and Sels (2014) demonstrate that social norms have no effect on entrepreneurial intentions, and the effect of social influence, they say, occur indirectly, via perception of locus of control and personal attitude. Therefore, in line with the findings by González and Husted (2011), it is evident that gender does not influence entrepreneurial alertness.

Age was negatively correlated with alertness, as well as the sub constructs associated with it. Thus, it is possible that as they get older entrepreneurs start to use other mechanisms to identify opportunities, as mentioned previously. A possible explanation for this result may be linked to the fact that the cognitive ability of the individual to capture and evaluate a situation and the way one processes the mapping of environmental changes (VALLIERE, 2013) is related to other contextual factors. When the three dimensions of the construct are analyzed separately, once again we observed the negative relationship between age and scanning and search and between age, association and connection (VALLIERE, 2013; FAIA, ROSA, MACHADO, 2014).

As for the entrepreneur's level of schooling, the results show a positive relationship between schooling and alertness, and the higher the schooling, the higher the entrepreneurial alertness. Thus, just as the relationship of formal training with the identification of opportunities, previously indicated by Smith, Matthew, Schenkel (2009), study showed that formal learning – expressed by level of schooling – positively influenced entrepreneurial alertness. For the dimensions scanning and search, schooling presented a positive correlation up to the level of specialization, but negative for Masters level. No correlation was identified in the dimension of evaluation and judgment, indicating the possible influence of other factors – other than the ones here analyzed –, as the fear of failure, previously identified by Mitchell and Shepherd (2010).

The research results also show that entrepreneurs' experience is negatively related to alertness. Thus, the higher the experience of individuals, expressed as in the length of time of experience as an entrepreneur, it is more likely that other mechanisms influence the identification of opportunities other than alertness, but heuristic analysis, as observed by Vaghely and Julien (2010). Experience in terms of number of ventures also presented negative association and it can be explained by the absence of entrepreneurial intention

in that entrepreneurs would be satisfied with one venture and would not want to open other businesses. Entrepreneurial experience showed itself negatively correlated with the dimension association and connection. Regarding the characteristics of entrepreneurial experience and development, the results of this study demonstrate that the number of initiated ventures and the number of current ventures of the entrepreneur have a negative relationship with alertness, although not significant. This finding may be explained by the possible little interest of the entrepreneur in seeking new opportunities, due to the time and effort spent managing the current venture. As for the size of the venture, a positive relationship with entrepreneurial alertness is observed. Possibly, this relation is due to major ventures favoring alertness by the number of contacts and the greater market reach, which confirm the findings by Mas-Tur and Soriano (2014).

Finally, we emphasize that the use of the scale developed by Tang, Kacmar and Busenitz (2012) proved to be effective in measuring alertness, although the tool has some limitations, one of which refers to the absence of questions about the fear of failure. Individuals who have had previous experiences of failure in business reacted negatively to the alert, as shown by Ucbasaran, Westhead and Wright (2009), and thus fear of failure could be inserted in the dimension evaluation and judgment, which comprises the said scale. In addition, the scale does not measure important dimensions on alertness, as the perception of risk and uncertainty, for when uncertainty is greater development becomes more favorable, and not the discovery of opportunities (SANZ-VELASCO, 2006; SARASVATHY, 2008). But when demand and supply are uncertain, the scenario favors creation, not the discovery of opportunities (SHORT ET AL., 2010).

6 FINAL CONSIDERATIONS

This research corroborates the validity of the entrepreneurial alertness measurement scale, developed by Tang, Kacmar and Busenitz (2012), previously validated by Faia, Rosa and Machado (2014). The analyzes reinforce the explanatory power of all the construct dimensions, that is: scanning and search; association and connection; evaluation and judgment to assess entrepreneurial alertness.

The factors identified as the ones that positively influence entrepreneurial alertness were the level of schooling and the size of the company. Age and entrepreneurial experience were negative factors associated with entrepreneurial alertness showing that expert entrepreneurs are guided by methods other than scanning and search for information. Even so, alertness is important for those who want intend to act as

entrepreneurs, although they can be developed and improved, as suggested by Tang, Kacmar and Busenitz (2012).

The research showed the importance of the study by expert entrepreneurs, in that they use other ways to identify business opportunities, other than entrepreneurial alertness. In addition, we demonstrate that alertness is not determined by gender differences.

One of the limitations of this research is the nature of the sample, by covering only entrepreneurs working in the trading or service business. Therefore, future studies may broaden the focus of research, including industry entrepreneurs. It is important to note that most entrepreneurs participating in the survey were from small businesses, and has been in the market on average, for seven and a half years. Comparisons to medium and large companies and enterprises with longer periods of market activity may point out different results, enriching the theoretical contribution.

Finally, it is important to note that for alertness to turn into business it is necessary to consider that the individual's ability in alertness or signals depends on their ability to build and rebuild the information and to make judgments quickly before the window of opportunity closes. The window of opportunity, according to Tang, Kacmar and Busenitz (2012) refers to the length of time of the information transfer to others. The window can be longer when there are limiting mechanisms of imitation (such as secrets, patents) or shorter if there is no limit to imitation. The opportunity lasts for a given time, and this duration is dependent on the necessity of investment required, the number of companies or individuals who perceive it and on the dynamics of events in the environment (TRZCIELINSKI; TRZCIELINSKI, 2011), and is directly associated with alertness, which can be learned and improved. It is dependent on the imagination and helps individuals to pay more attention to changes (TANG; KACMAR; BUSENITZ, 2012).

CONTRIBUTIONS BY THE AUTHORS

The article entitled entrepreneur Alert: study of the influence of individual characteristics and development, to be published in volume 13, number 5 of this magazine, is the result of research outlined jointly by all authors. Data collection was performed by the authors Valter da Silva Faia and Juliano Domingues da Silva. Data processing was discussed jointly by the three authors and statistical tests were performed by the authors Valter da Silva Faia and Juliano Domingues da Silva. The data were analyzed jointly by the authors, as well as the final draft of the article.

REFERENCES

- ALVAREZ, S.; BARNEY, J. Discovery and creation: alternative theories of entrepreneurial action. **Strategic Entrepreneurship Journal**, Oxford, v. 1, n. 1-2, p. 11-26, 2007.
- ARDICHVILI, A.; CARDOZO, R.; RAY, S. A theory of entrepreneurial opportunity identification and development. **Journal of Business Venturing**, London, v. 18, n. 1, p. 105-123, 2003.
- BARON, R. Opportunity recognition: evolving theoretical perspectives. In: LANDSTRÖM, H.; LOHRKE, F. **Historical foundations of entrepreneurship research**. Great Britain: Edward Elgar, 2010. p. 121-141.
- BARON, R.; SHANE, S. **Empreendedorismo: uma visão do processo**. São Paulo: Thomson Learning, 2007.
- CHA, M.; BAE, Z. The entrepreneurial journey: from entrepreneurial intent to opportunity realization. **Journal of High Technology Management Research**, London, v. 21, n. 1, p. 31-42, 2010.
- CHIASSON, M.; SAUNDERS, C. Reconciling diverse approaches to opportunity research using the structuration theory, **Journal of Business Venturing**, v. 20, n. 6, p. 747-767, 2005.
- COHEN, Wesley M.; LEVINTHAL, Daniel A. Absorptive capacity: a new perspective on learning and innovation. **Administrative Science Quarterly**, p. 128-152, 1990.
- CORBETT, A. C. Experiential learning within the process of opportunity identification and exploitation. **Entrepreneurship Theory and Practice**, Chicago, v. 29, n. 4, p. 473-492, 2005.
- CORNER, P. D.; HO, M. How opportunities develop in social entrepreneurship. **Entrepreneurship Theory and Practice**, Chicago, v. 34, n. 4, p. 635-658, July, 2010.
- DAHALAN, N.; JAAFAR, M.; ROSDI, S. A. Local community readiness in entrepreneurship: do gender differ in searching business opportunity. **Procedia-Social and Behavioral Sciences**, v. 91, p. 403-410, 2013.
- DETIENNE, D. R.; CHANDLER, G. N. The role of gender in opportunity identification. **Entrepreneurship Theory and Practice**, v. 31, n. 3, p. 365-386, 2007.
- DEW, N. et al. Effectual versus predictive logics in entrepreneurial decision-making: Differences between experts and novices. **Journal of Business Venturing**, London, v. 24, n. 4, p. 287-309, 2009.
- DIMOV, D. From opportunity insight to opportunity intention: the importance of person-situation learning match. **Entrepreneurship Theory & Practice**. v. 31, n. 4, p. 561-583, 2007.
- ECKHARDT, J. T., SHANE, S. A. Opportunities and entrepreneurship. **Journal of Management**, London, v. 29, n. 3, p. 333-349, 2003.

FÁVERO, L. P. et al. **Análise de dados**: modelagem multivariada para tomada de decisões. Rio de Janeiro: Elsevier, 2009.

FAIA, V. S.; ROSA, M. A.; MACHADO, H. V. Alerta empreendedor e as abordagens *causation e effectuation* sobre empreendedorismo. **Revista de Administração Contemporânea - RAC**, 18, 2, p. 196-216, 2014.

FORNELL, C.; LARCKER, D. F. Evaluating structural equation models with unobservable variables and measurement error. **Journal of Marketing Research**, v. 18, n. 1, p.39-50, 1981.

FOSS, N. J.; KLEIN, P. G. Entrepreneurial alertness and opportunity discovery: origins, attributes, critique. In: LANDSTRÖM, H.; LOHRKE, F. **Historical foundations of entrepreneurship research**. Great Britain: Edward Elgar. 2010. p. 98-121.

GAGLIO, C. M. The role of mental simulations and counterfactual thinking in the opportunity identification process. **Entrepreneurship Theory and Practice**, Chicago, v. 28, n. 6, p. 533-552, 2004.

GIELNIK, M.M. et al. Antecedents of business opportunity identification and innovation: investigating the interplay of information processing and information acquisition. **Applied Psychology**, 63, 2, p. 344-381, 2014.

GONZÁLEZ, D. M.; HUSTED, B. W. Gender, human capital, and opportunity identification in Mexico. **International Journal of Gender and Entrepreneurship**, v. 3, n. 3, p. 236-253, 2011.

GRÉGOIRE, D.; BARR, P. S.; SHEPHERD, D. A. Cognitive processes of opportunity recognition: the role of structural alignment. **Organization Science**, Hanover, v. 21, n. 2, p. 413-431, 2010.

GRICHNIK, D.; SMEJA, A.; WELPE, I. The importance of being emotional: who do emotions affect entrepreneurial opportunity evaluation and exploitation? **Journal of Economics Behavior & Organization**. London, v. 76, n. 1, p. 15-29, 2010.

HANSEN, D.J., LUMPLIN, G.T., HILLS, G.E. A multidimensional examination of a creativity-based opportunity recognition model. **International Journal of Entrepreneurial Behaviour & Research**, v. 7, n. 5, p. 515-533, 2011.

HAIR JUNIOR, J. F. et al. **Análise multivariada de dados**. 6. ed. Porto Alegre: Bookman, 2009.

JULIEN, P. A. **Empreendedorismo regional**. São Paulo: Saraiva, 2010.

KEH, H. T.; FOO, M. D.; LIM, B. C. Opportunity evaluation under risky conditions: the cognitive processes of entrepreneurs. **Entrepreneurship Theory and Practice**, Chicago, v. 27, n. 2, p. 125-148, winter 2002.

KIRZNER, I. Entrepreneurial discovery and the competitive market process: an Austrian approach. **Journal of Economic Literature**. v. 35, p. 60-85, mar. 1997.

- LUMPKIN, G.T.; LICHTENSTEIN, B. B. The role of organizational learning in the opportunity-recognition process. **Entrepreneurship Theory & Practice**, Chicago, v. 29, n. 4, p. 451-472, 2005.
- MAES, J.; LEROY, H.; SELS, L. Gender differences in entrepreneurial intentions: a TPB multi-group analysis at factor and indicator level. **European Management Journal**, v. 32, n. 5, p. 784-794, 2014.
- MARÔCO, J. **Análise de equações estruturais: fundamentos teóricos, software & aplicações**. Pêro Pinheiro: Report Number, 2010.
- MAS-TUR, A.; SORIANO, D. R. The level of innovation among young innovative companies: the impacts of knowledge-intensive services use, firm characteristics and the entrepreneur attributes. **Service Business**, v. 8, n. 1, p. 51-63, 2014.
- MITCHELL, J. R.; SHEPHERD, D. A. To thine own self be true: images of self, images of opportunity, and entrepreneurial action. **Journal of Business Venturing**, London, v. 25, n. 1, p. 138-154, 2010.
- MOLE, K.; MOLE, M. Entrepreneurship as the structuration of individual and opportunity: A response using a critical realist perspective. **Journal of Business Venturing**, London, v. 25, n. 2, p. 230-237, 2010.
- MURPHY, P. A 2 x 2 conceptual foundation for entrepreneurial discovery theory. **Entrepreneurship Theory and Practice**, Chicago, v. 35, n. 2, p. 359-374, mar. 2011.
- SANZ-VELASCO, S. A. Opportunity development as a learning process for entrepreneurs. **International Journal of Entrepreneurship Behavior & Research**, v. 12, n. 5, p. 251-271, 2006.
- SARASON, Y.; DEAN, T.; DILLARD, J. Entrepreneurship as the nexus of individual and opportunity: a restructuring view. **Journal of Business Venturing**, London, v. 21, n. 3, p. 286-305, May 2006.
- SARASVATHY, S. D. **Effectuation elements of entrepreneurial expertise**. New horizons in entrepreneurship. Northampton: Edward Elgar, 2008.
- SHANE, S.; VENKATARAMAN, S. The promise of Entrepreneurship as a field of research. **Academy Management Review**, New York, v. 25, p. 217-226, 2000.
- SHEPHERD, D.; DETIENNE, D. R. Prior knowledge, potential financial reward, and opportunity identification. **Entrepreneurship Theory and Practice**, Chicago, v. 29, n. 1, p. 91-110, 2005.
- SHORT, J. C. et al. The concept of 'opportunity' in entrepreneurship research: past accomplishments and future challenges. **Journal of Management**, London, v. 36, n. 1, p. 40-65, 2010.
- SMITH, B. R., MATTHEWS, C. H., SCHENKEL, M. T. Differences in entrepreneurial opportunities: the role of tacitness and codification in opportunity identification. **Journal of Small Business Management**, v. 47, n. 1 p. 38-57, 2009.

TANG, J.; KACMAR, M. K.; BUSENITZ, L. Entrepreneurial alertness in the pursuit of new opportunities. **Journal of Business Venturing**, London, v. 27, n. 1, p. 77-94, 2012.

TRZCIELINSKI, S.; TRZCIELINSKA, J. Some elements of theory of opportunities. **Human Factors and Ergonomics in Manufacturing & Service Industries**, Chichester, v. 21, n. 2, p. 123-131, 2011.

UCBASARAN, D.; WESTHEAD, P.; WRIGHT, M. The extent and nature of opportunity identification by experienced entrepreneurs. **Journal of Business Venturing**, London, v. 24, n. 2, p. 99-115, 2009.

VAGHELY, I. P.; JULIEN, P. Are opportunities recognized or constructed? an information perspective on entrepreneurial opportunity identification. **Journal of Business Venturing**, London, v. 25, p. 73-86, 2010.

VALLIERE, D. Towards a schematic theory of entrepreneurial alertness. **Journal of Business Venturing**, London, v. 28, p. 430-442, 2013.

WELPE, I. M. et al. Emotions and opportunities: the interplay of opportunity evaluation, fear, joy, and anger as antecedent of entrepreneurial exploitation. **Entrepreneurship Theory and Practice**, Chicago, v. 36, n. 1, p. 69-96, Jan. 2011.

WOOD, M. S.; MCKINLEY, W. The production of entrepreneurial opportunity: a constructivist perspective. **Strategic Entrepreneurship Journal**, United Kingdom, v. 4, n. 1, p. 66-84, 2010.

ZAHRA, S. A. The virtuous cycle of discovery and creation of entrepreneurial opportunities. **Strategic Entrepreneurship Journal**, United Kingdom, v. 2, n. 3, p. 243-257, 2008.

APPENDIX A

Distribution measures of the degree of entrepreneurial alertness on sample groups

	Entrepreneurial Alertness	Standard Deviation	Asymmetry (<i>sk</i>)	kurtosis (<i>ku</i>)
Gender				
Male	4.52	.86	-.73	.27
Female	4.30	1.00	-.97	.48
Schooling				
Elementary School	3.33	1.37	-1.73	-
High School	4.23	.92	-.50	-.30
Undergraduate Degree	4.50	.93	-.82	.40
Graduate Degree (Specialization)	4.68	.77	-1.18	2.34
Master's Degree	4.78	.65	-1.34	1.59
Number of Initiated Ventures				
Only 1	4.50	.97	-1.00	.64
More than 1	4.35	.75	-.34	-.53
Not reported				
Number of Current Ventures				
Only 1	4.45	.94	-.91	.54
More than 1	4.48	.81	-.50	-.12